D9.2-Exploitation plan update

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Responsible:	**C-ECO**
Contributors:	**BOSCH, CIR, KTH, SIMAVI, FHG, TUD, MU, HOMIE, GOR, SIG**
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This is a draft document and subject to approval for final version. Therefore the information contained herein may change.

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History of Changes

Version	*Date*	*Modification reason*	*Modified by*
0.1	14.10.2022	Initial Draft	Konstantinos Georgopoulos
0.2	02.11.2022	Quality check - FHG	Jan Koller
0.3	11.11.2022	Quality check - KTH	Sayyed Shoaib Ul Hasan
0.4	21.11.2022	Final Draft for review	Konstantinos Georgopoulos
1.0	30.11.2022	Final deliverable	Konstantinos Georgopoulos

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List of abbreviations

Abbreviation	*Explanation*
CE	Circular Economy
DIN	Deutsches Institut für Normung (German Institute for Standardisation)
ICT	Information and Communications Technology
ISO	International Standard Organization
N/A	Not applicable
OEM	Original Equipment Manufacturer
TRL	Technology readiness level

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1. Executive Summary

This report describes the updated exploitation plan for the ReCiPSS project, a funded project by the European Union's Programme Horizon 2020, under Grant Agreement number 776577. The Deliverable 9.2 "Exploitation plan update" is related to the tasks 9.1 "Developing the exploitation strategy and plan" and 9.2 "Developing business cases and upscaling plans". The deliverable report provides the final common exploitation strategy and clear individual exploitation plan and exploitation trends within the consortium, as well as the communication and sustainability strategy to set up the basis for the future viability of the results developed in the ReCiPSS project.

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2. Introduction

2.1. Introduction

The project results can be used for many purposes, from commercial to societal, or scientific purposes, or for improving public knowledge, awareness, and action around the topics of circular economy and product service systems. The knowledge gained in ReCiPSS project could support policy makers or standardization on the topics of circular economy. Taking this into consideration, five result types were identified:

- Products,
- Processes,
- Know-how,
- Academic,
- Standardization/ Policy making.

Furthermore, a short description of each result is provided, followed by a market analysis and the marketability of the results, focusing on the potential users of the results, how the potential users will be contacted by the partners, what market needs might be solved/met thanks to the results and what outputs will be created, as well as the achieved technology readiness level (TRL) of each result.

Several events had been organized by the project partners for the exploitation of the project achievements. In this report, the exploitation events conducted are presented.

2.2. Document Scope

This document is a result from the tasks 9.1 “Developing the exploitation strategy and plan” and 9.2 “Developing business cases and upscaling plans. The report provides the final common exploitation strategy and clear individual exploitation plan and exploitation trends within the consortium, as well as the communication and sustainability strategy to set up the basis for the future viability of ReCiPSS.

As a European project financed by public funds, ReCiPSS partners want to ensure through the exploitation plan that the project results benefit the largest group of persons and reach wider target groups.

ReCiPSS has produced many types of results during the last 52 months. These results could be used for commercial, societal, or scientific purposes, or for improving public knowledge, awareness and action around the topics of circular economy and product-service-systems, but also, they could be used as recommendations for policy making or standardization.

As it was described in the draft version of the exploitation plan D9.1, the core strategy was to use the extensive contact network of each consortium members as a starting point to get in touch with new potential users of the ReCiPSS solutions. The industrial partners will develop own individual exploitation plans based on their contributions to the project and their business development strategy.

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The document describes the key exploitable results, their characteristics, the potential users and target groups who can benefit by the use of the results, the intent way of exploitation, their impact to the users, as well as the Technology Readiness Level of each individual key result.

2.3. Methodology

The "Exploitation plan draft" was delivered in M6 of the project (November 2018). As it is easily understood, many things changed the months after, mainly because of the outbreak of the COVID-19 pandemic in Europe at the beginning of 2020, that had influence to the project, its planning, its results but also on the exploitation activities. While the "Exploitation plan draft" focused on the partners and their potential results, the *"Exploitation plan update"* focuses on the final project results developed by the partners during the whole project period.

For the scope of this report, all the project results were collected, for example on basis of the IPR registry, see deliverable D9.4, and listed. Then, the partners were asked to evaluate the marketability of these results by defining the target group or audience who would be interested in the usage of the results, explaining how they intent to exploit the results and the reasons of expected impact by the users. Furthermore, all the results are listed together as common results of the ReCiPSS project, and not under a specific demonstrator, as one of the main targets is the transferability of the results to different industries and not exclusively on automotive or white goods.

Finally, several events took place in order to support the activities of the exploitation of the results and solutions offered by ReCiPSS. An extensive list of the events is also included in this deliverable.

2.4. Document Structure

The introduction, the document scope and the methodology are described at the second chapter followed by the final key exploitable results at the third chapter. A list with all the achievements is presented together with the type of each result and the responsible partner, before the Individual results are explained in more detail in the respective tables. At the fourth chapter the exploitation events are listed with focus on the highest attraction of interest by industrial, academic and policy makers stakeholders. At the final chapter an analysis of the key exploitable results is presented as a conclusion of the overall activities of the partners.

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3. Exploitation results

3.1. Key exploitable results

3.1.1. Paragraph

Table 1 shows a list of key exploitable results developed in the ReCiPSS project. In addition to the exploitable result, the industry to which it can be assigned (automotive or white goods) the type (product, process or other) to which it corresponds and the partner(s) who developed the result are shown.

Table 1: Key exploitable results

No.	Key exploitable result	Type	Partner(s)
1	Impacting on the implementation of CE in industry, by working in DIN and ISO standardization activities.	Standardization	C-ECO
2	Core management as a service	Product	C-ECO
3	Concept of transferable core return options to enable circular business models	Process	C-ECO
4	Digital infrastructure and systems to incorporate and manage options ("right-to-return")	Process	C-ECO
5	Educational material: Case studies for masters and PhD courses on Circular Economy	Academic	KTH
6	Commercialization of multi-method simulation models for modelling of circular manufacturing systems	Know-how	KTH
7	Knowledge base: exploit the knowledge base created from the ReCiPSS project for further research and industrial implementation	Know-how	KTH
8	Circular business model development	Know-how	MU
9	Market analyses and marketing strategies	Academic	MU
10	Methodology for mapping and assessment the circular business model innovation process	Process	MU
11	Guidelines for the systematic risk assessment	Academic	MU
12	Mini-case studies and tasks for master's degree students on circular business models	Academic	MU
13	New core selection process for latest generation of common rail injectors.	Process	BOSCH
14	Metal 3D Printing Spare Parts for Remanufacturing of a Diesel Injection Pump	Process	BOSCH
15	Bilateral advice to industrial partners on setting up the necessary return logistics to implement remanufacturing.	Know-how	FHG
16	Educational Material for professionals and students on Circular Economy with a special emphasis on Reverse Logistics	Academic	FHG
17	Placed, installed, and connected the demonstrator models in the market	Process	HOMIE
18	Shared insights/information with Participants regarding Homie Pay-Per-Use existing Pay-Per-Use Business	Know-how	HOMIE
19	Exploratory conversations and ideas with Participants regarding Pay-Per-Use Payment Systems and Platform	Know-how	HOMIE
20	The methodology, conceptualization (a) meta models, b) scenarios for centralization and decentralization and c) trade-off analysis for environmental and economic performance) of circular value and supply chains simulations will be used to create more detailed models of circular supply chains.	Know-how	CIR
21	The circular supply chain framework developed from the WP4 learnings will be used to train strategy and sustainability professionals (as seminars and workshops).	Know-how	CIR
22	Mapping Gorenje's journey of implementing Pay-per-wash value proposition and publishing as a case study in an academic journal (e.g., business or strategy)	Academic	CIR
23	Writing a case study on the development of ReCiPSS platform and publishing in an academic journal.	Academic	CIR
24	Tools for assisting companies in becoming more circular	Know-how	TUD
25	User interface platform for user interaction regarding the options management - source code	Product	C-ECO/ SIMAVI
26	User interface platform for centralizing the three sub-UI frontends (options management, company management and support) - source code	Product	C-ECO/ SIMAVI

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27	User interface platform for user interaction regarding the company management - source code	Product	C-ECO/ SIMAVI
28	User interface platform for user interaction regarding the support management - source code	Product	C-ECO/ SIMAVI
29	Development and contribution to backend APIs for option management in displaying reports into interactive formats (histograms, pie charts, quota)	Product	C-ECO/ SIMAVI
30	New approach on collecting additional product-information to CRI-cores and linking it for circular use to an original marking (2D-code) which has been applied to the product in initial production	Product	C-ECO/ SIMAVI
31	Development and implementation of an interface (API) to communicate used-parts return options between IT-systems	Product	C-ECO/ SIMAVI
32	Software platform to digitally incorporate and manage options ("right-to-return") - source code	Product	C-ECO/ SIMAVI
33	Long lasting ASKO washing machine (construction and inbuilt algorithms)	Product	GOR
34	E-wallet for pay-per-use deployment	Product	GOR
35	Web store	Product	GOR
36	ConnectLife app for long lasting ASKO washing machine	Product	GOR
37	Installed demonstrators on four different markets	Know-how	GOR
38	Built the ReCiPSS backend server and developed connector APIs to existing business systems such as SAP and SAGH+ (connectors to and from IoT platform)	Product	SIG
39	Further developed the ReCiPSS backend server in order to support processes such as billing, feedback, contract changes	Product	SIG
40	Connect data from business systems and IoT, create AR experience and publish the data	Product	SIG
41	Created User stories and use cases to develop backend service	Know-how	SIG

The individual exploitable results are presented in detail below. The type of the results, their characteristics, the target groups and how these groups will be reached by the project partners, the reasons that these results are considered key exploitable results and why are important for the project and the target groups, as well as the achieve technology readiness level will be discussed in more detail.

Table 2: Result by C-ECO (Standardization)

1. Impacting on the implementation of CE in industry, by working in DIN and ISO standardization activities.	
Partner	C-ECO
Type of Result	Standardization/ Policy making
Characteristics	Input into ISO TC323 (Designation of ISO 59010). Participating on DIN CE Roadmap committee.
Target market/ Audience	Users of ISO and DIN standards (Industry, academia, research, etc.)
Intent way of exploitation	Influencing standard basing on learning and results from ReCiPSS project
Reasons of expected impact	Speed up the transition to CE and Circular Manufacturing Systems. Shifting to CE business models. Standardization is missing for the transition to CE.
TRL	N/A

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Table 3: Result by C-ECO (Product)

2. Core management as a service	
Partner	C-ECO
Type of Result	Product
Characteristics	Service-offer for automotive parts traders to manage physical and commercial core return procedures for them.
Target market/ Audience	Automotive Aftermarket Other industries focusing on remanufacturing
Intent way of exploitation	Marketing and selling of service product to wholesalers/ dealers of car parts and remanufacturers.
Reasons of expected impact	Create transparency in core return processes especially for wholesalers. Enable outsourcing of physical core handling w/o losing control; Increase & optimize core return rates for remanufacturing
TRL	9

Table 4: Result by C-ECO (Process/ concept)

3. Concept of transferable core return options to enable circular business models	
Partner	C-ECO
Type of Result	Process/ Concept
Characteristics	Apply concept of transferable options (warrants) from financial industry to CE. Manage complex reverse supply chains basing on financial incentives.
Target market/ Audience	Automotive Aftermarket Other industries where return of used products needs to be managed
Intent way of exploitation	Use concept to express demand for used products and trigger returns. Enable new business models in CE.
Reasons of expected impact	Incentivize the returns of specific used products. Link product attributes and conditions to commercial return conditions. Establishing an industry standard for returns of used products.
TRL	7-8

Table 5: Result by C-ECO (Process/ concept)

4. Digital infrastructure and systems to incorporate and manage options ("right-to-return")	
Partner	C-ECO

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Type of Result	Process/ Concept
Characteristics	Providing core return option as digital entities. Allowing creation, exercising, transfer and expiring of core options. Providing APIs and UI for users to connect to the digital infrastructure.
Target market/ Audience	Users of "Core Management-As-A-Service"
Intent way of exploitation	Use to deliver "Core Management-As-A-Service"
Reasons of expected impact	Creation, exercising, transfer and expiring of core options.
TRL	6-7 (for Automotive Wholesalers); 4-5 for other users/ industries

Table 6: Result by KTH (Academic)

5. Educational material: Case studies for masters and PhD courses on Circular Economy	
Partner	KTH
Type of Result	Academic / Educational material
Characteristics	Presentations and lectures based on project results
Target market/ Audience	Students/ Industry professionals
Intent way of exploitation	Courses, workshops, seminars
Reasons of expected impact	Expedite the education on Circular Manufacturing Systems
TRL	N/A

Table 7: Result by KTH (Know-how)

6. Commercialization of multi-method simulation models for modelling of circular manufacturing systems	
Partner	KTH
Type of Result	Know-how
Characteristics	Multi-method simulation models used for consultancy purposes. Simulation models for decision support in implementing Circular Manufacturing Systems
Target market/ Audience	Manufacturing Industry or equivalent

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Intent way of exploitation	Consultancy support and bilateral research projects
Reasons of expected impact	Speed up the transition to CE and Circular Manufacturing Systems
TRL	4

Table 8: Result by KTH (Know-how)

7. Knowledge base: exploit the knowledge base created from the ReCiPSS project for further research and industrial implementation	
Partner	KTH
Type of Result	Know-how
Characteristics	Knowledgebase created from the ReCiPSS project. Knowledgebase based on Scientific publications, deliverables, these and technical reports.
Target market/ Audience	Academia and Industry
Intent way of exploitation	Research projects and other forms of industrial collaboration
Reasons of expected impact	Speed up the transition to CE and Circular Manufacturing Systems
TRL	N/A

Table 9: Result by MU (Know-how)

8. Circular business model development	
Partner	MU
Type of Result	Know-how
Characteristics	Based on the market analyses macroenvironment), interviews with demonstrators, empirical research and literature review alternative circular business models for both demonstrators were developed. Some characteristics within several elements can be generalized.
Target market/ Audience	Any company aiming to innovate/transform business models to be circular one.
Intent way of exploitation	Published to the wide audience via zenodo.org (open access).
Reasons of expected impact	Awareness and understanding of the challenges of circular business model innovation/transformation and of circular business model development.

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TRL	N/A

Table 10: Result by MU (Academic)

9. Market analyses and marketing strategies	
Partner	MU
Type of Result	Academic/ Educational material/ Know-how
Characteristics	Results from the direct and indirect competitor analyses were used to formulate marketing strategies for both demonstrators. Some of the logic (e.g., factors analysed) could be generalised.
Target market/ Audience	Students/ Industry professionals
Intent way of exploitation	Courses, workshops, seminars
Reasons of expected impact	
TRL	N/A

Table 11: Result by MU (Process)

10. Methodology for mapping and assessment the circular business model innovation process	
Partner	MU
Type of Result	Process
Characteristics	Innovation process to adapt/change or develop circular business model should be mapped and assessed to understand and learn challenges and barriers in the process for the potential future use. Methodology was developed for both demonstrators based on the literature review. Methodology could be generalised.
Target market/ Audience	Any company aiming to innovate/transform business models to be circular one.
Intent way of exploitation	Published to the wide audience via zenodo.org (open access).
Reasons of expected impact	Awareness and inspiration of how to evaluate processes of innovation/change management and associated challenges related to the circular business models - methodology
TRL	4 (Research to prove feasibility)

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Table 12: Result by MU (Academic)

11. Guidelines for the systematic risk assessment	
Partner	MU
Type of Result	Academic/ Educational material/ Know-how
Characteristics	Literature review and results from the mapping and assessment of the innovation process of both demonstrators lead to the guidelines for the systematic risk assessment of the innovation process.
Target market/ Audience	Any company aiming to innovate/transform business models to be circular one.
Intent way of exploitation	Published to the wide audience via zenodo.org (open access).
Reasons of expected impact	Awareness and inspiration of how to systematically assess the risk of business model innovation/transformation to become circular one – guidelines.
TRL	N/A

Table 13: Result by MU (Academic)

12. Mini-case studies and tasks for master's degree students on circular business models	
Partner	MU
Type of Result	Academic / Educational material
Characteristics	Case studies and task for education were created for the courses Marketing, International marketing, operations management, Corporate Social responsibility and Business Ethics to understand and solve different aspects of circular business models development and realization.
Target market/ Audience	University professors, students and researchers.
Intent way of exploitation	Education
Reasons of expected impact	Understanding of the different challenges circular business models development brings with.
TRL	N/A

Table 14: Result by BOSCH (Process)

13. New core selection process for latest generation of common rail injectors.	
Partner	BOSCH

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Type of Result	Process
Characteristics	Result is an improvement during core selection concerning data quality like elicitation of OE numbers, production date, core age. This information even linked to the single core by using the 2D code that is unique on each injector. Elaborated data used for new reman project approach and also usable in the reman production process. Improvement of process efficiency. Possibility to adapt the new core selection process to other product groups.
Target market/ Audience	Internal use also for other product groups.
Intent way of exploitation	Internal communication of the results to the relevant departments/ workshops/ showcasing the results.
Reasons of expected impact	Availability of qualitative data can help the new reman projects, as well as the remanufacturing process.
TRL	9

Table 15: result by BOSCH (Process)

14. Metal 3D Printing Spare Parts for Remanufacturing of a Diesel Injection Pump	
Partner	BOSCH
Type of Result	Process
Characteristics	It was proven that 3D metal printing becomes more and more attractive. But there are still hurdles concerning the technical and process release for automotive standards.
Target market/ Audience	Internal use of the results
Intent way of exploitation	Internal communication of the results to the relevant departments/ workshops/ showcasing the results.
Reasons of expected impact	N/A
TRL	9 (installed)

Table 16: Result by FHG (Know-how)

15. Bilateral advice to industrial partners on setting up the necessary return logistics to implement remanufacturing.	
Partner	FHG
Type of Result	Know-how

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Characteristics	Multi-method simulation for the evaluation of different scenarios in the reverse supply chain of used products. Procedure for planning, implementing and optimising the reverse supply chain using AnyLogic.
Target market/ Audience	Industry companies that need to set up return logistics in order to be able to enter remanufacturing or want to optimise it.
Intent way of exploitation	Bilateral Projects
Reasons of expected impact	Establishment of new recovery systems to enable remanufacturing of technical products. Optimisation of existing reverse supply chains with regard to ecological and economic sustainability.
TRL	4 (Research to prove feasibility)

Table 17: Result by FHG (Academic)

16. Educational Material for professionals and students on Circular Economy with a special emphasis on Reverse Logistics	
Partner	FHG
Type of Result	Academic
Characteristics	Educational Material in form of presentations, case studies, exercises to promote the circular economy within industry and research.
Target market/ Audience	Professionals and students of the University of Bayreuth
Intent way of exploitation	Education
Reasons of expected impact	Raising awareness of the circular economy and understanding the principles of return logistics.
TRL	9

Table 18: Result by HOMIE (Process)

17. Placed, installed, and connected the demonstrator models in the market	
Partner	HOMIE
Type of Result	Executive work/ Process
Characteristics	Installed 30 washing machines with 30 users in the Netherlands
Target market/ Audience	Final users of washing machines

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Intent way of exploitation	Marketing and selling of service offer
Reasons of expected impact	Understanding of the feasibility and market for pay per use
TRL	5-6

Table 19: Result by HOMIE (Know-how)

18. Shared insights/information with Participants regarding Homie Pay-Per-Use existing Pay-Per-Use Business	
Partner	HOMIE
Type of Result	Know-how
Characteristics	Creating awareness and insights regarding Pay-Per-Use as a stimulation and motivation instrument to enhance sustainable behaviour. We have learned that Pay-Per-Use in a Domestic surroundings are hard to succeed. Pay-Per-Use models are for the best combined with shared-use applications.
Target market/ Audience	The methodology for enhanced decision-making can used to create more detailed models of circular supply chains.
Intent way of exploitation	HOMIE is already operating a successful pay per use model in the market. Through this process, HOMIE has generated additional insight on (B2B markets / Platform).
Reasons of expected impact	-
TRL	5-6

Table 20: Result by HOMIE (Know-how)

19. Exploratory conversations and ideas with Participants regarding Pay-Per-Use Payment Systems and Platform	
Partner	HOMIE
Type of Result	Know-how
Characteristics	Creating awareness and insights regarding Pay-Per-Use as a stimulation and motivation instrument to enhance sustainable behaviour.
Target market/ Audience	End-users of washing machines
Intent way of exploitation	Additional insights are enriching knowledge of the offer for final users.

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Reasons of expected impact	The exchanges with ATAG supported the development of their Pay-Per - Use / Tracker business model
TRL	5-6

Table 21: Result by CIR (Know-how)

20. The methodology, conceptualization (a) meta models, b) scenarios for centralization and decentralization and c) trade-off analysis for environmental and economic performance) of circular value and supply chains simulations will be used to create more detailed models of circular supply chains.	
Partner	CIR
Type of Result	Know-how
Characteristics	The methodology for enhanced decision-making can used to create more detailed models of circular supply chains.
Target market/ Audience	Sustainability, Business strategy and operations professionals
Intent way of exploitation	Seminars and workshops
Reasons of expected impact	The circular supply chain models developed in WP4, will be used as a decision-making tool for the companies when going circular.
TRL	5-6

Table 22: Result by CIR (Know-how)

21. The circular supply chain framework developed from the WP4 learnings will be used to train strategy and sustainability professionals (as seminars and workshops).	
Partner	CIR
Type of Result	Know-how
Characteristics	Circular supply chain framework will be further developed, tested, validated by different companies.
Target market/ Audience	Sustainability and Business strategy professionals
Intent way of exploitation	Seminars, workshops and a book
Reasons of expected impact	Any OEM interested in transforming their supply chain and business towards circular strategy will benefit from such seminars and workshops.
TRL	5-6

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Table 23: Result by CIR (Academic)

22. Mapping Gorenje's journey of implementing Pay-per-wash value proposition and publishing as a case study in an academic journal (e.g., business or strategy)	
Partner	CIR
Type of Result	Academic
Characteristics	In-depth case study based on interviews
Target market/ Audience	Consumer goods companies, researchers studying the implementation of the circular economy and sustainability and business professionals.
Intent way of exploitation	Seminars, workshops, publication
Reasons of expected impact	By documenting the opportunities and learnings of implementing the circular economy, the scholarly knowledge will be advanced and it will contribute to spearhead more circular business models.
TRL	4-5

Table 24: Result by CIR (Academic)

23. Writing a case study on the development of ReCiPSS platform and publishing in an academic journal.	
Partner	CIR
Type of Result	Academic
Characteristics	In-depth case study based on interviews
Target market/ Audience	Automotive companies, researchers studying the implementation of the circular economy and sustainability and business professionals.
Intent way of exploitation	Publication and seminars, workshops
Reasons of expected impact	By documenting the opportunities and learnings of implementing the circular economy, the scholarly knowledge will be advanced, and it will contribute to spearhead more circular business models.
TRL	4-5

Table 25: Result by TUD (Know-how)

24. Tools for assisting companies in becoming more circular	
Partner	TUD

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Type of Result	Know-how
Characteristics	The product journey map, Circular Product Readiness, Disassembly Map, and co-creation impact model are being used by students and companies.
Target market/ Audience	Students and industry professionals
Intent way of exploitation	Use within study and graduation project as well as product development
Reasons of expected impact	Students and professionals have practical tools and knowledge at their disposal to speed up transition to circular economy
TRL	4-5

Table 26: Result by C-ECO & SIMAVI (Product)

25. User interface platform for user interaction regarding the options management - source code	
Partner	C-ECO/SIMAVI
Type of Result	Product (IT component)
Characteristics	The user interface for user interaction regarding the options management is a sub-UI frontend for administration of the options, containers, payment obligations, charts statistics and quota histograms. Trade functionalities (transfer containers of options & create options) are filtered based on the user role.
Target market/ Audience	Automotive part OEMs Automotive aftermarket Consumers
Intent way of exploitation	These are the envisaged paths of exploitation: 1. utilisation of results as further reference for other projects of SIMAVI 2. joint ownership together with C-ECO; for the time being discussions are held between SIMAVI and C-ECO 3.licensing if there is the case 4. using results internally 5. selling results and providing services
Reasons of expected impact	In the actual economic and political context in Europe, the ICT components made within ReCiPSS- Automotive platform will support the diminution of raw materials consumption.
TRL	6-7

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Table 27: Result by C-ECO & SIMAVI (Product)

26. User interface platform for centralizing the three sub-UI frontends (options management, company management and support) - source code	
Partner	C-ECO/SIMAVI
Type of Result	Product (IT component)
Characteristics	The main frontend integrates qiankun functionalities that redirects the user to the specific sub-UI application based on user roles (Client, Company and Support)
Target market/ Audience	Automotive part OEMs Automotive aftermarket Consumers
Intent way of exploitation	These are the envisaged paths of exploitation: 1. utilisation of results as further reference for other projects of SIMAVI 2. joint ownership together with C-ECO; for the time being discussions are held between SIMAVI and C-ECO 3.licensing if there is the case 4. using results internally 5. selling results and providing services
Reasons of expected impact	In the actual economic and political context in Europe, the ICT components made within ReCiPSS- Automotive platform will support the diminution of raw materials consumption.
TRL	6-7

Table 28: Result by C-ECO & SIMAVI (Product)

27. User interface platform for user interaction regarding the company management - source code	
Partner	C-ECO/SIMAVI
Type of Result	Product (IT component)
Characteristics	The user interface platform for user interaction regarding the company management represents a sub-UI frontend for administration of the company accounts, company parameters, overview and users roles.
Target market/ Audience	Automotive part OEMs Automotive aftermarket Consumers
Intent way of exploitation	These are the envisaged paths of exploitation: 1. utilisation of results as further reference for other projects of SIMAVI

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	2. joint ownership together with C-ECO; for the time being discussions are held between SIMAVI and C-ECO 3.licensing if there is the case 4. using results internally 5. selling results and providing services
Reasons of expected impact	In the actual economic and political context in Europe, the ICT components made within ReCiPSS- Automotive platform will support the diminution of raw materials consumption.
TRL	6-7

Table 29: Result by C-ECO & SIMAVI (Product)

28. User interface platform for user interaction regarding the support management - source code	
Partner	C-ECO/SIMAVI
Type of Result	Product (IT component)
Characteristics	The user interface platform for user interaction regarding the support management represents a sub-UI frontend to administrate the support help for using the platform.
Target market/ Audience	Automotive part OEMs Automotive aftermarket Consumers
Intent way of exploitation	These are the envisaged paths of exploitation: 1. utilisation of results as further reference for other projects of SIMAVI 2. joint ownership together with C-ECO; for the time being discussions are held between SIMAVI and C-ECO 3.licensing if there is the case 4. using results internally 5. selling results and providing services
Reasons of expected impact	In the actual economic and political context in Europe, the ICT components made within ReCiPSS- Automotive platform will support the diminution of raw materials consumption.
TRL	6-7

Table 30: Result by C-ECO & SIMAVI (Product)

29. Development and contribution to backend APIs for option management in displaying reports into interactive formats (histograms, pie charts, quota)	
Partner	C-ECO/SIMAVI

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Type of Result	Product (IT component)
Characteristics	The APIs that were developed for the reports view return information about open, expired or exercised options with information regarding the company and the value from a specific period defined in the frontend request. The total number is then displayed in the user specified report format (pie/quota/histogram) in percentage.
Target market/ Audience	Automotive part OEMs Automotive aftermarket Consumers
Intent way of exploitation	These are the envisaged paths of exploitation: 1. utilisation of results as further reference for other projects of SIMAVI 2. joint ownership together with C-ECO; for the time being discussions are held between SIMAVI and C-ECO 3.licensing if there is the case 4. using results internally 5. selling results and providing services
Reasons of expected impact	In the actual economic and political context in Europe, the ICT components made within ReCiPSS- Automotive platform will support the diminution of raw materials consumption.
TRL	6-7

Table 31: Result by C-ECO & SIMAVI (Product)

30. New approach on collecting additional product-information to CRI-cores and linking it for circular use to an original marking (2D-code) which has been applied to the product in initial production	
Partner	C-ECO/SIMAVI
Type of Result	Product (IT component)
Characteristics	This service contains functionalities for importing customer data into the ReCiPSS system. External services and clients can connect to the developed APIs in order to integrate the options.
Target market/ Audience	Automotive part OEMs Automotive aftermarket Consumers
Intent way of exploitation	These are the envisaged paths of exploitation: 1. utilisation of results as further reference for other projects of SIMAVI 2. joint ownership together with C-ECO; for the time being discussions are held between SIMAVI and C-ECO 3.licensing if there is the case

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	4. using results internally 5. selling results and providing services
Reasons of expected impact	In the actual economic and political context in Europe, the ICT components made within ReCiPSS- Automotive platform will support the diminution of raw materials consumption.
TRL	6-7

Table 32: Result by C-ECO & SIMAVI (Product)

31. Development and implementation of an interface (API) to communicate used-parts return options between IT-systems	
Partner	C-ECO/SIMAVI
Type of Result	Product (IT component)
Characteristics	APIs were developed to establish the communication between the ReCiPSS ICT system and external sources that want to export their options.
Target market/ Audience	Automotive part OEMs Automotive aftermarket Consumers
Intent way of exploitation	These are the envisaged paths of exploitation: 1. utilisation of results as further reference for other projects of SIMAVI 2. joint ownership together with C-ECO; for the time being discussions are held between SIMAVI and C-ECO 3.licensing if there is the case 4. using results internally 5. selling results and providing services
Reasons of expected impact	In the actual economic and political context in Europe, the ICT components made within ReCiPSS- Automotive platform will support the diminution of raw materials consumption.
TRL	6-7

Table 33: Result by C-ECO & SIMAVI (Product)

32. Software platform to digitally incorporate and manage options ("right-to-return") - source code	
Partner	C-ECO/SIMAVI
Type of Result	Product (IT component)
Characteristics	ICT platform was developed according to the user requirements, where specific tasks were defined to build a backend (with orchestrator,

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	company, options and other services) and a frontend (micro-frontend architectures with 4 interfaces - main, client, company and support).
Target market/ Audience	Automotive part OEMs Automotive aftermarket Consumers
Intent way of exploitation	These are the envisaged paths of exploitation: 1. utilisation of results as further reference for other projects of SIMAVI 2. joint ownership together with C-ECO; for the time being discussions are held between SIMAVI and C-ECO 3.licensing if there is the case 4. using results internally 5. selling results and providing services
Reasons of expected impact	In the actual economic and political context in Europe, the ICT components made within ReCiPSS- Automotive platform will support the diminution of raw materials consumption.
TRL	6-7

Table 34: Result by GOR (Product)

33. Long lasting ASKO washing machine (construction and inbuilt algorithms)	
Partner	GOR
Type of Result	Product
Characteristics	"High-quality tumble dryers build like professional which are founded on the basis of quality, durability, and efficiency that cater to both small and large businesses across all industry sectors. The machines are tested through the rigorous method of 15000 hours - guaranteed."
Target market/ Audience	Household users, laundry rooms, student dormitories, dentists, small businesses, etc.
Intent way of exploitation	Expanding product offer on different markets
Reasons of expected impact	Introduction of novel circular pay-per-wash business model
TRL	8

Table 35: Result by GOR (Product)

34. E-wallet for pay-per-use deployment	
Partner	GOR

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Type of Result	Product / Service product
Characteristics	Service which enables end users to buy the credit for usage of pay-per-use appliances in public laundry rooms
Target market/ Audience	Household users, laundry rooms, student dormitories, dentists, small businesses, etc.
Intent way of exploitation	ASKO web store
Reasons of expected impact	Introduction of novel circular pay-per-wash business model
TRL	6

Table 36: Result by GOR (Product)

35. Web store	
Partner	GOR
Type of Result	Product / Service product
Characteristics	Service which enables end users to subscribe the pay-per-use appliances to be used at home
Target market/ Audience	Household users, laundry rooms, student dormitories, dentists, small businesses, etc.
Intent way of exploitation	ASKO web store
Reasons of expected impact	Introduction of novel circular pay-per-wash business model
TRL	7

Table 37: Result by GOR (Product)

36. ConnectLife app for long lasting ASKO washing machine	
Partner	GOR
Type of Result	Product / Service product
Characteristics	The mobile and web apps enable users to communicate with machines
Target market/ Audience	Household users, laundry rooms, student dormitories, dentists, small businesses, etc.
Intent way of exploitation	Android and IoS app stores
Reasons of expected impact	Introduction of novel circular pay-per-wash business model

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TRL	TRL8

Table 38: Result by GOR (Know-how)

37. Installed demonstrators on four different markets	
Partner	GOR
Type of Result	Know how
Characteristics	The demonstrator of more than 330 appliances deployed on four different markets (SLO, NL, DK, SE).
Target market/ Audience	Household users, laundry rooms, student dormitories, dentists, small businesses, etc.
Intent way of exploitation	Marketing and sales through web and existing sales channels.
Reasons of expected impact	Introduction of novel circular pay-per-wash business model.
TRL	7

Table 39: Result by SIG (Product)

38. Built the ReCiPSS backend server and developed connector APIs to existing business systems such as SAP and SAGH+ (connectors to and from IoT platform)	
Partner	SIG
Type of Result	Product (IT-component)
Characteristics	Developed a full-stack ReCiPSS backend server with database, persistence, and business logic layers. Developed a REST API to create, update and read information, to be used by the existing business systems.
Target market/ Audience	Manufacturing Industry or equivalent
Intent way of exploitation	Use for further Product Development
Reasons of expected impact	Development of an array of APIs and connectors to facilitate a robust aftermarket - IoT platform
TRL	-

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Table 40: Result by SIG (Product)

39. Further developed the ReCiPSS backend server in order to support processes such as billing, feedback, contract changes	
Partner	SIG
Type of Result	Product (IT-component)
Characteristics	Implemented e-Wallet and contract storage services in ReCiPSS backend server.
Target market/ Audience	Manufacturing Industry or equivalent
Intent way of exploitation	Use for further Product Development
Reasons of expected impact	Development of a robust aftermarket platform that will enable circular economy processes
TRL	-

Table 41: Result by SIG (Product)

40. Connect data from business systems and IoT, create AR experience and publish the data	
Partner	SIG
Type of Result	Product (IT-component)
Characteristics	Developed a generic service platform based on existing and new modules connecting machines (IoT integration module, installed base module), technical information (Aftermarkt PIM), economic information (ERP, CRM) and service support systems (augmented reality module). This platform can generically be implemented by manufacturing companies.
Target market/ Audience	Manufacturing Industry or equivalent
Intent way of exploitation	Seminars and discussions within industry
Reasons of expected impact	Educate professionals on Circular Economy and SBBM with the aim of adoption of such a solution within their companies
TRL	-

Table 42: Result by SIG (Know-how)

41. Created User stories and use cases to develop backend service	
Partner	SIG

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Type of Result	Know-how
Characteristics	Developed a platform and a business case for an ICT platform that supports circular business models.
Target market/ Audience	Manufacturing Industry or equivalent
Intent way of exploitation	Use for further Product Development
Reasons of expected impact	Educate professionals on Circular Economy and SBBM with the aim of adoption of such a solution within their companies
TRL	-

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4. Exploitation activities and events

For the communication of the project result, the partners individually, but also the consortium as a whole, have organized several events in order to raise the awareness and make the result available to the audience. In the following paragraphs the exploitation events organized for maximizing the diffusion of the project results are reported.

4.1. Workshop organized by project's demo wholesaler: "Supplier Day"

On 23.09.22, the Ernst Lorch KG has invited their suppliers for automotive-spare-parts to the headquarters in Albstadt, Germany. During this event, among other topics, the Lorch-management presented on the ReCiPSS-project and their participation and role in the project. Especially the reman-suppliers have been informed about the new ReCiPSS-solution and the increased transparency generated from that. Lorch was using this opportunity to share its positive experience from the service-usage and to motivate remanufacturers to join in order to maximize benefits for all stakeholders. As a result, C-ECO has been contacted by remanufacturers showing interest in the project's results after the event.

- **Organizer:** Ernst Lorch KG
- **When:** 23.09.2022
- **Where:** Lorch-Headquarter, Albstadt, Germany
- **Participants:** Who was participated: Reman suppliers
- **Results and outcome:** Made suppliers aware of ReCiPSS, try to populate the ReCiPSS platform

4.2. Workshop in Automechanika: "Core Management as a Service"

On 14.09.2022, C-ECO has organized an industry-workshop as a side event to the Automechanika in Frankfurt/Germany. Automechanika is the leading trade fair for automotive service industry. In Frankfurt in 2022, 2,804 exhibiting companies from 70 countries presented their innovations and trade visitors were able to obtain additional information at over 350 events. In the industry-workshop, C-ECO explained the service and the platform developed in ReCiPSS in a live-demonstration to remanufacturers, wholesalers and other interested industry-participants. Wholesaler Ernst Lorch KG was sharing its positive experiences of being involved as a key-user in the development process as well as being an early adopter for using the "Core management-as-service" in their business-environment.

- Organizer: C-ECO
- **When:** 14.09.2022 (11:00-12:00)
- **Where:** Automechanika Frankfurt 2022, DE
- **Participants:** Part-OEM's/Remanufacturers, Wholesalers, other industry-participants

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Figure 1: Photos from the workshop in Frankfurt

4.3. Paving the way for innovative Circular Economy products and services in the electronic and automotive sectors

On 19.10.2022, the H2020 projects C-SERVEES and ReCiPSS have organized a physical event in Brussels. The key results of the event include:

- successful demonstration of a Pay-Per-Use business model in the white goods sector implemented by Gorenje, a company of the Hisense Europe group, for their washing machine. As part of the project, 300 machines are being installed in 4 European markets.
- successful demonstration of Core Management as a Service to enable remanufacturing in the automotive sector implemented by Circular Economy Solutions GmbH (C-ECO), a subsidiary of Robert Bosch GmbH. As part of the project, more than 80,000 cores (used parts) are already collected using this new service. Different stakeholders (i.e. remanufacturers, wholesalers, traders, workshops etc.) from the automotive sector are already benefiting from this new service in commercial settings.
- the role and need for innovative IT solutions for successful implementation of Circular Business Models.
- relevant policy recommendations to facilitate transition towards circular economy in the EU.
- Contribution towards Circular Economy standardization efforts as part of ISO/TC 323.

Figure 2: Event invitation

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- **Organizer:** H2020 projects C-SERVEES and ReCiPSS
- **When:** 19.10.2022
- **Where:** Brussels
- **Participants:** EU policy officers, stakeholders from industry and academia

Figure 3: Photos from the event in Brussels

4.4. Kongress BW

On the "KongressBW", a regional congress on resource-efficiency organized and hosted by the government of Germany's federal state Baden-Württemberg. C-ECO was presenting "Core management-as-a-Service and the ReCiPSS-development in a forum "Zirkuläre Wertschöpfung 4.0 – Chancen und Herausforderungen der Digitalisierung für eine kreislauffähige Produktion" (in English: Circular Value Creation 4.0 – Opportunities and Challenges of digitization for circular production). The forum was organized and hosted by Karlsruhe Institute of Technology (KIT). C-ECO was also representing with an own booth where a lot of interest on the service was experienced.

- **Organizer:** C-ECO
- **When:** 20.10.2022
- **Where:** Karlsruhe, Germany
- **Participants:** Stakeholders from industry and academia
- **Additional information:** https://www.kongress-bw.de/node/1067

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Figure 4: Photo from the presentation of "Core management-as-a-Service" in Karlsruhe

4.5. IT solutions for Circular Economy

- **Organizer:** SIMAVI, KTH, Signifikant, PDSVision
- **When:** 11.11.2022
- **Where:** Online
- **Participants:** Stakeholder from Industry and Academia
- **Results and outcome:** Participants learned about:
    - Circular Manufacturing Systems: A way forward for the European Manufacturers
    - ICT platform challenges supporting circular business models
    - Digital Twin Concept supporting Circular Economy
    - AR Demo
    - ICT platform for the Circular Manufacturing System in the automotive industry

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Figure 5: Photo from the online event

4.6. ReCiPSS Day

- **Organizer:** KTH with ReCiPSS partners
- **When:** 16.11.2022
- **Where:** Stockholm, Sweden
- **Participants:** Stakeholders from Industry and Academia
- **Results and outcome:** presentation of key results related to
    - Business model
    - Product design
    - Co-creation
    - Supply chains
    - ICT developments
    - Modelling and simulations
    - Demo white goods
    - Demo automotive
    - Policy brief, standardisation and organisational challenges

Figure 6: Left: Group consortium photo – Right: Photo from the event at KTH

4.7. Nordic Circular Summit 2022

Nordic Circular Summit is the biggest conference on circular economy in the Nordics. The event offers talks, debates, panel discussions and workshops on topics such as circular tools, regenerative models and materials, communicating circularity, business and finance, energy and resources, construction, manufacturing and much more.

- **Organizer:** Nordic Circular Summit
- **When:** 23.11.2022
- **Where:** Stockholm, Sweden
- **Participants:** Stakeholders from Industry and Academia
- **Results and outcome:** EU Project ReCiPSS's partner and White Goods demonstrator Gorenje participated in the Nordic Circular Summit 2022 where they organized a partner session with title "*Is Servitisation of Traditional Industry Possible?"* to present their results on the development of pay-per-use services in Hisense Europe on ASKO premium appliances and how they are addressing different aspects of the industrial and business environment and demonstrating the pay-per-use system of white goods appliances.

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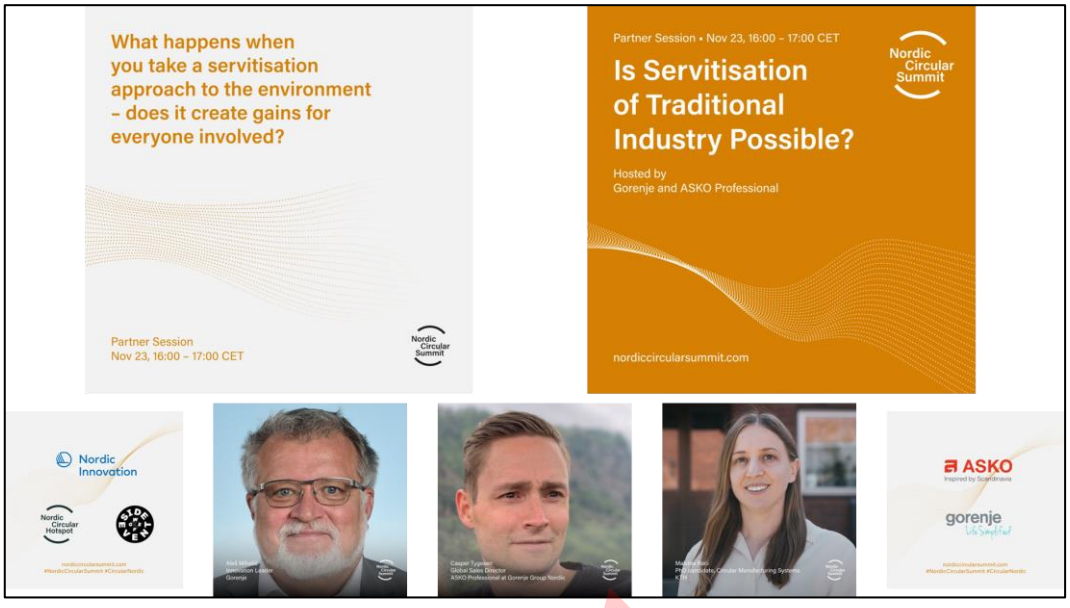

Figure 7: Nordic Circular Summit 2022: Social media communication material

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5. Conclusions

After the analysis of the 41 collected exploitable results, some general conclusions can be drawn regarding the type of results, the relevance of the demonstrators on the exploitable results as well as the Technology readiness levels (TRLs).

During ReCiPSS project 16 products have been developed and created; 9 products were produced for the automotive industry, while 7 for the white goods. The achieved TRL of the product results vary from TRL6 (technologies demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies) to TRL9 (actual system proven in operational environment). Further research and development is required for the results which were not achieved the highest TRL.

Furthermore, 6 new processes have been developed, 5 by industrial partners and 1 by an academic partner. 4 of them have been triggered by the Automotive Aftermarket demonstrator, 1 from the White Goods demonstrator, while 1 process applies to every industry and the results are openly accessible by everyone who is interested in.

The knowledge gained during the ReCiPSS project can be used by the partners either commercially as offer to their customers in the form of seminars, workshops, or consulting services, or by raising awareness and inspiration to relevant groups around CE. In total, 11 *"Know-how"* results are listed for both industrial and academic partners.

Many of the project research results are already used by the academic partners as educational material or baseline for further research at the academic institutions by professors, students and researchers. Case-studies and interview results will be also used for academic purposes by technology partners, in the form of journal publications, seminars and workshops to consumer goods companies, automotive companies, researchers on the field of the implementation of CE and sustainability and business professionals. In total, 7 *"Academic"* results are reported by the partners in the *"Exploitation plan update"*.

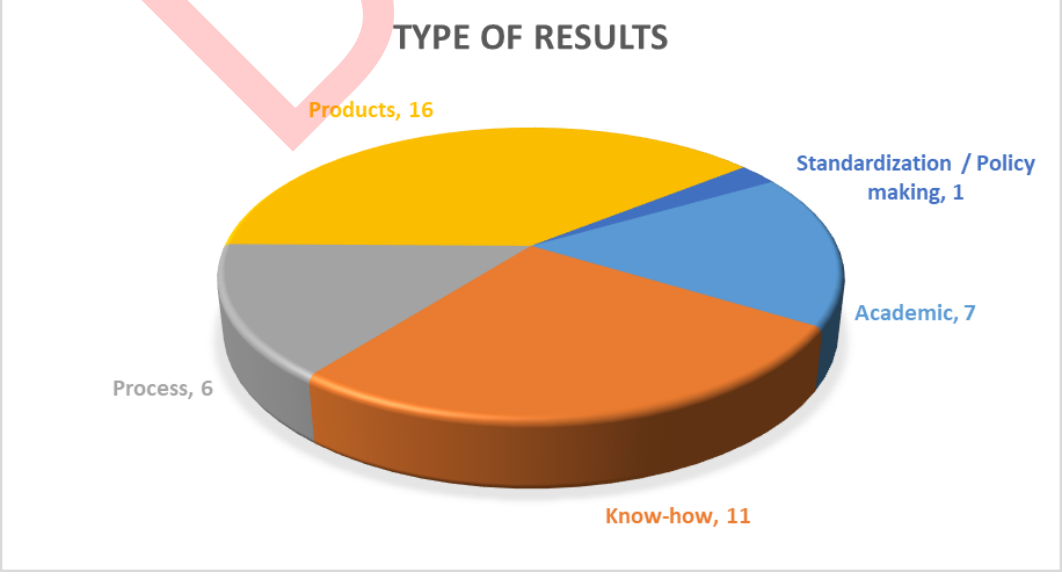

Figure 8: The types of the results

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The main goal of the exploitation is the wide use of the results by everyone who is interested in and not limit the use of them to the pilots or demonstrators of the project. Nevertheless, it would be interesting to see which demonstrator initiates/ triggers each specific result. Having a closer look to the results, we have a very balanced picture, as 14 of the 41 results are coming from activities relevant to the Automotive Aftermarket demonstrator, while 14 are triggered by the White Goods demonstrator. Furthermore, 13 results are the outcome of the activities and input of both Automotive and White Goods demonstrators.

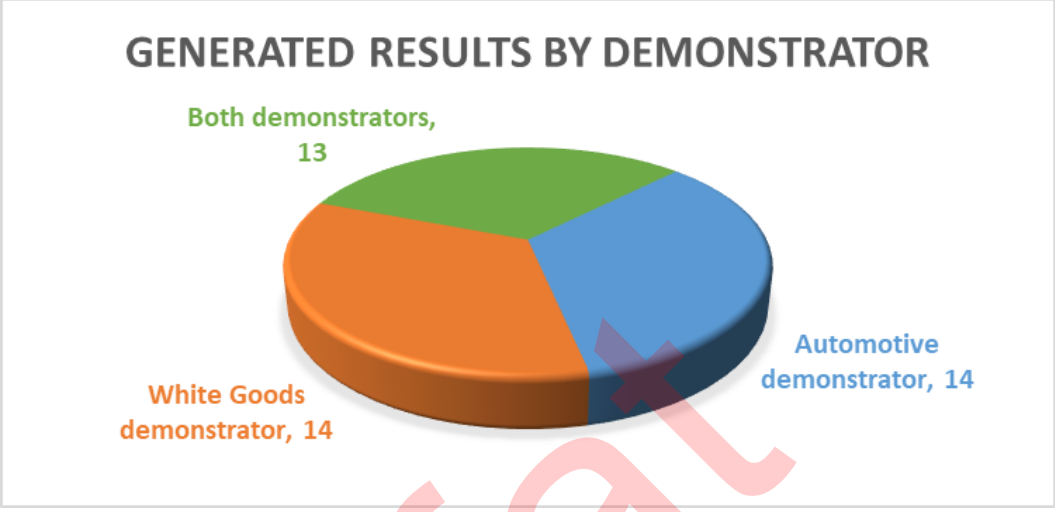

Figure 9: Results according to the demonstrators

From the 27 results that reported TRL, 3 of them has been reported in the highest TRL, meaning that the solutions are tested, launched and proven in operational environment, while 15 results are between TRL 6 and 8, meaning that the results are developed, complete and qualified and ready to be integrated into an operational environment.

Furthermore, 9 results are classified between TRL4 and TRL6, meaning that the solutions are validated and demonstrated in relevant environments (of the automotive and white goods demonstrators) or in lab and in relevant environments.

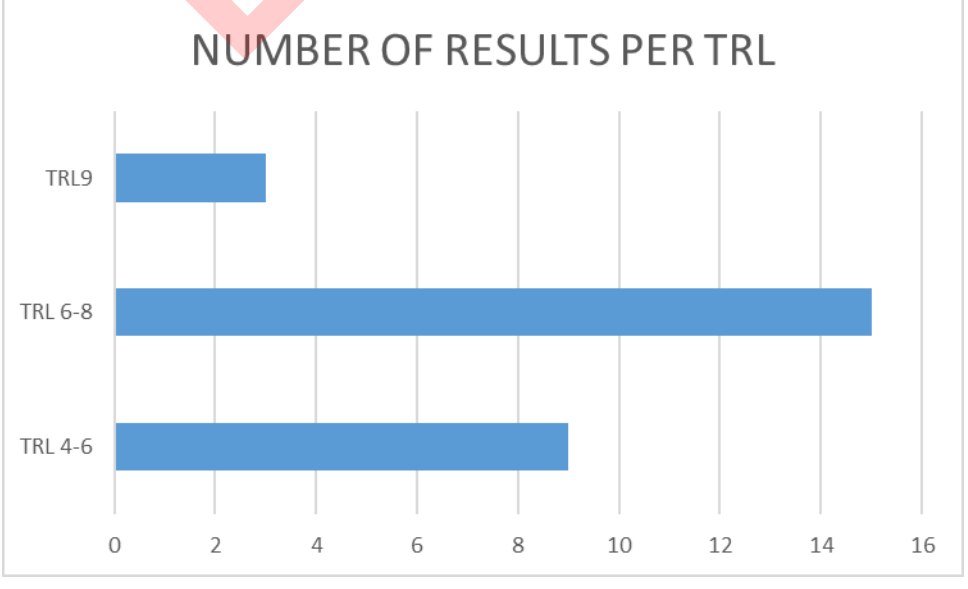

Figure 10: Number of the results per TRL

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Furthermore, events were organized by the consortium partners to achieve the highest exploitation of the project results. The target audience at these events varied from policy makers at the European Union level, to industry and academia and potentially final users. The events were focusing on the circular business models, use of product service systems, circular manufacturing, circular service products, such as Core Management-as-a-Service, demonstration of service products, etc.

Finally, the partners are engaged to continue exploiting the project results after the end of the project and continuing improving the work done at the ReCiPSS project.

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