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ISABEL

Improving the sustainability

of the European Magnetic Field Laboratory

D 3.5: Knowledge/technology transfer strategy report

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ANALYSIS OF INNOVATION PRACTICES IN EMFL LABORATORIES AND PROPOSED KNOWLEDGE AND TECHNOLOGY TRANSFER STRATEGY

Contents

I. INTRODUCTION

1. BACKGROUND

1.1 OVERALL OBJECTIVE OF THE H2020 ISABEL PROJECT

The ISABEL project aims to strengthen the long-term sustainability of the European Magnetic Field Laboratory (EMFL) by broadening its user base, improving its services and increasing its socio-economic impact. It is part of the European framework programme for research and innovation's Horizon 2020. One of the main goals of this project is to bring the EMFL closer to industry and SMEs in order to stimulate innovation and promote collaboration and technology transfer.

1.2 THE ROLE AND IMPORTANCE OF EMFL FACILITIES:

EMFL brings together three major laboratories: LNCMI, with its two sites in Toulouse (pulsed fields) and in Grenoble (continuous fields), both in France, HLD in Dresden, Germany (pulsed fields) and HFML in Nijmegen, Netherlands (continuous fields). These sites offer unique research conditions for exploring phenomena in physics, materials science, chemistry and biology at very high magnetic fields (continuous and pulsed). Access to these facilities plays a key role in fundamental and applied research, particularly in the development of new materials and devices. The EMFL is a key player in maintaining European competitiveness in this strategic field, with potential applications in energy, healthcare and advanced technologies.

2. DELIVERY AND OBJECTIVES

The aim of WP3 is to stimulate the innovation potential of the EMFL facilities and bring them closer to industry and small and medium-sized enterprises (SMEs) by:

1. raising awareness among EMFL staff of the importance of intellectual property rights (IPR) and economic and societal issues,
2. raising awareness among industry and SMEs of the cutting-edge science and unique technological developments carried out at EMFL facilities,

3. stimulating collaborations with industry and SMEs through a knowledge and technology transfer strategy,
4. attracting industrial users to EMFL facilities.

CNRS INNOVATION plays a key role in this WP, providing expertise in intellectual property (IP), research promotion and industrial partnerships. Its action covers the entire technology transfer process, from the evaluation and protection of innovations to the definition of an operational strategy tailored to the needs of academic and industrial players.

In concrete terms, CNRS INNOVATION is leading a number of key initiatives: dedicated IP training courses, the organization of specialized seminars, the launch of calls for innovative projects, and the analysis of innovation practices within EMFL laboratories. This latter approach aims to identify the levers and obstacles to technology transfer in order to propose an optimized strategy for disseminating knowledge and skills. This deliverable is precisely in line with this objective.

3. TARGETS OF THE DELIVERY

- Researchers using EMFL infrastructures and wishing to strengthen their collaborations with industry: Raise awareness of technology transfer issues and provide training in best practices (intellectual property rights, confidentiality) and tools to protect inventions and strategies to facilitate the transfer of their research to industry,
- Institutions: Support institutions in implementing policies that promote innovation and technology transfer,
- ISABEL partners: Strengthen existing collaborations and create new ones to maximize the impact of research.

4. CHALLENGES FOR TRANSFERRING KNOWLEDGE AND TECHNOLOGY TO INDUSTRY AND SMEs

- Economic development and sustainability of EMFL infrastructures:

- Generate additional income for infrastructures via industrial contracts,
- Strengthen socio-economic impact (tangible spin-offs: jobs, innovations, industrial collaborations) and international visibility enabling the EMFL to play a central role in global research, attracting talents and funding,
- Train young researchers in cross-disciplinary skills (IP, entrepreneurship).

- Interest for industry and SMEs: Technology transfer is essential for transforming scientific discoveries into commercial innovations, boosting the competitiveness of companies:

- Access to cutting-edge technologies (e.g., superconducting magnets, instrumentation, etc.),
- Opportunities for collaboration to develop innovative applications (e.g., medical imaging, green energy, etc.).

- Strengthening the European ecosystem:

- Stimulating innovation and competitiveness of SMEs in key sectors (e.g., health, environment),
- Positioning EMFL as a key player in innovation, in conjunction with partners such as CEA, Oxford Instruments, Bilfinger Noell or Bmax,
- Contributing to societal challenges (energy transition, innovative therapies, etc.).

II. ANALYSIS OF INNOVATION AND TECHNOLOGY TRANSFER PRACTICES AT EMFL

1. OVERVIEW

As part of the initiative to gain a better understanding of practices for valorising scientific results and interactions with industry, in order to identify intangible assets (secret know-how, unique processes, patents) that could be the subject of industrial transfers, we carried out a series of visits to the four EMFL sites (LNCMI – Toulouse, LNCMI – Grenoble, HFML – Nijmegen and HLD – Dresden). These visits provided us with an opportunity to talk to researchers, engineers and technical managers about their experiences of industrial collaboration, technology transfer and the valorisation of research work.

The analysis was based on in-depth interviews with laboratory staff, enabling us to gather concrete feedback on the services provided to industry, the technology-transfer mechanisms in place and the obstacles encountered. Each site has its own specific approaches and challenges: Grenoble focuses on service provision, but encounters administrative hurdles, Nijmegen favours open dissemination of results, without any real structuring of industrial transfer, Toulouse favours a collaborative approach with partners such as Bmax or Airbus, and, finally, Dresden emphasizes support for researchers in technology transfer, structuring initiatives such as the Innovators School and relying on HZDR Innovation GmbH to market results and services to companies.

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NAME	TOPIC	REQUESTED SKILLS
LNCMI – TOULOUSE (FRANCE)		
Maxime LEROUX	Measurement of superconducting critical current (55T)	Contractualization with companies manufacturing conductors
Oleksiy DRACHENKO	Material transfer, knowledge	MTA & knowledge
Marc NARDONE	Cryogenics	Know-how
Carlo RIZZO Rémy BATTESTI	Magnetic vacuum birefringence	Patent, collaboration
Jérôme BÉARD	Coils and generator team	Patent, know-how, collaboration
Nicolas BRUYANT	Instrumentation	Services with health companies
Cyril PROUST	Sample holder patent	Patent to come
Simon TARDIEU Florence LECOUTURIER-DUPOUY	High strength conductors team	Patents [1-2], know-how, collaborations Questions about technology transfer or start-up creation
LNCMI – GRENOBLE (FRANCE)		
Eric BEAUGNON	Know-how with companies, sometimes leading to collaborations	Services and collaborations
Xavier CHAUD et Eleonora SARTORI	Questions about know-how and patents	Know-how and patents
François DEBRAY	Instrumentation	Patents
Pierre PUGNAT	Superconductors LTS production line	
Steffen KRÄMER	Industrial contact; services with luxury companies	Instrumentation, ISO 17025

Christophe TROPHIME	Simulation of resistive & superconducting magnets (starting)	Open-source software
HFML – NIJMEGEN (NETHERLANDS)		
Steffen WIEDMANN	Superconductors and semiconductors	
Hans ENGELKAMP	Instrumentation	
Frans WIJNEN	Magnet design	
HLD – DRESDEN (GERMANY)		
Tino GOTTSCHALL	Characterization of magnetic materials	Requirement for very high resolution of remanence and coercivity
	Analysis of magnetic systems	Measurement and evaluation of magnetic field distribution in magnetic systems
Marc UHLARZ	Sensor development	Test and evaluation of newly developed sensors, i.e., function linearity and possible malfunction in high static and pulsed magnetic fields

2. ANALYSIS OF EXISTING PRACTICES

2.1 STRENGTHS AND GOOD PRACTICES OBSERVED

- Existence of dynamic, innovative research teams at all 4 EMFL sites: pooling of expertise and advanced equipment (cryostats, state-of-the-art instrumentation, hybrid magnets, etc.).
- Existence of support structures for technology transfer around the 4 EMFL sites:
    - CNRS Innovation (TTO, national subsidiary of CNRS): technology transfer, patent registration, licenses, industrial partnerships, premature financing,
    - SATT Toulouse Tech Transfer (regional TTO, Occitanie Ouest): technology maturation, patents, Deeptech start-up set-up,
    - SATT Linksium (regional TTO, Grenoble Alpes): specialized in the maturation of technologies from public research, Deeptech incubator,

  - Services Partenariat et Valorisation (SPV) of the CNRS Occitanie Ouest and Rhône-Auvergne delegations: support to laboratories for contracts, IP and industrial relations,
  - Radboud Innovation – Valorization (Radboud University, Nijmegen): in-house unit managing patents, contracts, spin-offs,
  - Recruitment of an industrial liaison officer at HFML laboratory level to develop valorization activities and collaboration with industrialists (Meike ARNOLD)
  - HZDR Innovation GmbH (Dresden): a legal entity dedicated to valorization of results, services, consulting, and marketing
- Involvement of researchers in projects with socio-economic impact. This is demonstrated by their willingness to move beyond a purely academic framework to address concrete industrial issues. The diversity of the profiles encountered (see table in II.1) testifies to the researcher's commitment to application-oriented research. SuperEMFL (https://emfl.eu/superemfl/) is an example of researchers involvement in European H2020 (Horizon Europe) collaborative programs with an industrial or societal impact. Another academic project led by Toulouse's LNCMI involves industry as part of a French National Research Agency (ANR) project (SIgMA Project: https://anr.fr/Projet-ANR-20-CE08-0027). Another project, PEPR High-Temperature Superconductors (SupraFusion, https://suprafusion.fr/), involves Grenoble's LNCMI to stimulate research and innovation around superconductivity and fusion phenomena under extreme conditions.
- Examples of successful collaborations with industry (*cf.* 2.2).
- HZDR - HLD (Dresden): Setting up an "Innovators School" to raise scientists' awareness of technology transfer.
- HZDR Innovation Fund and Innovation Fund+PLUS: finance up to 90% of transfer projects and provide intermediate funds to prepare transfers and spin-offs.

2.2 CASES OF SUCCESSFUL COLLABORATIONS

Several collaborations, mainly in the form of service provision, have emerged within EMFL sites, illustrating the laboratories' ability to respond to concrete industrial needs and commit to projects with high technological added value. Here are just a few examples of successful collaborations:

LNCMI - Toulouse (France):

- Collaboration with a French company specialized in magnetoforming, magnetowelding, to develop magnetoforming tools with long lifetime (https://www.occitanie-ouest.cnrs.fr/fr/cnrsinfo/des-bobines-de-magnetoformage-grande-duree-de-vie-au-lncmi-un-savoir-faire-unique).

- Development of a cryostat for a world leader in the aeronautics and space industry, enabling tensile and fatigue tests at temperatures corresponding to those of liquid hydrogen and led to industrial order.
- Collaboration with IRT/Saint Exupery and an international high-tech group operating in the fields of aeronautics, space and defence to develop high strength conductors with low weight.
- Collaboration with an international company based in Spain which provides insulation for electrical wires, to develop high-strength wires resisting to oxydation and high temperatures.
- Collaboration with an international high-tech group operating in the aeronautics, space and defence to study the birefringence of mirrors used by Safran for their gyrolasers, a know-how that Safran does not possess.
- Collaboration with a UK company specialized in the production of graphene-based electronic devices to characterize magnetic sensors.

LNCMI - Grenoble (France):

- Two targeted services: one for a Swiss luxury watch manufacturer, and another for a small luxury SME.
- Exploratory collaboration with a French company in water cycle management, waste recovery and energy management. The collaboration consisted in trying to make river water drinkable through magnetic water treatment.
- Collaboration with a global company specializing in *in-vitro* diagnostic solutions in 2017 under confidentiality agreement for a period of 6 months.
- Collaboration with a leading provider of high technology products and systems for industry and research for technical co-development (mechanical design, validation of ribbons) and exchange of confidential information for stress calculations.
- Collaboration with an international company specializing in engineering and industrial maintenance services on winding and industrialization issues.
- Collaboration with a German company specializing in the development and production of high-temperature superconducting (HTS) ribbons to test ribbons at 4 K (involvement of CNRS, CEA, and two others companies).

HFML - Nijmegen (Netherlands):

- No collaboration in recent years.

HLD - Dresden (Germany):

- Partnership with an innovative German company specializing in magnetic cooling technology.

2.3 IDENTIFIED OBSTACLES AND BARRIERS:

Collaborations between laboratories and industry offer mutual benefits. Industry benefits from cutting-edge expertise (such as characterization under magnetic fields), while laboratories enrich their research with the data and materials obtained. Even in the absence of direct intellectual property, these interactions promote the intellectual advancement of researchers.
However, despite these synergies, the valorisation of research within EMFL laboratories comes up against several structural obstacles. Researchers are still insufficiently aware of the challenges of commercialization and intellectual property, which limits the detection and protection of innovative results. Furthermore, exchanges with industry often lack a secure legal framework, particularly in the systematic absence of confidentiality agreements (NDA). What's more, industrial collaborations are frequently limited to one-off services, without any real technology transfer strategy, which limits the economic and societal impact of research work.

Insufficient awareness of commercialization and IP:

- Weak culture of innovation and entrepreneurship in EMFL laboratories,
- LNCMI-G and LNCMI-T: Researchers have to declare their inventions themselves, which complicates the process,
- HFML: No contractualization of industrial trials, even when companies use research results,
- HLD: Importance of raising scientists' awareness, which led to the creation of the "Innovators School".

Lack of protection for exchanges with industry (e.g., NDAs):

- LNCMI-G and LNCMI-T: NDAs take too long to be validated, which discourages some industrial partners,
- HFML: Informal collaboration with industry, with no mechanism for financial return,
- HLD: Possibility for a strategic partner to own the IP, which can pose a problem in the event of an imbalance in investment.

Collaborations limited to the provision of services without technology transfer:

- LNCMI-G: Model based on provision of services rather than co-development,
- HFML: No industry-funded scientific collaboration and provision of services to companies without participation in project definition (example: a Swiss company specializing in IT and science rejected a proposal deemed too academic),
- HLD: Collaborations in the form of "Contract Research", where services are mainly consultancy or measurement.

Lack of feedback and declarations:

- By their very nature, EMFL laboratories have not submitted any declarations or proposals that could be used for analysis and commercialization. This complicates the identification of valorisation opportunities.

Reservations and resistance from researchers:

- Some researchers have been reticent about commercialization in the past, which complicates their involvement and acceptance of technology transfer initiatives.

Barriers to technology transfer linked to cultural differences between academic research and industry:

- LNCMI: Absence of a structured technology transfer committee despite initial ambitions (a fortnightly committee had been envisaged, set up but encountered difficulties to meet due to the lack of invention declaration),
- HFML: Preference for open access (scientific publications), preventing the filing of patents,
- HLD: Transfer projects require co-financing, which may limit access for some researchers.

Disengagement due to a niche market deemed too small (costs vs. benefits).

Divergence in strategy between academic research and industry:

- Short-term logic vs. fundamental research (e.g., Renaissance Fusion start-up),
- Timeframes incompatible with industrial urgency (setting up NDAs, contracts, etc.)

Lack of platforms in laboratories dedicated to collaborations with industry (investment too costly: 3-4 M€ are needed to create a superconductor characterization platform).

Recruitment of human resources at laboratory level to structure value-adding and technology transfer activities with industry (constraint linked mainly to limited funding and the complexity of the profiles sought).

2.4 FOLLOW-UP INDICATORS:

Indicator	LNCMI-G (since 2019)	LNCMI-T (since 2019)	HLD (since 2020)	HFML (since 2020)
Research collaboration contracts	6	8	2	-
Material transfer agreements	4	2	-	-
Non-disclosure agreements (NDAs)	9	6	2	-
Service provision contracts	8	8	2 (contract research)	-
Patent applications	-	5	3	1
Start-ups created	0	0	0	0

- Patent filing remains limited. Across all facilities:
  - LNCMI-T and LNCMI-G: the invention disclosure process remains rare and poorly structured
  - HLD: 3 patents have been filed since 2020, but no license agreements have yet been signed
  - HFML: only one active patent, and no recent industrial contracts

The use of patents is hindered by a prevailing culture of open publication and a lack of training in intellectual property.

- No start-ups have been created from EMFL in recent years. This reflects:
  - A low entrepreneurial culture,
  - A lack of support mechanisms (such as incubators or dedicated pre-maturation programs).
- Industrial collaborations are mainly limited to one-off services (measurement services, custom tool development) (see section 2.2). These collaborations do not lead to structured technology transfer or co-development.

The overall observation is that valorization at EMFL still relies heavily on academic scientific output, with a high volume of publications (more than 130 publications per year according to the 2024 annual report (https://emfl.eu/emflwebsite/wp-content/uploads/2025/05/EMFL-annual-report-2024-final.pdf). This activity strongly contributes to international scientific visibility but remains mainly focused on the academic world.

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III. STRATEGY FOR THE TRANSFER OF KNOWLEDGE, SKILLS AND TECHNOLOGY

Formalizing partnerships:

- Structure collaborations through clear research contracts, including balanced intellectual property clauses,
- Secure exchanges with industry by systematically introducing confidentiality agreements (NDA),
- Explore shared funding (ANR, European projects) to carry out larger-scale projects,
- Mobilize transfer engineers to facilitate negotiations and optimize the valorisation of results.

Strengthening Partnerships:

- Identify the needs of industry and foster collaborations with researchers (e.g., CNRS InnoBridge program),
- Promote different models of collaboration: Industrial PhD, contract R&D services, national/international calls for proposals involving laboratories and industry,
- Diversify value-adding mechanisms: Licenses, spin-offs, co-developments, R&D services,
- Raise researchers' awareness of intellectual property protection and value-adding strategies.

Development of new markets:

- Adapt approaches according to the industrial sectors targeted (magnetism, energy, electronics, health, etc.),
- Identify cross-functional applications to maximize the impact of innovations,
- Structure innovation transfer: from research to innovation,
- Encourage the creation of spin-offs and startups, by setting up support systems (incubators, funding).

Strengthen Valorization Tools:

- Set up an invention monitoring committee to encourage the filing of patents and structure know-how transfers,
- Promote the use of confidential technical files as an alternative to patents,
- Deploy a transfer engineer to structure relations with industry,
- Draw inspiration from the HZDR Innovation Fund (Dresden) to finance the final phases of transfer projects.

Structuring Collaborations with Industry:

- Move from a service provision model to structured co-developments,
- Accelerate the contractualization of collaborations (NDAs, co-development agreements, licenses),
- Encourage hybrid models (industrial PhD, public-private consortia),
- Take advantage of strategic partnerships (e.g., Dresden) to guarantee a return on investment.

Improving the Interface with Industry:

- Create a one-stop shop (transfer engineer) for technology transfer,
- Organize webinars and industrial meetings to boost collaborations,
- Participe to industrial exhibitions,
- Develop strategic partnerships with companies to finance R&D,
- Structure a more balanced contractual framework for strategic partnerships, to better protect intellectual property.

IV. VALORIZATION ROADMAP

Phase	Objective	Main actions
Short-term: Diagnosis and Structuring	Analyze current capabilities and structure technology transfer	- Draw up a **skills map** to identify areas of excellence (already done as part of the project) - Set up a **network of industrial ambassadors** (former PhD students or post-docs from the laboratories now working in companies, industrial researchers, innovation/R&D managers, etc.) to encourage interaction with the private sector: **recruit an innovation engineer** for the French, German and Dutch sites, whose mission will be to: • Create lasting bridges between EMFL and industry, • Encourage the identification of opportunities for collaboration (services, joint projects, industrial PhD, etc.), • Increase the visibility of the laboratory's skills in different industrial sectors. - Structure the technology-transfer model to improve the fluidity of collaborations. This involves putting in place a clear, legible and operational framework to organize how EMFL laboratories interact with companies, within a transfer logic (of knowledge,

		technologies, research results), in order to facilitate, accelerate and make collaborations more reliable. This can include: • Defining standardized procedures for collaborations (contracts, NDA, IP, ...), • Clarify who does what (administration, researchers, lawyers, etc.), • Identify innovations that are ready to be transferred, • Have contractual and legal tools adapted to different types of collaboration (service, co-development, license, etc.). This would bring fluidity to the collaboration by reducing the time needed to draw up contracts, simplifying procedures for partner companies and avoiding blockages linked to IP or information exchanges.
Medium-term: Development and Collaboration	Build bridges with industry and prototype appropriate solutions	- Respond to national and European calls for proposals to foster strategic collaborations with companies (CNRS premat, SATT premat/mat, regional programs, ERC, ERC-POC, Horizon Europe, national programs, European programs, etc.). This would make it possible to: • Stimulate concrete R&D partnerships in fields such as health, energy, environment, materials, superconductors, ... • Create a priming effect by co-financing the first stages of collaboration whose objective is to move up the TRL, • Attract new industrial partners by offering them an incentive and secure framework, • Align projects with national or European strategic priorities. - Industrial prototyping according to the specific needs of partner companies. This means the design and production of prototypes (devices, equipment, components, etc.) adapted to the concrete expectations of industrialists, drawing on the scientific and technological skills of EMFL's laboratories. In other words, the aim is to translate know-how or research results into a tangible object or system that can be used by the company to: • Validate a proof of concept,

		• Test a function or technology in an environment close to real-life conditions, • Prepare for future industrialization. The objectives of industrial prototyping are to: • Respond to a specific request made by the company (and not solely on the basis of the laboratory's scientific interests), • Accelerate technology transfer by providing a technical dossier of exploitable know-how, • Reinforce the laboratory's attractiveness.
Long-term: Integration and sustainability	Integrate EMFL technologies into emerging markets over the long term	- Sustaining industrial collaborations and strengthening strategic partnerships. This involves putting in place concrete mechanisms and actions to ensure that collaborations with companies do not remain ad hoc, but become sustainable, structured and mutually beneficial over the long term. This involves: • Transforming a one-off project (e.g., test, service, proof of concept) into an ongoing relationship with the company • Establishing a logic of recurring partnership (co-supervision of theses, participation in collaborative projects, regular meetings, ...), • Guarantee continuity in exchanges, even when people or organizations change. - Valorisation of innovations beyond the initial sector, by exploring other industries. This means going beyond a single sector of application to exploit a research-derived innovation and identifying and activating other industrial fields that could benefit from the same technology, even if they are not its original domain. In concrete terms, this would make it possible to: • Diversify transfer opportunities and industrial partnerships, • Create unexpected leverage effects between sectors, • Reduce risks by not being dependent on a single market or field For example, a technology developed for aeronautics (such as a cryogenic sensor or a high-performance material) may also be of interest to:

		• the medical sector (MRI, imaging), • luxury goods (materials testing), • energy (storage, conversion), • or life sciences (measuring instruments). - Promoting the adoption of EMFL technologies in high-potential sectors. This means implementing targeted actions to publicize, demonstrate and encourage the use of technologies or know-how developed in EMFL laboratories in fast-growing or changing industrial sectors (quantum technologies, healthcare, etc.) likely to benefit from these innovations. This promotion involves: • Producing sector-specific application sheets for companies, • Proactively identifying key players (SMEs, ETIs, major groups) and building tailor-made relationships, • "Translating" technological offerings to make them readable and attractive.

V. ACTIONS AND RECOMMENDATION(S)

In order to strengthen the dynamics of research commercialization and foster synergies between EMFL laboratories and industry, several levers for action have been identified around four priority axes:

1. Reinforcing awareness of commercialization and intellectual property:
   - Organize regular training sessions for researchers on IP issues and best practices in commercialization,
   - Set up seminars and workshops to share success stories and feedback.

2. Structure and improve collaborations with industry:
   - Systematically introduce confidentiality agreements to secure exchanges with industry,
   - Develop clear research contracts including balanced IP clauses,
   - Explore shared funding (national programs, European projects, etc.) to carry out larger-scale projects,
   - Move from a service provision model to structured co-developments,
   - Accelerate the contractualization of collaborations (NDAs, co-development agreements, licenses, etc.)
   - Encourage hybrid models (industrial PhD, public-private consortia, etc.).

3. Development of new markets and promotion of EMFL technologies:
    - Adapt approaches to target industrial sectors (magnetism, energy, electronics, healthcare, etc.),
    - Identify cross-disciplinary applications to maximize the impact of innovations,
    - Encourage the creation of spin-offs and startups, by setting up support systems (e.g., incubators, funding),
    - Produce sector-specific application sheets for industrialists,
    - Proactively identify key players (SMEs, ETIs, major groups) and build customized relationships,
    - Work on the "translation" of technological offerings to make them readable and attractive.

4. Strengthening value-adding tools and securing long-term industrial collaborations:
    - Set up an invention monitoring committee to encourage patenting and structure know-how transfers. Although this action, initially planned as part of task 3.3 of ISABEL WP3, was unsuccessful due to a lack of feedback from invention declarations, we feel it would be beneficial to retain this action, the aim of which is to bring together the inventor and the valorization team (administration, patent engineer, etc.) to discuss the invention's potential and its patentability criteria (novelty, inventive step, industrial application),
    - Promote the use of confidential technical files as an alternative to patents,
    - Deploy an innovation/transfer engineer to structure relations with industry,
    - Transform a one-off project into an ongoing relationship with industry,
    - Establish a rationale for recurring partnerships (industrial PhD, participation in collaborative projects, etc.
    - Guarantee continuity in exchanges, even when people or organizations change.

References

[1] *Copper-silver composite material*
Inventeurs: F. Lecouturier, C. Laurent, D. Mesguich, A. Lonjon, S. Tardieu, N. Ferreira, G. Chevallier, C. Estournes
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[2] Composite conductive cable comprising nanotubes and nanofibers, coaxial microstructure including a copper matrix and said nanotubes and nanofibers and method for manufacturing said microstructure
Inventeurs: L. Thilly, F. Lecouturier, J-B. Dubois, N. Ferreira, P-O. Renault, P. Olier
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