D7.4 Identification and assessment of intermediate exploitable results

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1   EXECUTIVE SUMMARY

This document upgrades, summarizes and deals with the management of the exploitable results for the COREWIND project. This activity will gain precision and become sharper as developments will progress, therefore getting closer to the result exploitation. It will use the identified results from D7.3 (M18) as a starting point, also taking the inputs from the last 9 months (M27) of development in the COREWIND project.

This deliverable summarizes the COREWIND project Exploitable Results (ER) and their exploitation vision, serving as an intermediate analysis of their progress. It characterizes their distinctive features, maturity levels and steps needed to maximize exploitation, market uptake and commercialization. It is part of Work Package WP7 (Standardization, Commercialization and Exploitation Actions) and specifically of Task T7.2 (Competence analysis, identification and management of exploitation results). T7.2 activities, initially reported in D7.3, will continue to accompany the development of the results until M36, with a final document D7.5. They will run in parallel to the technical development to ensure readiness of market entry, while at the same time shaping the development paths to increase the strengths and limit the weaknesses.

In total, after evaluating the status of the project, a list of 20 ER have been identified and characterized at this stage: 11 "Products/Application", 4 "Services'', 5 "Knowledge & IP''. As part of the activities foreseen in this task, SWOT analysis and Value Proposition Map analysis have been carried out and are documented. Further analysis and exploitation strategy refinement will be documented in D7.5 in M36, also leveraging the acquired specific knowledge (e.g., market and stakeholder analysis, standardization needs). The analysis documented in this report (and in its following update) will be used to define exploitation plans (T7.3) and commercialization plans (T7.4).

2 Introduction and Methodology

Offshore wind generation is currently an expansive market and a lot of interest has been placed in recent years on floating technologies that have several advantages, including access to deep-water sites with more stable wind speeds. However, floating offshore wind is facing several challenges, including those related with corrosion, fatigue, erosion, lightning strikes and biofouling, just to name a few.

Offshore wind technology still needs to overcome some market barriers, mainly related to technical, social and economic (i.e., cost) aspects. The objective of this deliverable is to identify and initiate the management of the Exploitable Results (ER) of the COREWIND project as well as to create the framework for their post-project market uptake and exploitation. The outcome is a list of exploitable results and a methodology for a structured and synchronized approach to deal with them during the project. In this way, all available opportunities are identified, actions planned and executed and the project partners can start to develop business plans for their exploitable results. In the project, exploitable results provide a mechanism to define impact and strategy. After the project completion, exploitable results provide the way to achieve their impact.

This deliverable D7.4 is the second version of the final one, which is due M36 (D7.5) and an upgrade on D7.3, the first of the series, where initial exploitable results were identified. The list of exploitable results presented in D7.3 has been analysed, reviewed and updated to take into account progress made until M27 of the COREWIND project. As part of T7.2, SWOT analysis, Value Proposition Map and the fit between costumer/market needs (defined in T7.1) will be performed. SWOT analysis and Value Proposition Map analysis of key exploitable results are documented in this deliverable.

As a base definition, Exploitable Results are the achieved and/or expected results coming from the COREWIND project that will have an impact on economy, environment and/or society as a whole. These results have commercial or social significance and can be exploited as stand-alone products, processes, services, etc. In principle, these exploitable results might need further R&D, prototyping, engineering, validation after the project ends and before they become commercially exploitable. This set of exploitable results also includes "softer" results such as the platforms, publications of a journal article, a methodology or piece of knowledge that can be "shopped" to create contacts, first adopters, networks or other opportunities. However, often exploitable results are more tangible and concrete with therefore envisioned economic benefits for developers/owners.

The journey of exploitable result identification and management is exciting and should encourage "an entrepreneurial spirit" and "culture of innovation" within the project. Part of this spirit is captured in Figure 1 to communicate the vision of the exploitable results process.
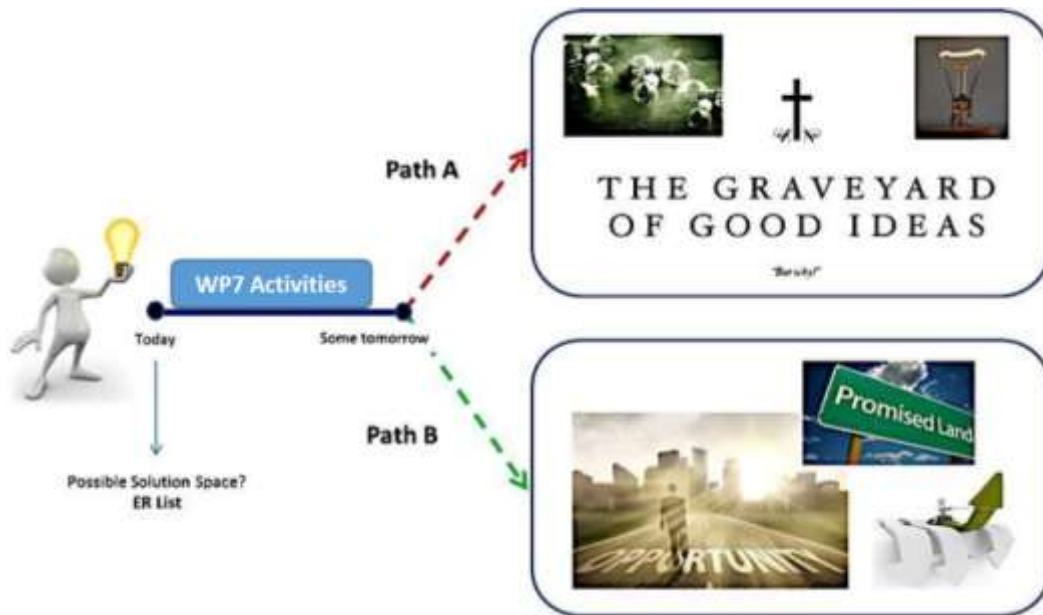
Figure 1: The journey of exploitable result identification and management. Outcomes.

<u>Considering Innovation Levels and Providing a Benchmark Reference</u>

It is helpful to provide reference points and benchmarks in the identification, communication and development of exploitable results related to innovation level and technology readiness levels. We do this using the concepts shown in Figure 2.

In considering these figures and concepts, it may be the case that Innovation Level or TRL may not be directly applicable to each type of exploitable result. However, they do provide one measure of "what is the progress beyond the state of the art?", "what is the current readiness of the ER in question?" and ''how far are they from commercialization/market entry?'' As a general objective, the COREWIND project aims to bring the project results to TRL 5, technology validated in a relevant environment. As the different ERs identified during the project are of different nature, some of them might even achieve a higher TRL at the end of the project.
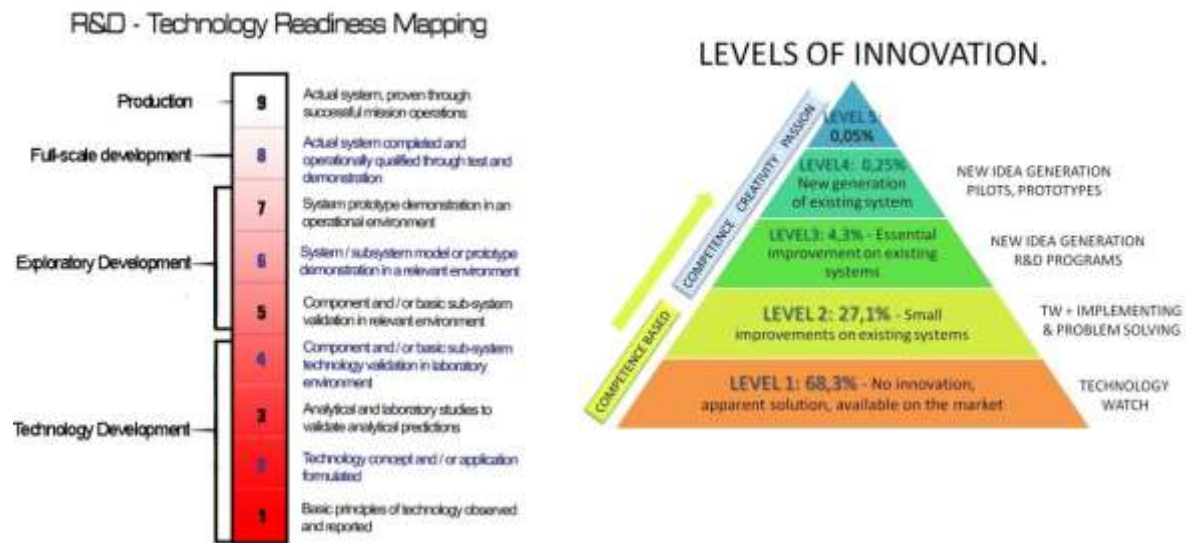
Figure 2. Innovation and TRL levels when communicating ERs

Exploitable Result Categories

Exploitable results can be categorized into several areas. They are not rigid and in the context of COREWIND the following areas are used:

- **Products** – items for sale
- **Processes** – ways to make or do something
- **Knowledge & Intellectual Property (IP)** – valuation of "how to"
- **Services** – by offering the above products, processes, equipment, or knowledge
- **Other** – Platform, publications, patent….

Exploitable Result Definition Points

From an Exploitation Strategy Seminar (ESS) provided by the Meta Group, the following items are key points to consider in the shaping and development of exploitable results. These points are not included in this deliverable (identification) but instead are part of the development and management process that will occur across the project and will be included in the updates.

- Innovativeness introduced compared to already existing Products/Services
- What is the Unique Selling Point (competitive advantage)?
- Product/Service market size?
- Market Trends/Public acceptance?
- Product/Service positioning?
- Legal or normative or ethical requirements (need for authorizations, compliance to standards, norms, etc.)?
- Who are the competitors for this result?
- Prospects/Customers?
- What are the costs to be incurred after the project end and before commercial exploitation?

- When is the time to market?
- Foreseen Product/Service price?
- Adequateness of consortium staff?
- External experts/Partners to be involved?
- Status of IPR: Background (type and partner owner)?
- Status of IPR: Foreground (type and partner owner)?
- Status of IPR: Exploitation forms (type and partner owner) e.g. direct industrial use, patenting, technology transfer, license agreement, publications, standards, etc?
- Which partner contributes to what (main contributions in terms of know-how, patents, etc.)?
- Partner(s) involved expectations?
- Sources of financing foreseen after the end of the project (venture capital, loans, other grants, etc.)?

3 Exploitable results – Consolidated view

The following ERs are an update of the ER list presented in D7.3, taking into account progress made in the COREWIND project up to M27. Each ER is assigned to a/several manager(s) who is/are responsible for providing information and updates on the result, defining the steps needed to reach full exploitation and launching it eventually into the market. This process is managed and supported by IREC. In the case of "Knowledge & IP" the ER Manager is likely associated to the IP owner(s). In total 11 "Products/Application", 5 "Services", 4 "Knowledge & IP" have been identified, as illustrated in Table 1.

Table 1 - Consolidated view of exploitable results

#	Type of ER	Exploitable Result	WP	ER Manager
1	Product /Service	FOWAPP	6	IREC
2	Product	DigitalTwin for FOWT	4	IREC
3	Product	Optimized mooring design – WindCrete	2	Innosea
4	Product	Optimized mooring design – ActiveFloat	2	Innosea
5	Product	WindCrete 15MW	1	Universitat Politècnica de Catalunya
6	Product	ACTIVEFLOAT floating structure	1	COBRA - ESTEYCO
7	Product/ Software Feature	HAWC2 software new modelling capability: Floating Wind Farm Modeling	1	DTU
8	Product/Software	Open-Source Software	1	University Stuttgart
9	Product/Software	Software	1	University of Stuttgart
10	Service	O&M planning and strategy tool	4	Ramboll
11	Service	Refinement of certification process for FOWT	7	UL
12	Service	Improved testing concept for FOWT	7	UL
13	Service	BIM model	4	Ramboll
14	Knowledge & IP	Floating Turbine wake Investigation	1	DTU
15	Knowledge & IP	Floating wind turbine Installation Modeling	4	DTU
16	Knowledge & IP	Limits of heavy-lift maintenance, large component exchange	4	Ramboll
17	IP	Innovative shared mooring system	1-2	University of Stuttgart
18	Product	1st campaign of experimental tests related to mooring and cable dynamics in COCOTSU flume		FIHAC
19	Product	2nd campaign of experimental tests related to integrated FOWT in Cantabrian Coastal and Ocean Basin and in Wind Tunnel		FIHAC and POLIMI
20	Service	Best practices and testing recommendations for experimental modelling of mooring and cable dynamics for FOWT		FIHAC

4   SWOT & Value Proposition Map

In order to complete the analysis of the exploitable results and adapt the exploitation strategy to the market and potential customers, further analysis has been made of key exploitable results. With this goal, SWOT analysis and Value Proposition map analysis are perfomed.

SWOT analysis, where strengths, weaknesses, opportunities and threads are identified for each ER, is designed for use in the preliminary stages of decision-making processes, as it helps identify the internal and external factors that are favorable and unfavorable to achieving the desired exploitation of the ER. SWOT analysis can also help to identify the competitive advantage of the analysed technology.

Value proposition map, on the other hand, is a useful tool to identify a complete list of benefits and advantages compared to competitors, pain relievers that costumers/markets expect, making it easier to find a match between the developed product or service and the customer expectations.

The specific concepts taken into account in the SWOT analysis for each of the aspects (strengths, weakenesses, threats and opportunities) and in the Value Proposition Map (consumer pains & gains, ER pain relievers & gain creators) are defined in the tables below, based on the input from the COREWIND project partners, and will help ER owners to gain knowledge on their ER value and evaluate the foreseen exploitation strategy.

SWOT

INTERNAL	STRENGTHS	An exploitable result must meet the market/customer specific demand and must have a strategic advantage among other competitors. The strengths might include price, perceived value, customer service, unique features, online or retail store availability or a warranty.
	WEAKNESSES	The ER however, may be at disadvantage regarding the competitors. The weaknesses might include selling at break-even or at a loss for a short time, customer loyalty to other brands, expenses on marketing/promotion, etc.
EXTERNAL	OPPORTUNITIES	Considered as external elements that could be exploited to the advantage of our result.
	THREATS	Considered as external elements that could present trouble to the exploitation of the result. Competitors are likely to react against new products/services in the marketplace and thus take measures that may cause you a disadvantage.

Value Proposition Map

CUSTOMER SIDE: description of what customers are trying to get done in their work.	PRODUCT/SERVICE SIDE: list of all the products and services a value proposition is built around.
PAINS: description of bad outcomes, risks and obstacles related to customer jobs.	PAIN RELIEVERS: description of how products and services alleviate customer pains.

GAINS: description of the outcomes customers want to achieve or the concrete benefits they are seeking.	GAIN CREATORS: description of how products and services create customer gains.

5   Conclusions

This deliverable updates and upgrades the exploitation strategy of the COREWIND project Exploitable Results. New ERs have been added to the list of those previously identified and undergone the same analysis (assignment of a manager, innovation characterisaton, initial and final TRL, exploitation vision and actions foreseen). In total, 20 Exploitable Results (ER) are currently identified and characterized: 11 "Products/Application", 4 "Knowledge & IP" and 5 "Services".

As a step forward in the process of exploitable result management initiated in D7.3, this deliverable includes tools to discuss, explore and develop the exploitation potential for the generated results. In this sense, SWOT analysis and Value Proposition Map Fit between desired features and benefits have been carried out to validate the exploitation strategy envisaged for each ER. The activities will be aligned with other tasks, namely Market and Stakeholder analysis (T7.1) and be critical for the definition of exploitation plans (T7.3), and commercialization plans (T7.4). As described above, the expected TRL at the end of the project is TRL 4-6, therefore additional development will be required and will also be the focus of activities in WP7.

In particular, the methodology to analyse the exploitation potential of the identified ERs and validate the exploitation strategy foreseen for each of them has been presented. Using widely known and useful tools like SWOT analysis and Value Proposition map, ER owners have been able to reflect on internal strengths and weaknesses of their technology and pair them with external threats and opportunities of the market. Furthermore, the ER owners considered the pains customer go through with the current state of the art technologies in the market and how their solutions can solve those particular issues along with the gains they would like to achieve and, accordingly, how the COREWIND solutions can contribute.