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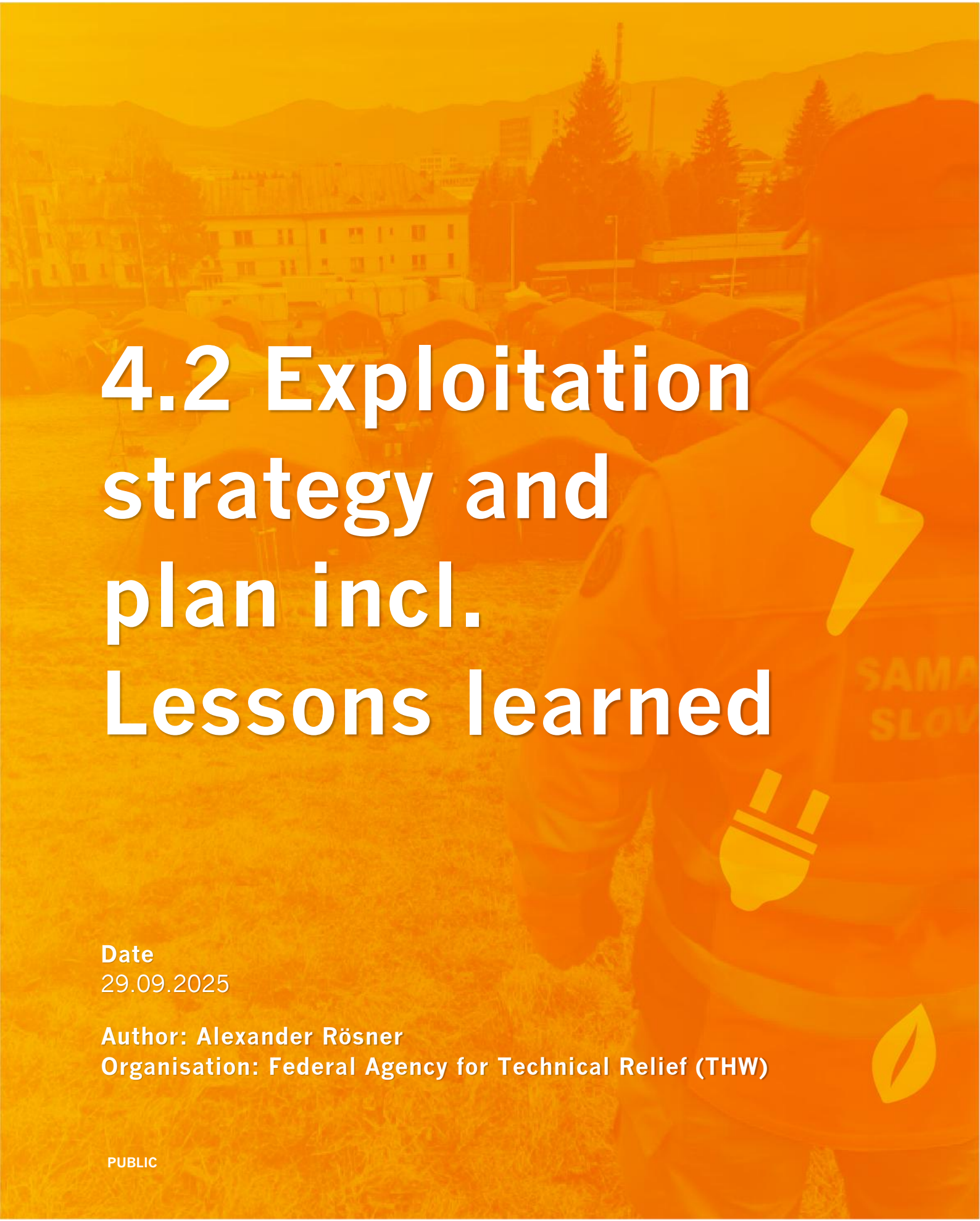

4.2 Exploitation strategy and plan incl. Lessons learned

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D4.2 Exploitation Strategy and Plan incl. lessons learned

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About the document

The Exploitation Strategy and Plan incl. Lessons learned provides an overview of the project´s results and lessons learned, exploitation routes, with special emphasis on the route towards innovation procurement, and activities to support the exploitation. It further presents a strategy on how to make optimal use of them and describes how stakeholder benefit from the project.

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Dissemination level

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SEN	Sensitive, limited under the conditions of the Grant Agreement	
CL	Classified information under the Commission Decision No2015/444	

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[1] 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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Abbreviations

BoO	Base of Operation
CERIS	Community for European Research and Innovation for Security
CMINE	Crisis Management Innovation Network Europe
CSA	Coordination and Support Action
ES	Emergency Shelter
IFAFRI	International Forum to Advance First Responder Innovation
OMC	Open Market Consultation
PAB	Policy Advisory Board
PCP	Pre-Commercial Procurement
PPI	Public Procurement of Innovative Solutions
REA	European Research Executive Agency
rescEU	strategic reserve of European disaster response
SME	Small- and Medium-Sized Enterprises
SOTA	State-of-the-Art
WP	Work Package

Consortium of Partners

THW	BUNDESANSTALT TECHNISCHES HILFSWERK, Germany
AutRC	OSTERREICHISCHES ROTES KREUZ, Austria
MSB	MYNDIGHETEN FOR SAMHALLSSKYDD OCH BEREDSKAP, Sweden
MoIF	MINISTERE DE L'INTERIEUR, France
CNVVF	MINISTERO DELL'INTERNO, Italy
HCSOM	MAGYAR MALTAI SZERETETSZOLGALAT EGYESULET, Hungary
ASSR	ASOCIACIA SAMARITANOV SLOVENSKEJ REPUBLIKY, Slovakia
GB	OPENBAAR LICHAAM GEZAMENLIJKE BRANDWEER
FhG	FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV, Germany
KEMEA	KENTRO MELETON ASFALEIAS, Greece
VIEIRA	VIEIRA PROCUREMENT LEGAL SERVICES, Portugal
PNO (fka ARTTIC)	PNO INNOVATION GMBH, Germany

Executive summary

The **Exploitation Strategy and Plan incl. Lessons learned** provides an overview of the project´s results and lessons learned, exploitation routes, with **special emphasis on the route towards innovation procurement**, and activities to support the exploitation. It further presents a strategy on how to make optimal use of them and describes how stakeholder benefit from the project. The eight key exploitation results are:

1. Scenario-based use cases for requirements analysis and future technology assessments
2. A questionnaire to assess functional and performance requirements within the emergency response organisations
3. A catalogue of functional and performance requirements per emergency response organisation for low emission power supply in Bases of Operations (BoO) and Emergency Shelters (ES) validated throughout the POWERBASE end-user network
4. A catalogue 12 commercially of the shelf and 21 emerging technologies including a patent and publication dynamics analysis resulting in a list of key suppliers for each technology
5. A compilation of capability gaps and future trends
6. A procurement strategy, including a business case, a cost analysis and preliminary PCP tender documents
7. A pan-European network of 32+ emergency response organisations and 25+ suppliers formed through workshops, technology showcases, fair attendance, and the OMC
8. Reusable training resources on PCP and PPI for emergency response organisations and public buyers

These POWERBASE project results shall be used for further research, to optimise ongoing decision-making and procurement processes of the partners´ procurement departments as well as to prepare for follow-up projects for innovation procurement of mobile, permanent power supply solutions with low to no emissions.

1. Introduction

POWERBASE (Low-Emission Power Supply for Emergency Shelters and Bases of Operations) is a Horizon Europe Coordination and Support Action (CSA) that aims to prepare the ground for the future procurement of innovative, renewable, mobile, and low-emission energy solutions tailored to the needs of emergency response organisations. During disasters (from natural or man-made hazards), access to clean, reliable, and self-sufficient energy is critical for operating Bases of Operations (BoO) and Emergency Shelters (ES). Currently, diesel generators dominate this space, despite their environmental and fossil fuel dependency drawbacks. The project uses a capability-driven approach to define real operational needs in diverse emergency scenarios, conduct a comprehensive State-of-the-Art (SOTA) analysis of renewable energy technologies, engage with suppliers and stakeholders through an Open Market Consultation (OMC), and develop a procurement strategy and tendering framework for a future Pre-Commercial Procurement (PCP) of innovative energy solutions. Therefore, the POWERBASE approach is very well aligned with the European Assistance for Innovation Procurement (EAFIP) toolkit to ensure that end-user needs —instead of technology— guide the innovation and procurement process. The aim of the POWERBASE project is to provide open access to results to the greatest extent that is possible, and to enhance sustainability by applying the FAIR principles. At the same time, the project will take steps to protect results to the extent necessary for successful exploitation.

POWERBASE has four primary objectives:

1. **Needs Identification (Work package (WP) 2):**
    - Definition of three master scenarios and six sub-scenarios (e.g. wildfire on a Mediterranean island, winter floods in Central Europe, earthquake in the Himalayas) with respective emergency response missions.
    - Collect and describe unmet power supply needs of emergency response organisations in operational contexts.
    - Identify and validate common functional and operational requirements for renewable energy supply.
2. **Technology Landscape Analysis (WP2):**
    - Perform a SOTA analysis of commercially off the shelf and emerging renewable energy technologies (Technical Readiness Level: 4 – 8) across multiple sectors and evaluate their relevance to replace diesel generators.
    - Identify existing solution suppliers.
    - Identify capability gaps and future trends in mobile renewable energy.
3. **Innovation Procurement Preparation (WP3):**
    - Implementation of training sessions for public buyers
    - Develop a comprehensive procurement strategy including business case, cost analysis, and preliminary tender documents.
    - Conduct an OMC with renewable energy solution suppliers.
    - Prepare for a future Pre-Commercial Procurement (PCP) including Intellectual Property Rights (IPR) compliance.
4. **Stakeholder Engagement & Awareness (WP4):**
    - Build a European community of emergency response organisations (32+) and renewable energy solution suppliers (15+).
    - Communicate POWERBASE work and results widely via workshops, events, technology showcases, and policy dialogues and engage cross-sectoral networks (e.g., CMINE, IFAFRI, CERIS)
    - Implement a broad communication strategy via events, social media, publications, and clustering activities.
    - Disseminate findings to drive adoption and innovation uptake across sectors.

POWERBASE will contribute to the transition from fossil-fuel-based to low emission power supply for BoO and ES, supporting the EU Green Deal target of a 55 % reduction in greenhouse

gas emission by 2030 compared to 1990. The transition will improve the living and working conditions for emergency responders and displaced persons by reducing noise, heat and greenhouse gas emissions. While using the tools and frameworks of innovation procurement, EU public procurers strengthen their capacities and increase their knowledge in cross-border innovation procurement. Finally, POWERBASE fosters the cross-sectoral uptake of mobile renewable energy technologies in sectors like disaster management, humanitarian aid, defence, and critical infrastructure.

A successful POWERBASE impact can only be achieved through a multi-disciplinary project consortium. The consortium includes twelve partners from ten European countries, composed of i) emergency response organisations or their representative (end-users), ii) academic organisations and iii) consultancies.

Emergency Response Organisations:

1. Federal Agency for Technical Relief (**THW**, Germany); POWERBASE coordinator; Expertise: technical and humanitarian assistance and large-scale emergency response operations
2. Austrian Red Cross (**AutRC**, Austria); task leader: leads the identification of common functional and performance requirements; Expertise: technical and humanitarian assistance and large-scale emergency response operations
3. Swedish Civil Contingencies Agency (**MSB**, Sweden); partner: contributes to scenario definition and unmet needs identification; Expertise: ES deployment e.g. due to the rescEU project and international humanitarian operations
4. French Ministry of the Interior (**MoI-F, France**) supported by the affiliated entity CIVIPOL; partner: contributes to scenario definition and unmet needs identification and share innovation procurement experience; Expertise: technical and humanitarian assistance and large-scale emergency response operations
5. Italian National Fire and Rescue Service (**CNVVF**, Italy); partner: contributes to scenario definition and unmet needs identification; Expertise: Firefighting and technical assistance
6. Hungarian Charity Service of the Order of Malta (**HCSOM**, Hungary); partner: contributes to scenario definition and unmet needs identification; Expertise: ESs and humanitarian aid missions
7. Association of Samaritans of the Slovak Republic (**ASSR**, Slovakia); task leader: leads the development of scenarios; Expertise: ESs and humanitarian aid missions
8. Fire Department of the Port of Rotterdam (**GB**, Netherlands); partner: contributes to scenario definition and unmet needs identification Expertise: Firefighting in industrial areas and technical assistance

All emergency response organisations use their national networks to distribute POWERBASE results and raise awareness for low emission power supply.

Academic Organisations:

9. Fraunhofer Gesellschaft (**FhG**, Germany); WP leader: responsible for technology foresight, SOTA analysis and capability gap definition
10. KEMEA Center for Security Studies (**KEMEA**, Greece); WP leader: responsible as lead procurer for innovation procurement processes.

Consultancies:

11. Vieira Procurement Legal Services (**VIEIRA**, Portugal); task leader: provides legal support and training for public buyers.

12. PNO Innovation GmbH fka ARTTIC Innovation GmbH (**PNO**, Germany); WP leader: responsible for stakeholder engagement, communication, and project management support.

2. Project Key Exploitation Results

The POWERBASE project was designed to prepare the path for the uptake of innovative, low-emission power supply solutions in emergency response. As a CSA, it does not develop new technologies itself, but it produced several (key) exploitable results that are crucial for guiding future innovation procurement. The POWERBASE project generated in total eight key exploitable results (Table 1). These key exploitable results built the basis for the exploitation routes (Chapter 3).

Table 1: List of POWERBASE key exploitable results

#	POWERBASE exploitable result	Lead Partner
1	Scenario-based use cases for requirements analysis and future technology assessments	ASSR
2	Questionnaire to assess functional and performance requirements within the emergency response organisations	AutRC
3	Catalogue of functional and performance requirements per emergency response organisation for low emission power supply in BoO and ES validated throughout the POWERBASE end-user network	AutRC
4	Catalogue 12 commercially of the shelf and 21 emerging technologies including a patent and publication dynamics analysis resulting in a list of key suppliers for each technology	FhG
5	List of capability gaps and future trends	FhG
6	Procurement strategy, including business case, cost analysis and preliminary PCP tender documents	KEMEA
7	A pan-European network of 32+ emergency response organisations and 25+ suppliers formed through workshops, technology showcases, fair attendance, and the OMC	PNO
8	Reusable training resources on PCP and PPI for emergency response organisations and public buyers	VIEIRA

3. Sustainability, future plans and exploitation

3.1. Exploitation routes of exploitable results

The POWERBASE project has developed exploitation routes tailored to each of the exploitable results introduced in the previous chapter. These routes are charted towards the following goals:

- The use of POWERBASE project results for further research
- The use of POWERBASE results by the partners´ procurement departments to optimise ongoing decision-making and procurement processes.
- The use of POWERBASE results to prepare for follow-up projects for innovation procurement of mobile, low-emission power supply solutions.

The unique selling point, exploitation route and recommended action for each exploitable result is summarized in Table 2.

Table 3: List of POWERBASE exploitation strategy for exploitable results 1 – 8 from Table 1.

ER	Exploitation Strategy
1	• Individual emergency response organisations can use the identified requirements specific to their organisation to optimise procurement of energy solutions for BoO and ES • Technology suppliers may use the needs and requirements as published in deliverables D2.2 and D2.3 to further develop their technologies • The identified needs and requirements (D2.2 and D2.3) may inform other end users (e.g. in construction and defence sector) to optimise their procurement processes. • The list of common and validated requirements across emergency response organisations will prepare for a future innovation procurement (section 3.2)
2	• The methodology to identify needs, and the questionnaire to validate needs and requirements may be re-used or adapted by emergency response procurement departments to assess needs and requirements for other goods and services and thus optimise procurement processes. • The lessons learned during generation of the methodology to identify needs can be applied during follow-up procurement actions.
3	• The three master scenarios (wildfire, cross-border flooding, earthquake) with six sub-scenarios (published as D2.1) may help to assess emerging technologies and provide a framework for future innovation procurement (section 5.2). • These scenarios (D2.1) may inform suppliers of low-emission power supply and beyond about challenges and emergency responder´s needs.
4	• Partner organisations may use the SOTA database to identify renewable energy solutions that meet their procurement needs. • The database will be made publicly available (as part of deliverable D2.5) and may inform procurement departments of end users (e.g. emergency responders, construction workers and beyond) about available low-emission technologies and suppliers.
5	• The list of capability gaps and future trends will prepare for the future potential innovation procurement process (section 5.2). • The list of capability gaps and future trends will help funding agencies to optimise their agenda
6	• These business case, IPR, commercialisation plan will be instrumental in preparing for future innovation procurement (section 5.2).
7	• POWERBASE has gained visibility among key stakeholders and built a network of potential suppliers, which could be mobilised for future procurement by individual partners, and might be interested in joining innovation procurement actions. • The OMC event and matchmaking session may have provided the basis for collaborative R&D among suppliers of renewable energy technologies, enhancing innovation.
8	• The trainings have increased capacity among POWERBASE partners and may be exploited in cross-border (innovation) procurement by individual partners and enhance uptake of renewable energy technologies. • The materials could be reused in other contexts to enhance the capacity building of European public buyers.

3.2. Route to innovation procurement

As stated in D3.5 the designed POWERBASE PCP process is strategically positioned to address the so-called "valley of death" — the critical gap between early-stage R&D and market deployment where many promising innovations fail to progress.
By acting as an early and informed buyer, POWERBASE consortium creates a structured demand for solutions that are not yet commercially available but have high potential to meet the specific operational needs of emergency response organisations. Through competitive phased funding, real-world testing, and clearly defined functional requirements, the PCP will offer to suppliers a pathway to validate and mature their technologies under realistic conditions. This de-risks innovation, incentivises investment, and enables the transition from prototypes to deployable solutions and market uptake, thereby overcoming one of the key barriers to the commercialisation of low-emission, mobile energy systems tailored for the emergency response sector.

3.2.1. Business plan

Deliverable D3.3 confirmed that emergency response organisations remain almost entirely dependent on traditional generators, which are increasingly viewed as unsustainable due to high fuel costs, noise, emissions, and limited adaptability. The cost analysis showed that current systems generate long-term expenses, while offering little flexibility to meet evolving operational needs.
The POWERBASE solution is expected to deliver improvements by introducing modularity, smart monitoring, and integration of renewable sources. These features could reduce fuel dependency and maintenance costs while aligning with EU policy priorities.
At the same time, the market analysis conducted demonstrated that there is a high demand for innovative solutions. This combined with the need of partners to transition away from traditional generators, confirms that there is a realistic pathway toward market uptake once the POWERBASE solution is validated.
Furthermore, the PCP approach provides a structured route for transforming these findings into concrete procurement action. The process is divided into design, prototyping, and testing, ensuring that solutions are developed in close alignment with user needs, while stimulating innovation and competition in the market. In this way, the lessons of D3.3 do not remain theoretical but are translated into a business plan that supports both operational efficiency and long-term policy objectives.

3.2.2. Intellectual Property Rights

According to the provisions of draft Call for Tenders (see point 2.8) and the Framework Agreement (art. 5) each PCP Contractor will keep ownership of the IPRs attached to the results they generate during the PCP implementation. The tendered price is expected to take this circumstance into account, i.e. the financial compensation for IPRs must reflect the market value of the benefits received (i.e., the opportunity that the IPRs offer for commercial exploitation) and the risks assumed by the contractor (e.g. the cost of maintaining IPRs and bringing the products onto the market).

The ownership of the IPRs will be subject to the following:

the Buyers' Group has the right to:

- access the results, on a royalty-free basis, for their own use.
- grant upon notification of the contractors (or to require the contractors to grant) non-exclusive licenses to third parties to exploit the results under fair and reasonable conditions (without the right to sub-license).

the Buyers' Group has the right to require the contractors to transfer ownership of the IPRs back to the Buyers' Group if the contractors fail to comply with their obligation to commercially

exploit the results (see below) or use the results to the detriment of the public interest (including safety and security interests).

Moreover, the ownership of pre-existing rights will remain unchanged.

In order to be able to distinguish clearly between results and pre-existing rights (and to establish which pre-existing rights are held by whom) Tenderers are requested to list the pre-existing rights for their proposed solution.

Subject to pre-existing obligations that may apply to background IPRs, the Tenderer grants the members of the Buyers' Group a royalty-free, non-exclusive, irrevocable and non-sub-licensable license to use its background IPRs for the execution of the contract.

If applicable, subject to pre-existing obligations that may apply to background IPRs, the members of the Buyers' Group grant the Contractor a royalty-free, non-exclusive, irrevocable and non-sublicensable license to use its background IPRs for the performance of the contract.

3.3. Commercialization plans

As defined in the draft Call for Tenders (D3.4) the Contractors are expected to start commercial exploitation of the results at the latest four years after the end of the Framework Agreement.

These provisions on IPRs apply regardless of whether the Contractor participates in all phases of the PCP or only in some of them, and that the provisions that extend beyond the duration of the Framework Agreement remain in force even if the Contractor is not selected for the next phase of the PCP and the agreement with the Contractor is terminated.

To this end, the Contractors are required to undertake specific activities beyond product development to commercially exploit the results, by building a concrete exploitation plan, including a commercialisation strategy, that should explain the proposed approach to commercially exploit the results of the PCP in order to bring a viable product to market. Contractors should prepare a detailed market analysis providing a first outlook on the cost/benefit ratio in the transition towards full scale deployment.

Contractors must consider the future certification of their solutions or contribution to standardisation. The feasibility of the commercialisation plan to commercially exploit the R&D results (Technical Offer) will be assessed as part of the Award Criteria. Furthermore, the commercialisation plan will be part of the End-of-Phase reports of all three phases, as well as of the offers for the Phases 1, 2 and 3.

3.4. Activities to support the exploitation

In addition to the commercialisation activities performed by the PCP Contractors as stated above, POWERBASE partners will promote the R&D results. The Buyers' Group Members will also actively disseminate the Contractors' results at the end of each PCP phase via relevant public and industry related activities. It is the Buyers' Group objective to help develop a working market for such type of solutions in order to ensure their usability and sustainability and to help overcome possible, commonly defined deployment barriers.

After the PCP, the Buyers' Group will make their best efforts to support the Contractors and help remove barriers to the introduction onto the market of the solutions to be developed during the PCP.

4. Benefits for Stakeholders

Replacing diesel generators with mobile, low-emission power supply for ES and BoO will directly improve living and working conditions for emergency responders and displaced populations by reducing noise, air pollution and logistical burdens. Moreover, it increases self-sufficiency and decreases grid dependency. Reducing fossil fuel dependency during international missions helps mitigate the impact on local fuel prices caused by the presence of international emergency response organisations.
Furthermore, POWERBASE aims to enhance the innovation capacity of EU public procurers through training and support in cross-border procurement of innovative goods and services.

Facilitating the green transition of emergency response organisations

In the long-term, POWERBASE seeks to enable emergency response organisations to transition from fossil-fuel-based to low-emission power supply, by identifying mobile, renewable energy solutions for BoO and ES. This will help emergency response organisations meet national and EU-wide emission goals, such as the EU Green Deal target of a 55% reduction in GHG emissions by 2030.

4.1. Benefits for the end users

Emergency response organisations will be better equipped to facilitate the transition from fossil fuel generators to renewable energy for ES and BoO, due to the participation in POWERBASE and its follow up project POWERBASE PCP. Specifically, they will benefit from...

- a better balance between supply and demand side to bridge the gap between research push and market pull.
- a validated set of functional and operational requirements per organisation and across the emergency response organisation network that will guide procurement decisions for (renewable) power supply in the future.
- higher degree of interoperability between emergency response organisations, due to joint requirements analysis.
- reducing the risk of mistakes in follow-up tenders (for large scale deployment).
- high quality products at lower prices due to competition driven approach in follow-up PCP project.
- shared development risks with suppliers.
- License-free use for procurers at the end of a PCP project.
- a ready-to-use procurement strategy including legal and technical documentation for innovation procurement.
- a strengthened capacity to conduct cross-border joint procurement for innovative technologies.
- structured methods for assessment of functional and performance requirements among their organisation, which will optimise procurement processes and user satisfaction.
- a better understanding of the complexities of innovation procurement and industry innovation processes that will help them to navigate future (innovation) procurement processes.
- the contribution to national (e.g. German Renewable Energy Law) and EU (Green Deal) goals by enabling climate-resilient procurement practices.

4.2. Benefits for suppliers (industry)

POWERBASE (and POWERBASE PCP) informs suppliers about real and pressing end-user needs, while informing suppliers about the benefits of innovation procurement. Specifically, they will benefit from...

- the early access to clearly defined user needs, functional requirements, and deployment challenges from a large group of European emergency response organisations (potential public buyers).
- a shorter time to market due better anticipation of demand side as well as early feedback in product development stage
- insights into emerging research trends and competitor developments.
- the opportunity to showcase their technology to representatives of emergency response organisations
- the opportunity to engage in dialogue with the Buyers' Group about market needs.
- strategic opportunities for collaborative development of renewable energy technologies.
- the wider market size due to access to pan-European demand network as potential customer base.
- the risk-benefit sharing between demand and supply side under market conditions during a potential follow-up PCP action.

4.3. Benefits for society, citizens and policy makers

Society will benefit from a higher quality and efficiency of public services (emergency response) while mitigating environmental impact. Specifically, society will benefit from...

- indirect benefits through cleaner, quieter and safer emergency response operations.
- the reduced environmental burden on disaster-affected areas.
- the reduced dependency on fossil fuels for emergency response operations.
- the strengthened innovation and European leadership in renewable energy technology development that creates highly qualified jobs and increases European autonomy.
- optimised public R&D spending due to early emergency responder feedback

4.4. Activities to raise awareness of the project

To ensure that stakeholders are aware of the project and how they can benefit from the project, the project has actively built awareness of the project among stakeholders. A full list of activities is provided in D4.3. Here is a short summary.

- The Hub-and-Spoke Strategy has created a network of more than 50 end users and hence has established a community of public buyers interested in renewable energy solutions for crisis response. This network will be used to disseminate the results of the POWERBASE project, and the network will be informed about follow-up actions.
- The project has reached out to 210 suppliers and developers of renewable energy suppliers, and 31 suppliers registered to participate in technology showcases and/or the OMC event. Many participants opted in to receive information about the project, and they will be informed about the project results, and potential follow-up actions.
- Through active engagement in responder networks (e.g. IFAFRI, CERIS, CMINE, DIREKTION), participation in conferences, emergency responder workshops and technology fairs, the visibility and outreach of the project was enhanced.

- Through press releases, project videos, flyers, post on the project website and social media, articles in first responder magazines, participation in conferences, fairs and exercises, the POWERBASE lessons learned webinar and a CMINE policy recommendation paper, POWERBASE has disseminated knowledge about the project to diverse stakeholders
- POWERBASE organised several trainings to increase the capacity of emergency responder organisations for innovation procurement. Training content about procurement and IPR management is available on the project website (as part of D3.1).

5. Lessons learned from the POWERBASE project

The consortium considers the "lessons-learned" during the project implementation also as a valuable result.
POWERBASE is an ambitious 12-month research project, condensed with tasks and deliverables. Unlike most Cluster 3 initiatives—which typically span three years—POWERBASE must meet comparable obligations and adhere to the same legal framework, all within a fraction of the time. Adding to the challenge, the project is led by a consortium of partners who have never collaborated before. The POWERBASE consortium consists of nine organisations that have been very active in Horizon Europe/2020 projects in the past. Only three partners had little or no experience in Horizon projects before POWERBASE. Despite many years of Cluster 3 project experience, the consortium had to overcome several challenges that are relevant, in particular for short-term projects and CSAs that prepare for future potential PCP projects. During the in-person OMC Workshop 28.08. – 29.08.2025 in Athens, POWERBASE has collected lessons learned on needs identification and on project implementation. First, with the POWERBASE project partners and external stakeholders e.g. emergency response organisations, Small- and Medium-sized Enterprises (SMEs) and research institutions discussed lessons learned on needs identification organised by VIEIRA. Second, during an internal lesson learned on "project implementation" the consortium discussed challenges and opportunities. The following bullets summarize the collected and discussed lessons learned:

Challenges and related lessons for future Coordination and Support Actions

1. The coordinator could not designate a primary contact person for the project. Due to a personnel shortage, three interim project managers were responsible for managing coordinator tasks. When three employees are responsible for coordination, the likelihood of miscommunication increases, as does the risk of failing to share important information.
   Lessons learned: Ideally, the coordinating entity should have one primary contact person for the project's lifetime. An effective mitigation measure involves project partners (e.g., PNO Innovation) providing support to the coordinator throughout the transition period.
2. The short project duration (12 months) forces the consortium to short notice tasks for partners. Consequently, deadlines are tight, and often direct action is needed. Sometimes partners were overwhelmed by short notice tasks. To address this regular follow ups were conducted during the project.
   Lessons learned: Coordinator and WP-Leaders have to continuously raise awareness for the short project duration, and all partner primary project contacts must nominate substitutes in case of absence.
3. Scenario definition is helpful to create a common understanding between different emergency response organisations as well as academics and consultants. Nevertheless, very detailed emergency response scenarios have not been helpful because every scenario and all end-users have different energy demands. Energy demands differ because each organisation uses different equipment in a BoO or ES.
   Lessons learned: Use scenario definition workshops to create a common understanding but agree at an early stage (M1) either on a generic BoO/ES energy demand or use one reference emergency response team to mark a clear frame for the technology to be developed. In other words, while a scenario should be defined to set the boundary conditions, the focus should be on the operational environment rather than the emergency incident (e.g. min. camp size, services to be powered, etc).

4. The functional and performance requirements catalogue is a prerequisite for e.g. SOTA analysis or OMC. It is the emergency responders "wish list" which suppliers need to compare their products with. The initial catalogue of functional and performance requirements was too vague.
   Lessons learned: A meaningful (e.g. quantifiable) requirements catalogue needs to be finalized before the OMC starts (e.g. M2-4). Nevertheless, the requirements list should be "not too broad, not too narrow", to help the consultation with the market but not restrict innovation at the same time. At the beginning, a list of a few key requirements is sufficient to facilitate a common understanding. The full requirements list needs to be prioritized.
5. In the first round, the SOTA analysis was more detailed than necessary, leading to excessively long technology fact sheets.
   Lessons learned: While it was partly unavoidable to explore the different technologies in depth in order to assess their maturity and their fit with the initially vague requirements, the resulting technology fact sheets grew to as much as ten pages. This level of detail proved discouraging for the emergency response organisations, as it no longer provided a quick, easy-to-understand overview. For the second deliverable of the SOTA analysis (D2.5), the profiles were therefore streamlined and focused on the essentials to ensure a more concise, accessible, and user-friendly presentation.
6. In an interdisciplinary project such as POWERABASE, partners come from diverse backgrounds (e.g., emergency response, innovation procurement, and dissemination). At the outset, some partners lacked the technical expertise required to fully engage in the discussions.
   Lessons learned: Establishing a shared foundational understanding of electricity and generator technology would enhance the efficiency of discussions. Few short technical trainings at the beginning of the project and during the different meetings, would be beneficial.
7. It was difficult to interest suppliers of renewable energy technology in attending events like the POWERBASE OMC event as the project does not commit itself to procurement and travel costs are not reimbursed. In POWERBASE, this challenge was tackled efficiently through clear supplier-oriented communication and language.
   Lessons learned: It is important to clearly explain the purpose of the project and how suppliers may benefit from the project. It helps to have external communication be drafted/reviewed by communication experts. Exploiting personal connections and writing emails in their local language resulted in a higher likelihood of response. Use of clear and concise emails, a visual identity (POWERBASE logo), and the POWERBASE mailing address also helped.
8. The project was run by an interdisciplinary team of emergency responders, legal experts, scientists and consultants. All disciplines have their own jargon, which sometimes causes misunderstandings.
   Lessons learned: In internal communications try to avoid abbreviations and create a living glossary document which will be refined over the project lifetime. The internal information flow should be as efficient as possible.

Opportunities

1. The SOTA analysis combined desk research with visits to renewable energy fairs.
   Lessons learned: The fair visits proved to be particularly effective. Discussions with exhibitors served three main purposes: informing them about the project, learning more about their technology, and inviting them to the OMC.
2. Suppliers for the OMC event in Brussels have been identified in several ways e.g. by fair visits, Horizon Europe projects, SOTA, Chamber of Commerce.
   Lessons learned: The likelihood of OMC participation was higher for suppliers that have been contacted during fairs, and a personal contact has been established. A cheap and effective way for increasing visibility and OMC participation is to hire a group of student workers visiting project related fairs and spread the word.

3. POWERBASE organised nine in-person requirements workshops, with each participating country (except Sweden) hosting a workshop led by a local partner. The project employed the hub-and-spoke concept to gather requirements from a wide range of emergency response organisations. Each partner engaged with at least three national emergency response organisations or end-users.
   Lessons learned: The hub-and-spoke concept allows with minimum effort to get in touch with a large number of organisations. Moreover, by applying the concept on a national level there is no language barrier for the workshop.
4. Public perception of the POWERBASE project and its objectives is important. Although the project aims to clearly communicate its goals to the public, there is the potential for misunderstanding of the key messages by the public (e.g. people may think that emergency organisations prioritize the green transition over safety).
   Lessons learned: The project developed the framework of the Crisis Communication Plan as a best practice. It is important to proactively analyse how messages could be misunderstood by the general public to avoid such misunderstandings. It is also helpful to set up Google Alerts to track how the project is perceived online.
5. Raising public buyers' and suppliers' awareness for innovation procurement is essential. Public procurement training is an important tool to train emergency response organisations in innovative procurement. Public buyers in emergency response organisations often have never heard about innovation procurement before and therefore need an easy way to get started.
   Lessons learned: A series (e.g. 5 – 10) of short (max. 30 min) recorded training sessions could simulate a fictive innovation procurement project (e.g. PCP) lifecycle. The sessions highlight project milestones as well as often occurring challenges. The fictive project topic should be easily accessible for everybody independent of background e.g. innovation procurement of simple products in general.

6. Conclusion

POWERBASE is a Horizon CSA that aims to prepare the ground for the future procurement of innovative, renewable, mobile, and low-emission energy solutions tailored to the needs of emergency response organisations. The project consists of emergency response organisations, research organisations and consulting agencies. During the project period of 12 months the project's key objectives, such as the identification of needs, an analysis of the technology landscape, the preparation of innovative procurement as well as the pro-active engagement of emergency response organisation beyond those of the project consortium into the POWERBASE CSA have been achieved.

Additionally, the project generated eight key exploitation results providing the basis for exploitation routes for further research, activities of the emergency response organisations, and the preparation of innovative procurement. To overcome the valley of death between R&D and the market, a structured demand for solutions including a catalogue of functional requirements was developed. The key exploitation results also were the basis for the development of a business plan as well as the setting of IPRs and a commercialisation strategy for a potential follow-up PCP action.

Through the CSA, emergency response organisations improved their understanding of the complexities of innovation procurement and industry innovation processes, that will help them to navigate future (innovation) procurement processes. Additionally, the involved emergency response organisations developed a validated set of functional and operational requirements per organisation and across the emergency response organisation network that will guide procurement decisions for (renewable) power supply in the future. For emergency response organisations, the follow-up PCP will provide access to high quality products at lower prices due to competition driven approach.

On the other hand, the suppliers have early access to clearly defined user needs, functional requirements, and deployment challenges from a large group of European emergency response organisations, which are potential public buyers at the same time. With this information the supplier can reduce their time to market due better anticipation of demand side as well as get early feedback in product development stage during a follow-up PCP.

Besides this, closing the gap between end-users and suppliers, as well as equip emergency response organisations with sustainable, self-efficient, low to no-emitting equipment that is based on green power solutions helps also to achieve the EU Green Deal targets and will be a huge benefit for the society and citizens in the future.