Z - B R E 4 K

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Strategies and Predictive Maintenance models wrapped around physical systems for Zero-unexpected-Breakdowns and increased operating life of Factories

Z-BRE4K

Deliverable D8.2

1st Interim Plan for the Exploitation and Dissemination of Results (PEDR)

Work Package 8

Dissemination/Communication/Exploitation

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Executive Summary

Abstract	The present document will illustrate the beneficiaries' strategy and concrete actions related to the protection, dissemination and exploitation of the project results.
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Glossary of Acronyms

Acronym	Extended definition
PEDR	Plan for Exploitation and Dissemination of the Results
RTD	Research and Technological Development
IP	Intellectual Property
IPR	Intellectual Property Rights
OEM	Original Equipment Manufacturer
EFFRA	European Factories of the Future Research Association
ICT	Information and Communication Technologies

Acronym	Extended definition
FoF	Factories of the Future
CMMS/EAM	Computerized Maintenance Management Systems/Enterprise Asset Management
EFNMS	European Federation of National Maintenance Societies
NMS.	National Maintenance Societies – 22 in different EU countries
GSMP	Gulf Society of Maintenance Professionals
SMRP	Society for Maintenance and Reliability Professionals
GFMAM	Global Forum of Maintenance & Asset Management
DEM	Dissemination and Exploitation Manager
TRL	Technology Readiness Level
GA	Grant Agreement
CA	Consortium Agreement

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1 SUMMARY

The aim of Z-BRE4K project is to face the complexity of planning and control of manufacturing production systems arising from the dynamism and unpredictability of the challenges posed by constant changes in customer demand and capabilities of available resource, by developing a **novel predictive maintenance platform to eliminate unexpected-breakdowns and extend the life of production systems**.

The Z-BRE4K solution comprises the introduction of **eight scalable strategies** at component, machine and system level targeting

(i) the prediction occurrence of failure based on evidences (**Z-PREDICT**),
(ii) the early detection of current or emerging failure (**Z-DIAGNOSE**),
(iii) the prevention of failure occurrence, building up, or even propagation within the production system (**Z-PREVENT**),
(iv) the estimation of the remaining useful life (RUL) of assets (**Z-ESTIMATE**),
(v) the management of the aforementioned strategies through event modelling, KPI (key performance indicators) monitoring and real-time decision support (**Z-MANAGE**),
(vi) the replacement, reconfiguration, re-use, retirement, and recycling of components/assets (**Z-REMEDIATE**),
(vii) synchronizing remedy actions, production planning and logistics (**Z-SYNCHRONISE**),
(viii) while preserve the safety, health, and comfort of the human workers (**Z-SAFETY**).

Thanks to the three use cases, the project is focused on:

- the demonstration of a Lighthouse manufacturing process FRAMETOP for the multi stage zero defect manufacturing of next generation automotive chassis;
- a predictive platform for a production line with cold forming tooling;
- the introduction of a predictive maintenance service for the end user involved within compression molding machines.

This document is the first version (M12) of the **Plan for Exploitation and Dissemination of Results (PEDR) of Z-BRE4K** project. The contents of the first release include an overview of the concepts of Communication, Dissemination and Exploitation, their role in a H2020 project and the relative strategies and action plans that the consortium will follow to promote the project, to foster the knowledge of its results and to ensure their uptake for future business opportunities. **Communication, dissemination and exploitation activities all aim to help maximize the impact of Research and Innovation actions.** More into detail the document is structured in two sections:

- **PART 1: Communication and Dissemination Strategy.** This section comprises a brief introduction on the concepts of Communication and Dissemination and the fine line that distinguishes one action from the other in terms of objectives, focuses, target audience and formal obligations. The strategy to be deployed by the consortium for the promotion of the project and the dissemination of its results is duly outlined, starting

from the identification of the stakeholders, going through the notification to the stakeholders about the Z-BRE4K benefits and about the work and the progress in the industrial end users, to finally engage the stakeholders with the project. Moreover, several sub-sections are dedicated to the description of the key messages that communication and dissemination action aim to transfer, the tools and the channel that will be used to deliver the messages.

- **PART 2: Exploitation.** The third section of the document contains the exploitation vision of Z-BRE4K project together with the guidelines that will constitute the basis for all the future exploitation activities. More specifically, this document provides a number of checklists allowing the characterization of the various exploitation results, identifying the "object" and the "target", as well as to sketch a first draft of suitable exploitation strategies, through the identification of potential "suppliers" and "means". Furthermore, this first release of the PEDR contains a preliminary characterization of the exploitable results. However, in the next months of the project the characterization will be implemented and further investigated to go deeper in defining which can be the suitable exploitation strategies. Intellectual Property rights, Foreground IP and Background IP and all the IP claims or IPR management issues on project results will be addressed in the next release of the PEDR. This timing is coherent with project's planning, since the RTD work packages are expected to finish by M19, whereas the integration and testing (WP6) will mostly cover Y2 of Z-BRE4K project.

The Plan for the Dissemination and Exploitation of Results will be constantly updated during the project to guarantee the quality of the implementation and several internal versions of the document will be reviewed by the project consortium. The final plan will be delivered by M42 and it will be the most critical and important deliverable for the impact of Z-BRE4K and the further exploitation of its results beyond the project lifetime.

2 PART 1: COMMUNICATION AND DISSEMINATION STRATEGY

Communication and dissemination activities play an important role to **increase the impact** of an H2020 project as both represent useful instruments to raise awareness of EU funding opportunities, explain the societal relevance of the research, support the future research and innovation funding actions, facilitate the uptake of the results of the project to create potential business opportunities for new products or services.

The boundaries between communication and dissemination are often blurry and sometimes overlap depending on the content to be transmitted and the target group addressed. The main aspects that differentiate these actions are their aim, focus, and target audience. While communication aims to create awareness of the EU initiatives, promote the project and its results to a very differentiated target of audience ranging from stakeholders and investors to the media and great public, dissemination is more focused on fostering the transfer of knowledge created within the project to make the results available for others to use. The target audience for a dissemination action is represented by the scientific community, the industrial partners and the policymakers. In the following sub-sections, both the communication and dissemination strategies of Z-BRE4K project are reported.

2.1 COMMUNICATION

2.1.1 Beyond the definition of Communication

The glossary of the European Commission Research & Innovation Participant Portal defines the Communication on a project a "*strategically planned process that starts at the outset of the action and continues throughout its entire lifetime, aimed at promoting the action and its results. It requires strategic and targeted measures for communicating about (i) the action and (ii) its results to a multitude of audiences, including the media and the public and possibly engaging in a two-way exchange*".

The **main objective** of communication is to reach out the society, beyond the project own community, and promote the impact and benefits of the EU funded projects in a strategic and effective manner. The research activities carried out must be outlined with a language that can be understood by multiple audiences, included non-specialists. Besides project activities and tasks, communication actions must also convey the public policy perspective of EU research and innovation funding by addressing aspects such as:

- transnational cooperation in a European consortium – the benefits of working within a group that allows to achieve more than otherwise possible;
- scientific excellence – contributing to competitiveness and to solving societal challenges;
- impact on everyday lives – better use of results and spill-over to policy-makers, industry and the scientific community.

Communication measures are **horizontal issues** that run alongside the duration of the project. However, compared to dissemination and exploitation that get momentum towards the end of the project and after its conclusion, when more concrete outcomes emerge, communication starts to be relevant from the outset the project. This is mainly due to the aim of communication to inform the audience on the goals and the contents of the foreseen research activities and their expected impact rather than transfer the knowledge and results of the project.

There are some **guidelines** to follow to be effective when promoting project aspects:

- Communication actions must be strategically planned and not just be ad-hoc efforts;
- Communication objectives must be clearly defined before the action takes place, for example the expected impact, the reaction to be prompted;
- The language used to convey the contents and the contents themselves must be targeted and adapted to an audience that go beyond the project's own community including the media and the public;
- Communication action must convey a pertinent message that relates to the audience's everyday life and must be proportionate to the scale of the action, that is the number of beneficiaries involved and the available budget;
- The right medium and means must be chosen and deployed: working at a local, regional, national, EU-using one-way exchange (website, press release, brochure, etc.) or two-way exchange (exhibition, school visit, internet debate, etc.).

2.1.2 Z-BRE4K communication strategy

According to article 38 of the Grant Agreement "*The beneficiaries must promote the action and its results, by providing targeted information to multiple audiences (including the media and the public) in a strategic and effective manner.*

This does not change the dissemination obligations in Article 29, the confidentiality obligations in Article 36 or the security obligations in Article 37, all of which still apply".

The Grant Agreement clearly states the **obligation to communicate and promote project action** and to do so without breaching obligations of Article 29 on the dissemination of the results, reiterating the importance to take an integrated approach to carry out the communication together with dissemination activities to maximize the impact of the project.

Z-BRE4K's workplan is fully committed to communicate project's results and their benefits for the stakeholders to the widest possible audience. Z-BRE4K communication measures have five main milestones:

1. Prepare content, graphical identity and effective communication instruments:
    a. logo,
    b. web site,
    c. poster,
    d. presentation,
    e. press releases;

2. Produce marketing material and find communication channels to promote the project among the industrial stakeholders as well as audiences beyond the project's own community:
    a. pre-commercial brochure,
    b. newsletters
    c. videos
    d. Newspapers,
    e. Industrial magazines and journals,
    f. YouTube,
    g. Twitter,
    h. LinkedIn;
3. Promote Z-BRE4K to all target groups in EU and beyond (publications, participation in relevant external events, organization of project events – thematic workshops and final conferences);
4. Collect feedback from potential end-users and other target groups, thus facilitating Z-BRE4K tuning and improvements, as well keeping end users' requirements updated;
5. Reinforce the brand-name of Z-BRE4K as a key-player in the IoT, physical asset management and maintenance market;
6. Raise awareness on Z-BRE4K philosophy to scientific and standardisation communities to make them supporters, thus enabling improvements, but also furnishing the future generation of users/clients.

The objective of Z-BRE4K communication strategy is to plan the actions to maximize the impact of the project and to identify the proper promoting tools to raise public awareness about the project, its expected results and progress within a defined target to boost project's exploitation. To fulfil this ambition Z-Bre4k will take a structured approach following a precise timeline structured in **three main phases**:

- Phase 1 – Initial awareness (M1-M12) aims at agreeing upon communication strategy and future activities; creating initial awareness in markets related to Project's scope and objectives.
- Phase 2 – Targeted awareness (M13-M36) aims at informing targeted stakeholders and groups and target market about the technological breakthroughs and business benefits of Z-BRE4K.
- Phase 3 – Strategic phase (M37-M42) aims at maximizing target market and industry awareness regarding the Z-BRE4K platform and its exploitable products;

The Dissemination and Exploitation Manager together with the other partners will duly identify and profile the most relevant stakeholders and target groups at each stage of the communication strategy. Their favoured communication approaches and motivations for pursuing project results will be analysed. More in detail, Z-BRE4K communication strategy targets **two different audiences** with different aims:

i. **Industrial stakeholders** such as end users, IoT and OEM technology providers and integrators, maintenance consultants. The strategy is aiming at creating technical and business interest in the opportunities created by the project's results;
ii. **Scientific and standardisation communities:** The strategy is aiming at highlighting Z-Bre4k validated results beyond the state of the art, incl. results with potential for contribution to standards.

The relevant events for project promotion will be listed and the partners will discuss and identify the most appropriate communicator for each event. The website will provide up-to-date information about the project and a strong representation on relevant social media will be established. Traditional channels such as newspapers and industrial magazines will also be used; Publications will be prepared and participation in relevant events will be pursued, including the organization of Z-BRE4K thematic workshops and a final conference.

The following matrix summarizes communication support and actions and matches the targeted stakeholders' categories:

Figure 1. Communication plan

Communication Supports & Channels	KPIs	Target Stakeholders (✓=Main Target, ▯=Secondary)		
		R&D&I, Other Prof. Communit. (Groups-2,5)	End-Users (Group-1)	Facilitators (Groups-3,4)
Project documentation				
Leaflet	1 initial version + update	✓	✓	✓
Poster	1 initial version + update	✓	✓	▯
Reference PPT presentation	1 initial version + update	✓	✓	✓
Project publications				
Press releases	At least 2 per year	✓	✓	✓
Project newsletter	1 every 6 months	▯	✓	✓
Articles and proceedings	9 publications (1+3+3+2)	✓	✓	▯
Project deliverables	See list of deliverables	✓	▯	▯
Open access repository (RDR)	1 deposit per year	✓	▯	✓
Project videos (incl. YouTube presence)	4 for different commun. (1 initial version+update)	✓	✓	✓
Online presence				
Project website	1 website, monthly updated	✓	✓	✓
Related websites	10+	*Depending on specific website*		
LinkedIn	At least 1 monthly update	✓	✓	✓
Twitter	At least 2 monthly updates	✓	✓	✓
Events				
Presentation & feedback sessions	6	✓	▯	✓
Thematic workshops and other project events	Min 3 workshops + 1 final conference	✓	✓	✓
Participation at relevant External events	30+	*Depending on specific event*		

2.1.3 Z-BRE4K communication targets and message

The overall aim of Z-BRE4K communication activities is to ensure reach out the society and promote the impact and benefits of the EU funded projects in a strategic and effective manner. Therefore, communication actions target stakeholders and groups covering the full range of potential users in manufacturing value chains as well as industrial and ICT/FoF R&D communities. Each communication activity will be tailored to the specific group and the message to be conveyed:

1. Manufacturing and process companies, Big ICT industries, Food & Beverage, Transport, Aerospace, etc.
2. Industrial research communities, EFFRA, ICT and FoF research communities; Standardisation bodies.
3. Maintenance consultants and CMMS/EAM integrators; Suppliers/integrators of MES systems.
4. EFNMS (**European Federation of National Maintenance Societies**) and NMS (**National Maintenance Societies – 22 in different EU countries**).
5. Other international societies and umbrella organizations, such as GSMP (**Gulf Society of Maintenance Professionals**), SMRP (**Society for Maintenance and Reliability Professionals**). GFMAM (**Global Forum of Maintenance & Asset Management**) are also an important stakeholder (**participation of USA, Canada, Brazil, Australia, and Middle-East maintenance societies***).*

The main message that Z-BRE4K communication actions aim to deliver are:

- project scope,
- project progresses and activities,
- outcomes and results,
- updates on project meetings,
- news on events attended by the project beneficiaries where Z-BRE4K was promoted.

2.1.4 Communication Channels

There is a wide variety of communication methods and channels. The challenge is to select the right one(s) to bring the message to the target audience and achieve the project's purpose. The following table lists the **channels** used to make the Z-BRE4K communication strategy effective, highlighting per each channel the scope of the action.

Table 1 Communication channels

CHANNEL	SCOPE
Brochures	▪ Awareness
Website	▪ Awareness ▪ Information ▪ Promotion
Social network profiles	▪ Information ▪ Promotion ▪ Involvement
Printable manual	▪ AwarenesS ▪ Information ▪ Promotion
Posters	▪ Information ▪ Promotion

2.1.5 Communication Tools

- Logo and templates

A specific logo has been created for the project by a professional graphic studio. This logo symbolizes: The "**Z**" stands for zero, while the "**4**"is intended to play with the letter "A" which look similar (as "O" with "0" and "I" with "1"). There is an extra meaning on number "**4**" as it indicates also the Industry 4.0.

Figure 2. Z-BRE4K logo

Following the creation of the logo we set all the Word and PowerPoint templates so that all the colours, logos, and information about the project are displayed. All the templates report also the **EU flag and details of the European Union's program under with Z-BRE4K** was financed.

- Website

The website is on line as of January 2018 at the address:

https://www.z-bre4k.eu/

the Z-BRE4K website is primarily intended as a **window to promote the project** purpose, strategies, activities and the outcomes of the research.

Describing what the plans of the project consist in and how the funding provided by the EU are used is not the only objective of the website. Indeed, it should also act as an aggregator of news and events that are related to the topic of predictive maintenance, which may raise the interest of the visitors and increase the public knowledge of this matter.

The website also acts as an aggregator of news and events that are related to the ceramic industry and could be interesting for the visitors. Each partner is required to give the highest visibility to the website, linking it to their institutional websites, disseminating it among their networks and referring to it in any communication concerning the project. The Z-BRE4K website will be indicated in all communication templates circulated by the dissemination.

The information on the website will grow with the proceedings of the project. Each event and achievement will be disseminated to the public through the social networks and the website.

- Social networks

Social Media are currently the best way of diffusing information, probably with a better visibility than a single website. Therefore, we plan to use both LinkedIn and Twitter social network for promoting the Z-BRE4K project. The social media accounts will be constantly updated with the relevant news on project activities and events.

TWITTER

A Twitter account has been created for together with the mention @z_bre4k. This account is useful both for promoting the activities carried on by the consortium, and for diffusing external information relevant to the project. All partners have connected their account to the Z-BRE4K Twitter account and are currently re-twitting Z-BRE4K's messages.

LINKEDIN

A LinkedIn account has been created too. Through this account, we plan to connect all the people involved in Z-BRE4K and to promote the results of the project to all their contacts.

- Public web communications and promotional materials

The WP8 leader will prepare press releases in collaboration with each partner and the leader to raise awareness and disseminate information about the project. The Press releases will be disseminated through the partners' network and press contacts.

- A brochure illustrating Z-BRE4K project will be printed. This will be a sort of "manual" underlying the strategies that Z-BRE4K will deploy to obtain the predictive maintenance platform.
- **Posters and rollup**: 1 rollup has been created to support the participation to fairs and events.
- **Video**: A professional video maker company will be hired to realize a promotional video about the results obtained within the project. This video will be uploaded to the website, the social media and promoted by all partners.

2.2 DISSEMINATION

2.2.1 Beyond the definition of Dissemination

The article 29 of the Annotated Model Grant Agreement clearly states that "*each beneficiary must 'disseminate' its results by disclosing them to the public by appropriate means (other than resulting from protecting or exploiting the results), including by scientific publications in any medium*".

The article not only states an obligation but provides also the definition of dissemination that in wider terms means "spreading something, especially information, as far as possible". As previously mentioned, the fine line between communication and dissemination actions is often a blurry boundary that sometimes fades depending on the content to be transmitted and target group.

Compared to communication, dissemination activities are more focused on the results and solutions deriving from the project. The objective is not only to create awareness, but also to describe the results and the solutions to ensure understanding to enable others to use and take up results. Scientific community, industrial partner, policymakers are the audience addressed by dissemination activities since they might be the most interested in the use of the solutions provided by the project.

Therefore, the goal to transfer the knowledge and results to the ones that can best use them makes the dissemination a key activity to maximize the impact of a project: it ensures the possibility to use the project outputs beyond the lifetime of the project and to broaden their value compared to the original focus.

There are several benefits derived from a good dissemination strategy:

- Enhanced **visibility** of the project research line and drawing the attention of potential users of the project outputs;
- The gain in **credibility** within the scientific community and possibility to find new additional funding sources or to join new consortia;
- Occasion to learn novel approaches and solutions thanks to the exchange of knowledge on all levels and the cross-fertilization of ideas.

2.2.2 Z-BRE4K dissemination strategy

The main objective of Z-BRE4K dissemination plan is to identify and plan the activities to be performed to transfer the findings and the results of the project and develop a response mechanism between the consortium and the various stakeholders to maximize the impact of Z-BRE4K. More in detail, this translates in a series of milestones to be met: the creation of a **public awareness** of the project, the **generation of interest** within the scientific community, the direct **involvement of stakeholders** that can facilitate market up-take of the research results.

The Dissemination manager will not be the only one involved in the dissemination actions. To ensure the effectiveness of the strategy and the accomplishments of the fixed goals, dissemination will be performed both as a collective activity managed by the entire consortium and, at the same time, as an individual set of actions carried out by each single partner on a local level. Z-BRE4K members comprise both industrial and RTD partners who are well-established organizations that constitutes a natural channel for the dissemination of the project and its results to other potential users. Z-BRE4K dissemination actions rely on the yearly experience, know-how and expertise of its members to ensure that projects' output will have the necessary exposure to guarantee their utilization after the project is concluded.

The direct involvement of all partners into the dissemination guarantees an effective communication among the consortium as well as a timely information of the stakeholders on the project progresses.

The plan for the dissemination activities is an iterative process that started from the outline of the Description of Action, went through the kick-off meeting discussions and will be constantly updated over the full duration of the project. The Dissemination strategy is drawn up in accordance with the stage of the development of the outputs of the project:

a) **Phase 1 (M1-M12)**: in this phase dissemination activities are oriented to the identification of interesting information sources and dissemination opportunities.
b) **Phase 2 (M13-M36):** the consortium attends events of interest to disseminate preliminary project results and to start creating awareness and generating the interest of possible stakeholders.
c) **Phase 3 (M 37-M42)**: this phase is focused on the dissemination of the findings and results of the project to a more target audience for Z-BRE4K to facilitate the market take up of the research outputs.

Indeed, the most significant dissemination activities will be carried out as the final research results will be achieved and addressed to the industrial development stage.

Z-BRE4K dissemination actions not only comply with Article 29.1 of the Grant Agreement but also with Section 8.4 of the Consortium Agreement that specifically regulates the dissemination of owned (or jointly owned) results restricted to publications and presentations as follow "Prior notice of any planned publication shall be given to the other Parties at least 30 calendar days before the publication.

Any objection to the planned publication shall be made in accordance with the Grant Agreement in writing or by email to the Coordinator and to the Party or Parties proposing the dissemination within 15 calendar days after receipt of the notice. If no objection is made within the time limit stated above, the publication is permitted".

Besides the basic regulations within the CA and GA, Z-BRE4K dissemination management follows the **best practices** suggested by the EC Guidelines as well as the **principles** deriving from the well-established experience of the partners in other research projects:

- All the partners involved in the research activities will be made aware about the final results of the project and the implications resulting from the outputs like publications and presentations.
- All the scientific articles on the results of the project will be duly reviewed by the relevant partners involved in the development of the topic of the publication.
- All the articles and publications on project outputs will be shared within the consortium before the date of disclosure.
- All the partners should contribute to the dissemination according to their role and effort by participating and giving presentations at conferences, workshops, meetings, by publishing papers, holding press conferences, networking and similar activities.
- The Dissemination and Exploitation Manager (DEM) is the reference and contact point for every dissemination action. He/she is in charge to constantly verify the quality of the contents to be shared, to ensure the correct implementation of the project results and the consistency between the events to be attended by the partners and the purpose of the dissemination activity.
- All public results will be accessible from the project website and usable from all parties who may benefit from them to maximize the impact of the project.

To ensure the effective fostering of Z-BRE4K knowledge, the deployment of the dissemination strategy will consist in the identification of the following **milestones**:

- The topic and message of the dissemination action (the contents that will be shared);
- The target audience (who are the stakeholders to be addressed and that may have more interest for the topic);
- The messenger (the messenger should be a credible spokesperson who is expert of the subject to be disseminated);
- The methods and tools (the transfer method should be carefully considered depending on the nature of the event: the size of the audience, the background of the participants and the location);
- The expected outcome (the impact to be achieved and the purpose of the dissemination must be defined to optimally deliver the message).

2.2.3 Dissemination and Confidentiality

The dissemination activities are deeply entangled with the matter of Intellectual Property Rights Protection since data and results belonging to the background and foreground of the project

partners may be disclosed. Section 8 and 10 of the CA and Article 29.1 and 36 of the GA state and rule the connection between dissemination actions and confidentiality.

The main aspects of IP rights protection are the following:

- The creation, within the consortium, of a common understanding and awareness between the academic world and the industrial partners of the different interests and motivations to publish project sensitive to avoid undesired breach of confidentiality among the partners. The willing of academic partners to publish is driven by its commitment toward the scientific community while industrial partners' decision is led by commercial considerations.
- The signing of common agreement on publication of confidential information or any other information subjected to the IP rights of one of the partners.
- The establishment of a set of rules and procedures to avoid the violation of the IP rights and to regulate the publication of data on project results.

Article 29.1 of the GA states that "*A beneficiary that intends to disseminate its results must give advance notice to the other beneficiaries of — unless agreed otherwise — at least 45 days, together with sufficient information on the results it will disseminate. Any other beneficiary may object within — unless agreed otherwise — 30 days of receiving notification, if it can show that its legitimate interests in relation to the results or background would be significantly harmed. If a beneficiary intends not to protect its results, it may — under certain conditions (see Article 26.4.1) — need to formally notify the Commission before dissemination takes place*".

Moreover, Article 36 of the GA reports "*During implementation of the action and for four years after the period set out in Article 3, the parties must keep confidential any data, documents or other material (in any form) that is identified as confidential at the time it is disclosed ('confidential information')*".

In order to avoid any breach of confidence, no one within the consortium is allowed to publish any contents involving other partners' foreground, background or confidential data during and beyond the lifetime of project without the written approval of the parties involved. In case of disclosure of jointly owned results, each owner must be asked for its approval to publish without any possibility to withhold such consents.

All draft articles and publications must be reviewed by the Project Coordinator, the Project Manager and by the Dissemination and Exploitation Manager before publication or production for reporting and archiving purposes. They will check the fulfilment of the dissemination requirements and if there is any already available prior art. Moreover, they will evaluate the possibility to make the contents available on Z-BRE4K website or not.

2.2.4 Dissemination Channels

To be efficient in pursuing Z-BRE4K dissemination strategy, the consortium has identified the main channels to transfer the knowledge and the outcomes of the project:

Table 2 Dissemination channels

CHANNEL	SCOPE
Trade fairs and conferences	▪ Involvement ▪ Promotion
Conferences	▪ Involvement
Workshops	▪ Involvement
Journal articles	▪ Information

2.2.5 Key messages: the project outcomes

Once the main objectives of the project with its expected results and their benefits and significance for the target audience have been considered and the aim and objectives for the dissemination plan have been developed, the key messages for the dissemination need to be identified. As already reported within the document, Z-BRE4K dissemination activity will be focused on the project outcomes to foster the knowledge behind the results and make them available for others to use.

Key messages can be expressed in a single statement or in a series of statements. They are important because they help to focus on what is being disseminated, thereby they reduce the possibility of mixed messages.

When developing key messages, it is important to keep in mind:

- The audience's current awareness, knowledge and attitudes towards the issue.
- The response expected from the target audience/s (e.g. are you educating or informing, seeking to change attitudes or behaviors?).
- The benefits offered, and their significance.

It is also important to recognize that there is a limit to the number of messages which can be communicated, and often a trade-off between the number and complexity of key messages and the level of uptake achieved. The message is the extreme synthesis of what the project wants to communicate, or rather the essential core of the contents or line of reasoning that should, in any case, be learned and remembered by the receiver: everything, in the communication, must contribute to getting it through to the public. Messages should be based on what that audience wants to know, rather than on what they should hear. The style and content should be tailored for each audience. In order to be effective, the message must take into account the objectives but, above all, the public's needs. Good communication strategies should always have key messages to be used in a campaign. The messages have to be short, but at the same time capture the essential themes of a promotion or an intervention.

Particular attention should be given to possible incomprehension or misunderstandings. In fact, the message must be brief and clear, but not generic. In defining the message, it is important to

make an effort to go beyond the initial hypotheses that come to mind, remembering above all who you are addressing.

2.2.6 Dissemination Tools: Scientific Articles

In order to reach the scientific community Z-BRE4K consortium promotes scientific paper publication and project presentation at scientific conferences targeting relevant domains for the project. The expected impact of presentations at this kind of events is very high because of the attendance of scientists and industrial stakeholders.

In addition to the pure scientific papers, the results and impacts of Z-BRE4K project will be communicated to professional, end-users and industries through papers in technical bulletins and sectorial journals.

3 PART 2: EXPLOITATION

3.1 Exploitation vision

According to the European Commission glossary, Exploitation is defined as "*The utilisation of results in further research activities other than those covered by the action concerned, or in developing, creating and marketing a product or process, or in creating and providing a service, or in standardisation activities*."

This deliverable has already pointed out that **communication**, **dissemination** and **exploitation** are **different activities** taking place on a common playground: the results of the project. The concept standing behind the definition of exploitation, which is also the ultimate feature of the activity itself, is indeed the **effective and concrete use of the achieved project outcomes**.

The exploitation aims at using Research and Innovation actions to create a **concrete impact** for the society, with the expectation that the exploitable results will be used beyond the lifetime of the project.

Task T8.1 is addressed to write the Plan for the Exploitation and Dissemination of the Results. Thus, the deliverable related to this task is intended as a report of all the activities performed through the journey of exploitation: starting from the identification and characterization of the project results, going through the formulation of an exploitation strategy and the management of the IPR, to finally end with the identification of the market opportunities and the active stakeholder involvement.

The H2020 programme defines project outcomes as "Any tangible or intangible output of the action, such as data, knowledge and information whatever their form or nature, whether or not they can be protected, which are generated in the action as well as any attached rights, including intellectual property rights."

To be successful in writing the exploitation plan it is essential to **start with the identification and characterization of the exploitable results**. Indeed, not all of what has been achieved throughout course of the project is likely to have an exploitation route. Exploitable results are only those having a potential scientific, economic and social significance. During the project these outcomes provide a mechanism to **capture and quantify impact**, while, by the end of the project, a way to **achieve impact** beyond project's completion.

The identification of the exploitable results is an ongoing process that starts at the proposal stage, when a preliminary list of expected results is outlined. Some of the foreseen outputs become available throughout the course of the project, some towards the end, some may result not to be feasible, some new outputs may be identified. Therefore, it is of outmost importance to **closely monitor project progresses** to capture the results and to identify outcomes not foreseen at the beginning of the project, to **follow up and manage** them through the whole lifetime of the project.

Therefore, by transitive property, the Plan for the Exploitation and Dissemination of the Results is an evolving report that will be periodically updated according to the emerging results of the project, the changes in the stakeholders or work context and their potential use during the project lifetime.

When shaping the outcomes of the project, it is mandatory to think out of the box: contrary to common belief, exploitable results do not necessarily correspond to a product or a service. There are six categories from which exploitable results may belong to:

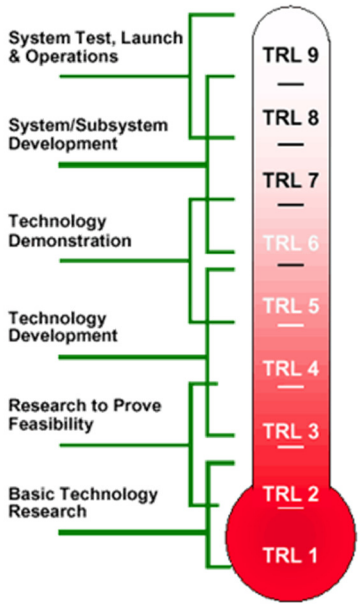
- **Equipment** – the machinery or tools needed to carry out a job; a set of physical tools, devices, kit assembled for a specific purpose.
- **Processes –** A systematic series of mechanized or chemical operations that are performed in order to produce something**.**
- **Products –** something that is made to be sold, usually something that is produced by an industrial process (as a custom, but may be personalized upon request).
- **Services** – offering the above products, processes, equipment, or knowledge as a help to perform a work.
- **Knowledge & IP** – understanding of or information about a subject that you get by experience or study, either known by one person or by people generally
- **Other forms of knowledge** – Platform, publications, patent….

A **systematic approach** to the characterization of the exploitable results provides for **reference points** and **benchmarks** related to the innovation levels and technology readiness.

For this purpose, this assessment will use the **Technology Readiness Level (TRL)**[1] tool, a powerful method that estimates the technology maturity of the project results.

Figure 3. TRL methodology

[1] European Commission (2017), H2020 Work Programme 2018-2020, General Annexes, Annex G, Technology readiness levels (TRL), https://ec.europa.eu/research/participants/data/ref/h2020/other/wp/2018-2020/annexes/h2020-wp1820-annex-g-trl_en.pdf

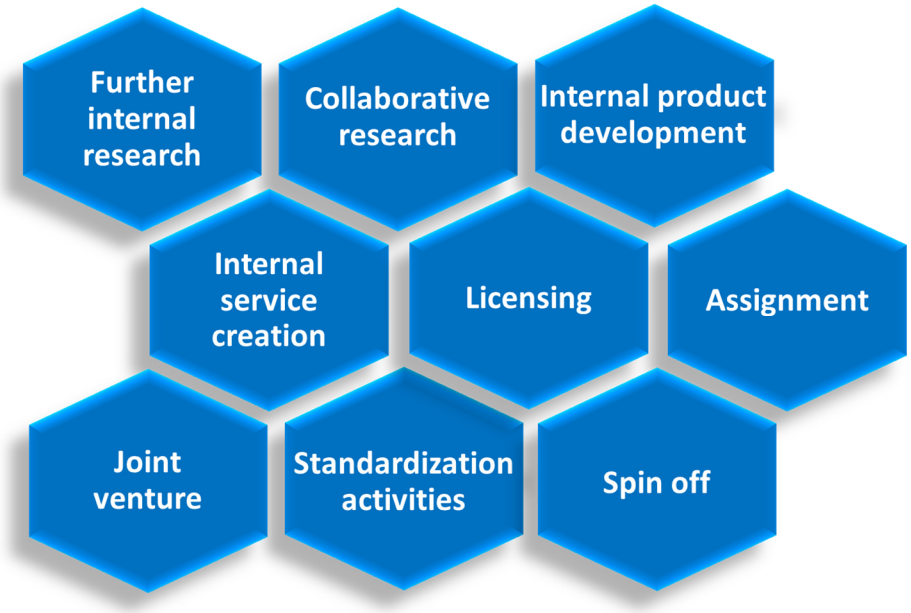


The TRL tools may not apply to all kinds of exploitable results coming from Z-BRE4K project. However, it is a helpful instrument for managing the progress of research and development activities since it provides a measure of the current readiness of the exploitable results and a common understanding of their technology status.

Turning innovation actions into concrete value and impact for society is also a matter of **thinking ahead**. Nevertheless, identifying, shaping and classifying the exploitable results coming form the project do not ensure their use beyond the lifetime of the project.

To **provide a future to project outcomes**, it is of outmost importance to have a **clear vision** for their exploitation and a **customised strategy** to follow depending on the nature of the results. Depending on the TRL reached, there are several routes for carrying out further exploitation, which are presented in the figure below:

Figure 4. Exploitation visions



The market uptake of the results of the project often requires further activities and considerable investments, which might not be encouraging unless outcomes are well protected through **intellectual property**. During a H2020 project, each partner of the consortium might be called to share his knowledge, experience and technological innovations to finalize the project idea. This means that the participants might contribute with some tangible and non-tangible assets giving rise to intellectual rights, that need to be protected through confidentiality agreements between the applicants.

A good plan for exploitation and dissemination of the results must state how the results and the relative intellectual property rights arising within the project will be protected. Intellectual property is in this way a cornerstone for an effective impact of research results in society.

3.2 Z-BRE4K Exploitation guidelines

The plan for the dissemination and exploitation of Z-BRE4K consortium follows a strategy based on:

1. The establishment of IP provisions within the consortium agreement (CA).

Regarding the ownership of the results, within the CA it is stated that results are owned by the partner who generated them. In case of an invention generated by more than one partner, they shall have the joint ownership of the work carried out and shall establish a separate joint ownership agreement regarding the allocation of ownerships and terms and conditions for the protection, dissemination and exploitation of the result. However, until the joint ownership agreement has been signed, the results shall be jointly owned in shares according to their state of contribution. Specifically:

- **regarding** exploitation, each of the joint owners shall be entitled to use their jointly owned Results on a royalty-free basis, and without requiring the prior consent of the other joint owner(s);
- regarding licensing, each of the joint owners shall be entitled to grant non-exclusive, non-transferable licenses to third parties, without any right to sub-license, without obtaining any consent from the other joint owner(s) under the jointly owned Result and under any IPRs protecting such result;

2. A systematic and harmonized description of the Exploitable results coming from the project.

The systematic description of the exploitable results shall be the result of the consultation and reflection among the partners and of an analytical process of screening of those, of all the project outcomes, that potentially create revenues and/or provide social benefits.

As a first step, partners are called to actively participate in the identification and characterization of their own exploitable results by answering to the following points:

- Name of the exploitable result?
- What problems are solved?
- What is the new element of the result that distinguishes it from the state of the art?
- How better is the solution (faster, cheaper, more reliable, more efficient, with less undesired effects)?
- Who will use the result?
- Why should the end users invest in or adopt the result?
    - Further Internal Research (thus research activities must be beyond the project)
    - Collaborative Research (the results used as background of future collaborative research projects)
    - Internal Product Development (results used in developing, creating and marketing a product/process)
    - Internal Service Creation (results used in creating and providing a service)
    - Licensing (results exploited by other organisations by through-out licensing)
    - Assignment (results exploited by other organisations by the transfer of ownership)
    - Joint Venture (results used as background of a joint venture)
    - Spin-off (a separate company established in order to bring to the market technology resulting from the project)
    - Standardisation activities (results used either to develop new standardisation activities, or to contribute to ongoing standardization work
- What are the stakeholders to be involved to achieve your exploitation vision?
- Do you expect to have reached a TRL higher or lower than TRL7 at M42?
- What are the expected steps in your go-to-market strategy?
- Who is/are your main competitor(s)?
- Who are the partners involved in the result?
- Did you protect, or will you protect this result? How? When?

The feedback collected from project partners shall be matched with the list of the expected exploitable results outlined in the Grant Agreement. The most relevant and promising outcomes in terms of social and economic impact shall be further developed and exploited trough the implementation of targeted exploitation actions to support partners' go-to-market strategy.

3. A shared process to define the IP Claims on the exploitable results.

The plan for exploitation reports the previous agreement in terms of organization and management of the results. Moreover, moments of discussion and reflection among the partners shall lead to draw up a strategy to define how the results that are capable of, or reasonably expected to be capable of, commercial or industrial exploitation might be protected from their early disclosure. It shall be stated how ownership and access rights between the project partners will be organized, including any economic conditions. Joint ownership should be considered. Applicants shall mention whether, in a case of jointly owned results, they might reach an agreement for the effective management of such results with details.

3.3 Z-BRE4K Exploitable results characterization

During year 1 of Z-BRE4K, project partners have carried out a preliminary characterization of exploitable results, which is reported in Table 3 below.

Table 3. Preliminary characterization of Z-BRE4K's exploitable results

PROPOSAL PHASE		IMPLEMENTATION PHASE		
Exploitable results	ER partner	Exploitable results	ER owner	Type of ER
Z-BRE4K STRATEGIES for improved maintainability and increased operating life of production	Joint Venture			
Z-BRE4K integrated suite for improved maintainability and Risk Management	Joint Venture			
Z-BRE4K KBS with semantic modeling of assets/ products/processes and their healthy/deteriorated signatures	EPFL, HOLONIX	Z-BRE4K Ontology	EPFL	KNOWLEDGE
New i-Like functionalities	HOLONIX	Condition monitoring module enhanced with semantic	HOLONIX	PRODUCT

PROPOSAL PHASE		IMPLEMENTATION PHASE		
Exploitable results	ER partner	Exploitable results	ER owner	Type of ER
		representation of the system		
Predictive Maintenance DSS, Scheduler and Recommendations Provider	ATLANTIS	Predictive Maintenance DSS, Scheduler and Recommendation Provider	ATLANTIS	PRODUCT, SERVICE
Condition Monitoring Suite (CM) for predicting machinery system failures based on trends forecasting and deterioration rate	ATLANTIS AIMEN	TO BE FURTHER ASSESSED m24	TO BE FURTHER ASSESSED m24	TO BE FURTHER ASSESSED m24
Maintenance KRIs and Risk Management system for production systems	ATLANTIS			
		FMECA	ATLANTIS	SERVICE
Machine-learning based Recommendations for the enhanced mainDSS product, based on C-45 induction algorithm	ATLANTIS	Machine Learning System and predictive and reasoning engine.	ATLANTIS	KNOWLEDGE, SERVICE
Machine-learning based analysis for deterioration trends analysis	CORE	Machine-learning based analysis for deterioration trends analysis	CORE	SERVICE
AUTOWARE open platform and use of industrial data spaces as operating system	INNOVALIA			
In-machine metrology linked with quality inspection – new M3 platform functionalities	TRIMEK	In-machine metrology linked with quality inspection – new M3 platform functionalities	TRIMEK	PRODUCT-EQUIPMENT

PROPOSAL PHASE		IMPLEMENTATION PHASE		
Exploitable results	ER partner	Exploitable results	ER owner	Type of ER
New machines with predictive Maintenance capacities	SACMI	New machines with predictive Maintenance capacities	SACMI	EQUIPMENT
		Market replication framework	CRIT	SERVICE
		Machine Learning System and predictive, preventive, diagnostic analytics	BRUNEL	KNOWLEDGE
		Collaborative research: industrial intelligent platform for the automotive sector	AIC-Automotive Intelligence Center	OTHER
		Z-BRE4K service	PHILIPS	PROCESS
		IDS Connector(s)	INOVA+	PRODUCT
		Intelligent Predictive Maintenance Platform	GESTAMP	PROCESS
		Machine learning based fault detection/ remaining useful lifetime estimation.	imec	SERVICE
		INTERNAL SERVICE CREATION: Software development of the IR-based control system for arc welding (adapting the software to new joint/Weld configurations).	AIMEN	SERVICE

PROPOSAL PHASE		IMPLEMENTATION PHASE		
Exploitable results	ER partner	Exploitable results	ER owner	Type of ER
		INTERNAL PRODUCT DEVELOPMENT: Development of quality control system for arc welding based on IR technology.	AIMEN	PRODUCT-EQUIPMENT
		Embedded condition monitoring compliant with IDS	AIMEN	PRODUCT
		Z-BRE4K SERVICE	CDS	PROCESS

This is only a preliminary table for the characterization of the exploitable results, which will be further assessed in the forthcoming months by means of a clear methodology, described in section 3.4 of the current version of the PEDR.

3.4 Exploitable results & IP

The protection of the Knowledge and Know-How is a fundamental asset of collaborative research and innovation projects, where several partners with different mindsets and interests come to sit at one table to work together. The proper Intellectual Property management of the previous knowledge and the foreground generated within the project allows to:

- disclose know-how and innovative ideas in a safety environment
- prove the ownership or joint ownership of a result or output of the project
- carry out business actions and make profit from commercial exploitation
- prevent or discourage any improper use of the knowledge and results from others.

The efficient and strategic safeguarding and protection of the intangible assets derived from project's activities through Intellectual Property Rights (IPR) and confidentiality rules has gained an increasing importance due to the emphasis of the H2020 program on a more effective exploitation of project's outputs.

Relevant IP claims and issues arise from the outset of the project during the conceptualization phase and grant/consortium agreement preparation. However, IPR last for the whole duration of the project: during its execution and implementation up to the exploitation and commercialization phase. Timing is therefore a fundamental aspect.

Each project period phase must correspond with a proper IP management step[2]:

- **Proposal Phase**: IP issues must be addressed in both the Grant Agreement and the Consortium Agreement and each partner should make sure that both these documents addresses their needs and that the set of rules established are suitable for the further implementation of the project.
    - Define the **existing knowledge**, the background. It is important to state whether or not background information will be used throughout the project. This is very useful to avoid possible disputes on ownership issues and access rights to background and results within the project life cycle.
    - Consider **potential confidentiality** issues to avoid that other partners disclose sensible data owned by another partner of the consortium, or that is intended for Intellectual Property rights
- **Implementation phase**: during this phase IP management should cover several aspects.
    - Knowledge management: an efficient knowledge management including the management of IP should be an integral part of the overall project management structure.
    - Confidentiality obligations: the specification of confidentiality obligations. Must be agreed with the partners on what information will be deemed confidential within the project, to whom and under what conditions confidential information may be transferred or disclosed, and how long confidentiality obligations will be upheld.
    - Ownership and transfer of ownership of results: to facilitate the matter of joint ownership a written agreement between the partners involved can be signed;
    - Protection and exploitation of results: it is important to regulate the IP protection of results capable of industrial or commercial application.
    - Background and Access rights: the rules for using the background of other partners must be established.
    - Settlement of disputes: define the rules in case of disputes on IP arising during the project implementation.
- **Conclusion phase**: project partners must be aware that obligations concerning IPR management and certain provisions in the agreements remain in force after the project conclusion. Confidentiality obligations, transfer of results, obligations to protect results capable of commercial exploitation must be considered also after the successful end of the project.

As previously mentioned within this document, Z-BRE4K consortium has already established a set of rules to manage Intellectual property within both the Section 3 of the Grant Agreement and the Section 9 of the Consortium Agreement at the proposal stage of the project. While the Grant agreement regulates the rights and obligation between the beneficiaries and the

[2] Your Guide to IP in Horizon 2020, IPR Help Desk
https://www.iprhelpdesk.eu/sites/default/files/documents/EU-IPR-IP-Guide.pdf

European Commission, the Consortium Agreement sets out the legal basis related to the implementation of the project among the partners.

Z-BRE4K IP management strategy aims to recognize from the beginning any potential disputes arising from the implementation of the project. To be effective in achieving this goal the Dissemination and exploitation manager will organize a workshop focused on the further characterization of project results and on the establishment of the ownership of the knowledge and know-how that each result implies.

The methodology followed by Z-BRE4K consortium will be the following:

a. A **preliminary training session on IP and its relationship with the exploitable results** will be carried out by the Dissemination and Exploitation Manager (DEM) indicatively during M13. The webinar will deal with the consolidated methodology that the consortium will use for the exploitable results and IP assets characterization. The training will be organized into two sections. The first one will address Exploitable Results-related concepts: what they are, what type of information project partners should report for a more detailed characterization, who are the right organization profiles to be involved in their definition/assessment, etc. The second section will be oriented to IP issues: background and foreground concepts will be introduced, the rules of H2020 program on IP will be explained to create awareness among the partners on IP issues and the importance of their contribution towards the maximization of the project impact.
b. Each partner will be **individually interviewed by the Dissemination and Exploitation Manager**. Starting from the preliminary list of Exploitable Results, *ad hoc* and customized questions will be outlined for each partner to better describe the results and to collect more specific data on the exploitation vision.
c. During the third periodic meeting (M16), the Dissemination and Exploitation manager will hold a workshop wherein the results of the work attained so far will be presented to the whole consortium, focusing on the foreground and background matrixes preliminary filled by the Dissemination and Exploitation Manager, where it is shown the knowledge that each partner contributes for each exploitable result. Partners will be asked **to further assess the matrixes indicating potential foreground or background in other partners' exploitable results**.
d. The same table will be subsequently filled with regards to the **exploitation claims** expressing the intention of the partners to exploit the results by:
    - making them and selling them (S)
    - using them internally to make something else for sale (U). U applies also to universities willing to use the result in new research projects.
    - to license them to 3rd parties (L);
    - to provide services (i.e.: consultancy) (C).
e. A final matrix will summarize the previous ones highlighting potential synergies or eventual criticalities like partners that claim the intention to exploit nearly all the exploitable results even by means of activities that are not typical of a the organization they belong to, that declare the intention of exploiting the project outcomes in any

possible way apparently without any specific business model in their mind, possibility of arising disputes on the ownership.

Following this methodology Z-BRE4K consortium should achieve a more detailed characterization of the results, a clearer vision for their exploitation and a more defined IP management strategy (indicatively by M18). Topics like the business plan and market replication of Z-BRE4K exploitable results will be more deeply addressed in the deliverables of WP7, however the Plan for Exploitation and Dissemination of Results will briefly touch upon these topics in relation to the exploitable results description.

The information collected so far will be included in an updated version of the D8.2 that will be presented at the Review Meeting at M18.

3.4.1 Foreground IP and Background IP

The European Participant Portal glossary defines:

- **Background** as "Any data, know-how and/or information, whatever its form or nature (tangible or intangible) including any rights such as intellectual property rights which are needed to carry out the project or exploit its results".
- **Foreground** as "Any tangible or intangible output of the action (such as data, knowledge and information, whatever their form or nature, whether or not they can be protected), which are generated in the action, as well as any attached rights, including intellectual property rights".

This chapter will contain the previously mentioned tables filled by each partner claiming the knowledge that each one of them contributes for each exploitable result:

Table 4 Exploitation Strategy Matrix on Background/Foreground IP

RESULTS/ PARTNERS	RESULT 1	RESULT 2	RESULT 3	RESULT 4	RESULT 5	…	RESULT N
AIMEN							
ATLANTIS							
BRUNEL							
CORE							
INNOVALIA							
FRAUNHOFER							
CRIT							
SACMI							
TRIMEK							
GESTAMP							
INOVA							

RESULTS/ PARTNERS	RESULT 1	RESULT 2	RESULT 3	RESULT 4	RESULT 5	…	RESULT N
HOLONIX							
EPFL							
PHILIPS							
IMEC							
CDS							
AIC							

Potential synergies and criticalities arising from the tables will be discussed during the workshop of the 3rd Periodic Meeting. Furthermore, the Dissemination and Exploitation manager will organize individual call to mitigate potential problems or promote and support the synergies arising among partners.

3.4.2 Exploitation and IP claims

This section will be implemented at a later stage of the project and it will be updated in a subsequent release of the PEDR.

3.5 Key exploitable results

This section will be implemented at a later stage of the project and it will be updated in a subsequent release of the PEDR.

4 CONCLUSIONS

The document has outlined the strategy to be followed by the consortium with regards to the communication, dissemination and exploitation activities. The aim of the plan is to lay the foundation to maximize the impact of the project during its duration and beyond its lifetime.
This first draft of the deliverable has been focused on the description of the steps to reach the stated goals and it includes a preliminary description of the exploitable results. Once the workshop on the exploitation will be carried out and a more detailed description of the exploitable results will be outlined, the relative exploitation visions business model will be developed.

5 REFERENCES

- J. Scherer, Addressing Impact and Exploitation in Horizon 2020 proposals, European IPR Helpdesk (2017)
- J. Scherer et al., Making the Most of Your H2020 Project, European IPR Helpdesk (2018)
- IP Management in Horizon 2020: project proposal, European IPR Helpdesk (2014)
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