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POWERBASE

D3.1 Workshop and Seminar report

Training activities, surveys and findings

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D3.1 Workshop and Seminar Report

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About the document

This deliverable aims to describe the training sessions and seminars organized during the POWERBASE project

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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
CN	Contract Notice
COTS	Commercial Off-the-Shelf
CSA	Coordination and Support Action
EAFIP	European Assistance for Innovation Procurement
ERO	Emergency Response Organisations
ES	Emergency Shelter
EU	European Union
HE	Horizon Europe
IP	Intellectual Property
IPRs	Intellectual Property Rights
kWh	Kilowatt hours
OMC	Open Market Consultation
PBG	Public Buyers Group
PCP	Pre-Commercial Procurement
PERO	POWERBASE Emergency Response Organizations
PPI	Public Procurement of Innovation
SOTA	State of the Art
TRL	Technical Readiness Level
WCPM	Union Civil Protection Mechanism
WIBGI	“Wouldn’t It Be Great If” methodology
WP	Work Package

Consortium 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
Fraunhofer	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

This report presents an overview of the training programme developed and delivered within the POWERBASE project to support the preparation of a PCP procedure for low-emission energy supply systems in emergency and disaster response contexts.
The training programme was strategically designed to build the necessary knowledge and skills across a multidisciplinary consortium composed of public buyers, **emergency responders, technical experts, and researchers. Recognising the varied backgrounds and levels of familiarity with innovation procurement among participants, the programme aimed to create a level playing field by introducing the fundamental legal, technical, and strategic concepts relevant to PCP and PPI.**
The training followed a stepwise approach, aligned with the project's timeline and technical deliverables. It covered key topics such as the EU innovation procurement framework, needs identification and functional requirements definition, SOTA analysis, IPR management, and the PCP process itself, including its phased structure, risk-sharing principles, and outcome-oriented nature. Methodologies like the WIBGI approach were used to challenge conventional thinking and encourage participants to articulate forward-looking, capability-driven needs.
Interactive workshops, targeted sessions, and national-level discussions allowed participants to engage with the content and reflect on practical applications in their fields. Feedback was continuously integrated to tailor the training to the consortium's evolving needs. One of the critical achievements was helping participants shift from a technology-driven mindset to a problem-solving, performance-based approach essential for effective innovation procurement.
Overall, the training programme contributed significantly to strengthening the consortium members' capacity to engage meaningfully in the preparatory work aimed at determining whether a PCP procedure was necessary and under what terms. It fostered a shared understanding of the legal and methodological frameworks and helped align the project's strategic and technical dimensions. The training not only supported the delivery of key project outputs but also laid the foundation for a successful and coherent implementation of the future PCP procedure.

1. Pre-Commercial Procurement training

1.1. Main objectives and target group

The training activities within the POWERBASE project are designed to strengthen the innovation and procurement capabilities of public buyers, with a particular focus on the specific challenges and requirements of a future POWERBASE PCP. The main objectives are to foster a shared understanding of innovation procurement, enhance practical knowledge of legal and procedural frameworks, and build competence across the consortium for effectively designing and managing procurement innovation processes aimed at developing low-emission energy solutions for emergency response operations.

These training sessions addressed three cross-cutting domains: innovation procurement, public procurement law and practice, and competence building tailored to the needs of PEROs. Although the Grant Agreement envisaged a brief gap analysis at the outset of the project to ensure the relevance and effectiveness of the training programme, it quickly became evident through the kick-off meeting that there was a widespread lack of prior knowledge in innovation procurement, particularly regarding PCP and PPI.

As a result, it was necessary to adapt the training programme to begin by clarifying the concept of innovation in the context of public procurement, before introducing the innovation procurement framework more broadly and distinguishing, in general terms, between PCP and PPI. Subsequent training sessions were then aligned with the progress of the various work packages and were methodologically designed to achieve two objectives simultaneously: to equip participants with practical tools and guidance on 'how to' perform key tasks—such as needs identification and functional specification definition—while also explaining the strategic importance of these activities for the preparation and success of the future PCP.

The training programme run from Month 1 to Month 12 of the project and followed an iterative, flexible structure, allowing adjustments to the topics as new needs emerge throughout the project lifecycle. While the primary audience is the POWERBASE consortium partners, the last seminar was also opened (in hybrid format) to members of the broader stakeholder network, thereby enhancing cross-institutional learning. In addition to structured content delivery, the training sessions created a space for all Consortium members to raise questions and clarify specific issues regarding the procurement process, fostering dialogue and peer learning.

1.2. Relevance of PCP training to the project goals

The training programme played a critical role in supporting the overall objectives of the POWERBASE project. By strengthening the consortium's understanding of innovation procurement and the PCP/PPI frameworks, the training ensured that all partners—regardless of prior experience—could actively contribute to the technical and strategic work of the project. It provided a shared conceptual foundation, practical tools, and legal-methodological guidance tailored to each stage of the PCP preparation.

As such, the training programme was not an isolated activity, but a cross-cutting capacity-building effort that enabled informed decision-making, improved coordination across work packages, and reinforced the project's ability to successfully launch and manage a demand-driven PCP process aligned with EU policy goals.

1.3. Alignment with project deliverables

The training programme was strategically designed not only as a capacity-building effort but also as a tool to accompany and reinforce the technical work carried out across the various POWERBASE WP. This alignment was particularly important throughout the initial months of the project, during which consortium members were actively engaged in identifying operational needs and defining functional requirements for low-emission power supply systems in emergency contexts.

A central challenge addressed by the training was the widespread tendency—common not only among practitioners but also across broader professional contexts—to define needs based primarily on current practices or existing constraints. To counter this, the training introduced future-oriented methodologies—particularly the WIBGI approach—to encourage participants to shift from a reactive to a more forward-looking perspective. The goal was to enable a more strategic articulation of needs, not limited to existing tools or infrastructures, but aimed at expanding capabilities and improving the provision of emergency services in complex, large-scale disaster scenarios. Without this capacity to anticipate future operational demands and adopt a long-term, capability-driven outlook, innovation cannot be effectively stimulated or sustained.

Another key aspect of alignment concerned the definition of functional (rather than prescriptive) requirements. Many participants instinctively framed requirements in terms of known technologies or incremental upgrades to existing equipment. The training aimed to address this bias by reinforcing the concept that innovation procurement demands open, outcome-oriented specifications. Rather than asking how to improve what already exists, participants were encouraged to focus on what performance, functionality, and impact are needed—leaving room for suppliers to propose novel, potentially disruptive solutions.

An additional moment of alignment between the training programme and the project's technical development emerged during the preparation of the SOTA deliverable. This stage provided a natural opportunity to consolidate the methodological groundwork laid during earlier phases—particularly in relation to needs identification and functional requirements—and to reinforce key concepts such as outcome-based thinking and long-term capability planning. At the same time, the training activities evolved to address more strategic dimensions of the innovation procurement process, including the role of IPR and the criteria for determining whether to pursue a PCP or opt for a PPI. This ensured that participants could progressively frame their technical contributions within the appropriate legal and procedural context, supporting a coherent and solid transition toward the PCP preparation phase.

This targeted focus was intentionally delivered in parallel with the work package tasks responsible for drafting the relevant deliverables. By doing so, the training served as both a methodological guide and a cognitive reframing tool, helping teams avoid common bottlenecks and contribute more effectively to the overall PCP preparation. The integration between training and project development ensured that conceptual learning translated into concrete contributions to the POWERBASE innovation procurement process.

1.4. Methodology for the content definition

1.4.1. Key topics

The training programme was structured around a set of key topics essential for understanding and implementing innovation procurement in the context of the POWERBASE PCP. These included:

- **Introduction to Innovation Procurement**: Innovation procurement was introduced as a foundational topic in the training programme, clarifying its role within the broader public innovation cycle and its strategic value for delivering better public services. The concept was presented as a means for the public sector to act not only as a buyer but also as a driver of innovation. The topic also addressed key success factors for effective innovation procurement, the rationale for public intervention, and the underlying legal and policy framework at the EU level. It concluded by outlining a step-by-step methodology to guide the design and implementation of PCP procedures.

- **PCP vs. PPI**: This key topic focused on understanding the specific features of PCP and PPI, highlighting their complementary nature within the innovation procurement framework. Particular emphasis was placed on the criteria for choosing between the two approaches, notably the maturity of available market solutions and the extent to which R&D is required. To support this distinction, an initial introduction to TRL was provided, helping to illustrate how different stages of technological development inform the appropriate procurement pathway.

- **Needs Identification and Functional Requirements/Outcome-Based Specifications**: Equipping participants with forward-looking tools and methodologies - such as the WIBGI approach - to identify unmet needs and translate them into functional (rather than prescriptive) requirements, while training them to frame procurement objectives in terms of desired outcomes and impacts rather than predefined technological solutions, thereby fostering supplier creativity and enhancing market responsiveness.

- **SOTA Analysis and Innovation Gap Assessment**: This topic focused on assessing existing or near-to-market solutions by conducting a SOTA analysis. It included the evaluation of available technologies, their TRLs, and a structured IPR search, and compiling technology fact sheets. Based on this, participants were guided on how to identify innovation gaps — areas where current solutions fall short — and determine whether further R&D is needed, thereby justifying the use of a PCP procedure.

- **IPR**: This topic introduced key IPR concepts relevant to PCP, including the distinctions between background, foreground, and sideground IPR. It explored their implications for ownership, access rights, and the exploitation of results, with a focus on how these aspects must be strategically managed throughout the PCP process. Emphasis was placed on the importance of conducting IPR searches to avoid conflicts with existing patents and to identify opportunities for innovation. The training also highlighted the need for clear, well-drafted IPR clauses in PCP contracts to safeguard both public interest and supplier incentives. By addressing the strategic role of IPR in innovation procurement, the topic aimed to equip participants with the necessary understanding to anticipate risks, ensure compliance with EU guidance, and maximise the long-term value of PCP outcomes.

- **Strategic Market Engagement and Preparation for Procurement:** This topic brought together several critical aspects of preparing for innovation procurement. It addressed how regulation, standardisation, labelling, and certification affect the deployment and acceptance of innovative solutions, using practical examples to illustrate how these elements can either enable or hinder market entry. It also covered the drafting of the business case, highlighting its strategic role in justifying the procurement of innovation and aligning it with long-term capability goals. Finally, the topic included open market consultation OMC practices, technology showcase sessions, and market analysis as key tools for understanding SOTA, identifying existing solutions or innovation gaps, and engaging stakeholders early in the process. These combined elements are essential to ensure that procurement decisions are informed, feasible, and aligned with both technical needs and policy objectives.

These topics were tailored to address both conceptual and operational challenges, enabling participants to apply the knowledge directly to their work within the project.

1.4.2. Training approach

The training was delivered using a modular and interactive approach, closely aligned with the progress and needs of the POWERBASE work packages. Rather than a one-time or stand-alone training, the programme was implemented as a series of targeted sessions, each timed to support specific project milestones.

Key features of the training approach included:

- **Contextualisation**: Each session was designed with direct reference to the current stage of project development, ensuring high relevance and immediate applicability.

- **Methodological Consistency**: The training consistently reinforced the core methodologies required for innovation procurement, including needs identification, functional specification drafting, and outcome-oriented thinking.

- **Progressive Complexity**: The training evolved from foundational topics—such as the legal and policy context of PCP—to more advanced issues, including IPR handling and procurement strategy design.

- **Practical Focus**: The training programme adopted a strongly practical focus, featuring real-world examples, interactive Q&A segments, and open discussions that encouraged active participation. These elements helped translate abstract concepts into operational understanding and made the content more accessible and actionable. It is also important to note that consortium members came from diverse institutional backgrounds and held varying roles within the project, which enriched the exchanges but also required a flexible training approach. The sessions were designed to accommodate this diversity, ensuring that both technical and non-technical participants could engage meaningfully with the content and apply it within their respective areas of responsibility.

- **Feedback Integration:** Participant feedback and evolving project dynamics were systematically monitored through informal exchanges, post-training reflections, and ongoing interaction with work package leaders. This feedback loop allowed for continuous adaptation of both training content and delivery format, ensuring that the programme remained responsive to the consortium's needs and aligned with the technical progress of the project.

This approach ensured that the training programme was not only informative, but also fully integrated into the project's operational workflow—enhancing the effectiveness of the capacity-building effort and directly supporting the development of the PCP process.

1.5. Overall program

1.5.1. Training sessions overview

As part of WP3, a comprehensive training programme was developed to build the consortium's capacity on PCP and related processes. The training plan was designed to accompany the work performed by the partners and to provide timely input supporting the preparation of project deliverables.

The sessions followed a progressive structure, gradually covering key topics such as PCP fundamentals, needs identification and assessment, functional requirements and SOTA analysis, market engagement, and IPR and risk-sharing strategies. Together, these sessions provided a coherent framework that prepared partners for the future PCP implementation.

1.5.2. The four (4) internal workshops on Innovation Public Procurement

Workshop 1: Kick-off meeting, 14-16 Oct 24, Frankfurt

The first internal workshop laid the conceptual foundations for the POWERBASE training programme. It began by clarifying the distinction between research and innovation, framing innovation procurement as a strategic instrument for improving public services. Participants explored the benefits of innovation procurement, including risk reduction, improved cost-efficiency, and enhanced operational performance.

The session introduced the key principles of strategic public procurement, including the use of pro-innovation triggers and procurement as a policy tool to promote societal objectives. A detailed explanation of the EAFIP methodology provided participants with a practical step-by-step framework for implementing innovation procurement, with special emphasis on the end-users' needs identification process. Participants also examined how to describe needs in a functional and forward-looking way, and how to distinguish between CSA and PCP phases within EU-funded projects.

This workshop established a shared vocabulary and understanding across the consortium and set the stage for more in-depth exploration of the PCP process in subsequent sessions.

The workshop was attended by 29 participants, all consortium members.

Workshop/webinar 2: 13 Dec 2024, online.

The second internal workshop, held online as a webinar, built on the foundational knowledge provided in the first session. It began with a review of key innovation procurement concepts and provided a more detailed explanation of the relationship between a CSA and the PCP procedure. A comprehensive presentation of the PCP process followed, including its three phases, core characteristics (such as risk-sharing, focus on R&D services, phased competitive development, and compliance with principles of transparency, equal treatment, and competition), and its clear distinction from the PPI and from the subsequent deployment of products or services.

The workshop further explored the societal value and strategic benefits of PCP, drawing comparisons between PCP/PPI and the innovation partnership procedure under Directive 2014/24/EU. Particular attention was given to identifying common barriers to innovation procurement and highlighting the importance of establishing a clear innovation procurement policy within public organisations. The session also addressed advanced tools and methodologies to support the identification and validation of unmet needs—an essential step in structuring a sound PCP strategy.

Finally, participants benefited from an experience-sharing segment in which KEMEA contributed by presenting lessons learned and practical insights from the iProcureSecurity PCP project, providing a real-world example of innovation procurement in the security domain. This added practical relevance to the theoretical content and fostered further discussion among consortium members.

The workshop was attended by 19 participants, all consortium members.

Workshop 3: 14 March 2025, Berlin

The third internal workshop began with a brief review of key topics covered in previous sessions, serving to consolidate foundational knowledge and ensure continuity across the training programme. The core of the workshop focused on deepening the understanding of strategic tools essential for advancing the PCP process.

The session introduced the purpose and methodology of prior art analysis, with practical examples illustrating how to conduct it effectively. Special emphasis was placed on its value in validating the innovation gap and its direct relevance to assessing unmet needs. This was followed by an exploration of IPR in the context of innovation procurement, addressing key definitions, ownership regimes (background, foreground, sideground), and the strategic management of IPR throughout the PCP lifecycle.

Further discussion centred on navigating regulatory frameworks, including applicable standards, labelling requirements, and certification procedures—crucial for ensuring that future solutions can be successfully deployed or how to address the absence, if needed. The workshop then turned to the role of the business case in supporting strategic decision-making, highlighting how prioritisation of needs can be grounded in operational relevance, scalability, and policy alignment.

The session concluded with the contribution of KEMEA with a presentation on open market consultation and market analysis, outlining their function in validating the maturity of potential solutions, engaging with stakeholders, and shaping a realistic and well-informed procurement strategy.

The workshop was attended by 26 participants, all consortium members.

Workshop 4: OMC meeting, 13 June 2025, Brussels

The fourth internal workshop was primarily focused on IPR and their role in risk-sharing within the PCP framework. Given the legal and technical complexity of the topic, the session aimed to provide a level playing field across the consortium by reinforcing a common understanding of IP fundamentals.

The workshop began by clarifying the distinction between IP and IPR, supported by concrete examples and an overview of the different types of IPRs. The discussion then moved to the specific application of IPR within PCP, encompassing both tangible and intangible outcomes arising from R&D activities. Special emphasis was placed on the importance of IPR searches, potential consequences of overlapping rights, and the strategic value of IPR as a tool to foster innovation under PCP.

Participants were introduced to key IPR definitions—background, foreground, and sideground IPR—highlighting their critical importance in the PCP contractual framework, especially regarding the protection of results, commercial exploitation, and licensing arrangements. Ownership models, exclusive and non-exclusive licensing, and transfer conditions were also addressed.

The session concluded by linking IPR to broader strategic considerations, such as security, technological sovereignty, and EU strategic autonomy. Best practices for managing IPR in innovation procurement were discussed, reinforcing the importance of early and clear contractual provisions. The workshop was marked by strong engagement and participation, reflecting the relevance of the topic across the consortium.

The workshop was attended by 20 participants, all consortium members.

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1.5.3. The national workshops on PCP

National workshops were conducted in the partner countries to support the collection and assessment of needs, with the involvement of both consortium members and external emergency responders. These sessions also incorporated elements of training in needs identification and assessment, and in PCP process. Hereinafter, a synthesis of each country report is presented, followed by a table summarising the number of participants and external responders engaged (Table 1).

Austria, (AutRC)

The Austrian Red Cross national workshop focused on defining functional requirements for Bases of Operations and Emergency Shelters, considering both existing infrastructure and field deployments. Participants emphasized fast deployment, easy transportability, and compliance with weight, volume, and regulatory requirements. The systems should be operational under extreme weather and climate conditions, not classified as dangerous goods, and independent from external fuel provision. They should be modular, transportable by road, air (including UAVs), or water, and capable of providing heating and cooling, including for medical purposes. Independence from weather conditions, redundant power sources (diesel, photovoltaics, storage), and minimal need for specialist operation were considered essential, together with simple activation and reactivation procedures.

Efficiency and reliability were highlighted as key priorities, with requirements including lightweight and compact systems, silent operation, water resistance, cost-effectiveness, and 24/7 stable energy supply even at peak times. Performance expectations included a minimum capacity of 20 kVA, the ability to serve multiple high-energy devices (e.g.,

smartphones, washing machines, electric kitchens), and connectors for each person involved. Scalability was also underlined, with solutions needing to range from supporting individual users to full operational settings and being connectable for national and EU-level operations. Interoperability with standards and consideration for other sectors were viewed as necessary for broader applicability.

Safety and security considerations focused on fail-safe mechanisms, spare parts availability, plug-and-play design, low-maintenance usability by non-specialists, and compliance with recommended weight, volume, and noise limits. Additional requirements included recyclability, pallet compatibility, affordable photovoltaic solutions, and adaptation of international transport regulations to facilitate rapid deployment. Participants distinguished between immediate response needs and long-term deployment requirements, stressing the importance of communication support, consumer tracking, and planning for unforeseen scenarios through After-Action Reports.

France, (MoIF)

During the French national workshop, conducted using the Nominal Group Technique, participants reviewed the energy resources currently used to meet operational needs and identified priority requirements for integrating green technology-driven generators into Bases of Operations (BoOs). Existing generator sets typically deliver approximately 3 × 15 kVA and are used for heating, lighting, equipment recharging, and powering medical and telecommunications systems, often combined with inverters to guarantee continuity of supply.

Discussions highlighted several disadvantages of current solutions, including high energy consumption for heating due to poor insulation of tents, vibration and noise causing CO pollution requiring monitoring, logistical challenges in fuel supply (particularly at night), and the need for mechanical expertise and suitable fuels, which complicate air transport. At the same time, the reliability and robustness of the current systems were acknowledged, with participants noting their long service life, ability to operate in diverse climatic conditions without temperature or humidity variations, and simple, secure storage.

Participants agreed that while emergency services are motivated by the ecological transition and already employ lower-impact solutions, any future green technology alternatives must demonstrate sufficient autonomy for different types of interventions, particularly during peak consumption periods and under extreme or hostile weather conditions. The group also compared the equipment, alternative solutions, energy storage approaches, maintenance routines, and challenges encountered by different SDIS units, noting both the lack of available alternatives and the interest in solar solutions such as EcoFlow for real-time monitoring and reduced maintenance needs.

Germany, (THW)

During the German EERO workshop, conducted using the World Café method and complemented by the 3-2-1 agile brainstorming method, discussions centred on bases of operations and quick response units, with particular attention to energy demand peaks caused by specialized equipment such as X-ray machines. Participants highlighted that generators are typically dimensioned for maximum loads but operate most of the time at much lower levels, resulting in inefficient energy use. They expressed a strong need for solutions that maintain high efficiency across a wide load range, including scenarios where equipment is delivered as relief goods to host nations. Transportability, particularly by air, was emphasized as a critical requirement for the equipment.

During the World Café session, ideas from earlier unstructured discussions were clustered around five parameters: efficiency, performance, functionality, interoperability, and scalability. The results underscored the importance of robust, user-friendly functionality that requires minimal explanation, given the stressful environments practitioners face after extended travel. Interoperability was linked to compliance with transport norms, and the renewable energy solution should be capable of producing between 5–15 kW in field conditions. Noise and heat emissions were considered of lower priority compared to reliability and ease of use.

The subsequent 3-2-1 brainstorming exercise helped refine and validate the results, adding a focus on guided troubleshooting solutions, potentially AI-supported, to assist non-experts such as medical teams in quickly resolving technical issues. The overall consensus stressed the importance of systems that are simple to deploy, operate, and maintain — the concept of "run and forget" was used to capture the ideal solution. Logistical and operational considerations, particularly when equipment is provided as relief goods, were seen as central to the design of future energy systems.

Greece (KEMEA)

During the Greek national workshop, hosted by KEMEA and conducted using the WIBGI (Wouldn't It Be Great If) method, participants engaged in lively discussions, sharing their experiences with mobile power supply solutions currently in use, the associated challenges, and their ideas for future improvements. They presented the most common methods for providing energy to remote emergency installations, including solar power, wind power, hybrid solar-wind systems, small-scale hydropower, thermal energy from local by-products, fuel cells, diesel and gas generators, and battery banks for energy storage. It was agreed that fuel supply for conventional generators remains a major challenge, often requiring local purchase or, in rare cases, special transport during humanitarian missions.

Using the WIBGI approach, participants outlined the requirements for an innovative solution, emphasizing simplicity in setup, operation, and maintenance, avoiding the need for specialized personnel. They recommended a hybrid system combining multiple energy sources with integrated energy storage, managed by a smart algorithm to optimize resource use throughout the day, while still including conventional fuel generators to guarantee baseline power for critical services such as the BoO command centre. Attention was called to the size and shape of the system, which should allow air transport and comply with the necessary certifications, as well as to the regulatory requirements for transporting dangerous substances.

Participants considered hydrogen power generation the most promising emerging technology but acknowledged its cost, storage, and safety challenges, as well as the need for a minimum initial power supply. Modular power generation was recommended, with camps divided into energy clusters to reduce total demand per unit. Other proposals included the use of photovoltaic rolls with nanocells, although the large surface area needed for deployment could be problematic. Data from 30 migration camps were presented, providing insight into minimum, maximum, and average energy consumption, which can inform future system design. Finally, discussions also addressed ways to reduce energy demand, such as limiting hot water consumption and restricting power outlets to essential uses.

Hungary, (HCSOM)

During the Hungarian national workshop, conducted using the WIBGI (Wouldn't It Be Great If) method, a diverse range of EEROs participated, including representatives from disaster management, heavy USAR, emergency medical teams, and smaller response

units. The structured discussions explored the scenarios defined in T2.1 and focused on the contexts in which future energy devices would be deployed. Participants shared a clear preference for a modular, closed-circuit system made up of smaller, combinable units, allowing cooperation between organisations and enabling on-site replacement of malfunctioning parts.

Using the WIBGI approach, participants emphasized that the devices should be easy to use, equipped with standardized and simplified control panels, and accompanied by accessible user manuals (e.g., QR codes) to assist new recruits. High mobility was considered essential, with solutions needing to be light enough to be carried by one or two people, transportable via roll containers or even as backpack-sized units, and suitable for aerial transport considering various cargo compartment shapes. They also stressed fast charging capabilities, compatibility with vehicle-to-load systems, and minimal surveillance requirements during operations to save human resources.

The discussions highlighted the need for cost-effective maintenance, waste management solutions for batteries, and reliable, consistent performance under extreme environmental conditions (-40 °C to +50 °C, water, dust, fire, and shock). Graphene battery technology was mentioned as a preferred option. Standardization and interoperability were seen as minimum requirements, including the use of compatible batteries or “translator” devices to facilitate replacement. Hybrid system operation and pre-installed connectors at public buildings were suggested to increase flexibility.

Italy, (CNVVF)

The Italian POWERBASE EERO workshop focused on challenges and needs related to ensuring power supply during emergencies and network maintenance, with special emphasis on operational continuity for critical infrastructures such as hospitals, train stations, and control centres. Discussions addressed the use of power generators in hydro-meteorological events, faults, and scheduled grid maintenance, as well as their predominant reliance on diesel fuel. Participants considered the transition to alternative fuels (methane, LPG, hydrogen, biofuels) feasible but noted safety issues to be resolved. Sustainability emerged as a key theme, with calls for integrating renewable solutions (BESS, photovoltaic panels, wind) while acknowledging that diesel generators remain indispensable in the early emergency response phase. Other topics included the impact of electric vehicle fleet charging needs on power demand, risks from diesel machinery emissions in tunnels, and the need for standardized equipment, preventive maintenance, staff training, and energy consumption optimisation through efficient systems and materials.

The workshop identified several promising solutions such as photovoltaic panels for stations and base camps, salt batteries as an alternative to lithium, and lower-impact fuels once safe supply chains are established. The need for remote-control and monitoring systems to reduce manual interventions was strongly emphasized, as was strategic planning for locating emergency shelters near substations. Technical data were gathered on generator capacities, consumption patterns, substation power levels, and grid management, providing a clear picture of energy requirements for base camps, shelters, and emergency scenarios. Modular system specifications were proposed, including 250 kW modules capable of heating, cooling, kitchen operations, and EV charging, with the option to integrate BESS modules, renewable charging sources, and co-generation units.

Additional critical points raised concerned the vulnerability of remote-control systems, the need for interoperability between EEROs, and safety issues from power returns during network maintenance. Efficient alternatives for high-demand electrical kitchens and safer solutions for flood dewatering pumps were discussed. The experts highlighted

the importance of improved emergency planning, funding for innovative BESS research, and proper battery disposal to ensure the credibility of sustainability efforts.

Netherlands, (GB)

During the Dutch EERO workshop, conducted using a combination of Braindump, SCAMPER, and WIBGI methods, participants mapped the current approaches to energy provision in emergency scenarios and identified key challenges and requirements for future solutions. The discussions focused on bases of operations and emergency shelters, emphasizing the need for reliable, low-emission, and mobile energy systems aligned with operational realities. Participants considered ways to substitute materials, combine existing technologies, adapt solutions from other sectors, and redesign energy provision to improve efficiency and resilience.

Using the WIBGI ("Wouldn't It Be Great If...") approach, the group formulated visionary ideas for future systems, prioritizing self-sufficiency, modularity, and sustainability. The need for solutions that can be transported easily, deployed quickly, and scaled according to demand was highlighted. Participants also explored hybrid approaches, integrating renewable sources with storage systems, to ensure continuous energy availability even under adverse conditions. Prototyping discussions further focused on defining the criteria an ideal solution should meet, balancing technical feasibility, cost, and logistical requirements.

The workshop concluded with a collective agreement that innovation activities should accelerate the transition away from fossil fuels while maintaining operational reliability. Future solutions should reflect user needs and support procurement processes for innovative, low-emission energy systems tailored to emergency settings. Participants expressed interest in continued involvement and in contributing to the development of functional requirement specifications and the upcoming innovation procurement phases.

Portugal (VIEIRA)

A National workshop about "Needs identification and assessment for EERO" was held in Lisbon, on the 31 January 2025.

This national workshop gathered first responders, academia, and technical experts to assess the operational requirements for low-emission power supply systems in emergency scenarios. The session began with a 20-minute introductory presentation outlining the distinction between CSA and PCP procedures, setting the legal and strategic context for the discussions that followed.

Participants focused on the need to address the entire life cycle of civil protection missions — from deployment and logistics to field operation, maintenance, and end-of-life considerations. There was broad consensus on the importance of compact, modular, and rapidly deployable energy systems capable of operating autonomously for at least three days without depending on local infrastructure. These systems must minimize logistical burdens, especially for air transport, and enable true operational mobility in challenging environments.

The workshop also highlighted the importance of efficient equipment recharging in the field and the ability to perform basic maintenance or part replacement on-site. Operational requirements emphasized energy density, weight efficiency, and user-friendliness, particularly for equipment such as saws or communication devices requiring frequent recharge cycles.

Key design principles identified by the group included modularity, scalability, interoperability, autonomy, and self-recharge capability. Participants noted that standardization (e.g., NATO-style interfaces) would significantly improve cross-border operations and reduce the time needed for teams to adapt during large-scale emergencies. Concerns were raised about batteries' sensitivity to altitude and temperature changes and the need for diversified, hybrid energy systems combining multiple sources for greater resilience.

The lack of interoperability—across power grids, connectors, equipment, and even hose types—was flagged as a critical barrier in joint operations. Participants recommended the development of mission-type-based modular systems and the integration of energy specialists in emergency teams to plan, adapt, and manage energy solutions effectively in the field.

The workshop also presented two pilot projects demonstrating real-world applications of second-life batteries and solar hybrid systems, showing how off-grid, portable, and low-emission solutions can effectively support shelters, medical posts, and communications units. These examples confirmed the practical feasibility of cleaner energy alternatives when designed with simplicity, redundancy, and interoperability in mind.

Finally, the group emphasized that training and standard-setting are essential to support adoption, maintenance, and effective use of innovative energy solutions. By incorporating energy supply into strategic planning and ensuring that operational tools are aligned with these new systems, Member States can significantly enhance their ability to respond quickly and efficiently through the European Civil Protection Mechanism—including cooperation with third-country teams.

Slovakia, (ASSR)

During the Slovakian national workshop, conducted using the World Café method, participants explored key requirements for future energy solutions with a focus on interoperability, modularity, efficiency, and functionality. Discussions emphasized the need for systems that can connect to existing networks, use standard and replaceable parts, and be compatible with international rescue equipment standards. Easy operation, both nationally and internationally, was considered essential, as was the integration of GPS modules and internet connectivity for remote management and software repairs. The ability to use domestic energy sources to power modules and the provision of professional competence certification were also mentioned.

A strong emphasis was placed on modularity, with solutions needing to scale up to 200 kW, remain easy to move, and allow interconnection of individual components, from small to large units, supported by a central service centre. Efficiency and performance requirements included stable voltage, overvoltage protection, low environmental impact across the lifecycle, resistance to various conditions, and continuous operation for 2–3 weeks. Participants discussed energy storage solutions, proposing 5–10 kW modular battery systems, and highlighted the potential of combining photovoltaics with micro or pico water turbines, while acknowledging that diesel generators may remain necessary as a backup.

Functionality considerations included hybrid systems that combine multiple energy sources, backup devices for redundancy, minimal noise and health risks, and easy self-testing features. The group noted the need to plan for technical inspections, certification, and the cost implications of monthly subscription fees, which could pose procurement challenges for some government entities. A consensus emerged around modular systems, recommending smaller units (e.g., 20 kW each) to reach

approximately 110 kW per camp, allowing greater transportability, flexibility, and lending between neighbouring municipalities in emergencies.

Table 1 – Participants in national workshops

MS/Consortium partner	Total participant number	EEROs participants' number
Austria /AutRC	14	7
France / MoIF	18	12
Germany / THW	12	7
Greece / KEMEA	19	13
Hungary / HCSOM	16	9
Italy / CNVVF	53	39
Netherlands / GB	17	16
Portugal / VIEIRA	17	8
Slovakia / ASSR	27	18
TOTAL	**193**	**129**

For further details regarding each national workshop, please refer to Annex 1

1.5.4. The POWERBASE seminar

The final POWERBASE seminar was convened on 28 August, during the OMC in Athens, to consolidate the knowledge generated during the project, present the lessons learned, and share best practices identified by the consortium. It provided a structured opportunity for partners to exchange views, validate findings, and jointly formulate recommendations for future PCP initiatives. The seminar was also opened to external stakeholders, including technology showcase providers, to enrich the discussion and broaden the exchange of perspectives. In total, **45 participants** took part, with **41 attending in person** and **4 joining online**, reflecting strong engagement and interest.

Lessons learned for needs collection and assessment

The session *From Needs to Innovation: Lessons Learned in Needs Collection and Assessment for Successful PCP* highlighted the critical role of well-structured needs assessment as the foundation of a successful PCP. The presentation situated the training within the broader POWERBASE capacity-building plan, which has progressively covered strategic public procurement, PCP fundamentals, needs assessment tools, IPR regimes, and market consultation, with this workshop focusing on lessons learned from CSA activities and real-world needs collection.

It was emphasized that structured needs collection is decisive for success. Needs that are too broad result in unfocused tenders and vague supplier responses, while overly prescriptive needs stifle innovation and discourage supplier participation. Misalignment with operational reality leads to impractical or rejected solutions. A robust needs assessment helps to identify genuine operational gaps, align stakeholders under a common challenge, and translate observations into procurement-ready input.

The risks of weak or late needs collection were detailed: market mismatch, technology push instead of demand pull, end-user rejection, low-quality tenders, and even the procurement of "innovative but useless" solutions. Lessons from the POWERBASE CSA

phase illustrated that Phase 0 is more than a preparatory step — it is where the foundation for a successful PCP is established. This phase aligns stakeholders, maps operational needs, validates functional specifications, analyses the SOTA, designs OMC, and anticipates legal and strategic issues such as IPR and risk-sharing.

End-user involvement was presented as central to the process. Needs collection was framed not as consultation but as co-creation of the challenge definition. End-users bring essential operational knowledge, prioritize requirements by urgency and frequency, and highlight practical constraints such as size, weight, deployment time, interoperability, and usability. The POWERBASE workshops demonstrated the value of this approach, moving from generic requests ("more low-emission energy") to specific functional challenges ("autonomous, modular, interoperable, scalable, silent low-emission power supply for remote field emergency shelters with a minimum 72-hour runtime without recharging").

Common pitfalls were addressed, including defining needs too broadly or narrowly, ignoring the SOTA, involving end-users too late, and setting overambitious or redundant objectives. It was stressed that needs collection shapes the entire PCP lifecycle, acting as the backbone of the process and influencing functional specifications, OMC design, evaluation criteria, and ultimately tender outcomes.

The presentation then turned to functional specifications, which were described as the bridge between identified needs and innovation-ready tenders. It was stressed that functional specifications should define success conditions rather than describe products. Technology neutrality was identified as essential to avoid vendor lock-in, stimulate creativity, encourage competition, and future-proof tenders. Instead of prescribing specific products, specifications should focus on performance outcomes, leaving space for innovative and hybrid solutions.

Mapping the SOTA was presented as a key exercise, not for cataloguing available solutions but for understanding the innovation landscape. SOTA analysis enables the definition of realistic innovation gaps, calibrates the ambition of the challenge, and guides risk management. A well-executed SOTA helps ensure that challenges are framed in ways that are both ambitious and achievable, reducing the risk of market failure or stagnation.

The second part of the presentation addressed how well-defined needs are translated into a strategic PCP approach. This process involves turning operational challenges into functional requirements, validating them through market analysis and OMC, and planning for IPR ownership, risk-sharing, and exploitation pathways. It was underscored that IPR strategy is a strategic enabler that must be considered from the start of the CSA phase, rather than being treated as a mere contractual formality.

Key IPR concepts were reviewed — background, foreground, and sideground — with emphasis on their importance for rights clarity, fair competition, and ensuring that results can be used and scaled after the PCP. The presentation discussed license-back terms, EU legal requirements, and how transparent background IP declarations, clear ownership terms, and well-defined licensing arrangements create trust, prevent free-riding, and maximize the value of public investment. Risk-sharing was presented as a cornerstone of PCP, requiring both financial and strategic alignment between procurers and suppliers.

The session concluded by underlining that robust, early-stage needs collection, continuous end-user involvement, technology-neutral functional specifications, and early design of IPR and risk-sharing strategies are essential to delivering successful PCP outcomes. When these elements are integrated into a coherent process — from CSA Phase 0 to market engagement and tendering — they enable public buyers to transform

fragmented challenges into actionable procurement strategies and to deliver scalable, innovative, and deployable solutions.

Best practices

The section on best practices, presented by KEMEA, highlighted tools and approaches to strengthen needs collection and validation. Current status screenings and focus groups were presented as effective means to obtain input from diverse user roles and to refine requirements iteratively. It was noted that focus groups often uncover hidden needs, regulatory constraints, and technical interface requirements that might otherwise be overlooked.

Requirements mapping and prioritization were emphasized as essential steps to distinguish between critical, desirable, and optional features, avoiding over-specification and reducing procurement complexity. The presentation also stressed the importance of integrating IPR provisions early in the process, giving both suppliers and procurers legal certainty and creating the conditions for greater market participation and collaboration.

2. Materials and resources

2.1. Presentations/Training materials

1. The four internal workshop trainings
2. The National workshop trainings: Greek and Portuguese training presentations
3. The National Workshops presentations
4. Seminar (hybrid) presentation

The full set of training presentations delivered during the project is included in **Annex 2 for reference.**

2.2. Bibliography and Reference Materials

- European Commission. *Pre-commercial Procurement: Driving innovation to ensure sustainable high quality public services in Europe*, COM (2007) 799 final.
- European Commission. *Communication from the Commission: Framework for State aid for research and development and innovation*, (2022/C 414/01).
- European Commission. *Guidance on Innovation Procurement*. Commission Notice C (2021) 4320 final, Brussels, 18 June 2021.
- European Commission. *Horizon Europe General Model Grant Agreement – Annotated version*, Version 2.0, 01 April 2025.
- Monteiro, B., Hlacs, A., & Boéchat, P. *Public procurement for public sector innovation: Facilitating innovators' access to innovation procurement*. OECD Working Papers on Public Governance, No. 80, OECD Publishing, Paris. Available at: https://doi.org/10.1787/92f7de2e-en .
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- iProcureNet Consortium. *Toolbox for Joint & Innovation Procurement in the Security Sector*, Version 2.0, April 2024. Available at: https://www.iprocurenet.eu/home/toolbox-2/.
- Baciu, I. (2021). *Research and Development Services*. In: R. Caranta and A. Sánchez-Graells (eds.), *European Public Procurement: Commentary on Directive 2014/24/EU*. Edward Elgar Publishing, pp. 154–172.
- Caranta, R. & Cerqueira Gomes, P. *Public procurement and innovation*. ERA Forum, 22, 371–385. Available at: https://doi.org/10.1007/s12027-021-00674-6 .
- Risvig Hamer, Carina (2021). *Technical Specifications*. In: Caranta, Roberto and Sánchez-Graells, Albert (eds.), *European Public Procurement: Commentary on Directive 2014/24/EU*, Edward Elgar Publishing, pp. 462–473.

3. Evaluation and feedback

The training activities delivered under POWERBASE WP3 were designed to strengthen the consortium's capacity to identify, validate, and address capability gaps through innovation procurement. The training plan was carefully drafted to accompany and support the work being carried out by each partner, ensuring that sessions were aligned with project milestones and provided relevant input to the work later reflected in the deliverables. However, due to the overall project schedule, it was not always possible to align every training session perfectly with the timing of the work being undertaken. This was acknowledged by one consortium member, who nonetheless confirmed that the training content was highly valuable and directly applicable to their tasks.

The evaluation of the training activities confirmed that they achieved their primary objective of building capacity within the consortium. Although a formal mid-project questionnaire received a limited response rate, the feedback collected indicated a clear improvement in partners' understanding of PCP processes, particularly regarding structured needs identification and assessment. Participants also expressed an interest in further strengthening their knowledge of IPR management and risk assessment strategies — areas which were subsequently given additional attention in later sessions.

Feedback gathered following the final seminar in Athens further demonstrated the effectiveness of the training component. Participants consistently noted that the sessions were highly relevant and contributed significantly to their ability to engage with PCP-related tasks. The practical focus of the training — including lessons learned, examples from previous projects, and interactive discussions — was particularly valued for its applicability to deliverable preparation and for enhancing partners' confidence in undertaking innovation procurement activities.

Overall, the training plan successfully met its objectives and contributed to building long-term capacity within the consortium. It provided partners with the methodological and legal tools necessary to participate effectively in PCP and strategic public procurement, leaving a durable knowledge base that extends beyond the life of the POWERBASE project and can be leveraged in future joint procurement initiatives.

4. Conclusions

The implementation of a structured training programme proved to be a fundamental pillar in the POWERBASE project, enabling the creation of a level playing field among consortium members with diverse backgrounds, roles, and prior experience. In complex multi-stakeholder projects such as those funded under Horizon Europe, this kind of capacity-building effort is essential to ensure a shared understanding of the legal, technical, and strategic dimensions of innovation procurement.

The training served not only to transfer knowledge but also to bridge disciplinary gaps and foster coherence across work packages and between technical and procedural tasks. In particular, the focus on cross-cutting themes—such as needs identification, functional requirements, and the strategic implications of PCP—helped participants understand how each element of the project contributes to the overall procurement strategy.

Notably, topics that may appear straightforward—such as identifying needs or defining functional requirements—proved to be challenging in practice. The tendency to think in terms of existing technologies or known solutions can inadvertently hinder innovation. The training specifically addressed this by promoting future-oriented, outcome-based approaches and by introducing methodologies that stimulate strategic thinking beyond current operational limitations.

The training also filled a critical knowledge gap. Innovation procurement and the phased PCP process remain unfamiliar territory for many public sector actors. The programme offered a solid conceptual and methodological foundation, which several participants—particularly those without prior experience in PCP—highlighted as a major advancement in their capabilities.

Moreover, the interactive format of the training sessions, which encouraged discussion, critical reflection, and the exchange of perspectives, was frequently cited by participants as a key success factor. This engagement not only reinforced technical understanding but also helped align the consortium's vision and approach.

In conclusion, the training programme was instrumental to the success of the POWERBASE project and has laid the groundwork for a robust and well-informed implementation of the PCP procedure. It demonstrated that training is not a parallel activity but an enabling mechanism—critical both to fostering innovation and to ensuring the effective execution of complex EU-funded procurement projects.

5. ANNEXES

- **Annex 1: 8 EEROs' National workshop reports**
- **Annex 2: Workshop Training presentations**

5.1. ANNEX 1 - 8 EEROs' National workshop reports

8 Reporting Forms - Workshop 3 "EERO Needs Assessment"

Feb2025

National Host (partner short name)	AutRC
Participating EEROs - needed: full organisations name and short name and number of participants - possible: demographic data (like gender, age group,...)	On Site: Austrian Red Cross, AutRC, 7 participants (1 m, 1 f) Samaritans, ASBÖ, 2 participants (2 m) Caritas, 2 participants (1 m, 1 f) Fire Services, 1 participant (1 m) Remote / Accompanying: Fire services (1 m), Austrian Forces Disaster Relief Unit (1 m)
Method chosen:	X Design Thinking incl. SCAMPER ~~Future Backwards Exercise~~ ~~Ideation (from Jobs to be Done / JTBD)~~ ~~Nominal Group Technique / NGT~~ ~~World Café~~ X Other: WIBGI
Summary of discussed aspects regarding WS3: - Comprehensible and concise - delivered in plain / body text style - max. 5000 characters incl. spaces - focusing on as many needs /requirements as possible and less on grammar or formulations:	Functionality • Use available resources such as recycling material / car batteries as puffer • available for air transportation (aircrafts or unmanned) • applicable for everyone • operating independent from Weather, climate conditions • not declared as dangerous goods (IATA) • central supplies being redundant (e.g. Diesel), additional feeding via photovoltaik, Charging from Storage • operational without specialist (Max. with minimal instructions) • not explosive • operation in extreme conditions (hot, cold, wet, dust) • without need of additional material / fuel provided by third parties • Charging, Activating, Re-activating in given conditions • UAV • independent of technical fuels • Enable Heating and Cooling • cooling or heating for medical purposes (e.g. pharmaceuticals) Efficiency 1. silent, light, water resistent, multi-connection option from USB-C to 400V/126A incl. Lighting Lese 2. time factor: set vs operations 3. costefficient / low cost (purchase and maintenance) 4. reduced weight / low weight 5. reduced volume / low volume 6. set up vs operational time 7. plan redundancy 8. stable energy provision 24-7 9. Reliability even in peak times Performance

	1. 20 kVA performance minimum 2. stable continious supply 3. "parameters: 4. voltage differences 5. Additional Services e.g. WASH" 6. "High energy consumables: 7. smartphones 8. washing machines 9. hygiene" 10. connector for each person involved 11. charging opportunity Scalability • expandable for national and EU operations • connectable • from single person use to running the full operational setting Interoperability ♦ take into account added value for andere branches · small market for ops ♦ Standards ♦ local, national, international Safety and Security Standards Safety and Security • failover / Securing via e.g. Start-Stopp • possibility to create spare parts easily • Plug and Play (SOP Check) • safe application and small maintanance by laymans • to be carried by 1-2 persons • take into account recommendations by authorities for reference values (weight, volume, noise,...) • need for specialists • specialists for energy, water, kitchen Additional • recycable • no declaration as dangerous good • fitting standard paletts (Euro) 1,2 x 0,8 m • affordable • photovoltaik solution scalable • Need for adaption of international regulations on transportation for storage etc • Redox! • close future = need of resources to be used as fuels • longter = photovoltaik with storage to be transported via road > air > water, operational within 72 hours, need of specialists • developped storage without being declared as dangerous good • differentiate for sudden onset / immediate / shortterm response vs longterm deployment • After Action Reports · plan the unplanable • communication support • stable network support • tracking the big consumer parts
If collected: **Figures** related to power supply incl. references like measure, period,...:	• 20kVA minimum • to be carried by 1-2 persons • according to standards in Austrian regulations for employees – see amongst others: LINK

Conclusion of discussed aspects on WS3: - Comprehensible and concise - delivered in plain / body text style with max. 2500 characters incl. spaces:	At Austrian Red Cross participants in the national workshop discussed about settings and requirements of Bases of Operations and Emergency Shelters from different stakeholders perspective set in given infrastructure as well as in the field. Those settings and general requirements have been further narrowed down to mainly functional requirements as listed above. Fast deployment, easy transportation (weight, package, means of transportation, regulations), safety and security for staff handling tool as well as durable and independent operations have been key and the golden thread for all collected aspects.
Attachments (max. 5 per partner, format jpeg, jpg, pdf) e.g. photos of flipcharts, slides Please Upload in Sharepoint Folder* named OrganisationsAcronym_ WS3_Subject and insert document link from Sharepoint here	• See here: 2025_01_29_Workshop3_EERO_AutRC
Additionally discussed and referred topics (optional, max. 1300 characters incl. spaces):	• General needs in Emergency Shelters vs Bases of Operations according to infrastructural setting (given infrastructure / in the field) -> as far as related to POWERBASE aspects -> transferred to results
Contact for any questions related to the submitted form and content:	Sandra Nestlinger, sandra.nestlinger@roteskreuz.at;

National Host (partner short name)	French Ministry of Interior MoI-F
Participating EEROs – needed: full organisations name and short name and number of participants – possible: demographic data (like gender, age group,...)	• Civil Defense Department of the French Ministry of Interior • French local fire and rescue services (Service départmental d'incendie et de sécurité) • Procurement Department of the French Ministry of Interior
Method chosen:	• Design Thinking incl. SCAMPER • Future Backwards Exercise • Ideation (from Jobs to be Done / JTBD) • Nominal Group Technique / NGT • World Café • Other: _____

Summary of discussed aspects regarding WS3: - Comprehensible and concise - delivered in plain / body text style - max. 5000 characters incl. spaces - focusing on as many needs /requirements as possible and less on grammar or formulations:	The aim of the workshop was to take stock of the resources currently needed to meet energy requirements and to agree on the priority requirements that need to be taken into account when using green technologies driven generators and that could be sets in BoOs. Currently, these generator sets have an approximate output of 3x15 kVA, and are used for various applications such as: • Heating • Lighting • Recharging equipment • Powering medical • Telecommunications equipment. • The generators are also combined with inverters to ensure continuity of supply. **The ideal** Disadvantages : • High-energy consumption for heating, due to insufficient insulation of the tents. • Vibration and noise/CO pollution requiring monitoring. • Difficulty in finding fuel quickly, need for experts in mechanics and fuel, and constraints for air transport. • Need to fill groups in the middle of the night. Advantages : • Reliable and robust, with few breakdowns and a long service life. • Operates in all conditions without temperature or humidity variations. • Simple, secure storage.
If collected: **Figures** related to power supply incl. references like measure, period,...:	See table below
Conclusion of discussed aspects on WS3: – Comprehensible and concise – delivered in plain / body text style with max. 2500 characters incl. spaces:	The emergency services are motivated by the ecological transition of energy resources, since since they already use solutions with a lower environmental impact. Nonetheless, products need to demonstrate the autonomy required for various interventions, especially at times of peak consumption and in extreme or even hostile climatic conditions.
Attachments (max. 5 per partner, format jpeg, jpg, pdf) e.g. photos of flipcharts, slides Please Upload in Sharepoint Folder* named OrganisationsAcronym_ WS3_Subject and insert document link from Sharepoint here	

Additionally discussed and referred topics (optional, max. 1300 characters incl. spaces):	
Contact for any questions related to the submitted form and content:	*Alberto BEVILACQUA* *alberto.bevilacqua@interieur.gouv.fr* *Thibaut REFFAY* *thibaut.reffay@interieur.gouv.fr*

National Host (partner short name)	*THW*
Participating EEROs - needed: full organisations name and short name and number of participants - possible: demographic data (like gender, age group,...)	Johanniter International Assistance (JUH) 3 participants I.S.A.R Germany (ISAR), 3 participants Federal Office of Civil Protection and Disaster Assistance (BBK), 1 participant - 6 male, 1 female
Method chosen:	ð Design Thinking incl. SCAMPER ð Future Backwards Exercise ð Ideation (from Jobs to be Done / JTBD) ð Nominal Group Technique / NGT X World Café X Other: additional agile brainstorming method (3-2-1)
Summary of discussed aspects regarding WS3: - Comprehensible and concise - delivered in plain / body text style - max. 5000 characters incl. spaces - focusing on as many needs /requirements as possible and less on grammar or formulations:	The workshop started with an open discussion, facilitated through individual introductory words on the interest in the workshop by each organization representative. Overall, the discussion at the German EERO workshop focused on bases of operations and quick response units. Regarding the equipment it became clear, that two of three participating organizations provide capacities for Emergency Medical Teams and therefore calculate with peaks in energy consumption for special equipment like X-ray machines. Since generators are usually selected according to the maximum load that can occur, but are operated most of the time in the lower third of the maximum output power, these applications are very inefficient. Therefore, there is a desire for solutions that have high efficiency over a wide load range. The participants further stated, that needs analysis should consider different approaches taking into account that equipment is also delivered as relief that will be left in the hosting nation. Use-cases also implicated the need of uncomplicated transportability of equipment not only, but often by airplane. During a world café ideas from earlier unstructured discussions were clustered using 5 parameters efficiency, performance, functionality, interoperability and scalability. The results show a high importance of robust functionality that is easy to use without many explanation. This aspect was repeated often referring to the stressful environments practitioners work in after long and complicated travels. In regards of interoperability and logistics norms for transport in vehicles should be considered. The renewable energy needed should be available in the field, allowing to produce 5-15 kW.

	Noise and heat emissions were seen as lower priority. The results were validated using a brainstorming method called 3-2-1 method. This agile method was used to develop ideas on needs and requirements within very few time building on the input from the group. This method facilitated – as an addition to the criteria mentioned above - a discussion on needs for trouble shooting. Guided trouble shooting for technology that may be AI-supported was seen as an opportunity. This supporting tool should be accessible also for non experts e.g. from a medical team.
If collected: **Figures** related to power supply incl. references like measure, period,...:	
Conclusion of discussed aspects on WS3: - Comprehensible and concise - delivered in plain / body text style with max. 2500 characters incl. spaces:	According to the participants, the uncomplicated use and maintenance in the field could not be stated enough. The phrase "run and forget" was used to visualize this idea. This applies especially if equipment is brought to nations as relief goods. Logistical and operational aspects therefore played an important role in the workshop.
Attachments (max. 5 per partner, format jpeg, jpg, pdf) e.g. photos of flipcharts, slides Please Upload in Sharepoint Folder* named OrganisationsAcronym_ WS3_Subject and insert document link from Sharepoint here	*THW_WS3_world_cafe1* THW_WS3_WorldCafe1.jpg *THW_WS3_world_cafe2* THW_WS3_WorldCafe2.jpg *THW_WS3_results_3-2-1-method* Ergebnisse-8-3-2-Methode.pdf
Additionally discussed and referred topics (optional, max. 1300 characters incl. spaces):	
Contact for any questions related to the submitted form and content:	*Project-powerbase@thw.de*

National Host (partner short name)	*Center for Security Studies (KEMEA), Athens, Greece*
Participating EEROs - needed: full organisations name and short name and number of participants - possible: demographic data (like gender, age group,...)	- *Hellenic Police (3m) – 3 different Directorates* - *Attica Prefecture, Civil Protection Directorate (3f)* - *Hellenic Fire Service (1m)* - *Hellenic Red Cross (1f)* - *Ministry of Climate Crisis and Civil protection, General Secretariat of Civil Protection (1m)* - *Ministry of Migration and Asylum, General Secretariat of Migration Policy (2m)* *In total 11 persons* a) the representative of the Fire Service, member of the Special Disaster Response Unit (EMAK) with numerous missions, including deployment to the earthquake hit Albania in 2019 and Turkey in 2023; b) the employees of the Ministry of Migration and Asylum, with hands-on experience on the management of numerous refugee camps in Greece; c) the representatives of the Hellenic Police, in charge of the requirements for the mobile

	operations center of the Hellenic Police, employed in the procurement and in civil protection;
Method chosen:	ð Design Thinking incl. SCAMPER ð Future Backwards Exercise ð Ideation (from Jobs to be Done / JTBD) ð Nominal Group Technique / NGT ð World Café √ Other: Wouldn't Be Great If...
Summary of discussed aspects regarding WS3: - Comprehensible and concise - delivered in plain / body text style - max. 5000 characters incl. spaces - focusing on as many needs /requirements as possible and less on grammar or formulations:	*Example: At Austrian Red Cross this example text was created during the workshop. Discussed points can be categorized ... and aspects mentioned are...* The workshop was successfully conducted with lively discussions with a number of participants with deep knowledge of the topic, as well as interest, even for future engagement with the project and the innovation public procurement activities. Experiences were shared by the participants. They all shared requirements for mobile power supply, what is currently employed, difficulties, challenges, as well as wishful thoughts and ideas for the future. The following common methods for supplying energy to an emergency remote installations have been presented by the participants, by their own initiative: 1. **Solar power** by solar panels, especially in sunny regions. This method is renewable and can be paired with energy storage systems like batteries to provide power when the sun is not shining. Currently, small panels are used for mobile devices, e.g. lighting poles (Red Cross owns few), UPS devises (for the operations center in/out a BoO). 2. **Wind power**: small wind turbines can be used in locations with consistent wind patterns. Like solar, wind power can be used in combination with battery storage to ensure a reliable power supply. 3. Alternatively, **Wind-Solar Hybrid systems**, with a combination of wind turbines and solar panels, can offer more reliable energy, as solar power works during the day, while wind power may be more available at night or during cloudy days. 4. **Hydropower**: if the installation is near a river or stream, small-scale hydroelectric systems can generate power employing the water flow. This method is more location-specific and less widely used, yet it may provide a rather stable energy source. 5. **Thermal energy**: in some remote areas, systems like thermoelectric generators can convert heat from fire (e.g.), an industrial process or geothermal source into electricity. This, depending on the source, may be adequate for a range of power requirements or may demand a more complex installation, inappropriate for emergency accommodation. Should thermal energy be needed for minimum camp services (i.e. heating of living/working areas, cooking, water heating, burning of wood, or other locally available byproducts such as pellet, briquettes, olive nuts and other residues, in specific burners or simple woodstoves, could be a green, easy and effective manner. 6. **Fuel cells** generate electricity through chemical reactions (e.g. hydrogen); they are a relatively new clean and efficient power generation method which can serve as a

backup power source. It is still less common and expensive, but could be ideal for remote locations with fuel delivery capabilities.

7. **Diesel or Gas Generators** consist of the most commonly used method for power generation, when renewable energy is not feasible and when backup power is needed, as they can provide immediate power. These generators are particularly useful and widely used in short-term emergencies or when other energy sources are insufficient. They can be found in a variety of power values and sizes. Fuel is required to be transported together or to be purchased on site.
8. **Battery banks** (such as lithium-ion or lead-acid) can store energy from renewable sources or generators. This is necessary for providing energy during the night and periods of low renewable energy generation.

It has been mutually agreed that the **transfer of the fuel** that traditional fuel/diesel generators employ **is a common challenge**; usually purchasing on site is opted for – when and where this is possible, local volunteer organizations often may offer, rarely it may be transferred with military flights or special flights during emergencies of humanitarian missions.

The requirements of the new innovative solution have been discussed in all five dimensions: Functionality, Efficiency, Performance, Scalability, Interoperability and the following recommendations have been made:

- It needs to be **simple in put-into-function, operation and maintenance**, with no need to be operated by specialized personnel
- It would be ideal to develop a system that is making **use of more than one power generation resources, plus energy storage**. A **smart algorithm** integrated into it will make optimized use of the most proper resource throughout the day. Possibly, in these could be included the conventional fuel generator in order to guarantee a baseline supply at least for critical services, e.g. the command center included at the BoO. Caution should be paid though to the cost which might become times #of power generator technologies.
- Caution should be also paid to the **dimensions (volume and shape)** of the system; it would be ideal to fit in a helicopter for ease of transfer, acknowledging the need for proper certifications that will allow transfer via air.
- **Transfer of dangerous substances** – should they be needed for power generation – via the sea and road, also requires special certifications.
- The power offered in a camp would better be in a **modular mode**: the camp can be divided in **clusters of energy** per isles of tents, in order to have lower power requirements per cluster and thus per power generation system.
- **Power generation with hydrogen** has been recognized as the most promising technology, although it requires an initial minimum amount of energy stored, e.g. via renewable or fossil fuel resources, and thus the system should also include power storage devices and the hydrogen generation might not always considered green. The hydrogen though is very explosive and thus problems maybe faced for the logistics: transfer and storage on site. Moreover, being a quite emerging technology, the operation of the system might be evident and may require specialized personnel. Last but not least, the cost of raw material used for fuel cells is high, what makes it less suitable for mass production but also for employment of such a system in external areas exposed to security risk (case of emergency shelters). Moreover, being

	an emerging technology, the absence of economy of scale increases the production cost. - Last but not least, the existence of **photovoltaic panels with nanocells** stored in rolls were discussed as an available, transportable, non-expensive and easy deployable technology. However, it is possible that for the energy needs of a camp, rolls of very big length might be needed and, apart from the logistics problem, the availability of large area around the camps, necessary for their deployment, cannot be guaranteed in all circumstances. Some examples of alternative electricity offered during emergencies were discussed: **Electrical cars** may be used for providing electricity in emergency situation in Vehicle to Load (V2L) function, as was the case of Tesla Cybertrucks sent to LA wildfires for offering power to firefighters operations; **powerships** are a floating power generation resource, easily deployable, although the fossil fuel they are using is heavily criticized.
If collected: **Figures** related to power supply incl. references like measure, period,...:	Representatives from the Ministry of Migration and Asylum collected, for the purpose of the workshop, electricity consumption data from 30 migration camps in Greece: - The smallest camp is of 97 persons, the largest of 4578 persons. - Min. monthly consumption is 14171kWh and min daily consumption is 472.36kWh/d and doesn't correspond to the smallest camp. - The highest monthly consumption is 391508.02KWh and max daily consumption 13050.26kWh/d and doesn't correspond to the largest camp. - The average daily consumption per person is 5.81kWh/p/d, the min 1.56kWh/p/d and the max 12.32kWh/p/d. Indicative power required: - Lighting of a tent/container: 10-15W with LED type lamps - Laptop operation: 100W - Power for phone/tablet charging: 5-10W - The main consumption is for heating SPHERE requirements for humanitarian camps needs may be generally lower than, especially EU, emergency camps. However, in terms of water consumption (and in particular hot water requiring power) may be lower in short-term emergency shelters and bases of operation.
Conclusion of discussed aspects on WS3: - Comprehensible and concise - delivered in plain / body text style with max. 2500 characters incl. spaces:	The participants found really interesting the vision and scope of the project and, although the ideal requirements they have expressed may be quite wishful, they still recognize the need and importance of the development of such a system. Following the discussion and analysis of different available and innovative power generation systems, the **ideal system for them is hybrid** and is composed by different energy resources that will be able to provide power throughout the day, all year round, in all scenarios. They do not renounce the fossil fuels and the traditional power generation as they think that this could be part of the hybrid system for guaranteeing minimum power supply for essential services. Additionally, they consider hydrogen power generation as the most promising emerging technology to their knowledge, which would also require a first minimum power generated and stored, not necessarily by green resources. Having said that,

	the hybrid system would also require the integration of energy storage systems, for which technology is also advanced (no further discussion on this was conducted). Attention should be paid to the **transportation requirements for dangerous substances** that an innovative system of power generation and storage may consist of. Without discussing specific figures, it was agreed that the system needs to have a **convenient size** to allow transportation and storage, while it was strongly recommended that it should be **easy for operation and maintenance**. Moreover, it has been recommended to account for division of the camp in energy clusters and thus the development of a **system deployable in modular manner** is also recommended. Figures for energy consumption in refugee camps have been shared and although the camps for humanitarian purposes have often different requirements in terms of services provided, they yet offer a good approximation of the max/min needs.
Attachments (max. 5 per partner, format jpeg, jpg, pdf) e.g. photos of flipcharts, slides Please Upload in Sharepoint Folder* named OrganisationsAcronym_WS3_ Subject and insert document link from Sharepoint here	Please find in the Sharepoint, the presentation file which we used during the workshop also for keeping notes and updating the slides (mix of English & Greek): *KEMEA_WS3_Main Presentation_GR.pptx*
Additionally discussed and referred topics (optional, max. 1300 characters incl. spaces):	Lots of discussion was held on **how to keep low the energy requirements**, given that power supply is often the most demanding by all means: e.g. a) reducing consumption of hot water by having public showers with non-independently accessible turn on/off button of the water heater; b) not providing to the beneficiaries socket outlets but rather usb sockets allowing only phones charging and not the use of other non-emergency related power consuming devices. The use of smart systems for optimization of energy needs and saving has be recommended. The innovative power generation (& storage) system to be developed for the needs of the emergency shelter and base of operations can be equally used for **energy provision to the operations on site**, e.g. search and rescue operations in which mobile power supply is demanding and essential. A presentation on **public procurement and innovation procurement** (in Greek) preceded the workshop session. This was enriched by questions and answers between Antonios Saoulidis and the interested participants, especially the ones from the procurement departments of their organisations. The presentation can be found: *KEMEA_WS3_PCP-PPI_AS.pptx*
Contact for any questions related to the submitted form and content:	Danai Kazantzidou-Firtinidou, KEMEA *d.kazantzidou@kemea-research.gr*,

Participating EEROs - needed: full organisations name and short name and number of participants - possible: demographic data (like gender, age group,...)	*Hungarian Charity Service of the Order of Malta (6)* *Bicske Municipal Fire Department (1)* *National Directorate General for Disaster Management, representing 2 departments:* *-Fire protection and emergency management (2)* *Fejér County Disaster Management Directorate (1)* *Budapest's Firefighting Association (1)* *HUNOR - Heavy USAR team (1)* *KKSZA (Foundation for Search and rescue dog) (2)* *Central Buda Volunteer Civil Protection Team (3)* *Hungarian Red Cross (1)* *In total 18 persons*
Method chosen:	ð Design Thinking incl. SCAMPER ð Future Backwards Exercise ð Ideation (from Jobs to be Done / JTBD) ð Nominal Group Technique / NGT ð World Café √ Other: Wouldn't Be Great If...
Summary of discussed aspects regarding WS3: - Comprehensible and concise - delivered in plain / body text style - max. 5000 characters incl. spaces - focusing on as many needs /requirements as possible and less on grammar or formulations:	During the Hungarian national workshop a good scale of EEROs were addressed and also took part in the event. Having experts around the table from DG for *Disaster Management,* heavy USAR and emergency medical teams, mid and smaller size units of emergency response, we were able to get a diverse sample from EEROs.The lively discussions underlined the relevance of the POWERBASE project. The participants expressed their interest for a follow-up event and discussion, which also showed the success of the event. The representatives specifically asked for keeping them updated about the POWERBASE project development. During the discussions we considered the context of the different scenarios (based on T2.1.) in which the devices would be used. • The future devices should be in a modular system consisting of smaller units that can be combined and linked, rather than having 1 enormous equipment. Here it was outlined that cooperation between organisations could also be a way, e.g. having specified teams/units with extra energy capacities. • The system should be Modular, but a closed circuit system. • The equipment should be easy-to-use. • Modularity would also support maintenance, like onsite replacement of a malfunctioned part. • The handling of the devices should be user friendly having simplified, but informative control panel. • Compatibility with vehicle-to-Load (V2L)systems to supply power from its battery directly to external electrical devices (mobile power source) and appliances. • Ensuring widescale of usage (also for new recruits) easy access user manuals should be available on/with devices, like using QR code system. • Future devices should have minimalized surveillance needs during operations to save human resources.

	• They should be highly mobile: weight (1-2 person/unit), roll container feature. Bigger units could have self-propelling features. • Should be easy to mobilise, even having units for smaller energy demand (sized for backpack). • It should have fast charging capability. • It was also commonly supported and desired to have a standardised control panel making • Endurance in extreme weather conditions: water resistant, dust-proof, fire proof, shock resistant. • Graphene battery technology is preferred. • It should be appropriate for normal non-emergency operations as well. • Aerial transportation aspects should also be considered: • different size and shape of the cargo compartments in the aircraft: not only square, but also arched. • Should be able to operate with constant performance between -40 and +50 °C • Its performance should reliable and constant. • Waste management aspects also should be considered: what happens with the used, or malfunctioned battery? • Pre-installed connectors at public buildings • Unified and standardised batteries should be introduced, or at least they should be compatible. (interoperability between brands) If not even compatibility is possible then „translator" devices should be available to make it easier to find replacement batteries onsite. • They should be capable for hybrid system operations. • The maintenance should also be cost-effective.
If collected: **Figures** related to power supply incl. references like measure, period,...:	
Conclusion of discussed aspects on WS3: - Comprehensible and concise - delivered in plain / body text style with max. 2500 characters incl. spaces:	Participants of the workshop shared opinion in looking for a modular solution, with easy and standardized structure control panel. Interoperability and compatibility of the different brands should be a minimum requirement. The demand with regard to reliable performance and easy onsite maintenance repair or replacement was also pointed out.
Attachments (max. 5 per partner, format jpeg, jpg, pdf) e.g. photos of flipcharts, slides Please Upload in Sharepoint Folder* named OrganisationsAcronym_WS3_Subject and insert document link from Sharepoint here	
Additionally discussed and referred topics (optional, max. 1300 characters incl. spaces):	The different organisations presented their solutions already in place. While BFA even introduced the development process how they integrated solar power in e.g. in their trailers. HCSOM presented how green energy is used everyday operations.
Contact for any questions related to the submitted form and content:	Imre Szabjan, szabjan.imre@maltai.hu

National Host (partner short name)	CNVVF
Participating EEROs - needed: full organisations name and short name and number of participants - possible: demographic data (like gender, age group,...)	Ministero dell'Interno, CNVVF, 14 participants (13 m, 1 f, all 53) ANAS, ANAS, 2 participants (1 m, 1 f) Comune Valfabbrica, VALFABBRICA, 1 participant (1 m) E-distribuzione, E-DISTR, 2 participants (2 m) ENEL, ENEL, 1 participant (1 f) Gruppo Ferrovie dello Stato, FS, 6 participants (6 m) Ordine Ingegneri Perugia, ORDINGPG, 5 participants (3 m, 2 f) Provincia di Terni, TERNI, 1 participant (1 m) Regione ABRUZZO, ABRUZZO, 3 participants (3 m) Regione TOSCANA, TOSCANA, 1 participant (1 m) Regione UMBRIA, UMBRIA, 12 participants (9 m, 3 f) Università di Perugia, UNIPG, 5 participants (4 m, 1 f)
Method chosen:	ð Design Thinking incl. SCAMPER X Future Backwards Exercise ð Ideation (from Jobs to be Done / JTBD) ð Nominal Group Technique / NGT ð World Café ð Other: _____
Summary of discussed aspects regarding WS3: - Comprehensible and concise - delivered in plain / body text style - max. 5000 characters incl. spaces - focusing on as many needs /requirements as possible and less on grammar or formulations:	In the course of the Italian POWERBASE EERO workshop, participants discussed extensively the challenges and needs related to the use of power generator in emergency as well as to preserve the service during network maintenance works. In general, the discussion highlighted their role to ensure the operational continuity and/or critical services of critical infrastructures, such as hospitals, train stations, train network and control centers, in the event of a power outage. The discussions covered various aspects: • Use scenarios: power generators are commonly deployed in hydro-meteorological emergencies, faults or scheduled maintenance to the electricity grid, and for daily rescue activities. Emergencies include earthquakes, floods, snowfall and fires. • Types of fuel: currently, power generators are predominantly diesel powered. The potential adoption of alternative fuels such as methane, LPG, hydrogen and biofuels was discussed and considered acceptable, even though some safety issues remain to be solved. • Connection to the grid. Power generators are equipped with the tools needed by the technicians to quickly connect them to electrical substations. • Sustainability. There was a clear agreement on the need to reduce the environmental impact of power generators, integrating sustainable components, such as BESS (battery energy storage system), photovoltaic panels and wind blades. • Energy transition and operational difficulties. While there was agreement on the need of a transition from fossil fuels towards more sustainable solutions, it was equally agreed that operational difficulties remain, especially in the initial stages of emergencies. The use of traditional diesel generators is still considered necessary to ensure an immediate and effective response, while innovative technologies (such as BESS and hydrogen) are considered as solutions more suitable for a later phase. In fact, sadly as it

	is, all the experts agreed on the need of particularly sound solutions, being the experts well aware that disaster-stricken population is already stressed, and not ready for compromises between their wellness and the protection of the environment. • Electric vehicle fleet management. It was highlighted that CNVVF acquired a great number of electric vehicles, with the consequent need to set up a charging system in the base camps, and consider its impact on the power demand. The same is true for other EEROs too, e.g., the Italian railway operator, which procured numerous electric vehicles for their staff. • An interesting scenario was raised by the Italian railway operator, which nowadays employs diesel machinery when working in tunnels: when these works run late, exhaust gases accumulate dangerously for the operators. To this regard, an environmentally friendly power generator would be critical to reduce this risk for the workers too. • Solutions regarded as promising. During the workshop, experts proposed the adoption of some current and/or innovative solutions, which were considered with potential: o Photovoltaic panels, to be installed in stations, or in combination with tents for base camps; o Salt batteries, mentioned as an alternative to lithium batteries; o Lower impact fuels as Hydrogen, Methane, LPG (Liquified Petroleum Gas), CNG (Compressed Natural Gas), and LNG (Liquid Natural Gas), could be promising once the relative storage, transport and supply chain would be streamlined and considered safe. • It was considered important too to standardize equipment and procedures to improve the efficiency of interventions, especially in emergencies. • The importance of preventive maintenance and staff training was highlighted too. • There was also a wide agreement on the need to optimize energy consumption, using low consumption systems and materials with high thermal efficiency. • Remote control and monitoring: The lack of advanced remote-control systems makes the management and monitoring of generator sets difficult, requiring frequent manual checks. The implementation of remote-control systems is crucial to improve emergency response and reduce intervention times. Finally, it was highlighted the importance of improving emergency planning, through the identification of suitable areas for emergency shelters, located nearby electrical substations.

If collected: **Figures** related to power supply incl. references like measure, period,...:	• Power demand: The power required varies depending on the scenario and the electrical loads to be served, the power generators employed go from 3 kW to 2000 kVA. o The maintenance or repairs of a medium-sized substation requires approximately 6 MWh for 36 hours. o Base camps can require up to 200 kW for 250 people, for heating, air conditioning and kitchens, being electric kitchens and meat lockers the components with higher energy demand. o Electric kitchen. An electric cooker with 1,000 meals per hour capacity requires 200 kW. o Shelters. The experts mentioned generators from 30 to 400 kVA, which they employ for shelters. o Peak consumption. the Umbria Region shelters were designed to cover a peak consumption of 500 kW, which also includes a kitchen. • Technical figures. Typically, a 250 kVA power generator is soundproof, has a water-cooling system, weighs 3500 kg and consumes from 19.4 to 77.7 liters/hour depending on the load. Its set up requires some 4 hours. • Service life. In most cases, power generators remain active for less than a day (64%), while in 31% of the cases they last from 1 to 10 days, while only in 5% of the cases they exceed 10 days. • Consumption. A 250 kVA power generator has a fuel consumption that varies depending on the load: o 19.40 litres/hour at 25% load o 39.30 litres/hour at 50% load o 57.30 litres/hour at 75% load o 77.70 litres/hour at 100% load • Electrical substations. Into the power grid, substations are powered with 6KV and 20KV. The distribution substations are powered by two 400 KVA transformers with intelligent absorption management. • Power generators size. The power generators used by the power grid operator (E-distribuzione) in case of works have different sizes: 60 kW, 100 kW, 400 kW, 500 kVA, 630 kVA, 700 kVA, 1 MVA (medium voltage), 2 MVA (medium voltage). • Grid network: The E-distribuzione grid network is managed through 28 control centers with backup, and 500 locations with recovery. It also manages 2800 substations dedicated to the power distribution. • Vehicle charging outlets. For each substation E-distribuzione installed several 11kW AC and one 100kW DC vehicles charging outlets. • Use of generators. The energy grid operator, E-distribuzione, deploys power generator more than 15,000 times per year. This data provides a picture of electricity consumption and supply figures in the various scenarios discussed in the workshop. It is important to note that some figures are specific to particular contexts, while others offer a general overview of typical capacities and consumption.

Conclusion of discussed aspects on WS3:
- Comprehensible and concise
- delivered in plain / body text style with max. 2500 characters incl. spaces:

In conclusion, the POWERBASE workshops highlighted the complexity of energy management in emergency situations, underlining the need for an integrated and innovative approach. The discussions highlighted various critical issues and opportunities, which can be summarized in the following key points:

- Dependence on fossil fuels. The current system relies heavily on diesel-powered generators, resulting in environmental and logistical impacts. It is therefore necessary to accelerate the transition towards more sustainable solutions, such as hydrogen, biofuels, batteries and renewable sources, while maintaining a realistic and gradual approach.
- Standardization and interoperability: The lack of uniform standards for equipment and procedures creates inefficiencies and delays in emergency responses. It is essential to promote the standardization of connection systems, cables and infrastructures, also through collaboration between different bodies.
- Consumption optimization: Energy consumption, especially in emergencies, is high and often not optimized. It is important to encourage the use of low-consumption technologies, such as LED lamps, heat pumps and efficient air conditioning systems, as well as high thermal efficiency materials for insulating rooms.
- Planning and logistics. Planning for base camps and shelters is often inadequate, with areas not ready to supply the needed power. It is necessary to identify areas equipped with adequate electrical panels or near substations, as well as taking care of the logistics for the positioning of the base camps.
- Training and competence: Personnel involved in emergency management require specific and continuous training to correctly use equipment and new technologies.
- Inter-agency collaboration: Collaboration and coordination between the various agencies (Fire Brigades, Civil Protection, Power grid operator, Road operator, Rail operator, etc.) are fundamental for an effective management of resources and emergency.

In summary, the innovation activities should be oriented towards:

- Research funding for innovative and sustainable technologies to reduce dependence on fossil fuels and environmental impact.
- Standardization and optimization of procedures and equipment to improve the response efficiency.
- Implementation of remote control and monitoring systems for more effective management of resources.
- Strategic planning and logistics for better organization of base camps and shelters.
- Continuous training of staff to ensure high competence and safety.

These aspects, if addressed in an integrated and collaborative way, will significantly improve emergency management and the resilience of critical infrastructures, ensuring greater safety and protection for the population.

	As a whole, to satisfy the needs exposed by the users, the future system should be modular and comply to the following: • the modules should have dimensions and weight compliant with the capacity of 4x4 medium-heavy truck (e.g., EuroCargo 150E30 4x4, which can carry a 13 feet Standard ISO shipping container 4x2x2.26m with weight capacity up to 500 Kg/sqm); • the single module should deliver 250 KW to cover the needs of heating, cooling, sanitary water (60 KW for 40 rescuers), kitchen (200KW for 1.000 meals per hour), vehicle charging system (200 KW for 30 vehicles); • the modules should be able to be linked in a single network; • the system could foresee an autonomous BESS (battery energy storage system) module, including: o batteries, o power conversion system, o inverter, o sensors, devices and measures to ensure fire & explosion safety, o air conditioning system for the batteries, o interconnection systems with other BESS and power generation systems, o electrical panel for civil and industrial use, o capacity up to 1 MWh; • BESS could be charged by o photovoltaic generator (if the needed space is available, e.g., 40 sqm for 10KWh), o wind power generator (if the weather conditions are favourable), o internal-combustion engine with tank of the following types: ♣ Diesel, ♣ Biodiesel (concrete availability of the fuel TBC), ♣ LPG - Liquified Petroleum Gas, ♣ Methane, ♣ Hydrogen (transport and storage safety issues TBC), ♣ LNG - Liquefied Natural Gas (transport and storage safety issues TBC), ♣ CNG - Compressed Natural Gas (transport and storage safety issues TBC); • co-generator units could be foreseen as add-on modules to provide heating, cooling, sanitary water.
Attachments (max. 5 per partner, format jpeg, jpg, pdf) e.g. photos of flipcharts, slides Please Upload in Sharepoint Folder* named OrganisationsAcronym_WS3_ Subject and insert document link from Sharepoint here	Uploaded into the sharepoint WP2/T2.2/Workshop 3 EEROs/Pictures folder
Additionally discussed and referred topics (optional, max. 1300 characters incl. spaces):	In the course of the Italian EERO Workshop the users highlighted the following issues as critical: • Remote control systems vulnerability. There was a wide consensus over the importance to include remote control systems into the system; however, these systems depend from the network infrastructures, which often provide limited duration

	in case of de-energizing (a few hours). It was considered as crucial to ensure higher duration for these systems in emergency. Furthermore, it was suggested to implement interoperability systems to improve communication and sharing of data between EEROs to obtain higher efficiency. • Tools issues. There were perplexities on the opportunity to adopt electrical dewatering pumps for flood, in particular if used by volunteers, due to the higher electrocution risk and the poor risk awareness, so that endothermic engine-based dewatering pumps are preferred to raise workers' safety. Base camp electrical kitchens have very high-power demand (200 KWh): more efficient solutions are required. • Safety issues. In case of maintenance works to the power network, workers are subject to new risks: in these cases, the power network is de-energized, but sometimes voltage returns due to power generators and BESS installed downstream, which represent a clear risk for workers. • Emergency plan. The experts agreed on the need to improve the emergency planning process, introducing a further criterion in the emergency shelter selection process: the availability in the same place or near-by of electrical substation, able to provide the amount of power required by the planned emergency shelter, and, as a consequence, to ensure a fast transition from power generators to power network. • Research funding: the experts raised the poor availability of research funding focused on BESS (Battery Energy Storage Systems), which could speed-up the delivery of innovative and sustainable solutions. • Disposal of used batteries. The users highlighted the importance to focus more attention on the disposal of batteries, so as to ensure higher credibility of the whole effort.
Contact for any questions related to the submitted form and content:	Marcello Marzoli marcello.marzoli@vigilfuoco.it

National Host (partner short name)	*VIEIRA*
Participating EEROs - needed: full organisations name and short name and number of participants - possible: demographic data (like gender, age group,...)	*Autoridade Nacional de Emergência e Protecção Civil, ANEPC, 1 participant (1 m, 30-50)* *Direcção-Geral de Energia e Geologia, DGEG, 3 participants (3 m, all 40-60)* *Cruz Vermelha Portuguesa, CVP, 2 participants (2 m, all 30-50)* *Câmara Municipal de Lisboa, 2 participants (2m, all 30-50)* *Regimento de Sapadores de Bombeiros de Lisboa, RSBL, 3 participants (3m, 30-50)* *Universidade de Évora, UnivE, 1 participant (1 m, 30-50)* *EDP, S.A., EDP, 1 participant, (1 m, 30-50)* *GALP, GALP, 1 participant (1 f, 30-50)* *Redes Energéticas Nacionais, S.A, REN, 1 participant (1 f, 30-50)* *Public Markets, Construction and Real Estate Institute, IMPIC, 1 participant (1f, 30-50)*

Method chosen:	ð Design Thinking incl. SCAMPER **ð Future Backwards Exercise X** ð Ideation (from Jobs to be Done / JTBD) ð Nominal Group Technique / NGT ð World Café **ð Other: WIBGI X**
Summary of discussed aspects regarding WS3: - Comprehensible and concise - delivered in plain / body text style - max. 5000 characters incl. spaces - focusing on as many needs /requirements as possible and less on grammar or formulations:	ð First responders discussed the relevance of considering the all life-cycle of the rescue/emergency civil protection process, including logistics and maintenance. Equipment needs to be quickly available with low logistic impact. The actual team's activation has a big logistic footprint. Transportation is a very relevant topic considering huge limitations in airplanes (thinking of batteries, e.g.previous experience demanded special containers for air travel and this was a huge limitation of capacity).But even in military airplanes (C-130), teams need to be shorter if the equipment takes up a lot of space, so compact equipment with the same power capacity would be better. Quick start at the rescue point demands more than transportability. True mobility is needed. Emergency teams shouldn't rely on the local capacity for starting to work at arrival. Therefore, the system should have capacity enough for working with autonomy for the first 3 days upon arrival, at least. The need of recharging equipment upon restitution (at the end of the day or after some hours' use) is something to be addressed. Although portable equipment is more and more efficient, one cannot disregard the fact that teams work in the rescue field with equipment (saws, e.g.) and that equipment needs to be recharged (some, only after some hours, or at the end of the day) and this constitutes a demanding supply energy factor. This also demands a supply system but a self-chargeable system, with quick deployment and quick restitution of equipment in the field. The maintenance (parts substitution) must be assured and needs to be easy to do. ð Modularity, scalability, mobility, autonomy, interoperability are the main characteristics of an energy supply source referred by the group. A solution should also consider the energy weight (at this moment, fuel carries more energy density that lithium batteries). Standardization (like "NATO standard") should be implemented. Lithium batteries don't handle well with altitude and temperature changes. Systems' complementarity creates more resilience. Decentralized systems should bring less need for transportation if interoperability and complementarity is granted. ð One of the most relevant topics in discussion was the interoperability of the civil protection/emergency systems (at least in EU). Sometimes, the mouse of a fire hose used in one Member State is different of used in other MS, or even in the same country are different types and measures not interoperable. Connection points to the power grid differ from country to country. This is an enormous problem to overcome in catastrophe events and takes time for teams to adapt instead of starting operating. But this lack of interoperability also brings added difficulties in maintenance and in support operations. It should also be considered the creation of a modularity system by event type characterization, with the allocation of specific structures. Or create types of operation by energy availability/characterization. And teams should also have an energy specialist, as they have communications support, or medical support ones. Energy supply should be part of the planning of a mission and the equipment to be used in missions should adapt to the energy power supply solution.

	ð A certain apprehension related with the use of batteries was referred, based on past experiences in fire in Canada, e.g. Batteries were divided by each member of the team, cataloged and inventoried what represented a huge amount of administrative work. But there are already 2nd life batteries to support the power grid (370kW/h and charges 100kW/h) and batteries of big capacity of 5MWh with utility scale. When this scales up to the heavy vehicles they can be themselves a power supply source. Batteries demands safety regulations, and the autonomy topic need to be taken in consideration. ð The best solution is a dual one: several sources, with complementarity, increasing the efficiency and reducing the emissions. Also, stand-alone mobile solutions with safety regulations to be disseminated in more scenarios. In DAKAR there was a hydrogen itinerant power supply (but air transportation is not possible) and 90% of the support in emergency situations goes by plane. The group highlighted the need to guarantee a strategy of energy management, with autonomy, but intelligent with a digital layer to be used by agents in the field (e.g integration of weather information). Retrofitting of generators should also be considered like in other industries. ð Finally, training of the teams is essential to ensure good operational conditions during all time, including in what refers to maintenance capacity.
If collected: **Figures** related to power supply incl. references like measure, period,...:	*This was not provided. Figures of the Scenario were accepted.*
Conclusion of discussed aspects on WS3: - Comprehensible and concise - delivered in plain / body text style with max. 2500 characters incl. spaces:	At VIEIRA workshop the main aspects discussed can be summarized to following categorizes. ð The definition or creation of a new low-emission power source needs to take in consideration the all life-cycle of the emergency civil protection typical events, from planning to maintenance and also shelf-life challenges. A cross-border option (inside EU) should be taken: either insisting in a decentralized system (and in this case implement interoperability and create a kind of classification for emergency events to standardize more typified and categorized responses), or carry forward to a stock pilling European centralized system, like the one of RescUE (or similar, for medical equipment post-Covid19). In any case, it is relevant to consider always a dual use (shelf-life). ð Low-emissions power supply solutions should also consider that generator sets are also improving to be more clean, more efficient and hybrid. ð The best solution for a low-emission supply source is modular, scalable, mobile, autonomous, auto-rechargeable, interoperable. Efficiency should be addressed by energy weight and energy density (more density with less weight provides more efficiency). ð The interoperability (between equipment, electric systems, grid connections, applicational interfaces) was related with the need of establishing standardization (like “NATO standard”) and regulation for safety and interoperability. This would allow systems’ complementarity that represents more resilience. ð Regarding the 3 scenarios, the conclusion was that there isn’t a solution that fits all, but modularity, complementarity, hybrid systems and interoperability could improve speed in response in logistics, transportation and therefore become more efficient in the response. ð These aspects, if implemented in Member-States, could improve the response in Europe countries and provide a

	better and quicker result within the European Civil Protection Mechanism and, consequently, also when MS need to integrate third country teams.
Attachments (max. 5 per partner, format jpeg, jpg, pdf) e.g. photos of flipcharts, slides Please Upload in Sharepoint Folder* named OrganisationsAcronym_WS 3_Subject and insert document link from Sharepoint here	*VIEIRA_Workshop3_Pictures* *VIEIRA_Workshop3_Presentations&OtherDocs*
Additionally discussed and referred topics (optional, max. 1300 characters incl. spaces):	A pilot project (2023) between CVP, UnivE and Betteries GmbH was presented to the group showing how 2nd life electric car batteries can be used to provide energy to an emergency shelter (clinical). The product can be used off-grid. Each block has 2,4kW/h. With 2 blocks they could fully supply 1 communications shelter, 1 advanced medical post, 1 cafeteria and 2 ambulances, during one morning without any generator. Inflating the shelters needed a reinforcement of supply. It can be used in outdoor environment but are no tests regarding thermal amplitude. Small car container (portable) was created, and it has all electronic power needed. Another pilot project was presented with a hybrid system (solar + batteries) created for educational purposes but considered with capacity for emergency purposes. The objective was using components available in any market, very low cost, low maintenance, 230v liable. The aim is creating an hybridizable system with other power sources, to provide energy without interruptions. Were used flexible photovoltaics modules of 310W made of glass fiber, foldable, each one with 5Kg. Used lead acid batteries, 4 panels of 310W/each, a 1600 VA inverter, 3kWA. It allows to join a solar system. It can be optimized. Betteries GmbH has it on the market. *https://betteries.com/*
Contact for any questions related to the submitted form and content:	*Filomena Vieira* *fv@vieiralegal.pt*

National Host (partner short name)	*Samaritan Slovakia - ASSR*
Participating EEROs - needed: full organisations name and short name and number of participants - possible: demographic data (like gender, age group,...)	*Example:* *Austrian Red Cross, AutRC, 4 participants (2 m, 1 f, 1 n, all 30-50)* *Samaritan Slovakia – ASSR – 6 participants (4m, 2f)* *Ematech s.r.o. – EMT – 1 participant (1f)* *District Director of the Fire and Rescue Corps Stara Lubovna – FRC SL – 1 participant (1m)* *Regional Director of the Fire and Rescue Service Zilina – RD FRC – 1 participant (1m)* *Rescue Brigade of the Fire and Rescue Corps – RB FRC – 2 participants (2m)*

	Chairman of the Association of Volunteer Firefighters – VF – 1 participant (1m) *Head of the Crisis Management Department Stara Lubovna- CM SL – 1 participant (1m)* *Head of the Crisis Management Department Kezmarok- CM KK – 1 participant (1m)* *Head of the Crisis Management Department Poprad- CM PP – 1 participant (1m)* *1 Bilateral meeting – prof. Peter Taus – Technical University Kosice – TUKE – 1 participant (1m)*
Method chosen:	ð Design Thinking incl. SCAMPER ð Future Backwards Exercise ð Ideation (from Jobs to be Done / JTBD) ð Nominal Group Technique / NGT ✓ World Café ð Other: _____
Summary of discussed aspects regarding WS3: - Comprehensible and concise - delivered in plain / body text style - max. 5000 characters incl. spaces - focusing on as many needs /requirements as possible and less on grammar or formulations:	1. Interoperability • Possibility to connect to the network • Professional competence to work with– Certificate? • Stability of electric current • 380V • Power connector compatibility • Easy operation – national & international • Use standard parts - make them easily replaceable in any country • international standards for the use of rescue equipment • possibility of using domestic energy sources to power the module • Integrated GPS module for safety • Internet connection - remote access for SW repairs • Hardware service 2. Modularity • Modularity up to 200 kW • Easy to move • possibility to adjust the performance from the current requirements • Individual components must be interconnectible • small units linkable to larger units • Central Service Centre 3. Efficiency and performance • Think about transporting hazardous materials • Need for cooling • overvoltage protection • stable voltage • reduce losses in power generation • possibility to use in different conditions - Day&Night, season • low environmental burden, not only during production but also when leaving the site/landscape • efficiency of material transport in relation to weight and volume • continuous operation for 2-3 weeks • user friendly • resistance 4. Functionality • backup device to ensure functionality • universal for use in different countries (mains voltage)

	• Modularity. From small to larger according to requirements • if it is to provide water heating it must have a high output at the expense of other things • Hybrid system · possibility to use more resources at the same time • resistance to impact voltage • minimum noise and health safety • easy to use – selftest • appropriate storage · think about technical inspections and certification. Is this necessary? For some government organizations it may be a problem if a module is purchased and will have a monthly cost (procurement)
If collected: **Figures** related to power supply incl. references like measure, period,...:	Energy storage was also discussed. One solution is to have 2 batteries 1x 5kW · 10kW. The best would be to build a camp and start measuring consumption, collecting more in-depth data. An extreme case could also be to use a geothermal drilling. According to a scientist from TUKE. If we go into photovoltaics, we have to reckon that the panels need their own space. which would take additional space for transport. However, it is the most suitable renewable solution at the moment. But we have to reckon that 120W is per m2 per panel. A suitable solution would be to have twin installations. We probably won't get rid of the diesel anyway (in case of system failure and complications). Possibility also to recharge a single module if conditions were unsuitable. There are also bifacial PV systems that could be even more efficient. The university has software that can use data to determine the best place to put the PV at the disaster site to make energy harvesting most efficient. The most appropriate combination would be PV and a water turbine. There are Mini · Micro · Pico. Depending on the need of the application. They are available to answer questions and suggest solutions.
Conclusion of discussed aspects on WS3: - Comprehensible and concise - delivered in plain / body text style with max. 2500 characters incl. spaces:	We have to think about possible complications and therefore having a small diesel generator as a backup is probably unavoidable. The weather can change and we may not have access to renewable resources. It is necessary to have well thought out energy storage in batteries, say 5kW and 10 Kw. In a modular way. Our solution should be wide ranging for small municipalities but also large states. If the solution is uniform, it will also simplify the lending in case of misfortune to "neighbours" and the procurement itself. It should also be borne in mind that the subsequent monthly fees (package subscriptions) may be problematic for the state procurement. GPS location and internet connectivity for easy remote management is also an important finding. If there is an option to have a central service center, this may reduce costs for buyers and of course simplify follow-up service. The consensus was for a Modular system with the ability to increase capacity up to 200 kW per module for example. The recommendation is to go for a smaller e.g. 20 kW solution that we can build for normal operation of 110 kW per camp. 5 smaller units are easier to transport.

Attachments (max. 5 per partner, format jpeg, jpg, pdf) e.g. photos of flipcharts, slides Please Upload in Sharepoint Folder* named OrganisationsAcronym_WS 3_Subject and insert document link from Sharepoint here	Shared in our folder Photo
Additionally discussed and referred topics (optional, max. 1300 characters incl. spaces):	*https://ooze.fberg.tuke.sk*
Contact for any questions related to the submitted form and content:	Jakub Liscinsky jliscinsky@as-sr.sk

5.2. ANNEX 2 – Workshop Training Presentations

The presentations are added in the following order:

- Presentation during Kick-Off Meeting in Frankfurt (Oct 2024)
- Online Presentation during WS2 (Dec 2024)
- Presentation during WS4 in Berlin (Mar 2025)
- Presentation during OMC event in Brussels (Jun 2025)
- Presentation during OMC workshop in Athens (Aug 2025)

POWERBASE

Kick-off meeting

14-16 October 2024 Frankfurt, Germany

WP 3

TASK 3.1 – TRAINING PROGRAM

Filomena Vieira

Vieira Costa Gomes – Sociedade de Advogados RL (VCG)

Funded by the European Union

1

Today's Agenda

- Objectives of Task 3.1 -Training
- Relevance of the topic "Strategic public procurement"
- What is innovation?
- Public procurement as a part of the innovation cycle: PCP/PPI and TRL linkage with procurement procedures (overview)
- Key success factors (specially, unmet needs identification and assessment)
- Step-by-step approach: (needs identification assessment, Prior Art Analysis (SOTA), IPR search, standardization, business case building, OMC)
- Wrap up
- Q&A

2

Objectives of the Task 3.1 – Training Program

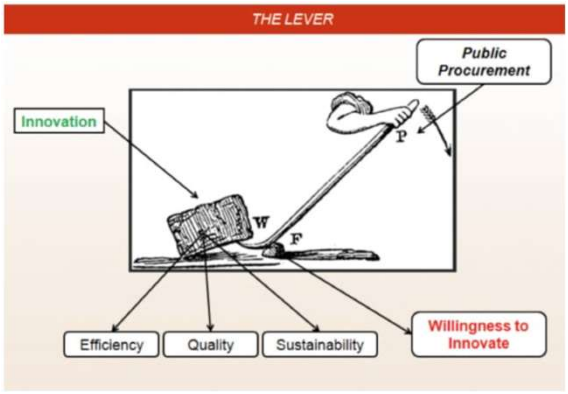
- Coordinate trainings on innovation public procurement and competence building for public buyers
- Trainings (in person and online) both for stakeholders' and network members
- Provide practical guidance to the project network on stimulating pro-innovation procurement
- Availability to provide specific trainings to overcome gaps on any topic related to strategic public procurement that may arise during "technical work".

SLIDO #1 QUESTION

- Have you ever heard about public procurement of innovation, or have you ever participated in any innovation public procurement procedure?
  - Answers (please choose as many as you wish):
    - No, never heard about it, but I am sure this is about to change
    - Yes, I have heard about it
    - Yes, I have participated in a PCP
    - Yes, I have participated in public procurement of innovation (not PCP)
    - Yes, I am a pro

Strategic Public Procurement

- Every year, over 250 000 public authorities in the EU spend around 14% of GDP (around €2 trillion per year) on the purchase of services, works and supplies. **In many sectors** such as energy, transport, waste management, social protection and the provision of health or education services, **public authorities are the principal buyers**.
- Public sector can use procurement as a tool to boost growth and investment, and to create an economy more innovative, resource and energy efficient, and socially inclusive. **Public procurement is a tool to deliver solutions to economic and societal challenges**.
- EC aims to improve public procurement practices, promote the demand of innovative goods, services & works in Europe, and foster the uptake of innovation. **It is though necessary to integrate the public demand into the innovation ecosystem**



Source: helthmanagement.org

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What is Innovation Procurement

- Undertaking the procurement process **in a way** that stimulates the supply chain to invest in developing better and more innovative goods and services to meet the unmet needs of an organization

OR

- Simply **removing barriers** to the procurement of innovative solutions

✓Procurement **in a way that** unlocks or exploits the creativity and innovation potential of suppliers to deliver better outcomes, cost effectively

***CHANGING* HOW WE THINK & UNDERTAKE PROCUREMENT & HOW WE WORK WITH SUPPLIERS**

6

What is Innovation Procurement

UNDER EUROPEAN REGULATIONS

Innovation procurement encompasses both the buying of the ***process*** of innovation – with partial outcomes - and the buying of the **outcomes** of innovation created by others (EC *Commission Notice on Guidance on Innovation Procurement*, 2018)

AND WHAT ABOUT INNOVATION IN POWERBASE PROJECT?

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Product innovations

- **Product innovations** must provide significant *improvements* to one or more characteristics or performance specifications:
  - ✓ addition of new functions
  - ✓ improvements to existing functions
  - ✓ Improvements to user utility (e.g., quality, reliability, durability, economic efficiency during use, affordability, user friendliness).
- Product innovations do not need to improve **all** functions or performance specifications, but ***routine changes or updates do not represent innovation***.
- Product innovations can use *new knowledge* or *technologies*, or be based on *new uses or combinations* of existing knowledge or technologies.

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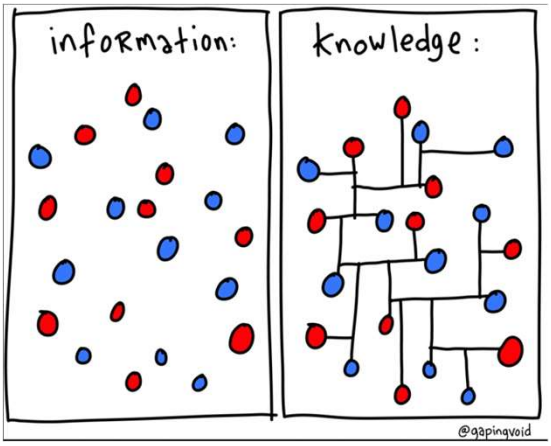
Innovation vs. Research

- It is important to distinguish **INNOVATION** from **RESEARCH**
  - ✓ Research is about gaining knowledge or new information and it results in knowledge.
  - ✓ Innovation translates knowledge into useable goods or services and is always targeted on known outcomes
- R&D categories (out of State Aid)
  - Fundamental research
  - Industrial research
  - Experimental development

A key success factor for innovation is an accurate understanding of the unmet need it is targeting.



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Research categories

- ***Fundamental research*** means experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts,without any direct commercial application or use in view;
- ***Industrial research*** means the planned research or critical investigation aimed at the acquisition of new knowledge and skills for developing new products, processes or services or for bringing about a significant improvement in existing products, processes or services. It comprises the creation of components parts of complex systems, and may include the construction of prototypes in a laboratory environment or in an environment with simulated interfaces to existing systems as well as of pilot lines, when necessary for the industrial research and notably for generic technology validation;
- **Experimental development** means acquiring, combining, shaping and using existing scientific, technological, business and other relevant knowledge and skills with the aim of developing new or improved products, processes or services. This may also include, for example, activities aiming at the conceptual definition, planning and documentation of new products, processes or services. Experimental development may comprise prototyping, demonstrating, piloting, testing and validation of new or improved products, processes or services in environments representative of real life operating conditions where the primary objective is to make further technical improvements on products, processes or services that are not substantially set.

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Why Innovation Procurement

- **INNOVATION PROCUREMENT BENEFITS**

✓ Strengthening the European single market

✓ Public procurement as an innovation policy tool

✓ Promoting capacity building among contracting authorities

✓ Advancing social and environmental goals

✓ Allow combining purchasing power and the goals of public policies

✓ Public buyer, instead of buying off-the-shelf (COTS), acts as an early adopter and buys a product, service or process that is new to the market and contains substantially novel characteristics (demand-driven)

SLIDO #2 QUESTION

- In your opinion, public procurement is more an enabler or a barrier to the uptake of innovation?

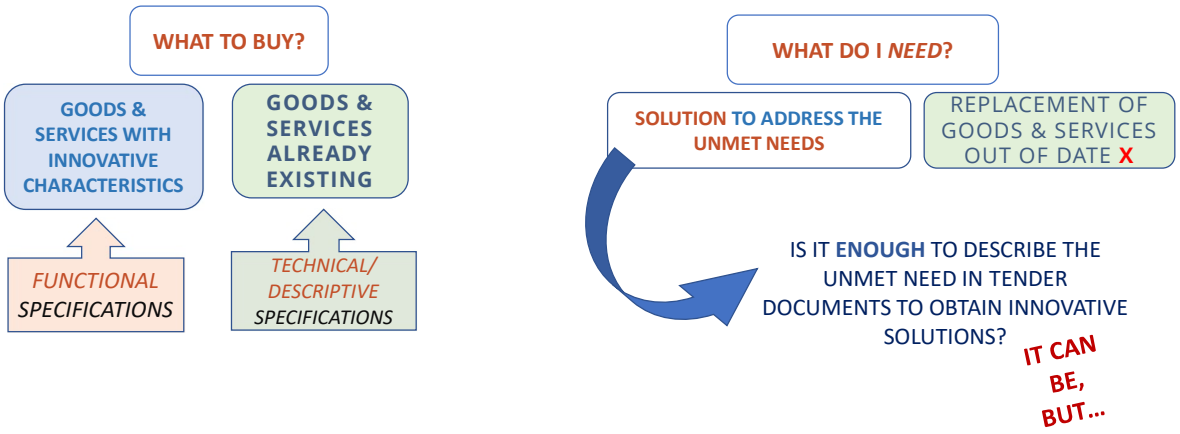
answers (please choose only one):

a barrier to innovation

enables innovation

Using Procurement as an Innovation Tool

The 1st approach to innovation starts in the way public purchaser addresses public procurement



Innovation procurement

Undertaking of the procurement process in a way that stimulates the supply chain to invest in developing better, innovative goods and services to meet the unmet needs and policy objectives of the sector and/or ensuring the **procurement process enables new solutions** to compete on a level playing with established goods and services.

Pro-Innovation triggers

TO TRIGGER INNOVATION PROCUREMENT CONTRACTING AUTHORITIES (CA) SHOULD:

- ❑ DEVELOP AN **INNOVATION CULTURE** WITHIN THE ORGANISATION

- ❑ **ATTRACT INNOVATORS**
  - ✓ Reduce red tape/burdens for tenderers (e.g. larger adoption of ESPD)
  - ✓ Adoption of proportional selection criteria allowing the participation of SMEs
  - ✓ Adopt division into lots
    - ✓ Improves start-ups and SMEs participation
    - ✓ Prevents supplier lock-in
  - ✓ Use of **standards**, open data, open interfaces and **open-source** software

- ❑ **ATTRACT INNOVATION** ENABLING THE SUBMISSION OF INNOVATIVE OFFERS
  - ✓ **Needs assessment** reveals real needs + improvements desired +leads to the designing process of tender documents + encourage the purchasing of innovation instead of buying off the shelf
  - ✓ **Explore SOTA: open market consultation**
  - ✓ **Tender expressing functional requirements + descriptive need + outcome desired**

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Pro-Innovation

- ✓ There are already well-established mechanisms to promote innovation in the case of **solutions that are not yet on the market or not commercially available**
  - pre-commercial procurement (PCP), and
  - public procurement of innovative solutions (PPI)

- ✓ Can **other public procurement instruments** promote innovation even in the case of procurement of COTS?

  - Joint cross border public procurement
  - Preliminary market consultation as a legal and flexible way to communicate with suppliers
  - Functional specification vs. descriptive requirements
  - Promoting innovation by value engineering

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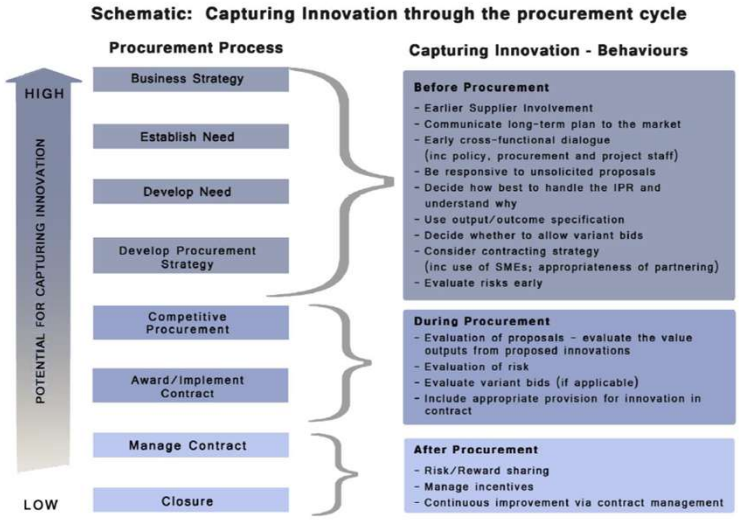
Innovation through the procurement cycle



Source: Public Procurement for Research and Innovation, Expert Group Report "Developing procurement practices favorable to R&D and innovation" September2005, available at http://ec.europa.eu/invest-inresearch/pdf/download_en/edited_report_18112005_on_public_procurement_for_research_and_innovation.pdf

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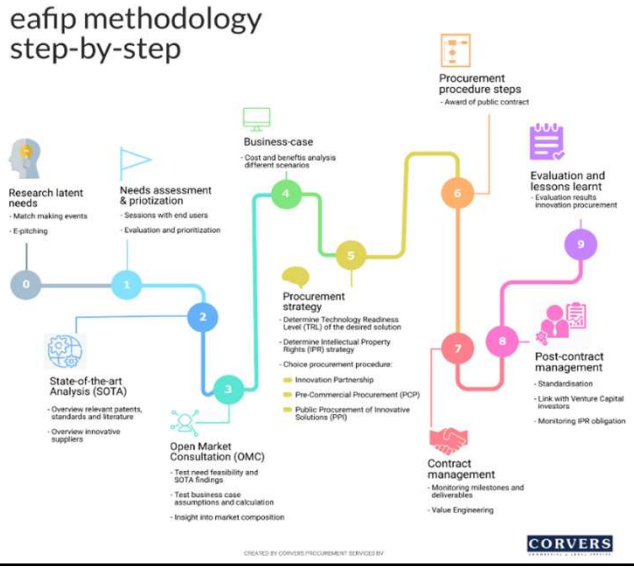
The EAFIP methodology process



Source: https://corvers.com/our-services/innovation-procurement/

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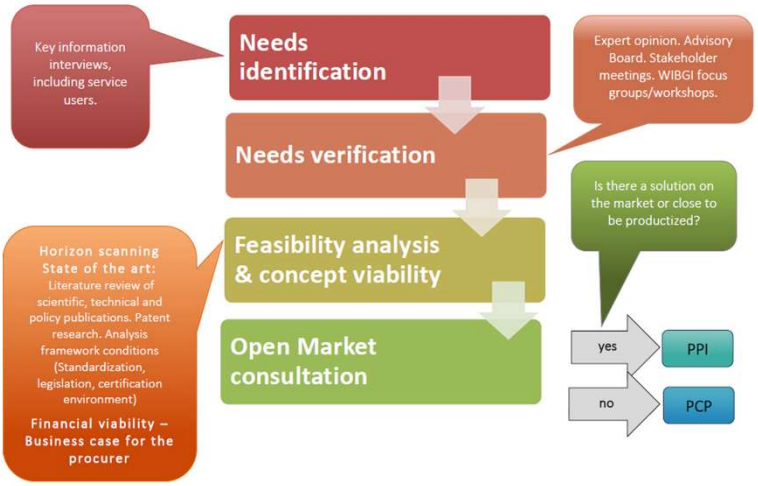
EAFIP Model – Steps to prepare an Innovation procurement procedure



Source: The EAFIP Toolkit – Module 2, available at www.eafip.eu

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The end-users' needs identification

Ensuring that the **need is shared** by multiple potential buyers/end-users will enable the **development of solutions** that are **scalable**, **interoperable** and **more cost-effective**. This type of pooling of demand and sharing of needs also secures **economies of scale that is key to maximize the potential of innovation procurement**

(*The EAFIP Module 2*)

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The end-users' needs identification

- **Step-by-step:**
  - Complete end-users identification (*who are the targeted end-users*?)
  - Unmet needs/challenges faced by the end-users (*what are end-users looking for*?)
  - Definition of the unmet needs in termos of desired performance and functions (NOT IDENTIFYING SPECIFIC SOLUTIONS!)

- **Needs identification and assessment methods:**
  - Interviews
  - Surveys
  - Collaborative senior management workshops/focus group (targeting the policy objectives, e.g.)

Definition of **common needs** using transparent, semi-quantitative methods to support consensus and **validate** whether a certain need is correctly interpreted, expressed, assessed, and valued in terms of importance for all end-users.

The WIBIGI methodology

Another effective method to identify Innovation needs is WIBIGI, using collective brainstorm exercises to complete the sentence:

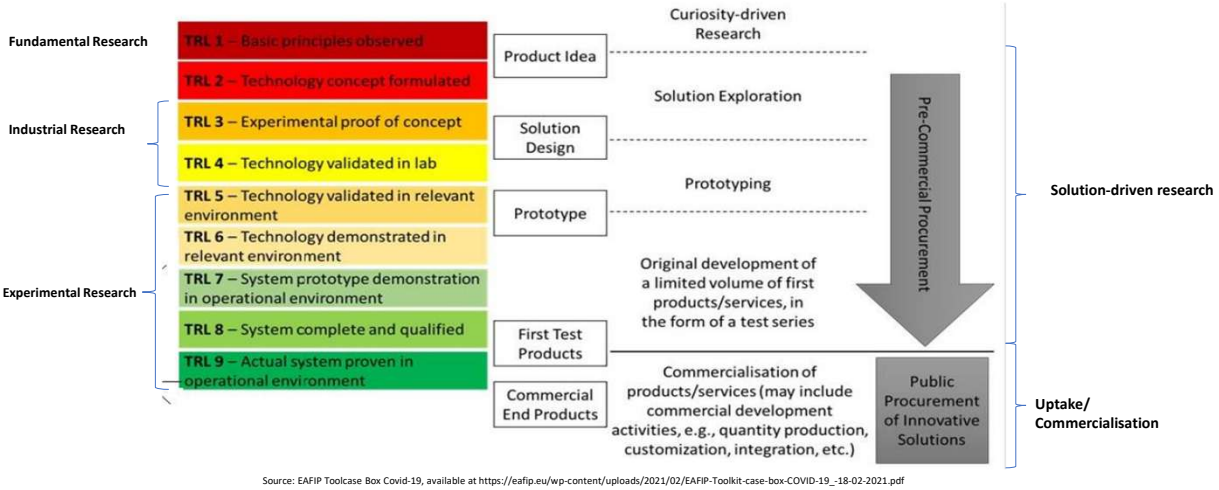
"Wouldn't it be great if …."

Usually, is usefull to have an experienced facilitator to conduct WIBIGI sessions, to draw out the mais issues and ideas, as well as a domain expert who can guide the facilitator with respect to technicalities.

Needs description process

- The identified needs must be clearly described in order to be validated in the next steps (Prior Art Analysis/IPR search/OMC)
  - Clear, unambiguous, but simple
  - Definition of the problem to be solved
  - Definition of clear required outcomes: functionality/performance/efficiency improvements
  - Attention to neutrality requirements ("technological agnostic sollutions", interoperability and open standards)
  - Do not over specify (customization) in a way that may limit the possibility to create a wide potential market for the new solution and to enable desired economies of scale and cost savings
- The identified needs will be validated in comparative terms and prioritized, on the basis of their expected impacts and trends
- The needs will be detailed further, after the OMC, to define the tender procedure specifications

Technology Readiness Levels (TRL) correspondence to public procurement procedures



Source: EAFIP Toolcase Box Covid-19, available at https://eafip.eu/wp-content/uploads/2021/02/EAFIP-Toolkit-case-box-COVID-19_-18-02-2021.pdf

Pior Art Analysis (SOTA)

- Need to confirm whether the identified needs are “unmet” needs
  - Identifies all information available in public domain (in key online and offline forums)
    - Existing products (trade shows, exhibitions)
    - Ongoing product development (R&D projects, scientific studies)
    - Published literature (websites, industry journals, vendor specific publications, reports by industry sector analysts, books, magazines)
    - Meeting with people with relevant experience
  - Information may be or not IPR protected

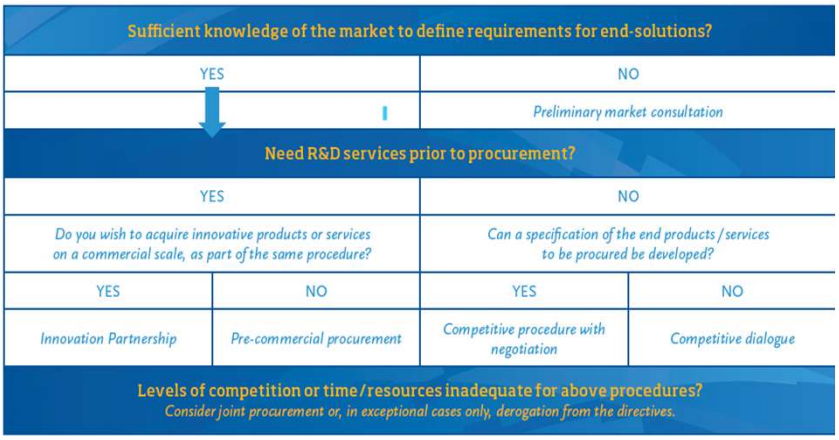
Intelectual Property Rights (IPR) search

- Fundamental to know whether the information avaliable is already protected by IPR
  - Search is held in national and international databases
- IPR search is also relevant for SOTA
  - Provides information on “how innovative” is
    - the R&D to be purchased (to go further to a PCP), or
    - the innovative solutions to be purchased (to go further to a PPI), and
  - Whether there is still scope for protecting innovative efforts done in the procurement by IPR, but also reveals
    - Whether there are already entities on the market who own “key IPRs” that cannot be avoided when addressing the needs validation
    - Whether the licensing policy may introduce high risks/costs in a way that does not allow to start the Innovation procurement
- Searching (i) patent and (ii)non-patent type IPRs: (i) keyword, patent classification, (ii) registered design rights, registered trade marks

Dealing with legal compliance, standards, certifications

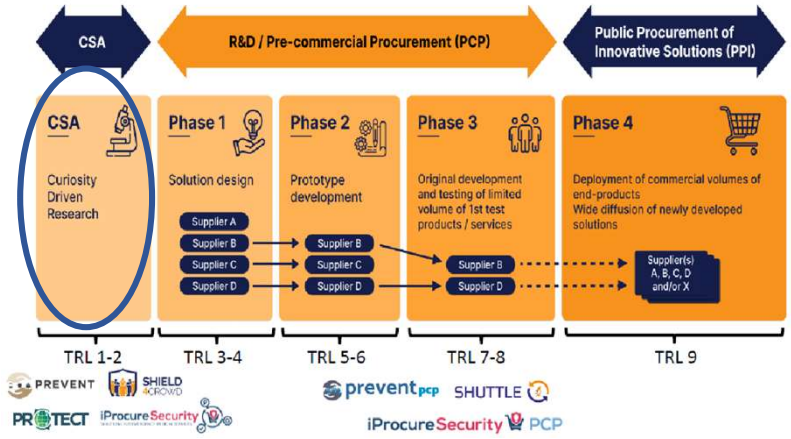
- Procurer has obligation to require ompliance of solutions developed through PCP with legislative requirements
- Standards/labels are possible means of proof that the procurer can request from the supplier in the tender documents (not mandatory) to ensure that the procured solutions meet certain desired characteristics (attention: not all standards are transparent and robust/accreditation third party independent process)
- It is possible that there is no legislation/standard/label ("radical Innovation"). In this case, the procurer
  - May sign the need of legislation to the legislator/policy makers
  - Can participate itself in standardization/labelling activities to define new standars/labels
  - May appoint a certification body (if it doesn't exist)
  - May incentivize, via tender documents, the PCP suppliers to engage in standardization/labelling/certification activities

Choosing the rigth innovation procedure



Source: Guidance for public authorities on Public Procurement of Innovation, available at www.Innovation-procurement.org

Wrap-up: Powerbase expected evolution process



Source: Ministère de l'Interieur et des Outre-Mer, "Overview of Joint Cross-border Public Procurement challenges and oportunities to come", available at iprocurenet/eu/event (2024).

ANY QUESTIONS?

THANK YOU!

Filomena Vieira
Public Procurement Lawyer

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Innovation Public Procurement: Driving Public Sector Innovation

Part I: From Needs Identification to PCP

Filomena Vieira
Vieira Procurement Legal Services

Funded by the European Union

Innovation Public Procurement: Driving Public Sector Innovation

Part II: PCP step-by-step approach: From Needs Assessment to OMC

Filomena Vieira
Vieira Procurement Legal Services

Berlin, 14th March 2025

Funded by the European Union

Today's Agenda

- 1 – Innovation Procurement: a demand-driven approach
- 2 – Innovation Public Procurement Procedures
  - 2.1. How to choose (PCP vs. IP)
  - 2.2. What is PCP
  - 2.3. TRL correspondence with public procurement procedures
- 3 – Needs identification and assessment
  - 3.1. Relevance of needs assessment to the PCP procedure
  - 3.2. Identifying needs: methods and tools
  - 3.3. Needs assessment and validation
- 4 – Wrap-up

Q&A

What is Innovation Procurement?

Definition

Innovation procurement leverages public funds to stimulate the development and implementation of innovative solutions addressing societal challenges and modernizing public services. It's a strategic approach that moves beyond traditional procurement methods, actively seeking new technologies, processes, and solutions to improve efficiency and effectiveness within the public sector.

Types

Two main approaches exist: **Public Procurement of Innovative Solutions (PPI)** focuses on procuring already-developed innovative solutions to meet specific public needs. **Pre-Commercial Procurement (PCP)** instead supports the research and development of new solutions by collaboratively engaging with innovators throughout the process, thereby mitigating risks and ensuring products meet public requirements.

Definition of Innovation Procurement

- Undertaking the procurement process in a way that stimulates the supply chain to invest in developing better and in more innovative goods and services to meet the unmet needs of an organization

- **OR**

- Simply **removing barriers** to the procurement of innovative solutions

✓Procurement **in a way that** unlocks or exploits the creativity and innovation potential of suppliers to deliver better outcomes, cost effectively

***CHANGING* HOW WE THINK & UNDERTAKE PROCUREMENT & HOW WE WORK WITH SUPPLIERS**

Innovation procurement

Undertaking of the procurement process in a way that **stimulates the supply chain** to invest in developing better, innovative goods and services to **meet the unmet needs** and **policy objectives** of the sector and/or ensuring the **procurement process enables new solutions** to compete on a level playing with established goods and services.

Public Procurement of Innovative Solutions (PPI)

Definition

Public Procurement of Innovative Solutions (PPI) involves procuring innovative goods or services that are already developed but not yet widely adopted. This approach allows the public sector to be an early adopter, testing and validating new solutions in a real-world setting. This often involves rigorous market research to identify suitable solutions.

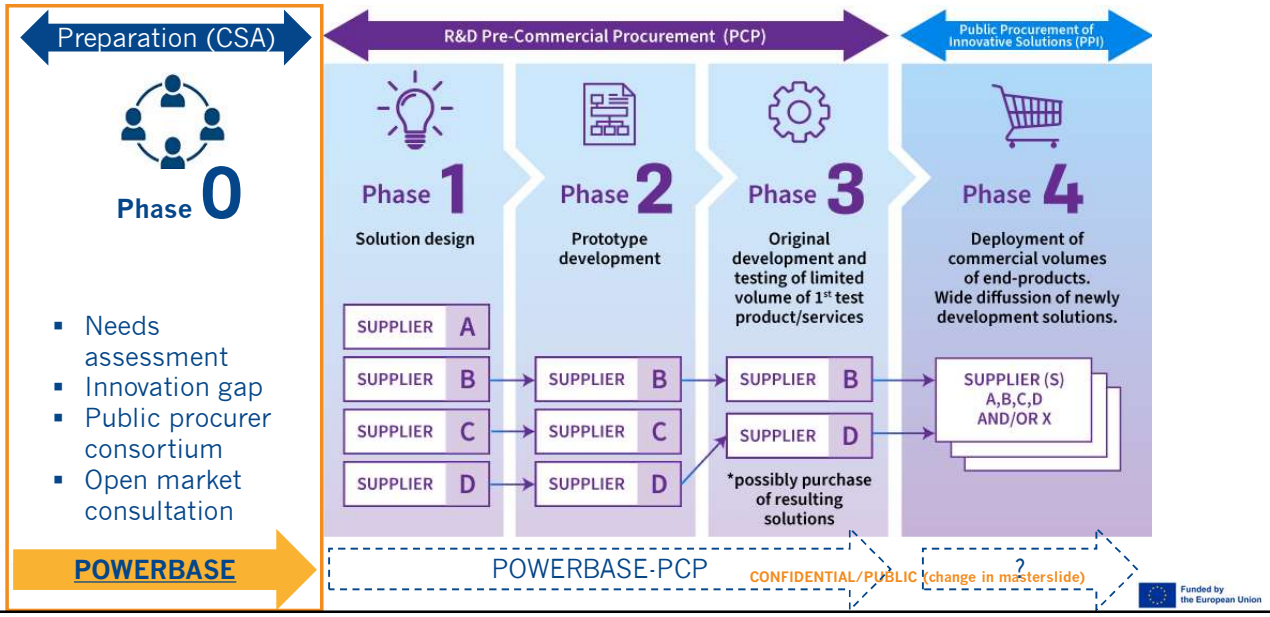
Focus

PPI focuses on procuring solutions that address specific public needs and offer a demonstrable improvement over existing alternatives. This might include technologies that enhance efficiency, services that improve citizen engagement, or processes that streamline administrative tasks. Risk assessment is a crucial part of the PPI process.

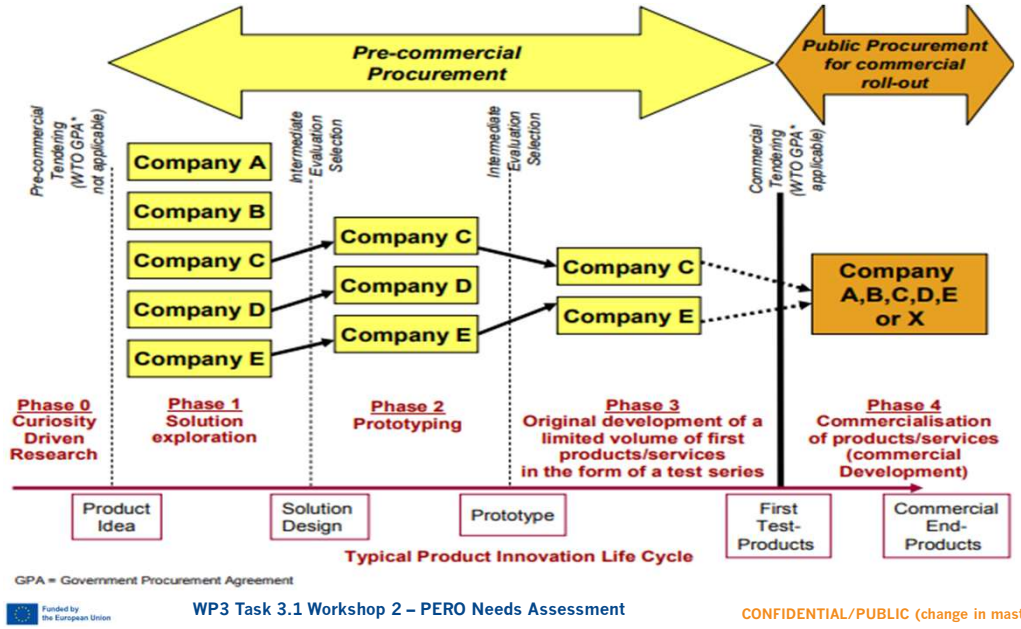
Market Readiness

Unlike Pre-Commercial Procurement (PCP), which involves funding the development of new solutions, PPI targets solutions that are closer to market readiness. While they might have shown success in niche applications, they may not yet have achieved widespread commercial adoption. The selection process evaluates the solution's viability, scalability, and ability to meet specific public sector requirements.

PRE-COMMERCIAL PROCUREMENT



From CSA to PPI



Source: COM(2007) 799 final, *Pre-commercial Procurement: Driving innovation to ensure sustainable high quality public services in Europe*

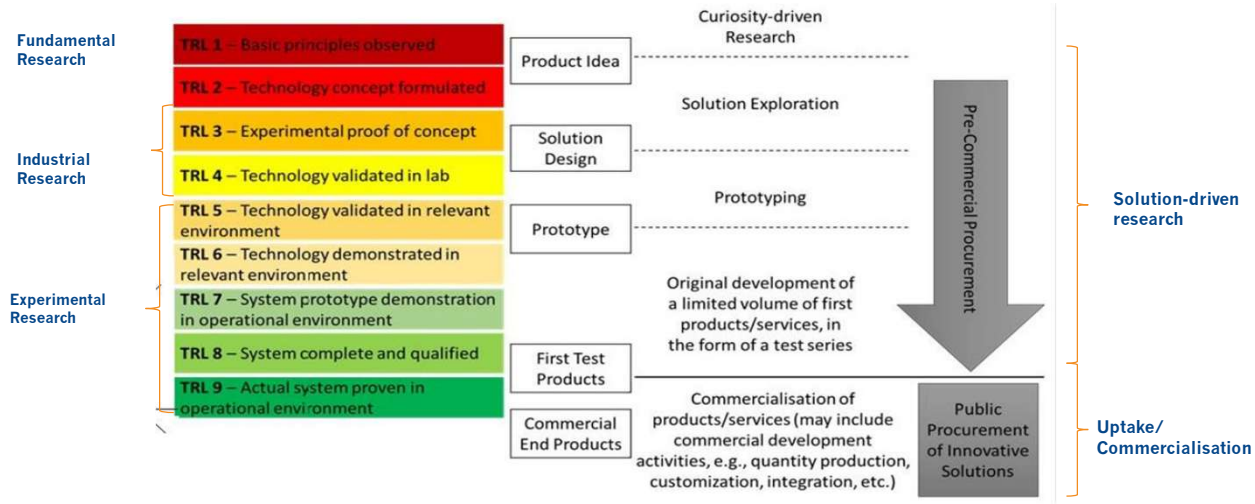
Pre-Commercial Procurement (PCP)

1	R&D Services	Procuring R&D services to address specific public needs, often involving multiple suppliers in a competitive process. This early-stage procurement focuses on innovation and generating novel solutions.
2	Competitive Development	Competitive development occurs in phases, allowing for iterative feedback and improvement. Each phase usually involves a reduction in the number of participating suppliers, with the most promising solutions advancing to the next stage. This structured approach encourages innovation and manages risk.
3	Risk-Benefit Sharing	Risk-benefit sharing is built into the process, with the public sector and suppliers sharing both the potential rewards and challenges of innovation. This collaborative approach incentivizes participation and fosters a shared commitment to success.
4	Separation	A clear separation exists between the PCP phase and the commercial deployment of the resulting product or service. This ensures a fair and transparent process, preventing conflicts of interest and promoting broader market adoption after the PCP concludes.

Key Differences Between PCP and PPI

Aspect	Pre-Commercial Procurement (PCP)	Public Procurement of Innovative Solutions (PPI)
Focus	Research & Development (R&D) - well before market readiness; funds innovative solutions to address specific public needs; goal is to stimulate novel solutions, not procure a finished product.	Solutions nearing market readiness; successful in niche markets but lack widespread commercial adoption; emphasizes procuring solutions at scale to meet significant public sector needs; process evaluates scalability, viability, and alignment with public sector requirements.
Outcome	Procurement of R&D services; contracts for research and development, leading to prototypes or initial product versions; focus is on developing technology/solutions and proving feasibility (tests).	Purchase of commercial volumes of end-products or services; solution is developed, tested, and ready for large-scale deployment; focus shifts from development to implementation and widespread use within the public sector.

Technology Readiness Levels (TRL) correspondence to public procurement procedures



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Benefits of Pre-Commercial Procurement (PCP)

Streamlined Public Service Delivery

PCP fosters innovation, leading to more efficient and higher-quality public services.

Cost-Effective Solutions

Early supplier involvement helps mitigate cost overruns, resulting in affordable solutions.

Reduced Procurement Risk

The phased approach enables early risk identification and management, minimizing project failure.

Optimized R&D Investment

PCP efficiently leverages public and private R&D resources, accelerating innovation.

SME Engagement and Growth

PCP offers SMEs opportunities in public sector projects, boosting innovation and economic growth.

Additional Benefits of PCP

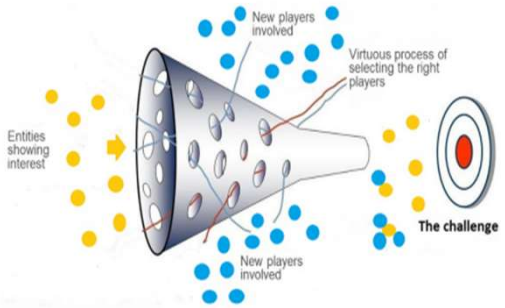
Increased Interoperability

PCP's phased approach ensures that solutions are designed with interoperability in mind from the outset. This reduces the likelihood of encountering integration problems later on, saving time and resources in the long run. It also facilitates easier adoption and wider use across public sector departments and systems.

Positive Impact on Market Competition

The open and competitive nature of PCP encourages participation from a broader range of businesses, including SMEs. This fosters innovation by exposing public sector challenges to multiple perspectives and approaches, leading to better, more cost-effective solutions and a healthier, more dynamic market.

Benefits of Public Procurement of Innovative Solutions (PPI)



Source: Innovation Public Procurement Broker (IPPB). An introduction for practitioners. Guidelines to design a broker for innovation public procurement. Available at https://ec.europa.eu/futurium/en/system/files/ged/action_7_innovation_public_procurement_broker_guideline.pdf, accessed in 11.12.20024.

1. **Improved Public Services**
   Improving the quality and / or efficiency of public services
2. **Company Growth**
   Helps innovative (start-up) companies to grow
3. **Innovation Investment**
   Incentivizes companies to invest in Innovation

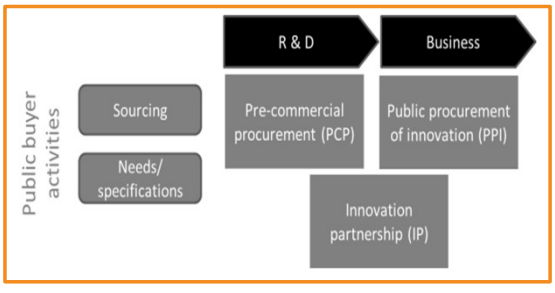
Long-Term Benefits of PPI

1. **Initial Investment**
   Higher entry cost for innovative solutions
2. **Long-Term Analysis**
   Cost-benefit analysis over the entire life cycle often proves positive
3. **Quality Improvements**
   Significant long-term quality/efficiency improvements
4. **Environmental Benefits**
   Can lead to significant environmental benefits when included as a quality improvement goal

PCP/PPI vs Traditional Procurement

Procurement Approach	Short-term tactical purchasing	Strategic tool for systematic improvement
Priority	Low cost over quality	Minimizes risks of deploying 'new' solutions
Value for Money	Often leads to suboptimal value	Enables procurers to de-risk novel technologies
Technology Risks	Risk of technology/vendor lock-in	Removes supplier lock-in
Solution Insights	Limited insight before deployment	Provides insights into competing solutions before deployment

PCP and PPI vs Innovation Partnership Procedure



Source: SERVAJEAN-HILST, Romaric. *How to Define the Value of a European Innovation Partnership. An easy-to-apply methodology for public buyers to use when estimating and negotiating the value of innovation partnerships, 2022, available at https://www.cde.ual.es/wp-content/uploads/2022/07/ET0622146ENN.en_.pdf, accessed in 11.12.2024.*

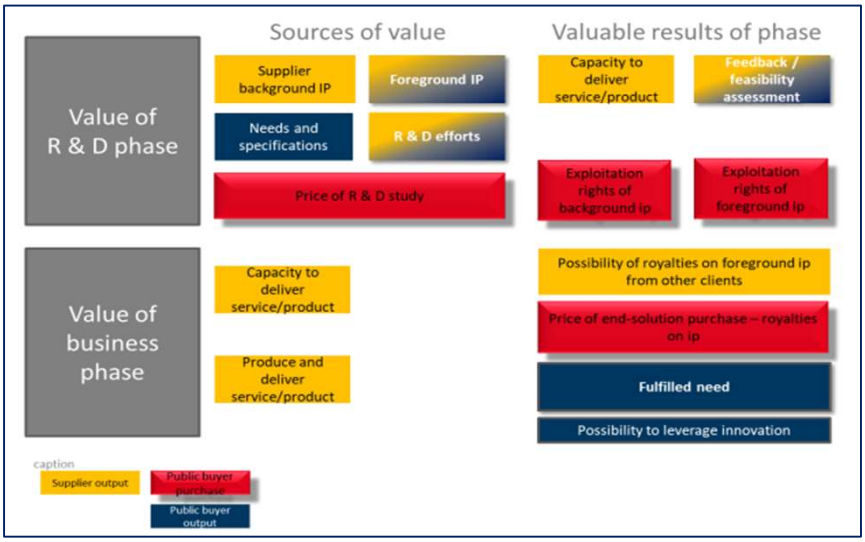
PCP-PPI	Innovation Partnership
Two separate but complementary procurements	Long-term vendor partnership combining R&D and product purchase
Suitable for high-tech R&D and/or significant customization of existing solutions	Suitable when R&D is limited to adapting/integrating existing solutions
Maintains competition throughout R&D and deployment phases	May reduce competition after selection of innovation partner(s)

Choosing the rigth innovation procedure

Sufficient knowledge of the market to define requirements for end-solutions?			
YES		NO	
↓		*Preliminary market consultation*	
Need R&D services prior to procurement?			
YES		NO	
Do you wish to acquire innovative products or services on a commercial scale, as part of the same procedure?		*Can a specification of the end products / services to be procured be developed?*	
YES	NO	YES	NO
Innovation Partnership	*Pre-commercial procurement*	*Competitive procedure with negotiation*	*Competitive dialogue*
Levels of competition or time / resources inadequate for above procedures? *Consider joint procurement or, in exceptional cases only, derogation from the directives.*			

Source: Guidance for public authorities on Public Procurement of Innovation, available at www.Innovation-procurement.org

PCP and PPI vs Innovation Partnership Procedure: value approach



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Barriers to Innovation Procurement

Resource Constraints

Budget and time (staff shortage) constraints

Lack of Incentives

Lack of incentives for engaging in innovation procurement / risk-averse public sector culture

Adoption Challenges

High learning curve and switching costs for potential end-users when adopting new solutions

Initial Costs

Higher costs of the first batch of innovations (benefits come with time after the investment)

Technical Expertise

Lack of experience to articulate advanced technological requirements

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Defining an Innovation Procurement Policy

1

Political Commitment

Clear commitment to implement innovation procurement

2

Preparatory Work

Groundwork for formulating an action plan

3

Action Plan Formulation

Detailed plan for implementation

4

Periodic Assessment

Regular evaluation of the policy's effectiveness

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Linking Innovation Procurement with Development/Public Policies

International Cooperation

Identify procurements that benefit from international cooperation

Local/Regional Priorities

Align with specific local/regional development priorities

ESIF

European Structural and Investment Funds (ESIF) for local/regional innovation procurements

Horizon Europe Funding

Apply for Horizon Europe funding for PCPs/PPIs benefiting from international cooperation

Key Takeaways

1 Strategic Importance

Innovation procurement is crucial for modernizing public services and addressing societal challenges.

2 Complementary Approaches

Pre-Commercial Procurement (PCP) and Public Procurement of Innovative Solutions (PPI) strategically drive demand-side innovation; these approaches are complementary.

3 Multiple Benefits

Innovation procurement improves public services, boosts the economy, and enhances competition.

4 Policy Framework

A robust policy framework is essential to overcome barriers and maximize the benefits of innovation procurement.

5 Synergies

Linking innovation procurement with broader development policies creates powerful synergies at all levels.

POWERBASE

This presentation outlines the EAFIP (European Assistance for Innovation Procurement) methodology for identifying and assessing needs in innovation procurement. We will explore the importance of early identification, methods for assessing end-user relevance, and best practices for describing needs and challenges (this presentation is based in texts of EAFIP toolkit, available at https://eafip.eu/, accessed 11.12.2024).

POWERBASE

Understanding the Importance of Early Identification

Unmet Need Definition

An "unmet need" is a requirement that current products, services or arrangements cannot meet, or can only do so at excessive cost or with unacceptable risk.

Types of Unmet Needs

1. Problems impacting current service delivery
2. Desire to improve future service quality/efficiency
3. Policy objectives addressing societal challenges
4. Legislative requirements for higher quality services

Benefits of Early Identification

- Allows time for effective understanding
- Avoids urgent problems
- Creates basis for prior art analysis and IPR search
- Facilitates proper open market consultation
- Eases translation into requirement specifications

Methods to Identify and Assess Unmet Needs

Internal Meetings

Starting point for brainstorming within the organization

Senior Management Workshops

Gain strategic perspective and financial support

Surveys

Conducted via email, phone, or post

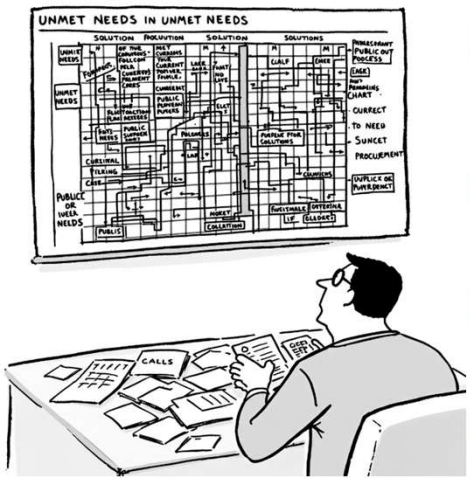
End-User Workshops

Engage directly with those who will use the solutions

Focus Groups

Structured discussions with internal and external experts

Describing the Need/Challenge Effectively



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   Allow the market to be creative in proposing solutions.
4. **Use Functional and Performance-Based Requirements**
   This approach offers the opportunity to be open to alternative technical ways to address the need
5. **Consider Total Life-Cycle Costs**
   Use methods like TLC-PE (Total Life-Cycle - functional and PErformance description) to optimize performance/quality and costs across the entire life-cycle of the solution.

Key points to remember

- ❑Innovation procurement must be **driven by end-user needs**
- ❑**Involve real end-users** if public procurers are not the end-users
- ❑Ask end-users to **define needs** in terms of **desired functions, performance, quality, efficiency**
- ❑**Needs must be described clearly and in objective way, focused on the problem(s) to solve and not over-specifying**

Key Questions in Needs Assessment

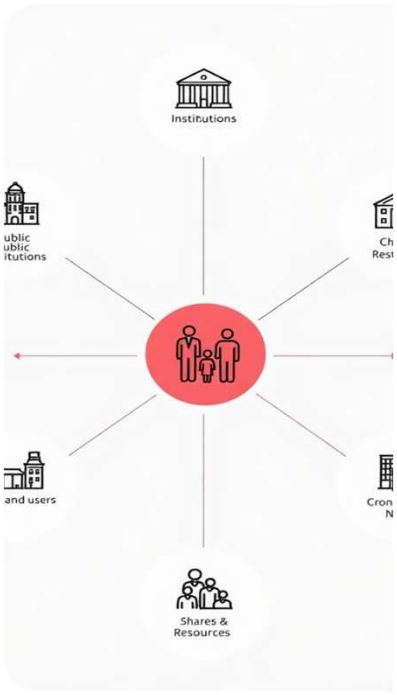
A. **Who are the targeted end-users?**

Identifying the correct end-users is crucial for effective needs assessment. This may include not only the public procurers but also the actual users of the services or products.

B. **What *improvements* are they looking for?**

- ✓ Understand the desired improvements in:
- ✓ Functionalities
- ✓ Performance
- ✓ Cost efficiency

These improvements should be defined from the end-user perspective to ensure relevance and adoption of the innovative solutions.



Importance of Shared Needs in Innovation Procurement

1

Identify Shared Needs

Perceived inefficiency or need rarely relate to only one local procurer. Involve multiple procurers or similar staff groups from various locations and organizations (cross-border).

2

Ensure Scalability

Shared needs enable the development of solutions that are scalable, interoperable, and more cost-effective.

3

Pool Demand

Pooling of demand and sharing of needs secures economies of scale, maximizing the potential of innovation procurement.

4

Joint Procurement Considerations

In joint PCPs, the challenge should be shared by all procurers. For joint PPIs, core functionality should be the same, with allowances for local specific features.

The end-users' needs identification

Ensuring that the **need is shared** by multiple potential buyers/end-users will enable the **development of solutions** that are **scalable**, **interoperable** and **more cost-effective**. This type of pooling of demand and sharing of needs also secures **economies of scale that is key to maximize the potential of innovation procurement**

(*The EAFIP Module 2*)

POWERBASE

Methodologies for Identifying Innovation Needs

WIBGI Methodology

Developed by the English National Health Service (NHS)
- Uses collective brainstorm exercises
- Completes the sentence *"Wouldn't It Be Great If...."*
- Involves an experienced facilitator and domain expert

Workshops with Customers/End-Users

Useful for Central Purchasing Bodies (CPBs)
- Collects new customer/end-user needs
- Presents future possibilities and plans for procurement activities
- Example: INNOBOOSTER Life PPI project

POWERBASE

Broad vs. Narrow Need/Challenge Formulation

Broad Formulation

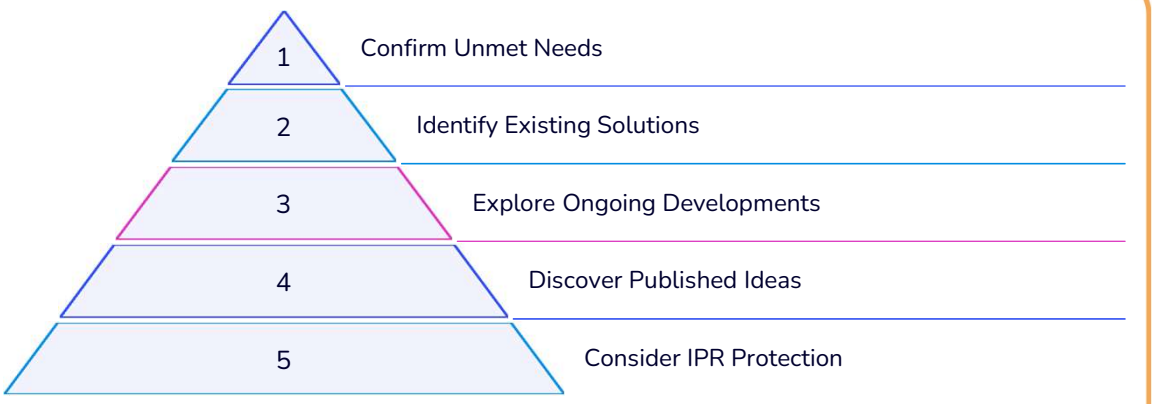
- ✓ Allows for more diverse and innovative solutions
- ✓ May require more complex evaluation criteria
- ✓ Can attract a wider range of suppliers

Narrow Formulation

- ✓ Provides clearer direction to suppliers
- ✓ May limit innovation potential
- ✓ Can lead to more directly comparable proposals

- Both approaches require carefully defined award criteria and formulas to allow for objective comparison of tenders.
- The choice between broad and narrow formulation has implications for both PCPs and PPIs.

Importance of Prior Art Analysis to the Unmet Needs Assessment



Once needs are identified, a prior art analysis will be conducted to confirm whether the identified needs are indeed "unmet". This analysis identifies all information available in the public domain, including existing products, ongoing product development, and published ideas, whether IPR protected or not.

Identifying needs-
Needs assessment & validation: methods & tools

A systematic approach to identifying and prioritising end-user needs, forming the foundation for a well-defined Common Challenge.

A series of targeted workshops aimed at gathering and prioritising requirements, ensuring that a comprehensive understanding of end-users' expectations and challenges is achieved.

A Value Engineering approach applied, facilitating exchanges among all stakeholders that incorporate a wide array of perspectives.

Our experience

iProcureSecurity PCP

Procurer Current Status Screening

Focus Groups

Requirements Mapping and Prioritization

Funded by the European Union

37

End users/ Procurer Current Status Screening

During the first months of the project the procurers/end users were asked to capture the current status of triage management and main elements that have to be considered for a new solution.

The goal was to identify all main aspects of the current situation to have a solid foundation that can be used during the upcoming steps (e.g., for the focus groups to identify requirements and to build individual use cases and process models further on).

All procurers were provided with a structured template that allowed them to internally collect relevant data on the current triage management processes. This was done through interviews and workshops based on typical scenarios that have to be handled (e.g., train, bus, plane accidents, earthquakes, floods etc).

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Focus Groups

Ensuring that initially collected information on the current status of triage management is enriched and discussed between main persons/roles involved in typical triage scenarios.

Based on discussing specific real scenarios, participants were able to identify from their experience and different perspectives what are currently the most relevant problems during the process but also identify what works well.

Based on the discussion of the current status of triage management as well as the current problems participants were asked to formulate a wishlist with their expectations of what a new triage management system should be able to do. This information was collected and structured.

The outcome of this Focus Group also showed where additional insights from individual roles was necessary (e.g., technical interfaces, standards, regulation, processes etc.).

Follow-up focus groups/meetings/interviews then emphasised on particular aspects in detail (where this was necessary).

Requirements Mapping & Prioritization

All collected inputs from the end users/ procurers were translated to English and aggregated in one large overview to clearly map and discuss the requirements with all end users/ procurers in the next step.

After the list was cleaned up each procurer was asked to conduct internally a prioritization with their team. Each requirement was given a priority between 0 – 10. 0 represents not applicable and 10 represents the highest priority (must have).

Finally, this led to a long list of 240 requirements. Essential requirements do not indicate a priority. To ensure all partners have the same understanding of each requirement, each entry was discussed during a series of virtual workshops. This ensured that no requirement was missed, allowed to further specify requirements where needed, add new requirements that came up during the discussion and discard requirements which were not of relevance.

Requirements Mapping & Prioritization

The final list was then screened once more by each procurer to allow them to update prioritization based on new insights of the discussion.

In depth discussion of all requirements was time consuming but extremely important as it led to a better common understanding of what a new solution could look like and which features it should cover to best support the involved EMS roles in the process. In addition, it built the baseline for the next steps which focus on the creation of use cases and process models.

ANY QUESTIONS?

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Innovation Public Procurement: Driving Public Sector Innovation

Part III - PCP step-by-step approach: From Needs Assessment to OMC

Filomena Vieira
Vieira Procurement Legal Services

WS4, Berlin, 14th March 2025

Funded by the European Union

TRAINING PLAN FOR POWERBASE PROJECT

DELIVERED

- ✓ WS1 – Strategic public procurement (Innovation concept, the innovation cycle through PCP/PPI, key success factors, PCP step-by-step)
- ✓ WS2 (webinar) – PCP: from needs assessment to OMC (PCP/PPI, needs identification methods & tools)
- ✓ WS3 National event – PCP in a nutshell
- ✓ WS4 - PCP: from needs assessment to OMC (SOTA, IPR search, regulatory/certification/standardization environment, business case, OMC)

GRANT AGREEMENT

- ✓ 1 training kick-off meeting: PCP in a nutshell
- ✓ 1 training during WS2: PERO Needs Assessment
- ✓ 1 training during WS4: PERO Needs validation & prioritization
- ✓ 1 training during the OMC event – 13th June
- ✓ 1 webinar on lessons learned: capability needs collection for joint crossborder procedures and best practices

Funded by the European Union

TRAINING PLAN FOR POWERBASE PROJECT

FUTURE EVENTS

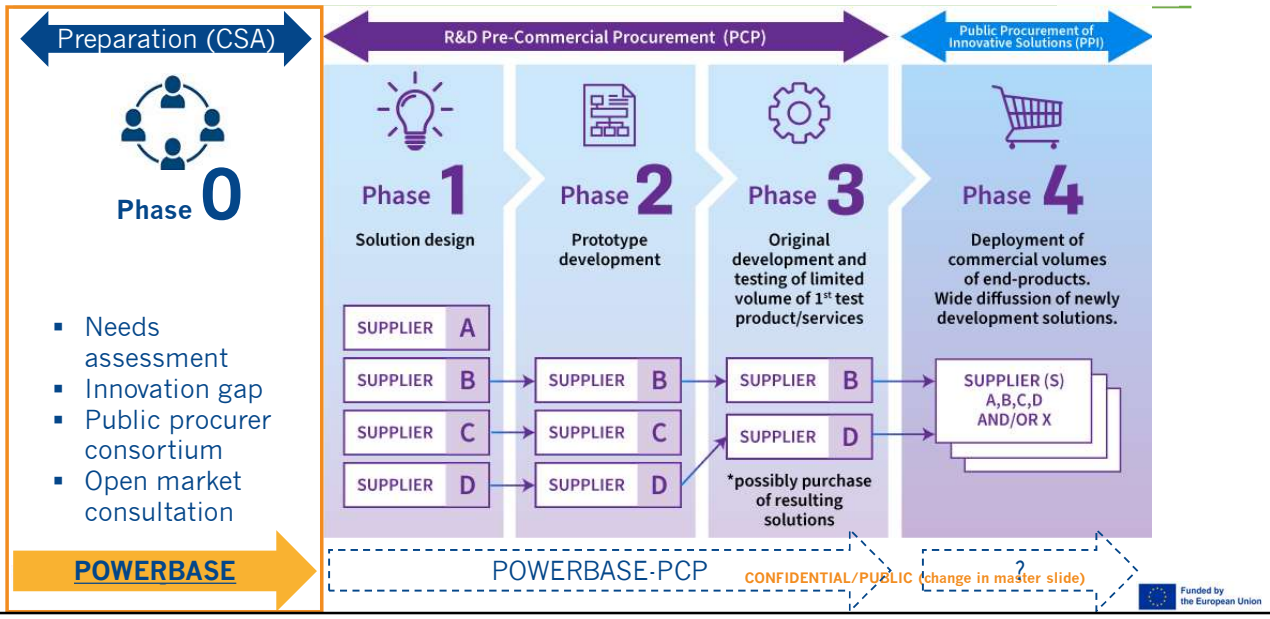
- ✓ 2 training sessions (webinars) for PEROs and EROs on Innovation public procurement
- ✓ 1 training during OMC event related with IPR, risk-sharing and PCP process – 13th June
- ✓ 1 webinar on lessons learned from POWERBASE project (joint crossborder public procurement and best practices) – September 2025
- ❖ After WS4 training (<30th March): Consortium partners survey on training needs will be sent, and training will be provided accordingly until the end of May

Today's Agenda

PCP step-by-step approach: from needs assessment to OMC

- 1 – Review of Needs Assessment Methodology: lessons learned
- 2 – Initial approach to Prior Art Analysis (SOTA) and IPR search and strategy
- 3 – Managing Regulation, Standardization, Labelling and Certification: Practical Examples
- 4 – Drafting the Business Case: strategic relevance and key contributions
- 5 - Open market consultation, technology showcases sessions and market analysis (KEMEA)
- 6 - Closing remarks and Open Q&A

PRE-COMMERCIAL PROCUREMENT



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Understanding the Importance of Early Identification

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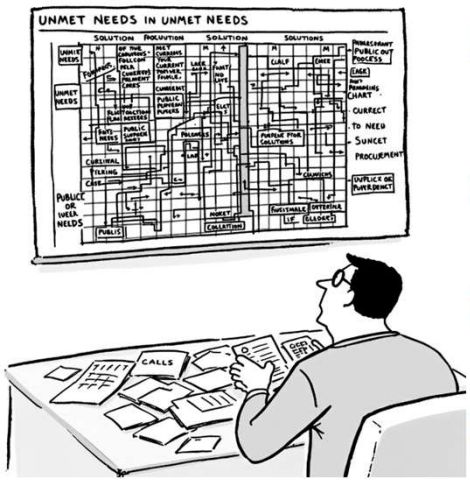
Describing the Need/Challenge Effectively



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1 - Review of Needs Assessment Methodology: lessons learned

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- ❑**Needs must be described clearly and in objective way, focused on the problem(s) to solve and not over-specifying**
- ❑ **A certain type of technology is not a requirement, but examples can be provided to allow the understanding of the wider technologies you are thinking of**

Key Questions in Needs Assessment

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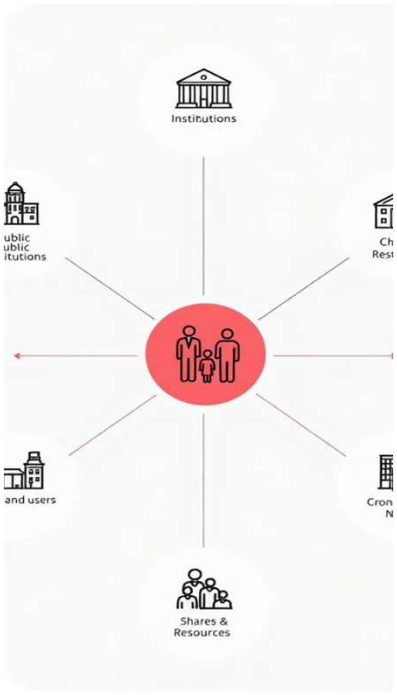

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Methodologies for Identifying Innovation Needs used in WS3

WIBGI Methodology
AutRC
HCSOM
KEMEA
VIEIRA

Design Thinking
AutRC
GB

Future Backwards Exercise
CNVVF
VIEIRA

World Café
ASSR
THW

6-3-5 Method
THW

Ideation
GB

Nominal Group Technique
MoI-F

POWERBASE

Broad vs. Narrow Need/Challenge Formulation

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Do not edit
How to change the design

From your experience in the national workshop, what were the biggest challenges you had to overcome to achieve a needs identification?

ⓘ The Slido app must be installed on every computer you're presenting from slido

15

POWERBASE

Do not edit
How to change the design

If you selected other, please specify

ⓘ The Slido app must be installed on every computer you're presenting from slido

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CHALLENGES & LESSONS LEARNED

- ✓ Human factor drains people's minds to known solutions and "Innovation" is perceived as an evolution of the existing solutions
- ✓ **Challenge**:
  - ✓ Needs identification without thinking of existing solutions and adaptations
  - ✓ Separate needs from solutions
- ✓ **Best practice:**
  - ✓ Preparation of the sessions:
    - ✓ Pre-defined scenarios, indicators (performance & functional) list for discussion
    - ✓ Preliminary analysis of methodology for needs identification to be used
    - ✓ Methodology adaptation to cultural/background/characteristics of the group (one may not fit all)
  - ✓ Skilled moderator/facilitator of the discussion

Initial approach to Prior Art Analysis (SOTA) and IPR search and strategy

When is an invention considered NEW? When it does not form part of the "*state of the art*".

State of the art: "*everything made available to the public by means of a written or oral description, by use, or in any other way, before the date* [prior art] *of filing of the European patent application*" (Art. 54(1) and (2) European Patent Convention)

Prior Art Analysis and IPR Search for Innovation Procurement

Prior art analysis is a **critical first step** in innovation procurement. It helps determine if solutions already exist on the market that can meet your needs.

Informed Decision Making (IDM)

Thorough Market Research

Investigate **existing solutions** before initiating innovation procurement to avoid redundant development.

IPR Search Process

Conduct **comprehensive** IPR searches to identify protected innovations and available technologies.

Informed Procurement Decisions

Use analysis results to determine whether standard or innovation procurement is **appropriate** for your needs.

If existing solutions are found, a standard procurement can be used instead of innovation procurement.

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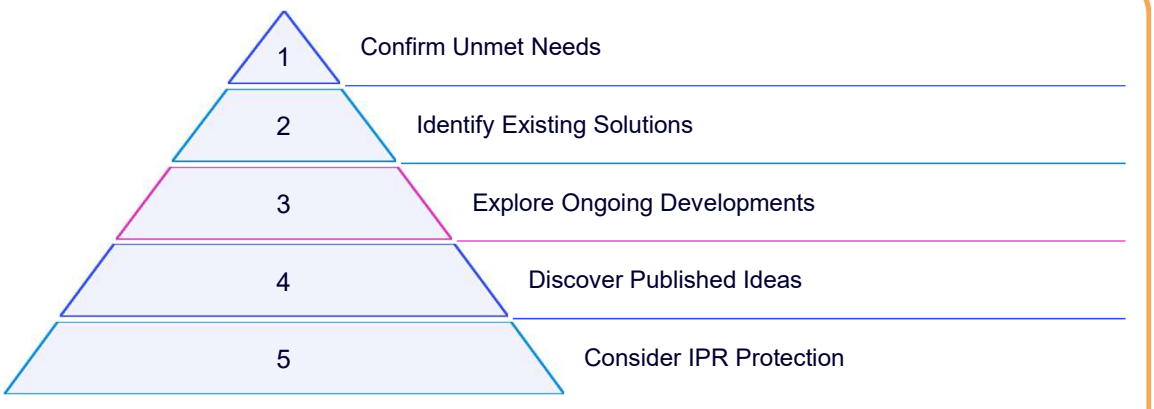
Importance of Prior Art Analysis to the Unmet Needs Assessment



Once needs are identified, a prior art analysis will be conducted to confirm whether the identified needs are indeed "**unmet**". This analysis identifies all information available in the public domain, including existing products, ongoing product development, and published ideas, whether IPR protected or not.

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Purpose of Prior Art Analysis

Verify Innovation Need

Determine if existing solutions already meet your needs before initiating costly innovation procurement.

Prevent Redundant Development

Avoid spending resources on recreating solutions that will soon be available through normal market activities.

Inform Decision Making

Gather evidence to justify proceeding with PCP or PPI, or deciding to purchase existing solutions.

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How to Conduct a Prior Art Analysis

Expertise Required

Ensure your team has relevant technological, industry, and scientific expertise. Specific knowledge is often necessary to assess whether existing technology is functionally equivalent to the innovation you seek.

Key Forums to Search

Cover online and offline forums for new ideas: existing products, roadmaps, trade shows, ongoing R&D projects, and published literature in industry journals and academic publications.

Expert Meetings

Meet with research directors, retailers, buyers, and others involved in creating, buying, or selling innovative technology. Their insights can reveal solutions not found through other search methods.

EXAMPLE - SMART@FIRE PCP PROJECT

A quite extensive prior art analysis was conducted in the SMART@Fire PCP project: for every company in the world active in the field of Protective Personal...

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SMART@FIRE PCP Project: Case Study

1

Extensive Prior Art Analysis

The project created detailed information fiches for every company worldwide active in Protective Personal Equipment (PPE) for fire brigades, positioning their R&D efforts on the Technology Readiness Levels scale.

2

University Support

The state-of-the-art study was carried out by Addestino and complemented by information gathered by the University of Ghent and Centexbel.

3

Standardization Impact

University research helped determine how ongoing standardization and certification work would influence the project's development and implementation.

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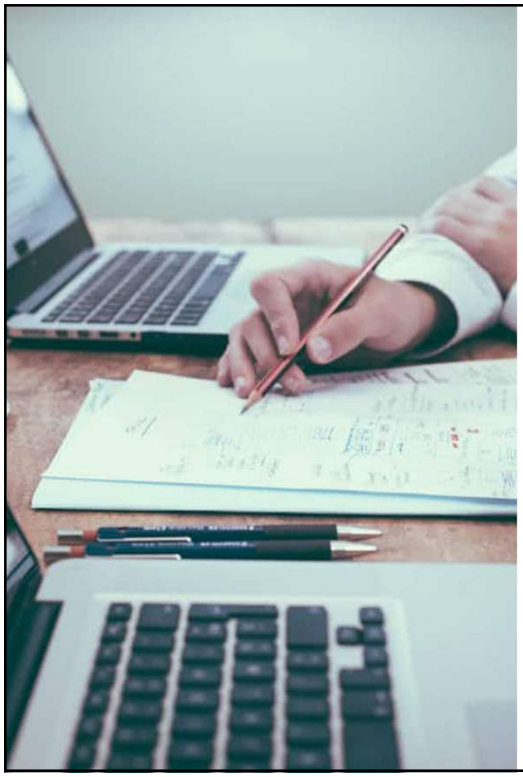

POWERBASE

Conducting Effective Prior Art Analysis

Assemble Expert Team

Ensure search teams have relevant technological, industry, and scientific expertise to properly assess functional equivalency.

Research Existing Products

Explore trade shows and exhibitions to understand current market offerings and product roadmaps.

Review New Developments

Investigate ongoing R&D projects and scientific studies that may yield solutions soon.

Examine Published Literature

Search industry journals, academic publications, and analyst reports for emerging technologies.

12

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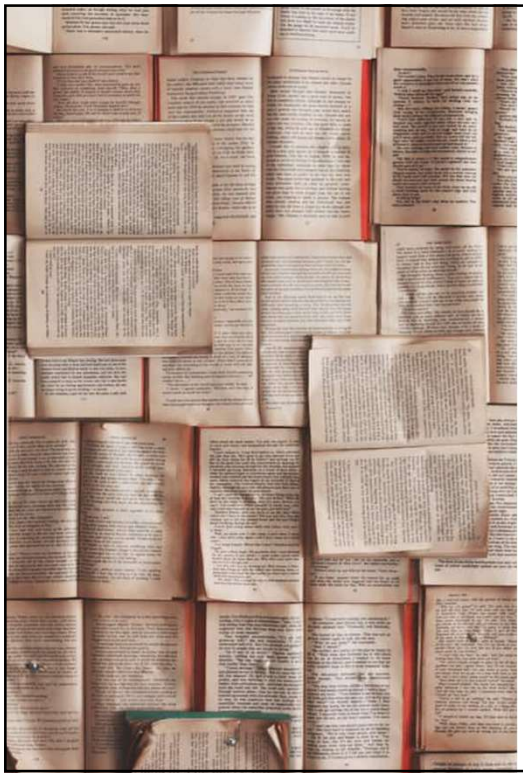

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Key Sources for Prior Art Research

Trade Shows

Displays of current products and upcoming developments from industry players.

R&D Projects

Ongoing developmental work that may soon yield market-ready solutions.

Published Literature

Academic publications, industry journals, and analyst reports detailing innovations.

Expert Networks

Researchers, retailers, and industry insiders with valuable insights on innovation trends.

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Case Study: SMART@FIRE PCP Project

Comprehensive Analysis

The project conducted extensive prior art research on Protective Personal Equipment (PPE) for fire brigades worldwide.

Technology Mapping

Each company's R&D efforts were mapped on the Technology Readiness Levels scale to understand development stages.

EU Project Tracking

The team analyzed all ongoing EU funded R&D projects in the field to prevent duplication.

Comprehensive Analysis Examples

- **Need: localization systems embedded in PPE**
- **Questions:**
  - **what solutions do exist in terms of localization systems?**
  - **what is their current development/deployment status/what are their weaknesses and strengths?**
  - **What are the associated risks and challenges?/what would it take to overcome those?**

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Risk Assessment Visualization

Info-Graphic Approach

SMART@Fire created visualizations demonstrating the relationship between value and risk of various possible projects.

Expert Input

Risk assessments incorporated expert opinions on sources and magnitude of potential challenges.

Technical Risk Scoring

Each system-level facet was assigned a risk score to prioritize mitigation efforts.

Standardization Considerations

Ongoing standardization and certification work was analyzed for its potential impact on the project.

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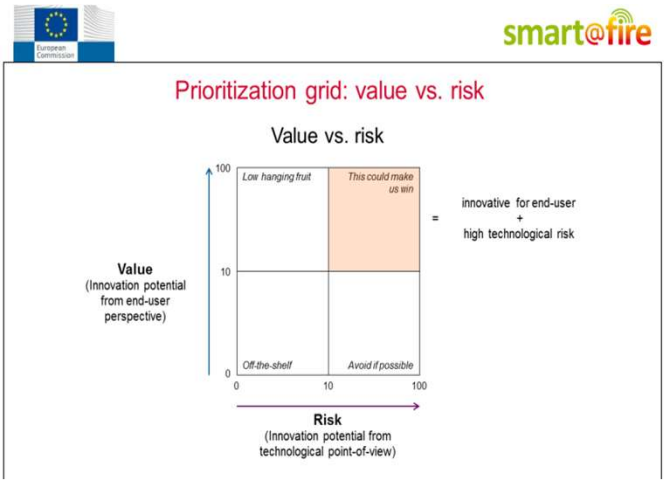
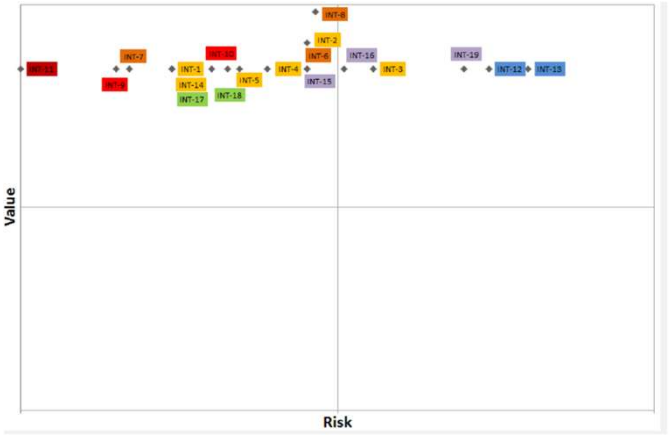
Risk Assessment Visualization



Source: Smart@Fire Deliverable 2.3 Presentation on approach Innovation Platform



Source: EAFIP, Module 2

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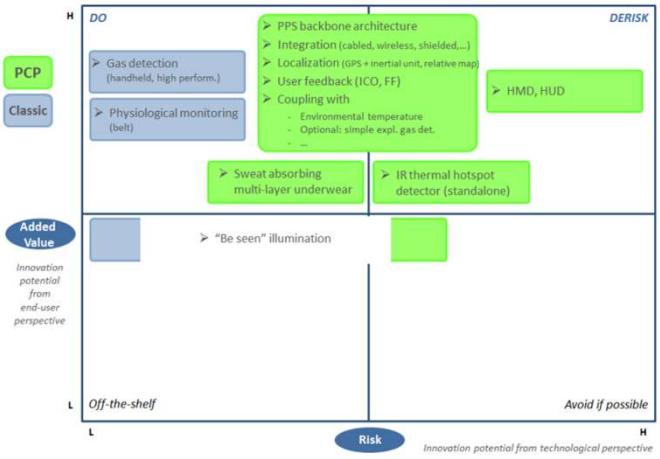
Risk Assessment Visualization

CHALLENGE	Eligible for:	Because:
1: PPS backbone	PCP	High added value, significant risk
2: Sweat absorbing multilayer underwear	PCP	Significant added value, significant risk
3: IR thermal hotspot detector	PCP	Significant added value, high risk
4: HMD/HUD firefighter visualization system	PCP	High added value, high risk
5: "BE SEEN" omnidirectional active illumination	PCP	Reasonable added value, significant risk (to make it usable)
6: Explosive gas detection	Classic	High added value, no technological risk as the goal is not to develop the next generation of small, cheap explosive gas detectors. Coupling with PPS backbone is considered in CHALLENGE 1.
7: Physiological monitoring	Classic	High added value, no technological risk. Coupling with PPS backbone is considered in CHALLENGE 1.



Source: Smart@Fire Deliverable 2.5.2 Final Innovation Platform Results

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INFORM DECISION MAKING (Smart@Fire)

- ✓ For some aspects of personal protection equipment certain solutions already exist and it made more sense to focus the PCP on those aspects of the unmet need for which there were no solutions yet.
- ✓ The decision to finally focus the PCP on the aspect of localization of firefighters in hazardous environments was taken as that would deliver the highest value whilst being reasonable to complete within available time and budget – acceptable risk.
- ✓ The highest priorities on the prototype development roadmap are typically those elements with the highest added value for the end-user and significant risk reducible within reasonable time elapse.
- ✓ The higher the risk, the more difficult to reduce it sufficiently within time and budget constraints. The right priorities for the prototype scope should be selected.

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Initial approach to Prior Art Analysis (SOTA) and IPR search and strategy

When is an **invention** considered NEW? When it does not form part of the "*state of the art*" [1].

State of the art: "*everything made available to the public by means of a written or oral description, by use, or in any other way, before the date* [prior art] *of filing of the European patent application*" (Art. 54(1) and (2) European Patent Convention)

[1] Patent law in all countries in the world adheres to a so-called '*absolute novelty*' standard. This means that the 'state of the art' is defined by all inventions in the public domain, whatever the country and whatever their antiquity.

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IPR SEARCH: Why is it Critical?

Verify Innovation Status

Determine if R&D or innovative solutions have sufficient novelty to be protected by IPR.

Identify Key IPR Holders

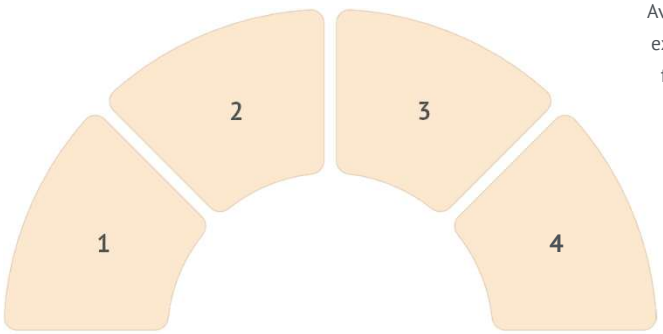
Discover entities already owning intellectual property essential to addressing your needs.

Assess Licensing Risk

Evaluate if existing IPR licensing policies create prohibitive costs or risks.

Prevent Downstream Problems

Avoid novelty-destroying pre-existing IPR that could block future patent applications.



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Consequences of Overlapping IPRs

1. **Question Project Justification**
   Existing IPR may indicate insufficient novelty to justify PCP or PPI procurement.
2. **Identify Potential Barriers**
   Contractors may face IPR obstacles when attempting to supply solutions or commercialize them.
3. **Consider Design Alternatives**
   Requirements may need modification to design around blocking IPR.
4. **Negotiate Licensing**
   Pre-emptive licensing agreements may be needed with IPR holders before commercialization.

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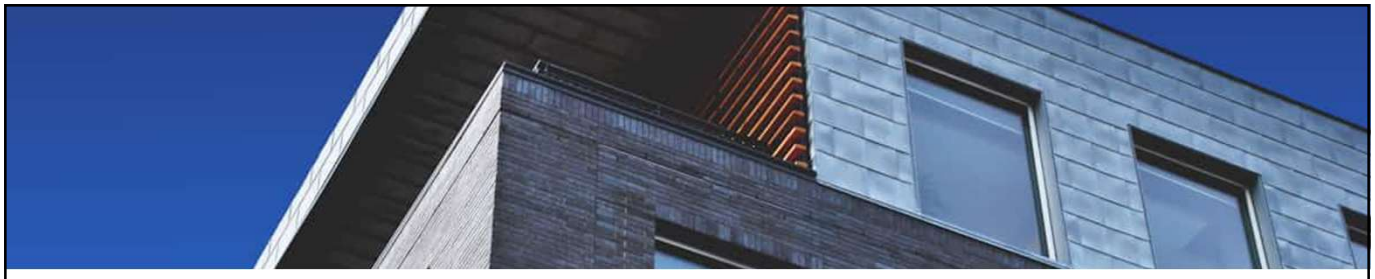

Types of Intellectual Property Rights

Registered IPR

Rights issued by central agencies requiring publication as part of the intellectual property grant (patents, trademarks, designs).

Unregistered IPR

Rights that don't require registration to be effective, such as copyright in Europe, which has no central database or publication requirement.

Patent Databases

Public repositories containing registered IPR information, searchable through various tools and techniques.

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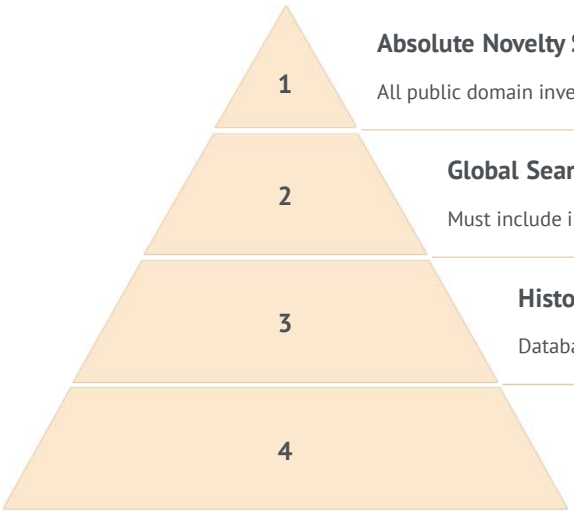
Patent Search Fundamentals



Absolute Novelty Standard

All public domain inventions worldwide affect state of the art

Global Search Scope

Must include international patents and applications

Historical Coverage

Databases cover patents from 1876 onward

Database Selection

Multiple databases ensure comprehensive coverage

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Key Patent Search Databases

European Patent Register (espacenet)

Contains 90 million patent documents from worldwide sources dating from 1876. Accessible at worldwide.espacenet.com.

US PTO Patent Database

United States Patent and Trademark Office database at uspto.gov provides comprehensive coverage of US patents.

Google Patents

Allows searchers to explore over 7 million US patents with different search algorithms than official databases.

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Keyword Search Techniques

1

Use Broad Terminology

Search for "handheld telecommunications device" instead of "mobile phone" to capture functionally equivalent technologies.

2

Try Multiple Formulations

Different phrasing can reveal different results. Explore synonyms and related terms.

3

Apply Boolean Operators

Use AND, OR operators to refine searches and capture relevant combinations of terms.

4

Follow Citations

Once relevant documents are found, review their citations to discover related technologies.

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Patent Classification Search

1

Base Categories (A-H)

Eight general classes including Chemistry, Physics, Textiles

2

70,000+ Sub-Categories

Detailed technological divisions for precise targeting

3

Classification Searching

Use espacenet's Classification Search button for structured exploration

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Comparative Search Methods

Keyword Search

- Easier for beginners
- Flexible and intuitive
- May yield over-inclusive results
- Good for concept exploration

Classification Search

- More precise targeting
- Avoids irrelevant results
- May be under-inclusive
- Requires understanding of classification system

Best Practice

- Use both methods
- Compare results
- Follow citation trails
- Consult experts when needed

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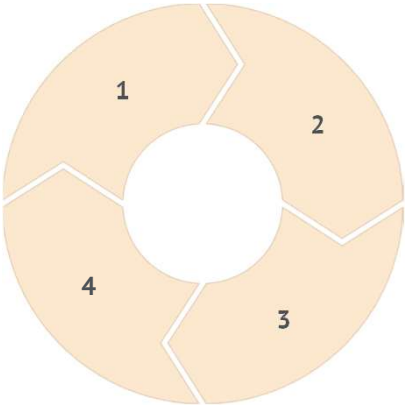
Interpreting Patent Search Results

Read Abstract

Quick summary of invention for relevance assessment

Examine Claims

Key section defining the scope of exclusivity



Consult Experts

Seek qualified patent agents for technical interpretation

Analyze Technical Details

Understand implementation approaches

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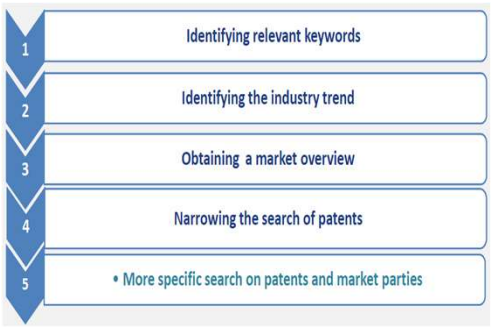
Case Study: LVNL Air Traffic Control

5

Step Methodology

LVNL used a five-step approach to conduct comprehensive SOTA analysis for voice recognition technology.



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Keywords Identified

Carefully selected search terms including contextual and functional parameters.

5

Top Industries

Research identified leading sectors developing voice recognition technology from 2010-2019.

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LVNL Keyword Selection Strategy

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Related to the functionalities/Performance (defining requirements of the system)	Related to the context of deployment
Voice recognition and response (VRR)	Air traffic Control
Speech recognition and respone	ATC
A.I. and Speech Recognition technology	Training
Voice dictation	Simulator
Speaker identification	Context / situation dependent interpretation
Audio mining	Application interface
Speech verification	
Speech analytics	
Voice model	
Machine learning	
Text to speech	

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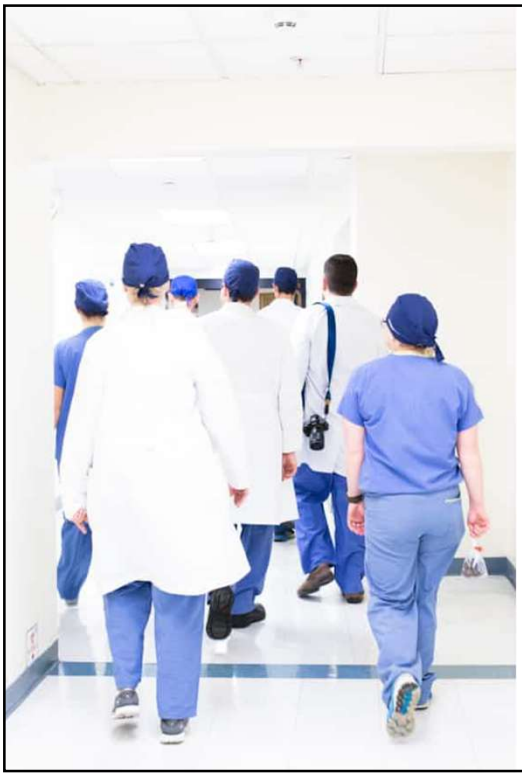

Case Study: DECIPHER PCP Project

1

Project Objective

Develop mobile solutions for secure cross-border access to patient healthcare portals in EU member states.

2

Horizon Scan Analysis

Two-part approach to ensure technological solutions were novel and IPR-protectable.

3

State of Art Analysis

Examined existing technologies and regulatory frameworks establishing service boundaries.

4

Patent Search

Determined protection and exploitability of technologies through USPTO and European databases.

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DECIPHER Patent Search Strategy

U.S. Patent Database

Used advanced search queries combining health, electronic records, mobile, interoperability, and cross-border terms. Identified 309 patents with 56 highly relevant to project goals.

European Patent Register

Multiple queries combining health records, medical records, semantic translation terms. Found 436 patents with 5 closely aligned to project objectives.

Result Application

Search findings used to determine patentability, guide exploitation strategy, and prevent conflicts with existing patents in tender documents.

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3- Managing Regulation, Standards, Labeling and Certification

For what concerns legislation, the procurer has the obligation to require **compliance** of the solutions developed or purchased through PCP or PPI respectively with existing legislative requirements.

Legislation Requirements

Procurers must ensure that all solutions developed or purchased through PCP (Pre-Commercial Procurement) or PPI (Public Procurement of Innovation) comply with existing legislative requirements. This is a **mandatory obligation** for all procurement processes.

Standards and Labels

Standards and labels are **means of proof** that procurers can request to ensure that the supplies/works/services procured correspond to the required characteristics. These are optional requirements that can be included in tender documents.

Certification Schemes

Not all existing standards and labels are supported by transparent, objective and robust accreditation systems. **Quality certification** should be done by independent third parties, based on sound scientific evidence and objective standards with broad stakeholder participation.

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What if you need legislation, standards, labels, certification schemes that don't exist?

Radical Innovations in PCPs

For radical innovations (in PCPs), there may be no existing legislation, standard, label or certification applicable to the innovation and the procurer may desire to take action himself to get new legislations, standards, labels and certification schemes defined.

Active Role in Standardization

When the procurer discovers the need for new legislation or policy requirements to deploy new innovative solutions, the procurer can signal the need to the legislator and policy makers and can participate in preparatory consultation rounds of legislative bodies/policy makers that are responsible to define new legislation or policy requirements.

Importance of Legislative Framework

In the case of standards, labels or certification schemes, the procurer can play a more active role. The procurer can participate itself in standardization/labelling activities to define new standards/labels for its radical innovation and may appoint a certification body if there is no existing certification body yet that can verify compliance with his requirements.

The procurer can also via its tender documents require / incentivize the PCP/PPI suppliers to actively **engage in standardization / labelling / certification activities**.

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Legislation

Existing legislative requirements can serve as drivers for procurers to initiate PCP/PPI projects.

Short-Term Requirements

Typical short-term legislative requirements may trigger Public Procurement of Innovation (PPI) actions by procurers seeking immediate compliance.

Long-Term Requirements

More forward-looking longer-term legislative requirements can trigger Pre-Commercial Procurement (PCP) initiatives, such as mandates to reduce CO2 emissions by specific percentages by 2030.

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Example: Link Between Legislation and PPI

Hospital Thermal Comfort Project

The County Hospital in Sucha Beskidzka, Poland, identified the need to reduce the temperature in the hospital rooms that are exposed to excessive sunlight in the summer, with the aim to secure patient and personnel thermal comfort.

Legislative Requirement

The need was reinforced by the legislative requirements: by the Ordinance of June 29, 2012, the Polish **Minister of Public Health mandated all health care providers to install** 'sun-blocking equipment in the **patients' rooms exposed to excessive sunlight' by December 31, 2016,** which turned the identified need into a future unmet need.

Required Outcomes

The Hospital **defined the need as "**Improvement of thermal comfort of patients and personnel of **Sucha Beskidzka Hospital with the lowest (zero) exploitation costs."** The required outcomes included: reduction of excessive sunlight, thermal comfort, energetic self-sufficiency, meeting health and safety standards, comfort of usage, and improving thermal comfort in winter time.

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Standardisation

Definition of Standardisation

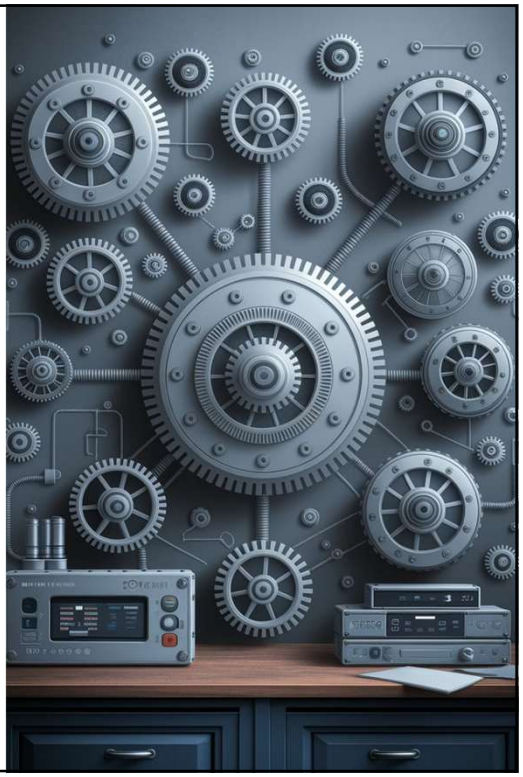
Standardisation refers to the tacit or explicit process by which certain shared features between technologies may be used to foster interoperability between devices, data or software. Examples of standards-**often referred to as 'interoperability standards'**- include common document formats (such as .docx or .pdf), communication protocols (eg. 4G LTE, WiFi), or image compression formats (eg. JPG, PNG). Standardisation may also include minimum quality or safety requirements imposed by legislation.

Benefits of Standardisation

Standardisation helps to reduce costs and encourage innovation, by allowing consumers (such as public procurers) **to benefit from greater competition and avoid 'lock in' (due to greater number of compliant** products to choose from), and allowing producers to focus their resources on producing products to a clear specification. Standards enable interoperability / compatibility between old and novel products, and they define test methods/measurement of the quality or safety of the products.

Role of PCP and PPI

PCP and PPI can encourage standardization in pioneering or fragmented markets. Where PPI can help encourage wider deployment of solutions that meet existent standards, PCP can create new standards. PCP can push a wide range of suppliers to commercialize solutions that are compliant with interoperability requirements of the procurer in the PCP tender specifications.



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What action can a procurer take with regards to standardisation?

Check Existing Standards

Prior to a PCP/PPI, the procurer should check if there are existing standards applicable to the envisaged innovation. In the technical specifications for the PCP/PPI, the procurer may request suppliers to evidence their compliance with existing standards as means of proof for specific desired solution characteristics.

Create New Standards

The public procurer may conclude that existing standards are not comprehensive and new standards should be created (see V-CON example below) or new test procedures need to be created for testing the compliance of new solutions with existing standards (see Smart@Fire example below).

SMART@FIRE EXAMPLE - link between PCP and creating new test procedures

Need for New Test Procedures

The procurers in the Smart@Fire PCP project required that all Personal Protective Equipment (PPE) being developed for fire brigades fulfill basic health and safety requirements. While existing PPE products had certification procedures, the procurers discovered that standard testing procedures weren't required for ICT components exposed to the same hazardous conditions.

Procurer-Defined Testing

In addition to known standards for PPE and ICT-related firefighting solutions, the procurers defined new test procedures within the PCP for components lacking mandated testing protocols. This included specialized testing for cabling and connectors under extreme conditions where no existing procedures were available.

Innovation Through Standards

By creating these new testing protocols, the Smart@Fire project demonstrated how PCP can drive innovation not just in products, but in standards and certification. This approach ensured that novel integrated technologies would meet the same rigorous safety requirements as traditional equipment.

Source: The market consultation summary, page 4, http://www.smartatfire.eu/media/33066/final-innovationplatform-results.pdf

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V-CON EXAMPLE - link between PCP and creating new *de jure* standards

The V-CON project demonstrates how Pre-Commercial Procurement can directly contribute to the creation of formal standards in the infrastructure sector.

1 Identifying the Need for Standards

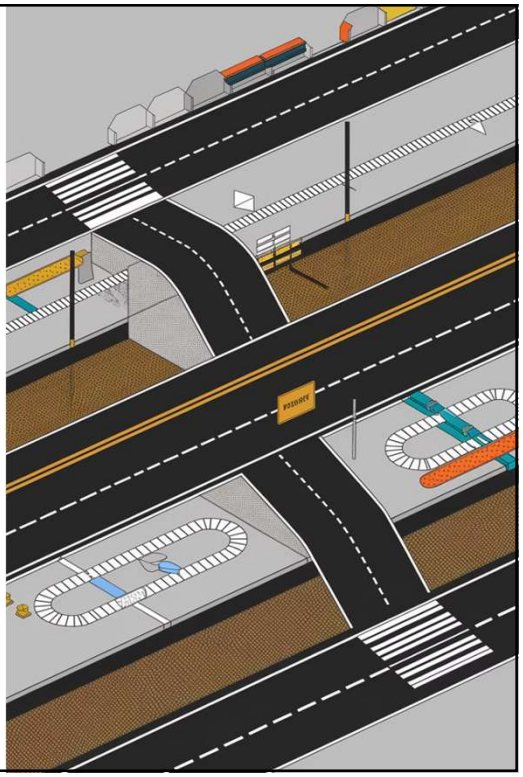
The EU funded V-CON project on virtual modeling of road infrastructure identified the lack of standardized information exchange across the civil infrastructure sector as a critical gap. Despite several developments, no comprehensive, generally accepted standard was immediately available.

2 Project Objectives

The V-CON PCP aimed to develop the required international open information standard while simultaneously procuring compliant software tools. The project team believed this approach would stimulate broader adoption across the sector.

3 Implementation Strategy

Two primary objectives were pursued: establishing a draft standardized information exchange structure, and procuring software systems through PCP that comply with this structure. The results would be embedded in large infrastructure projects in both the Netherlands and Sweden.



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Shock wave traffic Jam PCP - Creating Multi-Component Standards

Multi-Component Solution Approach

Brabant province in the Netherlands deployed a PCPs with multiple lots to develop different components for an end to-end solution to address the problem of shock wave traffic jams on highways. The procurer required in the PCP tender specifications open interfaces to ensure interoperability between the different components developed by vendors in different lots.

Coordination for Interoperability

During the PCP implementation, the procurer met weekly with contractors from different lots to ensure interoperability was maintained as development in different lots progressed. In order to ensure that the resulting components developed in different lots were really interoperable, the contractors from different lots were requested test together the integrated solutions.

Documentation

1

2

3

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More Info on Standardisation

Public procurers can play a key role in standardization through their procurement requirements and processes.

Contributing to Official Standards

Public procurers may contribute requirements to official standardization bodies, and can require PCP participants to also contribute to these bodies, helping transform de facto standards into de jure standards over time.

IPR and Open Development

Through PCP's IPR policy, procurers can require R&D providers to grant non-exclusive licenses under market conditions, ensuring open development of interoperable follow-on technologies and competitive solutions.

Aligning Timelines

Procurers can align de facto standard creation during PCP with official standardization processes, continuously mapping initiatives to formulate clear contractual obligations and verify compliance with FRAND licensing conditions.

More info: http://ec.europa.eu/information **society/newsroom/image/document/2015-47 /kerstjens oene 12176. pptx**

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Certification and labelling

Definition

Certification tests the conformity of a product with certain requirements deriving from legislation or from de jure/de facto standards. In the EU some products' characteristics are regulated by legislation.

Standards & Requirements

These standards define minimum performance and functionality requirements for the respective products. Certification of compliance with these standards provides a presumption of conformity with the respective legislation.

Labelling

Labelling entails the application of a visible sign on the product that certifies conformity with certain requirements defined in standards or in legislation.

CE Marking

Demonstrated compliance with the legislation will entitle the producer to apply the CE mark on the respective product. The CE mark is a requirement for commercializing such regulated products within the EU.

Certification and labelling increase trust of private and public consumers in the product and encourage wide deployment of innovative solutions.

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Swedish Energy Agency Example - link between certification, labelling and PPI

Since 1990, NUTEK (the precursor of the Swedish Energy Agency) has used technology procurement (Swedish name for PPI) in combination with certification and labelling to trigger producers to develop more energy efficient and thereby, more environmentally friendly products.

Procurement Process

NUTEK has coordinated nearly 60 different technology procurements. It grouped public (and possibly private) buyers interested in innovations with the same e.g. environmental characteristics. An open market consultation with industry was then held to clarify what level of innovation requirements can realistically be achieved by the supply side in the deployment time frame of the procurers.

Implementation & Results

The energy agency published the functionality, performance and cost requirements of the buyers group. Suppliers demonstrated whether their solutions met the requirements. Test/certification events were organized in cooperation with the procurers. The energy agency certified and labelled various energy efficient appliances, which were deployed gradually afterwards by procurers in the buyers group.

In total, the deployment of products resulting from all these technology procurements triggered by the Swedish energy agency has reduced Sweden's total dependency on nuclear energy with 10%.

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SMART@FIRE PCP - formulating new certification packages

The SMART@FIRE PCP project required development of certification approaches for innovative solutions:

1. Certification Requirements in PCP Phase

SMART@FIRE requires certification of solutions developed within the PCP. Companies participating in the PCP are required to have their solutions certified by established certification bodies.

2. Long-term Standards Development

SMARTFIRE also needs new certification processes to fully certify integrated PPE solutions in the long term. The project contributes to the development of new certification packages through participation in working groups of existing certification bodies.

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Statoil/Gassnova PCP - assigning a new certification entity

1. New Carbon Capture Solutions

Statoil and Gassnova initiated a PCP to develop new carbon capture solutions

2. Certification Challenge

They discovered that no existing certification schemes were suitable

3. Procurer-led Solution

The procurers assigned a new independent entity to certify compliance

4. Risk Reduction Strategy

Certification was made a requirement for any subsequent procurement

5. Certification Outcome

The certification process concluded that solutions were still too expensive

For their PCP, Statoil and Gassnova discovered no existing certification schemes were suitable. So they assigned a new independent entity to certify the new carbon capture solutions. Certification was made a requirement to reduce risks, but the process concluded the solutions were still too expensive to justify deployment.

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Building the business case for an innovation procurement

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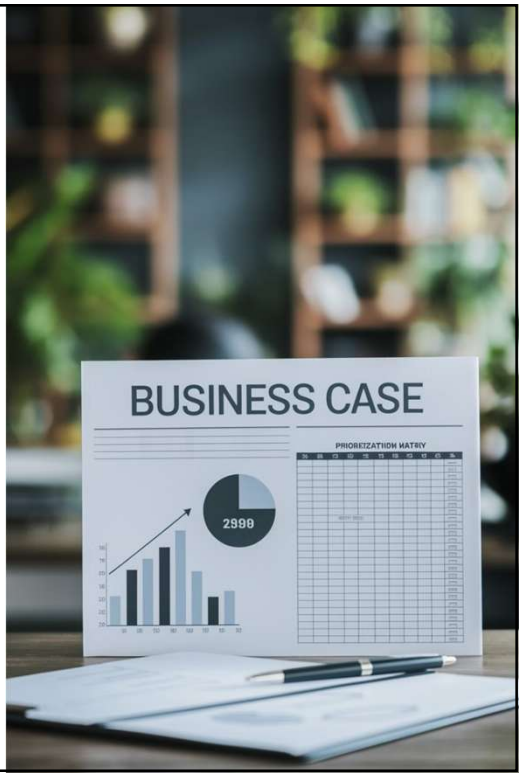
Why draft a business case for an innovation procurement

1 **Define Unmet Needs**

Once all unmet needs have been defined in terms of which functionality/performance improvements they would generate, and those needs for which solutions already exist have been removed from the list, the next step is to analyze costs versus benefits of starting an innovation procurement for each remaining unmet need on the list.

2 **Economic Justification**

This "business case" for the procurer: provides the economic justification (cost benefit analysis) to decide for which unmet needs it makes most sense to start an innovation procurement: it enables the procurer to prioritize unmet needs according to their highest potential impact versus costs.



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Example of needs prioritization based in business-case - Niguarda Hospital PCP

Historic Analysis for Ranking

To be able to rank unmet needs based on potential impact, it is very important to evaluate first the historic past-performance of the process or service under consideration, using key performance indicators (KPI) as a measure (in the form of cost, headcount, time, outcomes). Procurers should subsequently analyse, by making the business-case for each unmet need, which needs can provide the biggest contribution to their KPIs and thus can improve the public service the most. Procurers should choose long-term KPIs that are related to the quality and efficiency improvements, and that can measure progress on achieving the targeted quality and efficiency improvements.

Hospital Bed Automation Selection

In the case of Niguarda Hospital in Lombardy region, for example, the decision to focus the PCP on the need for automated moving of hospital beds has been selected out of 10 initially identified stringent needs. This choice was based on the fact that finding solutions for this need would create the biggest impact on the KPIs that are important to modernize the hospital, namely expected improvements in productivity, the possible reduction of dedicated personnel to carry out bed movements (provided that in Italy the existing personnel is below the actual needs of hospitals) and, ultimately, the reduction of the total cost of the public service offered (due to accidents and time needed to move the beds), as well as the improvement of patient comfort and safety when moved.

Business Case Benefits

The business case provides the procurer also with insights on how to practically organise his procurement to maximize expected impacts, whilst keeping the costs and risks to an acceptable level. For example, what should be the maximum budget and duration for the procurement to keep costs to an acceptable proportion of the expected benefits, how many vendors should be minimum engaged with to reduce the risk that nobody can deliver a working solution, how to set the "minimum" functionality / performance requirements to achieve the minimum quality/efficiency improvements needed, what are the benefits / drawbacks to split the procurement into lots and what are the dependencies between different lots, which test set-up is most suitable to check whether expected impacts are reached or not etc.

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The business case as a tool

Before the project

To determine whether there is enough economic justification to start the procurement and to set key parameters for organizing the procurement set-up in such a way to maximise expected impacts, whilst keeping the costs and risks to an acceptable predefined level.

During the project

To decide how to best monitor vendors performance and to project-manage the procurement so to keep costs/benefits in balance; to decide how to best deal with unexpected events inside the project or changes in the environment around the project.

After the project

To assess whether **the results achieved meet the public procurer's goals** (based on expected impacts defined initially in the business case before starting the project); to draw lessons learned and better prepare future procurements (e.g. to prepare a PPI after a PCP).

The business case enables the procurer to analyze how changes in key project parameters would impact the project (sensitivity analysis). It's important to verify these parameters and their sensitivity during the market consultation, and modify the business case if needed.

During a PCP or PPI project, the business case is a major control tool that is referred back to on a regular basis by the project manager to make sure that the project remains viable.

To construct the business case the following points should be addressed:

1. How to build a business case for an innovation procurement? (section 2.5.2)
2. What are the expected benefits? (section 2.5.3)
3. What are the expected costs? (section 2.5.4)
4. What is the timeline for the project: How long is the procurement expected to take and what is the duration during which the innovative solution will be used and will generate benefits? (section 2.5.5)

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How to build a business case for an innovation procurement

Main Components

In what follows we first explain the main components of how to build a business case for an innovation procurement. Then we discuss how to use the business case to design the innovation procurement so that it is most effectively geared to achieve the desired impact within the acceptable levels of cost/risk.

Understanding the Basic Elements

A business case makes a cost/benefit analysis for starting a project based on three financial indicators: the Net Present Value **(NPV),** the Internal Rate of Return **(IRR)** and the Return On Investment (ROI).

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Understanding NPV

1 Definition of NPV

The NPV is used to assess the overall profitability of a project, at the time when the public procurer needs to decide whether or not to start a project. Although formulae for computing the NPV, IRR and ROI are provided in Annex 2 to this Toolkit, here we shall briefly explain how such indicators are constructed.

2 Time Value of Money

A common feature of PCP and PPI projects is that they typically take place over a medium to long period of time: Often investments need to be made before benefits (cost savings, quality/efficiency improvements in the public service) become available Therefore, to evaluate project profitability, comparison of monetary sums available at different stages/dates is needed.

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Numerical Example of NPV

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Net Present Value (NPV) compares monetary values across different time periods by converting them to the same reference date.

Investment Today (t=0)

Starting point: Innovation procurement requires 1€ investment today.

Alternative: Deposit 1€ in bank at 1.5% yearly interest.

1

2

Time Passes (3 Years)

During this period, money has different time values.

Bank deposit grows gradually, while innovation investment develops value.

3

Future Value (t=3)

Innovation result: 1.1€ in 3 years.

Bank deposit result: Only 1.046€ after 3 years.

Comparison shows innovation is better investment.

Borrowing Decision Example

When short on funds, borrowing for innovation can be viable. At 1.5% interest, you could borrow 1.052€ today and repay it with the 1.1€ generated in 3 years. This exceeds the 1€ required, making borrowing for innovation with a solid business case financially sound.

For proper comparison, all monetary values must be converted to the same point in time, typically $t = 0$, when the procurement decision is made.

Understanding Present Value

Present Value Calculation

1.1€ in 3 years has a present value of 1.052€ today

Future Value Calculation

1€ today has a future value of 1.046€ in 3 years

NPV Comparison

Present value enables fair comparisons between different-timed cash flows

When Is An Innovation Procurement Worth Starting?

NPV>0

Worth Pursuing

Projects with positive NPV generally indicate financial sustainability

1000€

Monthly Savings

Potential regular benefit from innovation procurement

100,000€

Scaled Value

If adopted by 100 procurers (100 × 1000€)

Beyond NPV

While positive NPV indicates financial viability, Return on Investment (ROI) should also be considered to evaluate whether the project delivers competitive returns compared to alternatives.

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Financial Evaluation Criteria

NPV > 0

An innovation procurement project is worth starting when NPV is greater than 0, indicating a positive profit margin and financial sustainability.

Consider ROI

Simply having a positive NPV may not be enough financially. The return on investment (ROI) should also be taken into account.

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Example of NPV Calculation

Project Investment Example

For example, suppose an innovation procurement project needs an initial investment, at t **=** 0, of a **100€ but after three years it would generate revenues equal to 110€. Then, at** i = **1,5%** yearly interest rate, the NPV of this project would be given by

NPV Formula

$NPV = 110\ (1/(1 + 0.015))^3 - 100 = 105.2 - 100 = 5.2\ € > 0$

which suggests that the project would generate a positive profit margin to the public procurer. However, though *NPV* > 0 implies self-sustainability of the project this may not suffice to opt for it. Notice that both in this and in the above numerical example to compute NPV we used a formula with compound interest (1) 3 , to shift backward year by year, for three years, the future sum **1+0.015** of **110** to the current sum 105,2.

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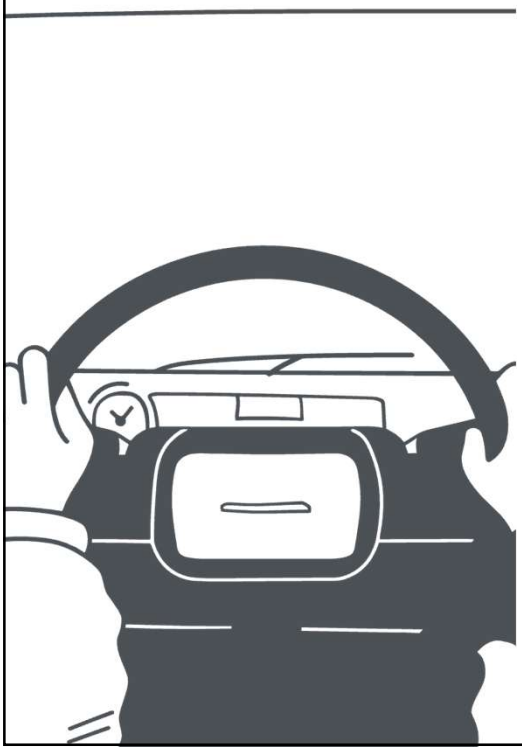

Legislation

Legislation as a Driver for PCP/PPI

In some cases, existing legislative requirements may be a driver for procurers to start a PCP/PPI. Typical short term legislative requirements may trigger PPIs, but more forward looking longer term legislative requirements can also trigger PCPs (e.g. requirements to reduce CO2 emissions by x percent by 2030).

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What action can a procurer take with regards to standardisation?

Check Existing Standards

Prior to a PCP/PPI, the procurer should check if there are existing standards applicable to the envisaged innovation. In the technical specifications for the PCP/PPI, the procurer may request suppliers to evidence their compliance with existing standards as means of proof for specific desired solution characteristics.

Create New Standards

But the public procurer may conclude that existing standards are not comprehensive and new standards should be created (see V-CON example below) or new test procedures need to be created for testing the compliance of new solutions with existing standards (see Smart@Fire example below).

Formal EU Standards

R. Apostol, 'Formal EU Standards in Public Procurement: A Strategic Tool to Support Innovation (2010) PPLR 2.

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SMART@FIRE EXAMPLE - link between PCP and creating new test procedures

Need for New Test Procedures

The procurers in the Smart@Fire PCP project, required in the tender documentation that the Personal Protective Equipment (PPE) that is being developed in the PCP for fire brigades should at all times fulfill basic health and safety requirements. For existing PPE products on the market, compliance with these requirements is demonstrated through existing certification procedures. However, the procurers realized that the existing regulation did not require these standard testing procedures for ICT related products exposed to the same hazardous conditions.

Procurer-Defined Testing

As a consequence, in addition to the known standards and directives for PPE and for ICT related firefighting products and solutions, the procurers decided to define themselves new test procedures that are used in the PCP for those parts of the PPE for which there were no testing procedures available/mandated by legislation (e.g. for the testing of cabling/connectors in extreme conditions).

Source Documentation

Source: The market consultation -summary, page 4, http://www.smartatfire.eu/media/33066/final-innovationpatform-resu lts.pdf

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V-CON EXAMPLE - link between PCP and creating new de jure standards

Identifying the Need for Standards

The EU funded V-CON project on virtual modelling of road infrastructure identified the lack of standardised information exchange and sharing over the civil infrastructure sector as an important lacuna. The project team identified several developments, but concluded that there was no comprehensive, generally accepted standard immediately available. Therefore, the V-CON PCP is develop (part of the) required international open information standard during their PCP that is developing solutions for virtual, and procure the required, compliant software tools. The project team believes that this will stimulate others in the sector to follow.

Project Objectives

From the above strategy, two primary objectives were derived. The first was to establish a draft version of a standardised information and data exchange structure. The second was to procure and test software systems in a PCP that comply with this structure. The results will be embedded in the procurement of two large infra projects, one in the Netherlands and one in Sweden. The result will be a draft version of a standard that will be used in the software that will be procured in the PCP part of the project.

Source: V-CON PCP project, http://www.rws.nl/engish/highways/v-con

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Shock wave traffic Jam PCP - Creating Multi-Component Standards

1

Multi-Component Solution Approach

Brabant province in the Netherlands deployed a PCPs with multiple lots to develop different components for an end to-end solution to address the problem of shock wave traffic jams on highways. The procurer required in the PCP tender specifications open interfaces to ensure interoperability between the different components developed by vendors in different lots.

2

Coordination for Interoperability

During the PCP implementation, the procurer met weekly with contractors from different lots to ensure interoperability was maintained as development in different lots progressed. In order to ensure that the resulting components developed in different lots were really interoperable, the contractors from different lots were requested test together the integrated solutions.

3

Documentation

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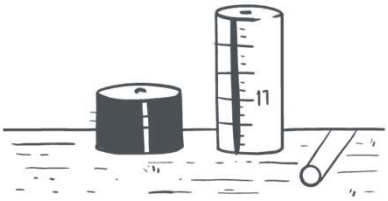
More Info on Standardisation



More info: http://ec.europa.eu/information **society/newsroom/image/document/2015-47 /kerstjens oene 12176. pptx**

Public procurers may contribute themselves via their requirements to official standardization bodies, and may require via their PCP tender documents the R&D providers participating in the PCP to contribute as well to official standardization bodies to turn the de facto standard in the long term into a de jure standard. Since the IPR policy of PCP is that the public procurer can require the R&D providers to grant non-exclusive licenses over their IPR (under market conditions) to third parties, public procurers may have a strong role in ensuring the open development of interoperable follow-on and competitive technologies.

Procurers can align the timeline of creating a de facto standard during the PCP with the timeline to contribute to the official standardization process of standardization bodies, driving therefore simultaneously the creation of de jure standards out of ongoing industrial developments in the PCP. The procurer should thus continuously map existing and ongoing standardization initiatives, in order to decide his own strategy for participating in standardization activities and to formulate clear contractual obligations for the providers to contribute as wel l to such standardization initiatives. The public procurer should check whether suppliers comply with such contractual obligations to contribute to standardization bodies and license out their related IPR on FRAND conditions, even after

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5 - Open market consultation, technology showcases sessions and market analysis

› **ELENI LIANOU** (KEMEA)

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Our experience

OPEN MARKET CONSULTATION & MARKET ANALYSIS

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How to obtain market feedback

- OMC Questionnaire(s)
- An OMC main event
- A series of informative webinars in different EU languages
- Q&As

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Market feedback

- The availability on the market of solutions addressing Prevent PCP need
- The efficiency of existing solutions
- The difficulty of overcoming the technological gap
- The timescale realism
- The financial support
- Market suggestions for the procurement

Market feedback

- The market agreed that no solution is currently able to address the Prevent PCP needs. The TRL level of the relevant technologies being considered as insufficiently high, stakeholders and Prevent PCP Consortium consider that there is both room for innovation and an existing demand for the expected solution.
- As suggested by the State-of-the-Art analysis, a Pre-Commercial Procurement appears as the most appropriate procedure. Results being uncertain in such procedure, the Buyers Group shall adopt a resolutely ambitious approach while providing support to the selected companies and consortia in all the project's steps.
- Technology suppliers are asking for a clear definition of the objectives to reach at each PCP steps, from the tender procedure preparation to the end of phase 3. The demand for clarity concerns all the aspects of the PCP: the goals, the technical description of each task to perform, the scenarios to explore and the evaluation methodology (from the selection of bidder to the third phase), etc...
- Contributions received clearly states that clarity implies a high level of details.

Market feedback

- The exchanges with the Market clearly suggest the Buyers Group to remain focused on the project goals: exploring a coherent set of scenarios appears as the best way to offer clear project conditions.
- Contributions urges the PCP Consortium to create the conditions where R&D providers can use data. In the same vein, it appears to the market as a responsibility for the PCP Consortium to ensure the authorisation to deploy the solutions and the possibility of testing them on in the pilot sites.
- Finally, the OMC contributors asked the PCP Consortium to provide a flexible and scalable framework, reflecting the progress achieved all along the PCP.
- The PCP Consortium to issue a tender documentation considering ways of introducing a part of flexibility in the procedure.

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Matchmaking sessions

- Facilitate networking among potential partners (tenders)
- Ease consortium building for joint tenders
- Lower barriers for adressing our need

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Matchmaking sessions

Questions to the technology providers:

- Value my organisation can add to a joint Tender
- Areas of cooperation sought
- Topics we are seeking cooperation
- Our solution(s) is aligned with the requirements

CLOSING REMARKS

Innovation Public Procurement: Driving Public Sector Innovation

Part IV - PCP step-by-step approach: Why do we need to talk about Intellectual Property Rights?

Filomena Vieira
Vieira Procurement Legal Services

WP3 – Task 3.1.
WS5, Brussels, 13th June 2025

Funded by the European Union

1

TRAINING PLAN FOR POWERBASE PROJECT

DELIVERED

- ✓ WS1 – Strategic public procurement (Innovation concept, the innovation cycle through PCP/PPI, key success factors, PCP step-by-step)
- ✓ WS2 (webinar) – PCP: from needs assessment to OMC (PCP/PPI, needs identification methods & tools)
- ✓ WS3 National event – PCP in a nutshell
- ✓ WS4 - PCP: from needs assessment to OMC (SOTA, IPR search, regulatory/certification/standardization environment, business case, OMC)
- ✓ WS5 – PCP: Why do we need to talk about Intellectual Property Rights? (current)

GRANT AGREEMENT

- ✓ 1 training kick-off meeting: PCP in a nutshell
- ✓ 1 training during WS2: PERO Needs Assessment
- ✓ 1 training during WS4: PERO Needs validation & prioritization
- ✓ 1 training during the OMC event – 13th June
- ✓ 1 webinar on lessons learned: capability needs collection for joint crossborder procedures and best practices

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Today's Agenda

PCP step-by-step approach: Why do we need to talk about IPRs?

1. Intellectual Property Fundamentals
2. IPR Search & IPR in PCP
    - 3.1. Importance of IPR Search
    - 3.2. The strategic relevance of IPR in PCP
3. Key IPR definitions
4. Relevance of clear IPR clauses
5. Strategic Management of IPR in PCP
6. Key Takeways and Open Q&A

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1. Intellectual Property Fundamentals

What is Intellectual Property?

As defined by the World Intellectual Property Organization, intellectual property refers to "***creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce***."

What are Intellectual Property Rights?

The EU Directive 2014/24/EU further clarifies IPR as "***copyright and related rights, patents, design rights, trademarks, plant variety rights, trade dress, geographical indications and similar rights***."

1. Intellectual Property Fundamentals (cont.)

Registered IPR

Rights issued by central agencies requiring publication as part of the intellectual property grant

- Patents
- Trademarks
- Registered designs

Unregistered IPR

Rights that don't require registration to be effective

- Copyright in Europe
- Trade secrets
- Unregistered design rights

No central database or publication requirement

Patent Databases

Public repositories containing registered IPR information

- Searchable through various tools
- Contain technical details
- Show ownership information

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1. Intellectual Property Fundamentals (cont.)

Intellectual Property

- Inventions
- Artistic & literary works
- Designs, symbols
- Names, images

Creations=assets, valuable and eligible for legal protection

Intellectual Property Rights

- Patents
- Copyrights
- Trademarks
- Trade secrets
- Industrial designs

Legal rights that grant the owner exclusive control over the use of the IP (right to prevent others from copying, distributing, using without permission)

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Intellectual Property vs. Intellectual Property Rights

Understanding the distinction between creative works and their legal protections

Intellectual Property: Inventions

New technological solutions and innovative products that solve problems

Intellectual Property: Creative Works

Artistic and literary works that express ideas and creativity

Intellectual Property: Designs & Symbols

Names, images and symbols used in commerce and branding

IP Rights: Patents

Legal protection for inventions, granting exclusive rights to use and commercialize

IP Rights: Copyrights

Legal protection for original creative works, controlling reproduction and distribution

IP Rights: Trademarks & Designs

Legal protection for brand identities, symbols, and industrial designs

1. Intellectual Property Fundamentals (cont.)

In the context of PCP, intellectual property encompasses both **tangible** and **intangible** deliverables arising from each R&D phase:

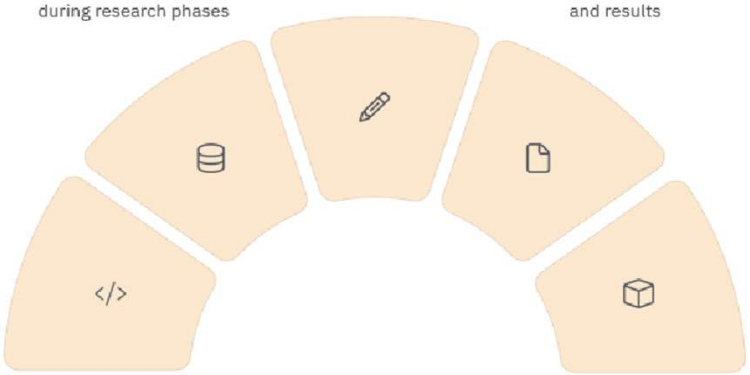
Designs
Technical drawings, specifications, and visual representations

Data
Information collected, organized, and analyzed during research phases

Reports
Documentation of findings, methodologies, and results

Software
Programs, algorithms, and code developed during the PCP process

Prototypes
Physical or functional models demonstrating concept validity



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2- IPR Search & IPR in PCP

2.1. The Importance of IPR Search in PCP

Risk Mitigation
Identifies whether technologies are already protected by third-party patents, copyrights, or other IP rights

Early Issue Detection
Flags "red-light" issues allowing redesign of requirements or alternative approaches

Informed Approach
Knowledge basis before locking in specifications

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2.1. Additional Benefits of IPR Search

1. **Background vs. Foreground Definition**

   Clearly distinguishes existing IP from new creations

2. **Tailored Rights Framework**

   Enables appropriate licensing and exploitation rights allocation (avoid risk-shifting)

3. **EU Compliance**

   Ensures alignment with the principles of the Treaty on the Functioning of the EU

4. **Budget and Project Planning**

   Supports accurate budgeting and project timeline development

5. **Knowledge Sharing**

   Facilitates appropriate results' sharing

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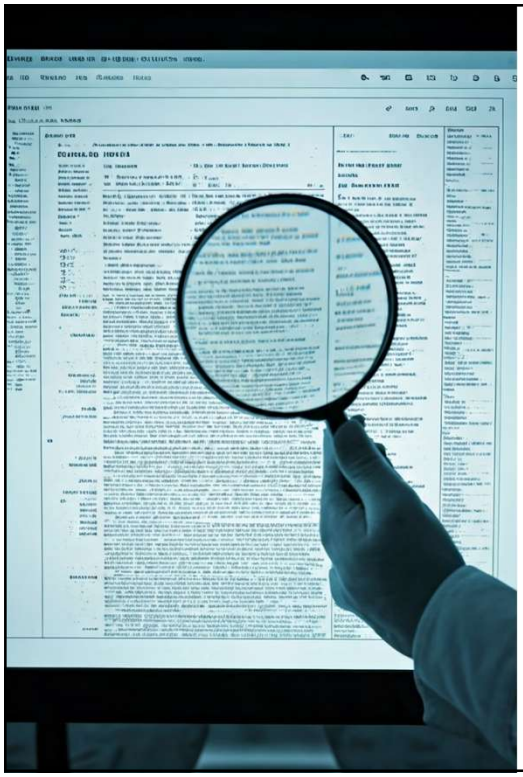

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Patent Search Fundamentals

Absolute Novelty Standard

All public domain inventions worldwide affect state of the art

Global Search Scope

Must include international patents and applications

Historical Coverage

Databases cover patents from 1876 onward

Database Selection

Multiple databases ensure comprehensive coverage

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Why IPR Search is Critical

Identify Key IPR Holders

Discover entities already owning intellectual property essential to addressing your procurement needs

Assess Licensing Risk

Evaluate if existing IPR licensing policies create prohibitive costs or risks of the project

Verify Innovation Status

Determine if R&D or innovative solutions have sufficient novelty to be protected

Prevent Downstream Problems

Avoid novelty-destroying pre-existing IPR that could block future patent applications

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Consequences of Overlapping IPRs

1. **Question Project Justification**
   Existing IPR may indicate insufficient novelty to justify PCP procurement.
2. **Identify Potential Barriers**
   Contractors may face IPR obstacles when attempting to supply solutions or commercialize them.
3. **Consider Design Alternatives**
   Requirements may need modification to design around blocking IPR.
4. **Negotiate Licensing**
   Pre-emptive licensing agreements may be needed with IPR holders before commercialization.

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2.2.The Strategic Importance of IPR in PCP

Innovation Incentives

Clear IPR rules encourage supplier investment in R&D. Suppliers will only invest substantial resources when they have clarity on which rights they retain and what opportunities exist for future commercialization.

Value for Money

Balanced rights ensure procurers don't overpay. Value comes from obtaining sufficient rights to exploit results without unnecessarily paying for complete ownership when more limited licenses would serve the public interest adequately.

Transparency & Fairness

Equal terms reduce legal disputes. This delicate balance between supplier and procurer interests is fundamental to successful PCP implementation and ensures all parties understand their rights and obligations.

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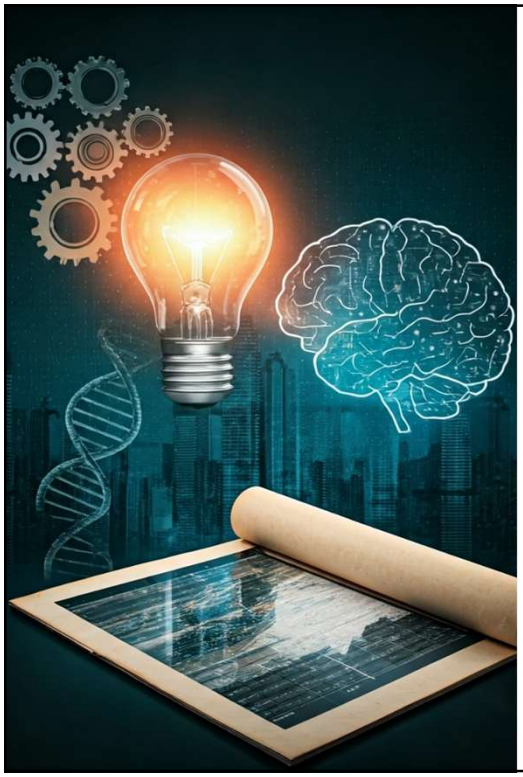

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IPR as a Tool to Foster Innovation

Economic Growth

IPR drives market expansion and wealth creation through protected innovations that generate new business opportunities.

Collaboration & Knowledge Sharing

Enables incremental improvements and technology transfer while maintaining appropriate protections for creators.

Innovation Culture

IPR helps cultivate an environment where people are motivated to develop novel solutions to address societal challenges

Providing Incentives

Granting exclusive rights IPR allows creators to invest time, resources and effort into R&D, knowing they will have the opportunity to profit from their work

Securing Investments

Provides legal certainty for business R&D expenditure, encouraging long-term commitment to innovation.

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How are IPR usually treated in innovation procurement?

Type of contract	Relevant IP	Typical management of IP
Purchase of off-the-shelf products e.g. **software**	Copyright, patents or trademarks over product	IP remains with the supplier. CA acquires licence for use.
Purchase of an adapted product e.g. an **ambulance**	Existing IP in the base vehicle; Design and trademarks of the CA for customisation; New design features	Each party retains its own IP and may have licence over other party's; New IP may be owned by one party or jointly.
Design and build of works e.g. a **bridge**	Design drawings for bridge; copyright over design; patented components or materials; technical know how	Design drawings will normally be owned by CA; Copyright remains with architect; other IPRs will remain with original owner.
Provision of service e.g. **consultancy or training**	Materials developed for delivery of service; pre-existing materials or templates	IP in developed materials will be owned or licenced by CA; Pre-existing IP remains with contractor

Source: SEMPLE, Abby. Public Procurement Analysis, WIPO Expert Meeting, 2019

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Key IPR Questions for Pre-Commercial Procurement

Ownership

Does the supplier retain patent ownership for innovations developed during the project?

Licensing

What rights does the procurer/Buyers Group receive? Exclusive or non-exclusive? Modification rights?

Transfer

Will full assignment of IPR be required at the conclusion of Phase III?

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Coffee Break

Time to refresh your mind. Grab a drink, stretch your legs.

We'll came back in 15 minutes!

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Back to Work

Welcome back! We hope you enjoyed your refreshment.

1 Minds recharged

2 Fresh perspectives after our brief pause

3 Let's dive into the next exciting topics

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3. Key IPR Definitions

Background

Material, documents, technology, data, or know-how held prior to signing the PPI contract, identified as background, and needed to implement the PPI or exploit its results.

Results (Foreground)

Any tangible or intangible output generated in the PPI, regardless of form or protection status. Includes materials, documents, technologies, solutions, data, knowledge, and any intellectual property rights attached to them.

Rights on Results

Industrial or intellectual property rights on the results, including rights on newly created materials and pre-existing materials incorporated into the results. May consist of ownership, license rights, or usage rights.

Understanding these definitions is crucial for properly structuring IPR provisions in PCP contracts and ensuring all parties have clarity on their rights and obligations.

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Key IPR Definitions in PCP

Results (Foreground)

Any tangible or intangible output generated during the PCP, regardless of form or protection status

- Materials and documents
- Technologies and solutions
- Data and knowledge
- Associated intellectual property rights

Rights on Results

Industrial or intellectual property rights on the project outcomes

- Ownership rights
- License rights
- Usage rights

Background

Pre-existing IP held prior to signing the PCP contract

- Must be identified as background
- Needed for implementation
- Required for result exploitation

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Additional IPR Definitions

Background Rights

Industrial and intellectual property rights on background materials. May include ownership, license rights, or usage rights belonging to any party involved in the PPI.

Sideground Rights

Industrial and intellectual property rights on sideground material, which may consist of ownership, license rights, or usage rights.

1

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Sideground

Material generated during the PPI timespan but not within the PPI activities, yet needed to implement the PPI or exploit its results.

3

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Pre-existing Material

Any material that exists before the contractor uses it to produce results in the PPI implementation. Includes both background and sideground material.

These definitions establish the framework for understanding the different types of intellectual property that may be involved in a PPI project and how they should be managed.

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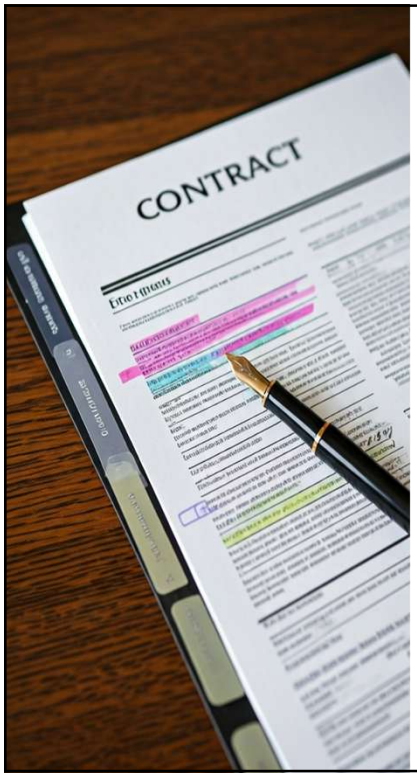

Key Components of a PCP IPR

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Background IP

Pre-existing rights each party brings to the project, clearly identified and documented to establish ownership boundaries.

Foreground IP

Rights generated under the contract, with specific terms on ownership, protection responsibilities, and exploitation.

License-back Terms

Typically includes royalty-free, non-exclusive licenses to the procurer for internal use, with clear scope limitations.

Commercial Options

Framework for negotiating exclusive licenses for wider deployment, often with predetermined pricing structures.

A well-structured IPR serves as a comprehensive framework governing all intellectual property aspects throughout the PCP process. This document provides both parties with certainty regarding their rights and obligations, forming the legal foundation for successful collaboration.

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Examples of Background IP in PCP Projects

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Type of Background IP	Example	Role in PCP
Patented technologies	Supplier's existing patent on novel sensor design	Building block in Phase I proof-of-concept; ownership remains with supplier
Software Libraries & Code	Proprietary data-processing library	Accelerates prototype development without starting from scratch
Technical Know-How	Trade-secret manufacturing processes	Ensures quality standards in prototype fabrication
Design Documentation	CAD drawings for existing platforms	Provides reference architecture for adaptations

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Background IP in PCP Projects

Background IP forms the foundation upon which new innovations are built in PCP projects. Suppliers typically bring various pre-existing intellectual assets to expedite development and leverage established technologies. Understanding these different types helps structure IP arrangements.

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The Critical Importance of Background IP Specification

Rights Clarity
Tender documents list each party's Background IP

Preventing Free-Riding
Stops suppliers claiming ownership of pre-existing tech

Fair Competition
Creates level playing field for all bidders

R&D Budgeting
Distinguishes between off-the-shelf and new development

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The Importance of Background IP Specification: transparency for both parties

For procurers - it provides clarity on which components are truly innovative versus which are pre-existing, helping to evaluate bid values accurately and allocate development budgets appropriately.

For suppliers - clear Background IP specifications protect their existing investments while providing certainty about which components they can freely commercialize beyond the specific procurement.

This balance ultimately leads to more competitive bids and better outcomes for public sector innovation.

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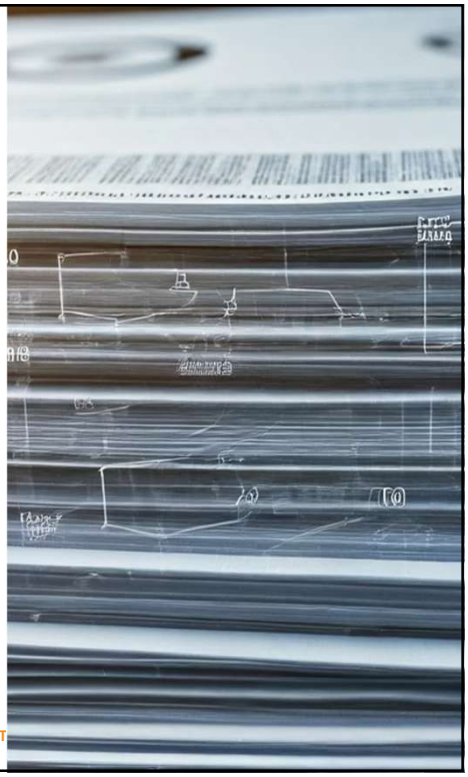
Transparent Background & Foreground IP in PCP Documents

The distinction between **background** and **foreground IP** is crucial for determining **ownership rights** and **licensing requirements** throughout the procurement process and beyond project completion.



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The Importance of Background IP Specification: transparency for both parties

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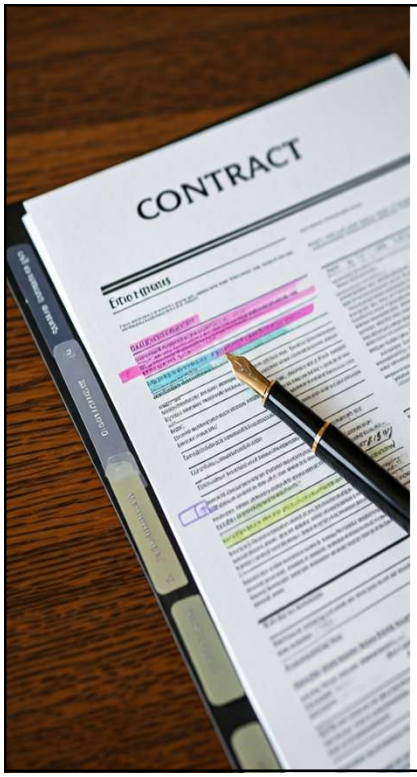

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Key Components of a PCP IPR

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A well-structured IPR serves as a comprehensive framework governing all intellectual property aspects throughout the PCP process. This document provides both parties with certainty regarding their rights and obligations, forming the legal foundation for successful collaboration.

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Foreground IP (example)

All new know-how, designs, software code, prototypes and test data generated by the Contractor during the execution of this contract ('Foreground IPR') shall be *owned by the Contractor*.

The Contractor shall grant the Procurer a royalty-free, non-exclusive licence to use and reproduce the Foreground IPR for internal purposes.

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License-back terms (example)

"The Contractor shall grant the Procurer a perpetual, royalty-free, non-exclusive license to use, adapt and modify both Background IP and Foreground IP for internal use within the Procurer's organization. The license shall include the right to permit other public bodies in the Buyers Group to use the Foreground IP under the same terms."

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Commercial options (example)

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Within six (6) months after completion of Phase III, the Procurer shall have the option to negotiate an exclusive license or full assignment of the IPR to commercialize the Foreground IP on market-based terms. If mutually agreed, the exclusive license shall include the right to sublicense to third parties under fair and reasonable conditions." (source: EuropeWaveproject available at europewave.eu)

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Confidentiality Provisions Example

"All non-patented know-how, trade secrets, technical specifications, test results and commercial information exchanged under this contract shall be treated as Confidential Information for a period of five (5) years after contract expiry. Neither party may disclose Confidential Information to any third party without prior written consent."

Source: EuropeWave project (europewave.eu)

Protected Content

Non-patented IP and commercial data

Duration

Five years post-contract protection

Disclosure Control

Prior written consent required

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Confidentiality (example)

POWERBASE

"All non-patented know-how, trade secrets, technical specifications, test results and commercial information exchanged under this contract shall be treated as Confidential Information for a period of five (5) years after contract expiry. Neither party may disclose Confidential Information to any third party without prior written consent."

(source: EuropeWaveproject available at europewave.eu)

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4. The Importance of Clear IPR Clauses

Defining clear IPR clauses in tender documents is crucial for all public procurements. Public buyers must ensure that the allocation of intellectual property rights takes into account the applicable IPR legal framework in Europe and at national level.

These frameworks include provisions on the minimum rights of use for lawful users of software, databases, and other intellectual property. Clear IPR provisions from the outset help prevent disputes and ensure both parties understand their rights and obligations.

Legal Compliance

IPR clauses must align with European and national legal frameworks governing intellectual property

Clarity for Bidders

Transparent IPR terms help potential contractors assess the commercial viability of participation

Dispute Prevention

Well-defined IPR provisions reduce the risk of conflicts during and after contract implementation

The Importance of Clear IPR Clauses

Legal Compliance

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Dispute Prevention

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Defining clear IPR clauses in tender documents is crucial for ensuring that all parties understand their rights and obligations from the outset.

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IPR Requirements in Procurement Documentation

Legal Requirements

Article 31 & 42 of EU Directive states:
In the procurement documents, the contracting authority shall define the arrangements applicable to intellectual property rights."

IPR arrangements are a mandatory element of all PCP documentation

Ownership Questions

PCP documents must address whether the supplier retains patent ownership, which can significantly impact bid pricing and supplier interest.

Clear ownership terms are essential for competitive bidding.

Licensing Arrangements

Documentation must specify if procurers receive exclusive/non-exclusive rights to use, modify, or sublicense the developed IP.

These rights directly affect the long-term value proposition of the procurement.

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5. Strategic Management of Intellectual Property Rights

Member States and public buyers are encouraged to take a **strategic approach** to IPR when dealing with public procurement.

This is particularly important when procuring innovative goods or services, research and development services, studies, or software that **may lead to the generation of new intellectual property rights such as patents, copyrights, design rights, or trademarks.**

A thoughtful approach to IPR management can significantly impact the attractiveness of public procurement for innovators while ensuring public interests are protected.

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Innovation Can Emerge in Any Procurement

Even in procurement competitions that don't specifically target innovative products or services, contractors may propose innovations during contract implementation. These unexpected innovations can provide significant value to public buyers and should be considered in IPR planning.

The potential for innovation exists in virtually all procurement categories, making IPR considerations relevant across the spectrum of public purchasing activities.

Unexpected Innovation

Contractors may propose novel solutions during implementation of standard contracts

Contract Flexibility

Procurement frameworks should accommodate innovative approaches

IPR Protection

Clear IPR provisions encourage contractors to suggest improvements

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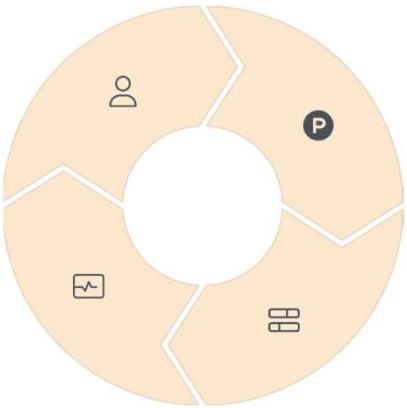
Ownership and Protection of Results

Rights Ownership

Specify who owns the IPRs attached to results generated by the contractor (standard: contractor ownership)

Monitoring Rights

Procurer's right to monitor the management of IPRs



Results Ownership

Clarify who owns the actual results (products/services, specifications, data models, drawings, source code)

IPR Management

Contractor responsibility for managing and protecting IPRs, bearing associated costs

Contractors must inform procurers of exploitable results within a specified timeframe, regardless of protection status. This information should include details about the results' content, confirmation of protection plans, and protection timing.

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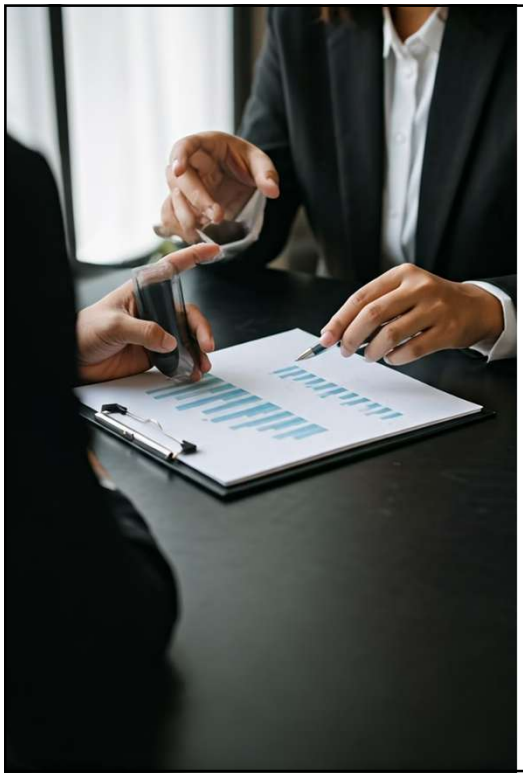

Commercial Exploitation of Results

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Exploitation Responsibility

Specify whether contractor or procurer has responsibility to commercially exploit results

Exploitation Timeline

Define the period within which commercial exploitation is expected if contractor has responsibility

Third Party Access

Rules defining rights and obligations for third parties to access the results

Ownership Transfer

If contractor fails to exploit results within the defined period despite best efforts, buyers group may require ownership transfer

Clear commercial exploitation provisions ensure that innovations developed through the PPI process reach the market and deliver value. These provisions balance the interests of contractors who developed the innovation with the public interest in seeing results utilized.

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Non-Exclusive Licensing Options

Default Option (No Restrictions)

Either party may give non-exclusive licenses to third parties without prior authorization, provided such licenses don't affect the other party's rights or obligations and aren't granted to entities subject to EU restrictive measures.

The licensing agreement must pass on all obligations to the third party, who must further pass these on in subsequent licensing.

Restricted Option

If there are participation or control restrictions in the HE call conditions, non-exclusive licensing is subject to the same restrictions as exclusive licensing of results.

This ensures that even non-exclusive licenses maintain the security and strategic autonomy protections required by the project.

Obligation Transfer

The party must ensure in the licensing agreement that all obligations under the contract are passed on to the third party, creating a chain of responsibility.

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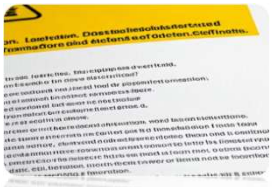
Exclusive Licensing and Transfer Restrictions



Third Party Rights

Exclusive licensing and transfers cannot affect the rights of other parties or the European Union.

Contractual Obligations

Transfers of ownership cannot affect the obligations that other parties have committed to fulfill.

Restricted Entities

Licensing or transfers cannot involve entities that are subject to EU restrictive measures.

Non-EU Transfers

Transfers to non-EU countries not associated with Horizon Europe may require specific EU approval.

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Pre-existing Materials and Rights

Ownership	Pre-existing rights typically remain unchanged, except in exceptional cases
Notification	Parties must inform each other about generation/changes in pre-existing rights within specified timeframe
Background List	Each party must provide a list of pre-existing rights and necessary software within defined period after contract signing
Access for PCP Tasks	Typically royalty-free, non-exclusive access to each other's background
Access for Exploitation	Fair and reasonable conditions, non-exclusive access to background for exploiting results
Sideground Access	Fair and reasonable conditions, non-exclusive access to sideground for PCP tasks and result exploitation

These provisions ensure that all parties have appropriate access to pre-existing materials and rights needed to implement the PPI and exploit its results, while respecting the original ownership of these materials and rights. The conditions should be fair and reasonable to all parties involved.

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Security and Strategic Autonomy

EU Security Interests

When safeguarding EU security interests is important, especially for security-related testing/deployment, contractors must ensure EU security interests are protected in commercial exploitation.

Strategic Autonomy

When safeguarding EU strategic autonomy is important, particularly for critical technologies or assets, contractors must ensure EU strategic autonomy in commercial exploitation of results.

EU Production Requirements

Contractors may need to ensure a significant amount of commercial exploitation takes place in EU Member States and/or countries associated with Horizon Europe.

For security-related goods/services, contractors may need to produce a higher percentage (potentially up to 100%) in specified countries. Any cooperation with entities from other countries must avoid affecting EU security or strategic autonomy interests and avoid negative effects on supply chain security.

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6. KEY TAKEAWAYS

1. **IPR matters in PCP because**:
   i. Aligns supplier capacity with public-sector needs
   ii. Enables clear paths from R&D to deployment
   iii. Reduces legal disputes & budget overruns

2. **Core IPR elements in PCP tender documents:**
   i. Background & Foreground IP
   ii. License-back
   iii. Commercial options
   iv. Confidentiality

6. KEY TAKEAWAYS (cont.)

3. **Best practices for Strategic IPR Management**:

   i. Start with an IPR Search (FTO-Freedom-to-Operate)
   ii. Involve legal, technical and procurement teams from the start to draft clear, unambiguous clauses
   iii. Embed phase-gate reviews: embed IPR checkpoints at each R&D phase (update licenses, options & risk assessments)
   iv. Reduces legal disputes & budget overruns

4. **Keep asking for specific training workshops/webinars**

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ANY QUESTIONS?

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Lawyer

VIEIRA PROCUREMENT LEGAL SERVICES

THANK YOU!

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Innovation Public Procurement: Driving Public Sector Innovation

Part V – From Neds to Innovation: Lessons Learnt in Needs Collection and Assessment for Successful PCP

Filomena Vieira
Vieira Procurement Legal Services

WP3 – Task 3.1.
WS6/Seminar, Athens, 28th August 2025 (hybrid)

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TRAINING PLAN FOR POWERBASE PROJECT

POWERBASE

DELIVERED

- ✓ WS1 – Strategic public procurement (Innovation concept, the innovation cycle through PCP/PPI, key success factors, PCP step-by-step)
- ✓ WS2 (webinar) – PCP: from needs assessment to OMC (PCP/PPI, needs identification methods & tools)
- ✓ WS3 National event – PCP in a nutshell
- ✓ WS4 - PCP: from needs assessment to OMC (SOTA, IPR search, regulatory/certification/standardization environment, business case, OMC)
- ✓ WS5 – PCP: Why do we need to talk about Intellectual Property Rights?
- ✓ WS6/Seminar – From Needs to Innovation: Lessons Learned in Needs Collection and Assessment for Successful PCP (current)

GRANT AGREEMENT

- ✓ 1 training kick-off meeting: PCP in a nutshell
- ✓ 1 training during WS2: PERO Needs Assessment
- ✓ 1 training during WS4: PERO Needs validation & prioritization
- ✓ 1 training during the OMC event
- ✓ 1 webinar on lessons learned: capability needs collection for joint crossborder procedures and best practices

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Today's Agenda

From Needs to Innovation: Lessons Learned in Needs Collection and Assessment for Successful Pre-Commercial Procurement

PART I – Framing the Innovation Needs: Structuring Needs to Define the Right Problem, not the Solution

1. Why Needs Collection Matters
2. Functional Requirements: What We've Learned
3. SOTA Scouting as Part of Needs Assessment
4. Q&A Session I

PART II - From Needs to Strategy: "Using Needs to Build a Robust PCP Strategy"

1. IPR Strategy: Start Thinking Early
2. Tools & Good Practices (KEMEA)
3. Wrap-Up: Lessons Learned – 5 Takeaways & Key messages
4. Closing Remarks

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Question 1

If your emergency team had to power up in the field, which one would you trust most?

1. A solar-powered coffee machine
2. A battery that only charges with dancing
3. A generator that needs no fuel...but only works at night
4. A mystery box labeled "Experimental" – Do not touch"

PART I - Framing the Innovation Needs: Why This Matters

In PCP, collecting needs is not just a preliminary formality — it is the foundation of the entire innovation journey. When treated strategically, needs collection enables:

- The definition of **clear, functional requirements** that reflect real operational challenges
- The early alignment of an **IPR strategy**, ensuring future exploitation and ownership clarity
- Informed **technology scouting** (State of the Art), to avoid redundancy and sharpen ambition
- Effective **end-user engagement**, creating buy-in and usability from the start
- And ultimately, the preparation of a **more focused, innovation-friendly PCP tender**
- 🔍 **The goal is not to describe a solution — but to understand and structure the problem.**

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Why Structured Needs Collection is Critical

Needs collection is often underestimated – but it determines the success or failure of the entire PCP process. When needs are:

Too broad
The tender lacks focus, and suppliers cannot respond effectively

Too narrow or prescriptive
Innovation is constrained or discouraged

Misaligned with users or market reality
Solutions are rejected or unviable

A well-structured needs assessment helps to:

- Identify real operational **gaps and pain points**
- Align different stakeholders under a **common challenge**
- Translate fragmented observations into procurement-relevant input

6

Needs are not Wishes

Wishes sound like:

In innovation procurement, it's tempting to describe what *we want* — but that approach often leads to failure.

"We want a hydrogen generator"

"We need mobile solar panels"

"We need a battery pack with 48 hours autonomy"

Structured needs, on the other hand, focus on the **problem to be solved**, not the product to be bought:

"We need to supply power in off-grid disaster zones for 72 hours without refueling"

''We need a portable energy solution that can be deployed by two people in under 10 minutes''

"We need uninterrupted power for critical medical devices in extreme temperatures''

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7

What happens Without Structured Needs?

When needs collection is weak, late, or fragmented, the entire PCP process is put at risk.

Most Common Consequences:

Market mismatch
Suppliers cannot respond to vague, unrealistic or contradictory challenges

Technology push instead of demand pull
Procurers end up adapting solutions, not solving real problems

End-user rejection
Solutions don't fit in field conditions or operational constraints

Low-quality tenders
Lack of clarity leads to confusion, appeals, or failed procedures

Real Risk: You may end

- Buying something innovative, but not useful
- Buying something that is a mere updated version of existing solutions, though not innovative, without transforming capacity

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8

Lessons from CSA Phase 0

The Coordination and Support Action (CSA) phase is more than preparation — it's where the **foundations** of a successful PCP are built.

Key Functions of the CSA Phase:

Mapping real-world operational needs

With end-user involvement

Aligning stakeholders

Across sectors, geographies, and missions

Preparing functional specifications

Based on validated challenges

Understanding the SOTA

And identifying innovation gaps

Designing OMC

To test needs and engage industry early

Anticipating legal and strategic issues

Like IPR, TRLs, and risk sharing

CSA Phase 0 transforms fragmented challenges into a **coherent problem definition** ready to be shared with the market fostering demand-driven innovation.

9

How End-Users Shape the Innovation Need

End-users are at the heart of the needs collection process: it is not about informing, but about **co-creation of the challenge definition**.

Why their input matters:

- Understanding of the real **operational context**: what works, what fails, what's missing
- **Prioritization** capacity: they are able to define priorities based on urgency and frequency
- Bring light to **practical constraints** that technical experts might overlook (size, weight, deployment time, safety, interoperability, usability, etc.)

In POWERBASE workshops, surveys, questionnaires helped to obtain needs directly from EROs

With EROs we moved from "*we need more low-emission energy source*" to "*we need autonomous, modular, interoperable, scalable, silent low-emission power supply for remote field Ess with minimum 72-hour runtime without recharging*".

10

Common Pitfalls in Needs Collection

Even well-intentioned processes can fail if needs are not collected **strategically and systematically**.

Frequent Issues:

Too broad
"we need green energy" (for what purpose, where? under which conditions?)

Too narrow/prescriptive
"we want lithium-ion batteries with 10kWh" (innovation where?)

Late definition+assessment
deeper definition when the project is underway. No time for proper validation

Absence of end-users' validation
poor usability, resistance to change/deployment

Ignored SOTA reality
overambitious (market not ready) or redundant (already existing)

SO: Start early, involve users, challenge assumptions

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Question 2

Which of these is *most often neglected* in innovation procurement projects?

1. Needs collection
2. Functional specifications
3. SOTA mapping
4. IPR strategy
5. End-user engagement

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SLIDO 3

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Question 3

Where do you see the biggest challenge when structuring an innovation need?

1. Getting clear input from end-users
2. Translating needs into functional specifications
3. Understanding the market and SOTA
4. Aligning stakeholders
5. Managing expectations (ambition vs feasability)

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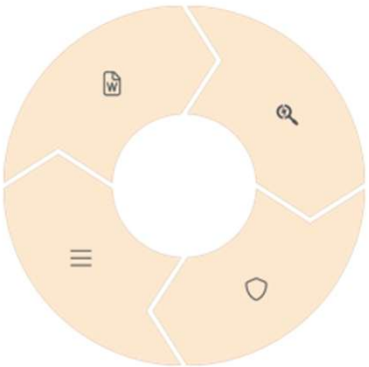
Needs Shape the Entire PCP Process

A well-structured needs assessment is not an isolated step — it influences every phase of the PCP lifecycle, from Phase 0 to Tender and Beyond:

Functional requirements
Derived directly from validated needs, but avoid over-specification

SOTA Mapping & OMC Design
Anchored in the challenge, so you need to guide ambition but avoid duplication



Evaluation criteria
Mandatorily aligned with the unmet needs, and not with a predefined product

IPR and Risk-Sharing Strategy
Shaped by early decisions on ownership, exploitation and innovation space

Needs collection acts as the spine of the procurement process: they are not the most evident thing, but they are essential to keep it coherent and innovation-oriented.

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From Needs to Functional Specification

Functional specifications are the bridge between a well-framed need and an innovation-ready tender.

What Makes a Good Functional Specification?

Problem focused
Description of *what* needs to be achieved, not *how* to do it

Technology neutral
Because it leaves space for innovation approaches

Measurable and verifiable
Because this enables evaluation without prescribing the solution

Aligned with end-users' priorities
As they reflect operational constraints and usability

A good functional specification doesn't describe a product — it defines **success conditions**. If functional specifications ignore these factors, you risk developing something technically impressive but operationally useless.

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Technology Neutrality is key

Functional specifications are the bridge between a well-framed need and an innovation-ready tender.

Why do Technology Neutrality Matters?

Avoids vendor lock-in
Encourages diverse approaches and competition

Stimulates creativity
Because it leaves room for unexpected or unconventional solutions

Future-proofs the tender
Because it keeps it open to fast-evolving technologies, allowing the inclusion of new entrants, emerging tech, and hybrid solutions

Don't specify:

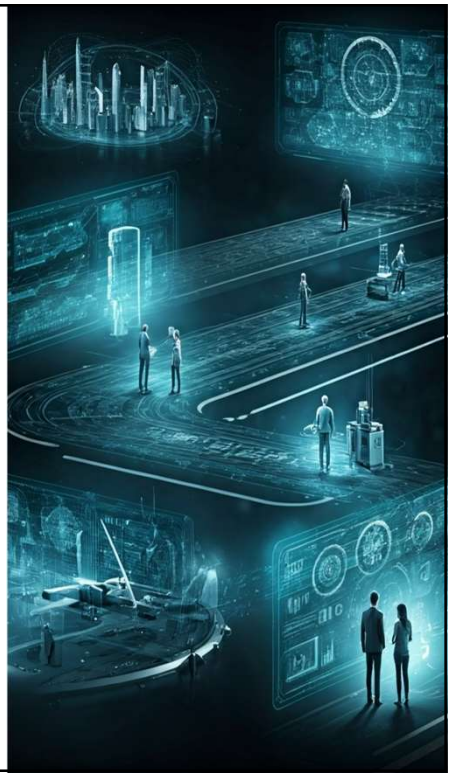
"solar panels with 300W output"

because it might exclude newer tech like solid-state generators or hybrid-microgrids.

Instead, focus on performance goal:

"an energy solution delivering 300W minimum for 12 hours under low-light conditions"

Your procurement remains flexible and innovation-driven, not outdated before it begins.



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What the SOTA Tells Us

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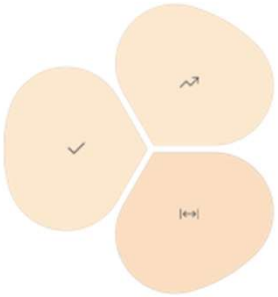
Mapping the State of the Art is not about listing available products — it's about **understanding the innovation landscape**. Key Insights from SOTA Analysis:

What already exists
Avoid inventing the wheel or duplicating COTS



What is emerging
Reveals trends, research pipelines, and early-stage innovations

What is missing
Identifies gaps between current solutions and operational needs inclusion

Why does it matter?

- Helps defining realistic innovation gaps
- Calibrates the challenge: too ambitious=market failure/too safe=no innovation
- Informs OMC design and the dialogue with suppliers

SOTA for Innovation Framing

POWERBASE

Mapping the State of the Art is not about listing available products— it's about understanding the innovation landscape.

SOTA helps you to:

- Define boundaries: what is already solved and where innovation is truly needed
- Position the challenge identifies the maturity gap
- Guide risk management: knowledge where technical uncertainty lies and how to share risk appropriately.
- Regarding PCP, SOTA defines **what you ask for** (scope), **how you assess** it (evaluation criteria), and **what** the market can reasonably **deliver** (realistic demand).

A well-executed SOTA analysis helps you frame the challenge in a way that is both ambitious and achievable

Lessons Learned – 6 Strategic Takeaways for Framing the Challenge

LESSON	INSIGHT
Start early	Needs shape everything that follows
Focus on the problem, not the solution	Good innovation begins with the right challenge
Involve end-users meaningfully	Structure their input to ensure usability and realism
Structure needs, don't list wishes	Use templates, workshops, and validation to clarify the challenge
Understand the State of the Art	Frame the innovation space and avoid redundant procurement
Ensure functional specifications are open	Technology neutrality invites market creativity

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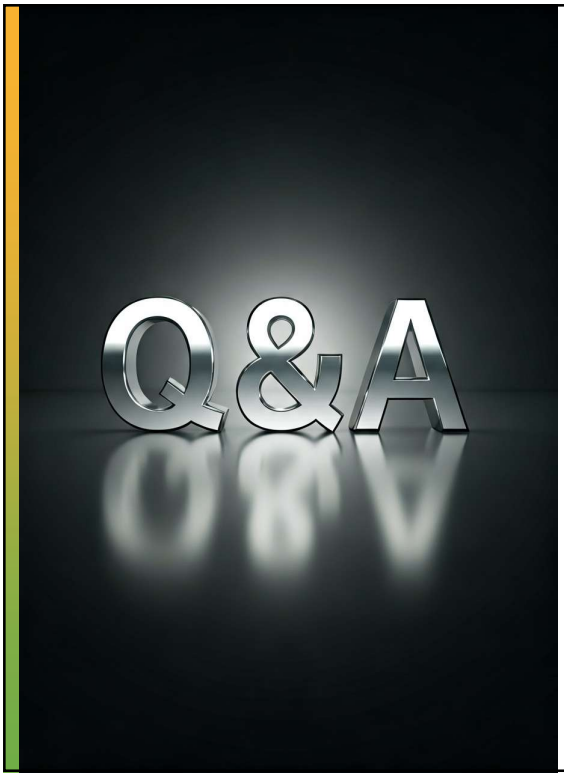

Q&A

Your questions and reflections

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Coffee Break

Time to refresh your mind. Grab a drink, stretch your legs.

We'll came back in 15 minutes!

21

Back to Work

Welcome back! We hope you enjoyed your refreshment.

1. Minds recharged
2. Fresh perspectives after our brief pause
3. Let's dive into the next exciting topics

22

From Needs to Strategy

Now that we've explored how to frame a well-structured innovation need, we'll look at how that need is **translated into a strategic PCP approach**, with a special focus on **IPR, risk-sharing, and long-term impact**.

We'll also reflect on key **lessons learnt**, drawn from the POWERBASE CSA and related EU experiences.

From Needs to Strategy

Now that we've explored how to frame a well-structured innovation need, we'll look at how that need is translated into a strategic PCP approach.

Needs Assessment

The foundational step, ensuring innovations address real public sector challenges effectively.

IP Rights & Risk Sharing

Crucial for defining ownership, fostering collaboration, and mitigating potential pitfalls in innovation projects.

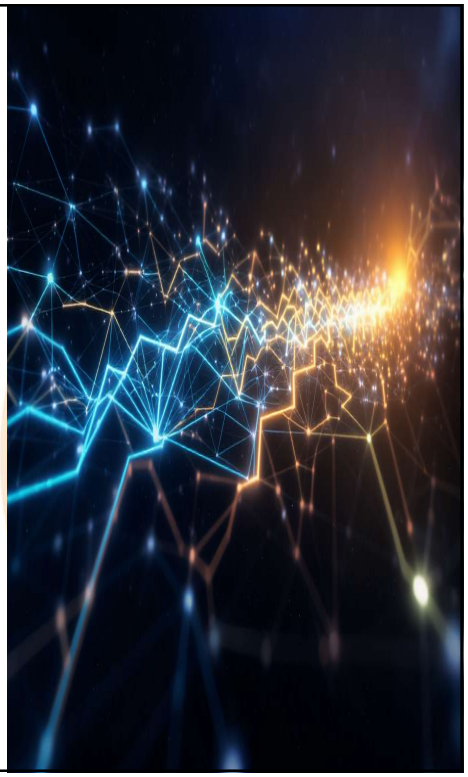
Strategic Implementation

Translating validated needs and IPR decisions into a coherent, actionable procurement strategy.

Impact & Learning

Focusing on the long-term benefits and incorporating lessons learned for continuous improvement.

This process includes a special focus on **IPR, risk-sharing, and long-term impact**, incorporating key **lessons learned** from the POWERBASE CSA and related EU experiences.



SLIDO 4

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If you invented the perfect emergency power solution, how would you name it?

Free text, one word

From Challenge to Procurement Strategy

Defining an innovation gap is just the beginning. To make it actionable, it must be translated into a procurement strategy that enables innovation, manages risk and delivers usable outcomes.

The Transition involves:

Operational challenges to functional requirements
Translating real-world needs into precise procurement language

Identifying the innovation space
And validating this space through market analysis

Planning for IPR ownership, risk-sharing, and exploitation pathways
Clarifying who uses the results, how, and under what conditions

Ensuring the strategy supports the end goal
Delivering scalable, sustainable, and deployable solutions

In POWERBASE, this meant moving from fragmented power supply needs to a **clear challenge definition** ready for market dialogue and eventual tendering.

Why IPR Strategy Starts in the CSA Phase

IPR is often treated as a contractual detail — but in PCP, it's a **strategic enabler** that must be considered from the start.

Determines usage rights

It determines **who can use, share, or commercialise** the results.

Supplier engagement

It shapes the **interest of suppliers** in joining the PCP.

Tender design influence

It guides the **tender design**, including licensing models, access rights, and exploitation terms.

Protection boundaries

It helps define **what must remain open** (e.g. interoperability) and **what can be protected**.

Needs collection already implies **strategic choices** about future use and ownership.

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What comes to mind first when you hear "IPR in PCP"?

- Contract clause nobody reads
- Legal headache
- Something we should start earlier
- A deal-breaker for suppliers
- Key to scaling innovation

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Key IPR Concepts in PCP: background, foreground, sideground

Understanding the IPR landscape early on helps avoid misunderstandings — and ensures the results can actually be used.

❑ **Background IPR**
- Pre-existing knowledge or technologies brought by suppliers
- Must be declared upfront
- May require access rights for testing, integration, or exploitation

❑ **Foreground IPR**
- New results generated during PCP
- Typically owned by the supplier
- Procurers usually receive usage rights for internal use and follow-up procurement

❑ **Sideground IPR**
- Knowledge developed in parallel but not directly under the contract
- It may be relevant if it is integrated in the solution
- May require negotiated access or clarification

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Key IPR Concepts in PCP: background, foreground, sideground

Background

Pre-existing IP brought into the PCP. Material, documents, technology, data, or know-how held prior to signing the PCP contract.

Foreground

IP created during the PCP by the supplier.

Sideground

IP developed independently by a party during the PCP, but not using PCP funding and not under the PCP contract. IP created in parallel to the PCP, but outside the scope of the contract.

Understanding these definitions is crucial for properly structuring IPR provisions in PCP contracts and ensuring all parties have clarity on their rights and obligations.

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Background IP in PCP Projects

Background IP forms the foundation upon which new innovations are built in PCP projects. Suppliers typically bring various pre-existing intellectual assets to expedite development and leverage established technologies. Understanding these different types helps structure IP arrangements.

Examples of Background IP in PCP Projects

Type of Background IP	Example	Role in PCP
Patented technologies	Supplier's existing patent on novel sensor design	Building block in Phase I proof-of-concept; ownership remains with supplier
Software Libraries & Code	Proprietary data-processing library	Accelerates prototype development without starting from scratch
Technical Know-How	Trade-secret manufacturing processes	Ensures quality standards in prototype fabrication
Design Documentation	CAD drawings for existing platforms	Provides reference architecture for adaptations

The Critical Importance of Background IP Specification

Rights Clarity

Tender documents list each party's Background IP

Preventing Free-Riding

Stops suppliers claiming ownership of pre-existing tech

Fair Competition

Creates level playing field for all bidders

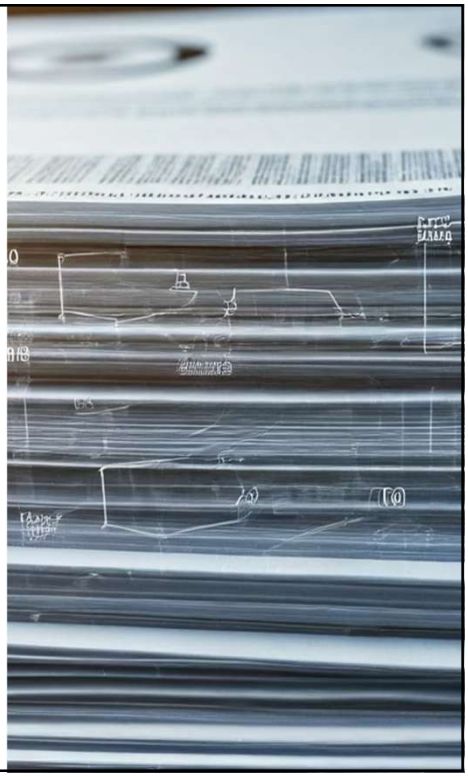
R&D Budgeting

Distinguishes between off-the-shelf and new development

33

Transparent Background & Foreground IP in PCP Documents

The distinction between **background** and **foreground IP** is crucial for determining **ownership rights** and **licensing requirements** throughout the procurement process and beyond project completion.



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Key IPR Concepts in PCP: background, foreground, sideground (cont.)

Having ownership is one thing — being able to **use the results** is another.

Key insight: Public buyers don't always need to own the solution, BUT They must have the right to use it

If access rights are missing:
- Testing and validation may be blocked
- Scaling and deployment become legally complex
- The public investment loses long-term value.

Always ensure that the IPR model includes **access and exploitation rights** — not just a declaration of ownership.

Needs and Ownership: Who Will Use What, When, and How?

Every PCP project must align its **innovation need** with a **clear vision for future use** – including how results will be accessed, owned, and exploited.

Who

needs the results? (One buyer? Multiple agencies? End-users?)

When

will they need access? (During testing? After PCP? For scaling in future tenders?)

How

access will be granted (Ownership? Licensing? Joint exploitation

From Needs to Ownership: Some needs require ownership (security-sensitive systems), but others may benefit from shared or open models

How IPR Shapes Tender Design and Innovation Space

Your IPR model influences not only what suppliers develop — but **how they participate**, **how much they invest**, and **what innovations they bring**.

1

Setting conditions for participation

Suppliers assess whether they can retain enough value to justify R&D effort

2

Defining the scope of exploitation rights

Buyers must ensure they can use and scale the results

3

Balancing openness and protection

Enabling interoperability while preserving Innovation incentives

So, the challenge is:

💡 How to require enough openness for solutions to be usable and scalable (interoperability), without taking away the supplier's motivation to innovate (incentives tied to IPR).

License-back terms (example)

"The Contractor shall grant the Procurer a perpetual, royalty-free, non-exclusive license to use, adapt and modify both Background IP and Foreground IP for internal use within the Procurer's organization. The license shall include the right to permit other public bodies in the Buyers Group to use the Foreground IP under the same terms."

IPR Requirements in Procurement Documentation

Legal Requirements

Article 31 & 42 of EU Directive states:
In the procurement documents, the contracting authority shall define the arrangements applicable to intellectual property rights."

IPR arrangements are a mandatory element of all PCP documentation

Ownership Questions

PCP documents must address whether the supplier retains patent ownership, which can significantly impact bid pricing and supplier interest.

Clear ownership terms are essential for competitive bidding.

Licensing Arrangements

Documentation must specify if procurers receive exclusive/non-exclusive rights to use, modify, or sublicense the developed IP.

These rights directly affect the long-term value proposition of the procurement.

The Importance of Background IP Specification: transparency for both parties

For procurers - it provides clarity on which components are truly innovative versus which are pre-existing, helping to evaluate bid values accurately and allocate development budgets appropriately.

For suppliers - clear Background IP specifications protect their existing investments while providing certainty about which components they can freely commercialize beyond the specific procurement.

This balance ultimately leads to more competitive bids and better outcomes for public sector innovation.

Risk Sharing and Exploitation: Strategic Choices Early On

PCP is based on the idea that **both the public buyer and the supplier share the risks and benefits** of developing innovative solutions.

What Risk Sharing Means:

- Buyers share the financial risk (co-fund R&D activities across phases
- Suppliers bear technical risk (no guarantee of success or future procurement)
- Outcomes are uncertain by design

Early clarity on exploitation models helps avoid conflicts. The IPR strategy must align with the expected pathway to market and be consistent with the long-term plan for how the solution will be deployed or commercialised.

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Common Pitfalls in PCP and How to Avoid Them

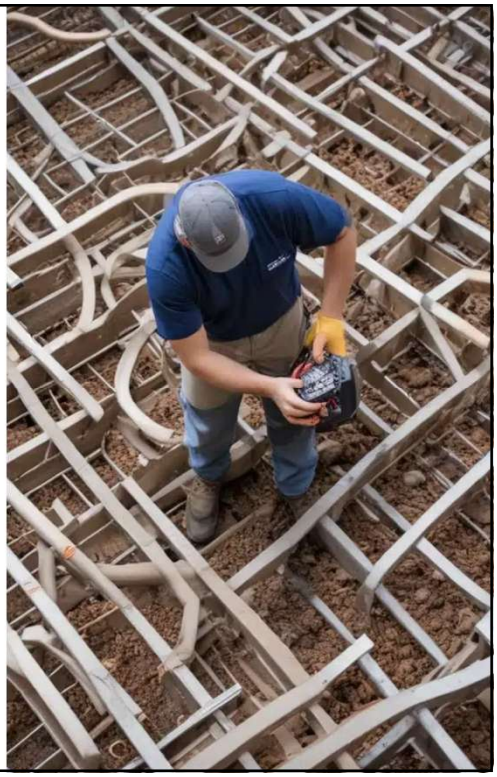
Poorly designed IPR strategies can lead to legal dead ends, supplier disengagement, or unusable results.

Frequent Pitfalls:

- Unclear ownership and access rights (conflicts, disputes at testing, scaling)
- Too restrictive IPR terms (deters SMEs participation or limits innovation)
- Too open or vague models (risk loss of control or inability to scale securely)
- IPR decisions left too late
- Misalignment with procurement goals

How to Avoid Them:

- IPR definition in CSA phase
- Matching IPR terms to long-term strategy
- Engaging legal, technical and user perspectives early
- Transparency with suppliers from the beginning



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Which of these aspects do you is the hardest to define at the start of a PCP?

- IPR ownership and access rights
- Risk-sharing between buyers and suppliers
- Long-term exploitation pathway
- Alignment between need and legal strategy
- Functional specifications based on needs

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Tools & Good Practices

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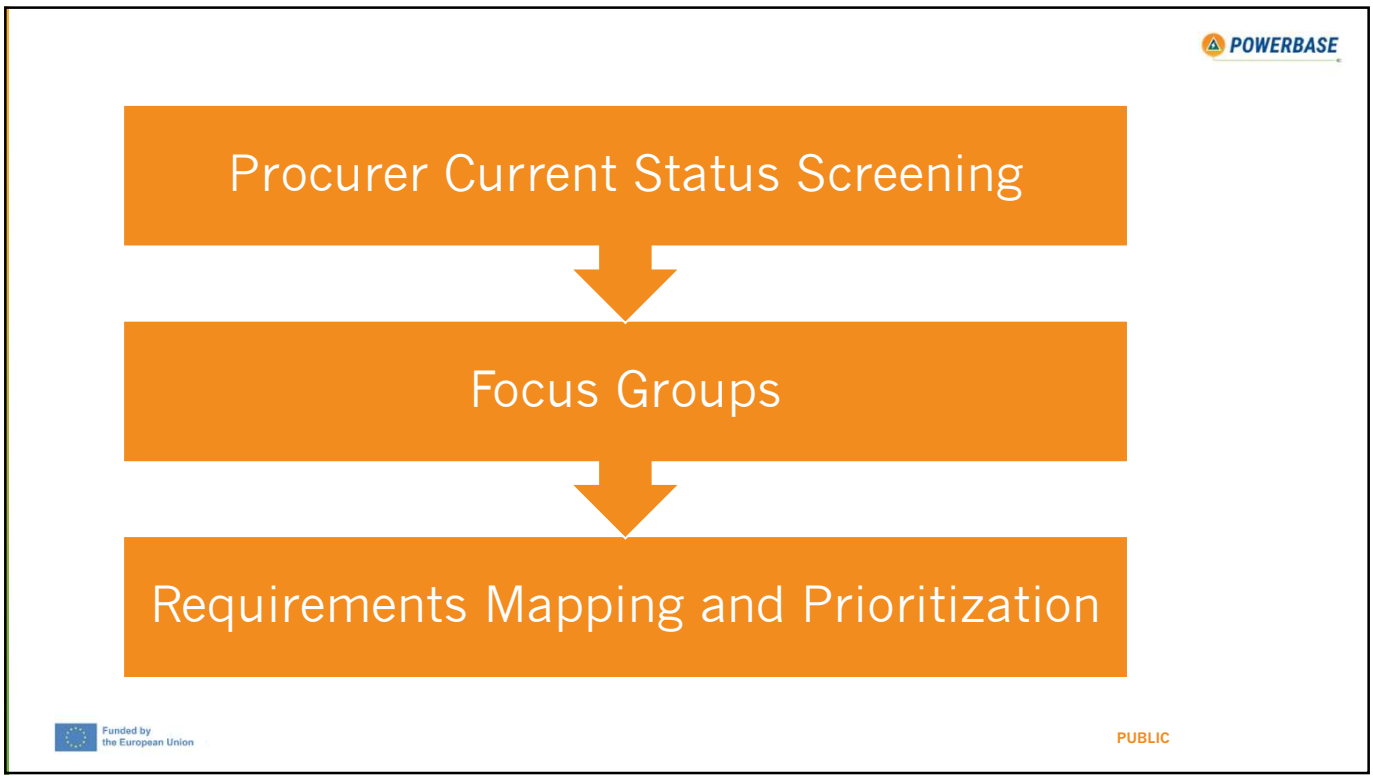
POWERBASE
Procurer Current Status Screening
Focus Groups
Requirements Mapping and Prioritization
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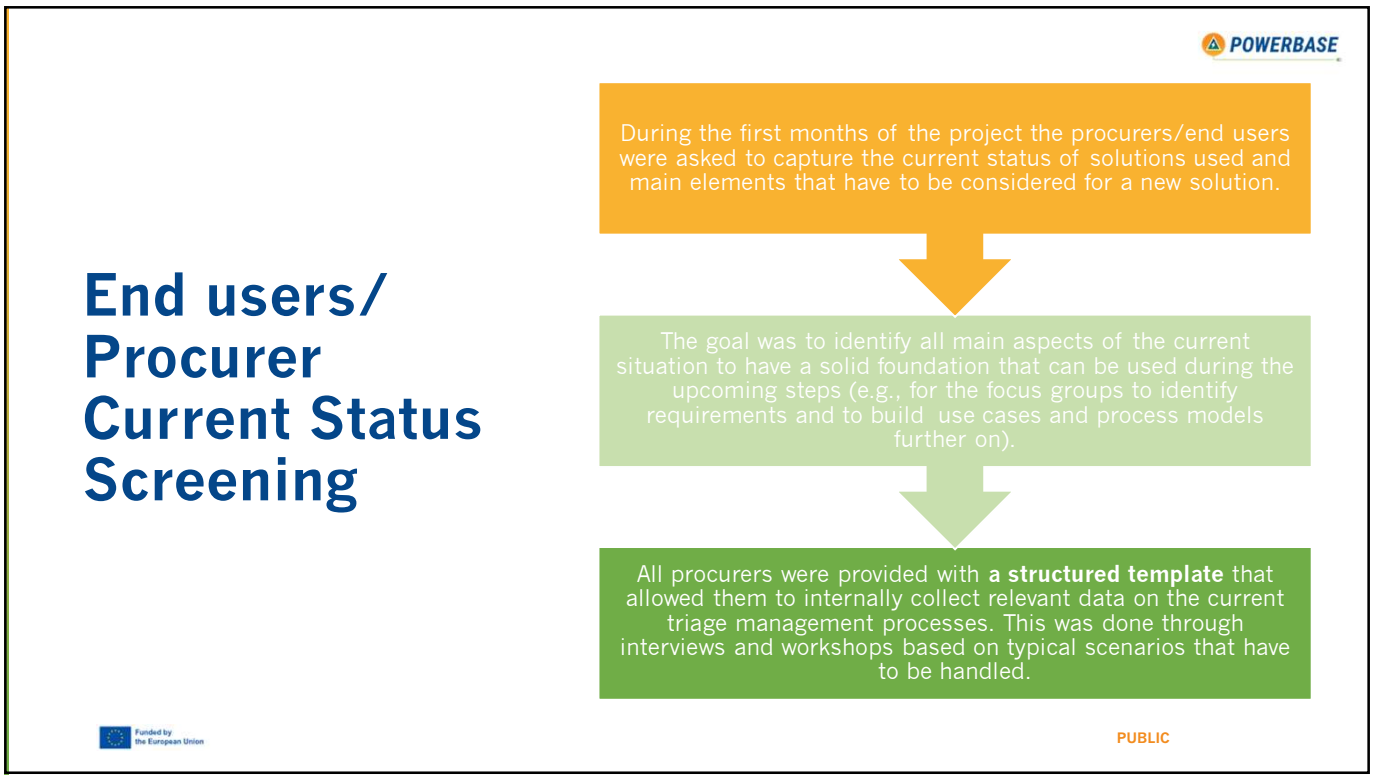
POWERBASE
End users/ Procurer Current Status Screening
During the first months of the project the procurers/end users were asked to capture the current status of solutions used and main elements that have to be considered for a new solution.
The goal was to identify all main aspects of the current situation to have a solid foundation that can be used during the upcoming steps (e.g., for the focus groups to identify requirements and to build use cases and process models further on).
All procurers were provided with a structured template that allowed them to internally collect relevant data on the current triage management processes. This was done through interviews and workshops based on typical scenarios that have to be handled.
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Focus Groups

Ensuring that initially collected information on the current status of solutions used is enriched and discussed between main persons/roles involved in typical scenarios.

Based on discussing specific real scenarios, participants were able to identify from their experience and different perspectives what are currently the most relevant problems during the process but also identify what works well.

Based on the discussion of the current status of solutions as well as the current problems participants were asked to formulate a wishlist with their expectations of what a new triage management system should be able to do. This information was collected and structured.

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Focus Groups

The outcome of Focus Groups also showed where additional insights from individual roles was necessary (e.g., technical interfaces, standards, regulation, processes etc.).

Follow-up focus groups/meetings/interviews then emphasised on particular aspects in detail (where this was necessary).

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Requirements Mapping & Prioritization

All collected inputs from the end users/ procurers were translated to English and aggregated in one large overview to clearly map and discuss the requirements with all end users/ procurers in the next step.

After the list was cleaned up each procurer was asked to conduct internally a prioritization with their team. Each requirement was given a priority between 0 – 10. 0 represents not applicable and 10 represents the highest priority (must have).

Finally, this led to a long list of 240 requirements. Essential requirements do not indicate a priority. To ensure all partners have the same understanding of each requirement, each entry was discussed during a series of virtual workshops. This ensured that no requirement was missed, allowed to further specify requirements where needed, add new requirements that came up during the discussion and discard requirements which were not of relevance.

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Requirements Mapping & Prioritization

The final list was then screened once more by each procurer to allow them to update prioritization based on new insights of the discussion.

In depth discussion of all requirements was time consuming but extremely important as it led to a better common understanding of what a new solution could look like and which features it should cover to best support the involved end users roles in the process. In addition, it built the baseline for the next steps which focus on the creation of use cases and process models.

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Intellectual Property Rights provisions

- Ownership of results (foreground)
- Declaration of pre-existing rights (background IPRs)
- Protection of the results
- Commercial exploitation of results
- Promotion of R&D by the Buyers' Group

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Lessons Learned – 5 Strategic Takeaways for Designing the Strategy

LESSON	INSIGHT
A strong procurement strategy starts with the problem, not legal clauses.	Legal instruments support the strategy — they don't replace it.
IPR is a design choice that must align with the need.	The wrong IPR model can block deployment and reduce impact.
IPR must ensure not only ownership but also access and exploitation rights.	Value lies in how results are used, not in names on a title
Risk sharing is legal, strategic, and long-term — not just financial.	Poorly allocated risk undermines innovation and adoption
Always design with scalability and deployment in mind.	Innovation only matters if it can move beyond pilots

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KEY MESSAGES

- Start with the need – every decision traces back to how the problema was defined.
- Define challenges, not solutions – functional specifications must be open and performance-based.
- Use SOTA strategically – to frame the problem, open the innovation space and avoid unrealistic demands.
- Make IPR a design choice – align it with the need, ensuring access and exploitation rights.
- Think deployment from start – strategies must enable scalability, not just prototypes.

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Strong needs and smart strategies drive innovation through procurement

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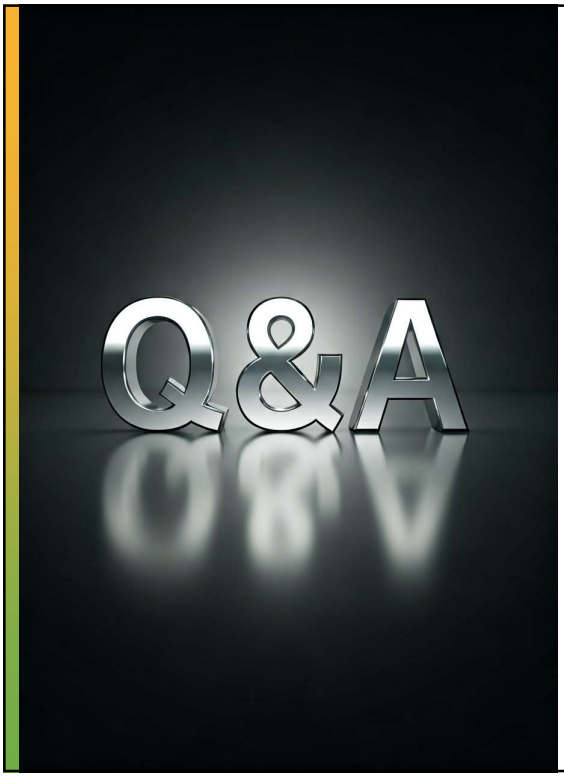

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Q&A

Your questions and reflections

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ANY (FURTHER) QUESTIONS?

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