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## INNOVATIVE DIGITAL WATERMARKS AND GREEN SOLVENTS FOR THE RECOVERY AND RECYCLING OF MULTILAYER MATERIALS

**Funding scheme:** European Union's Horizon 2020 Research and Innovation programme

**Call identifier:** H2020-SC5-2020-2

**Theme:** CE-SC5-24-2020: Improving the sorting, separation and recycling of composite and multilayer materials

**Grant Agreement:** 101003532

**Project start date:** June 1<sup>st</sup>, 2021

**Duration:** 36 months

### DELIVERABLE N°8.3

#### Report on Preliminary Market Analysis, Dissemination Plans and KPI Results

<b>Due date of deliverable:</b> 31/11/22	<b>Actual submission date:</b> 23/12/22	<b>Lead Beneficiary:</b> TWI
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## 1 Introduction

Project Sol-Rec2 aims to develop and implement innovative strategies for improving the sorting, separation and recycling of pharma blister packs and laminate consumer packaging waste consisting of multiple layers of polymers and aluminium combinations. The project also aims at developing innovative digital watermark technologies and a tool box of 'Green' solvents for the recovery and recycling of multilayer materials and to demonstrate rapid, efficient sorting of multilayer packaging. This deliverable report describes the consortium's communication policy and dissemination strategy to ensure that relevant, accurate, and consistent information reaches the stakeholders and other general audiences of the Sol-Rec2 project. The policy provides a framework to manage and coordinate communication activities including criteria and metrics for the measurement and evaluation of the performance of these activities and resulting project impacts. Given that the project's planned innovations intend to address the technological challenges associated with the plastic recycling (pharma, laminate pouches) industry, a preliminary dissemination and engagement strategy was therefore implemented to foster awareness and public uptake of the economic and technological benefits of the project and to provide feedback to inform future activities.

The report is a *living document* that will be updated as the project progresses, it should be read in conjunction with the communication plan and dissemination strategy.

## 2 Project Summary

This deliverable report contributes towards the following work package objectives:

- To summarise the results obtained from the market analysis, feedback from industry and the targeted markets
- To formalise a communication policy
- To formalise a dissemination strategy and participate in dissemination activities.

The report is divided into three sections:

Section-1 will focus on providing a summary of the results obtained from,

- i. Consumer market analysis and survey
- ii. Feedback from industry and the targeted markets (following the completion of work package 1 and Deliverables D1.1 - D1.3).

Section-2 will focus on formalising the dissemination strategy which includes,

- i. Scope/overview of the dissemination strategy
- ii. Stakeholder engagement
- iii. Dissemination tools
- iv. Evaluation.

Section-3 will focus on the communication strategy which is divided into sub-sections and includes,

- i. Scope of the communication strategy
- ii. Objectives of the communication strategy
- iii. Implementation and
- iv. Evaluation of the communication strategy.

This deliverable D8.3 report aims to present a preliminary strategy on how Sol-Rec2 technology will be marketed and provides a communication strategy on targeted end users. The report also lists all dissemination activities and KPI results in Period 1.



### 3 Market Analysis

#### 3.1 Consumer market analysis and survey

As detailed in deliverable report D1.1, a consumer survey was carried out to provide a detailed assessment of public attitudes towards multilayer packaging and its recycling. The questionnaire, consisting of thirty questions, was shared with the public for their responses. The results of the survey were collected and compiled into a database. The data obtained between the periods of August 1<sup>st</sup> 2021 to October 31<sup>st</sup> 2022 is presented in Appendix A. The information obtained will be used to inform the ongoing Sol-Rec2 strategy and also help in focusing the dialogue for the consultation with industrial players.

Some of the data obtained during the survey is presented in the figures below. A total of 3442 answers were collected from the survey (up to October 31<sup>st</sup> 2022). The number of answers by country are presented in Figure 1.

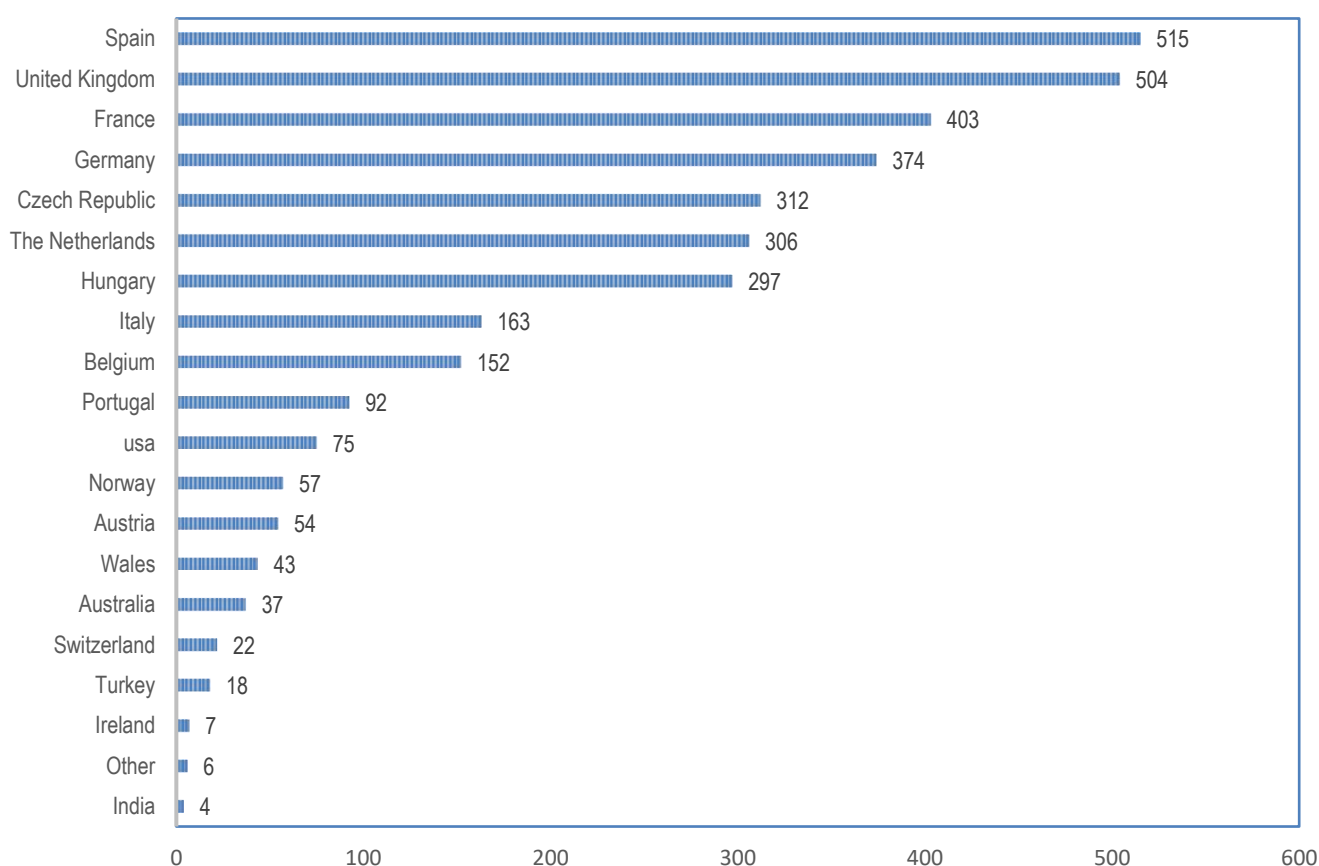


Figure 1 Number of answers by country

The majority of survey participants were from European countries, although responses were also received from other parts of the world. The largest age groups surveyed were from 25 to 34 years old and from 35 to 44 years old, which was 28% and 23% of overall responses respectively (presented in Figure 2).

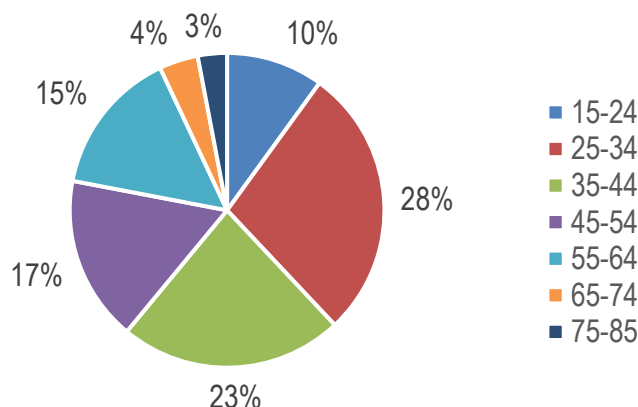


Figure 2 Age of survey participants

Out of 3442 survey participants, 91% expressed their willingness to take their finished blister packages to their local pharmacy for recycling (Figure 3). While 48% of the participants reported that no access to a recycling facility would discourage them from recycling food packaging and 42% of participants reported that not enough information on how to recycle their food packaging would discourage them from recycling (Figure 4). Approximately 63% of the participants indicated that they check if their food packaging can be recycled (Figure 5), whilst 93% of the participants also agreed that there should be stricter legislation to ensure that the plastic is recycled (Figure 6). The survey also included questions to identify whether the consumers were willing to pay more to switch to more environmentally friendly packaging. The majority of the survey participants responded positively to the switch to biodegradable packaging as presented in Figure 7.

The results from the survey highlight willingness from the targeted consumers/public to switch to more environmental packaging and recycling practices. Education on recycling of packaging materials and ease of access to recycling facilities would encourage more people to recycle.

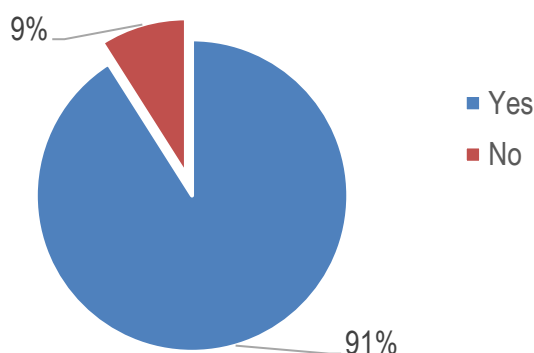


Figure 3 Responses to the survey question: "Would you be willing to drop off blister packs at your local pharmacy for recycling?"

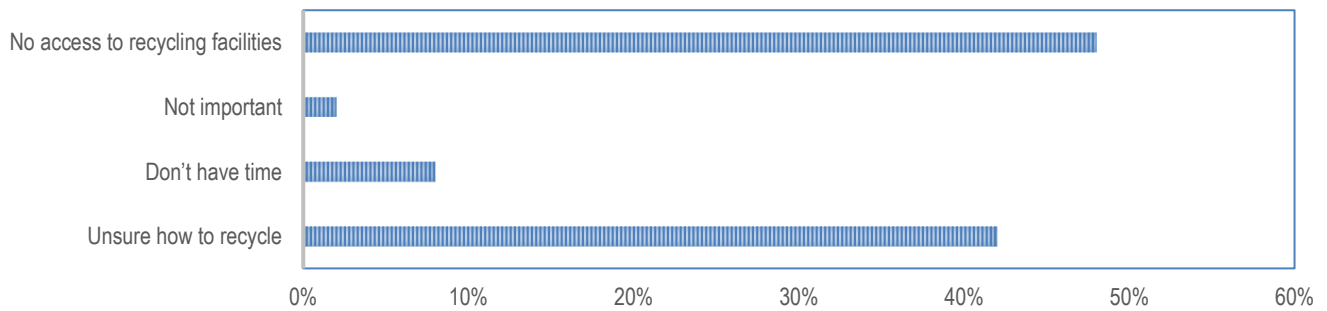


Figure 4 Responses to the survey question: "What reasons would discourage you from recycling food packaging?"

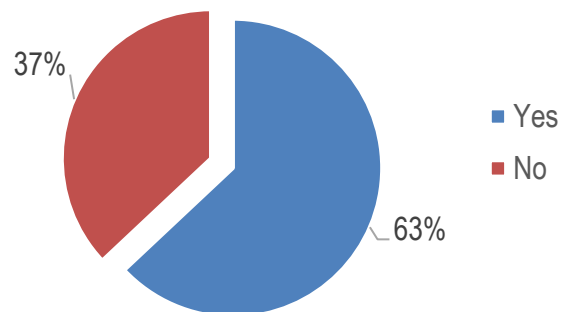


Figure 5 Responses to the survey question: "Do you look at food packaging to see if it can be recycled?"

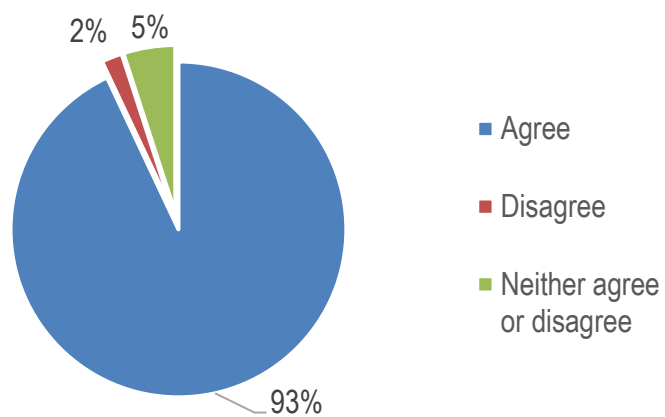


Figure 6 Responses to the survey statement: "There should be stricter legislation to ensure more plastic is recycled"

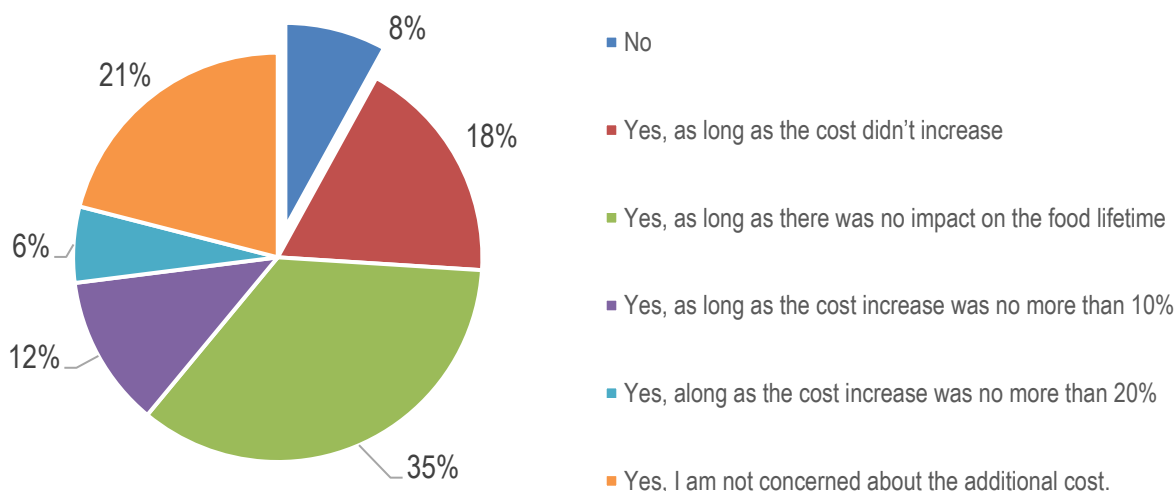


Figure 7 Responses to the survey question: "Would you prefer the use of biodegradable (compostable) food packaging over the use of traditional fast-food packaging?"

## 3.2 Feedback from industry and targeted markets

### 3.2.1 Industry consultations

Within the project activities reported in deliverable report, D1.2, a dialogue with manufacturers of multilayer packaging as well as packaging end users was initiated. The objective of this consultation with industry was to establish an understanding of individual multilayer packaging requirements and the key barriers currently restricting its recycling. These discussions also acted as a platform to generate interest for sustainable recycling strategies being developed in the Sol-Rec2 project. A questionnaire was prepared (available in D1.2 Appendix A) and shared with relevant industrial contacts for feedback. Companies including GSK, Astra Zeneca and Novartis and fast-moving consumer goods companies (FMCG) such as Unilever and Procter & Gamble were contacted for their feedback. Detailed discussion of the information obtained is available in deliverable report, D1.2, whilst the main points of discussion related to the:

- Type of product contained in their packaging
- Type of multilayer package used for their specific application
- Type of barrier that their packaging provides or their requirement for barrier properties
- Stability and sterilisation requirements for the packaging materials
- Preferred polymer or materials for packaging
- Inks and adhesives used in packaging
- Challenges and restrictions faced when considering recycling of their products
- End-of-life strategy

Despite difficulties of finding the right contacts within companies and high levels of non-responsiveness, several successful discussions took place that gave insights into the industry barriers, requirements and future trends. The identified common goals and objectives of industry that were highlighted included:

- Manufacture and design of recyclable packaging
- Increase recycled content in packaging

- Simplify packaging designs to aid recycling, primarily through minimising the number of materials utilised
- Elimination of aluminium layers in packaging (with the exception of pharmaceutical applications)
- Transition towards paper based packaging

From the consultation with the targeted market, a common trend was identified; industry is moving towards the adaptation of a “mono-material” packaging and the use of paper as a main component in packaging body. Industry is aiming to introduce paper-based packaging that will consist of 95% fibres and 5% plastic. However, the consortium believes that this transition could lead to a substantial increase in the product's carbon footprint and will affect the materials' integrity/fitness for service, and thus limit the application environments of future products. The motivation for this move towards “mono-materials” is increased recyclability and a reduction of environmental impact due to waste mismanagement. In a report issued by the Ellen MacArthur Foundation's named “The Global Commitment 2021 Progress Report”, it was stated that there is a focus on the reduction or elimination of multilayer materials as well as metallised films among packaging companies (Global Commitment 2021 Progress Report, 2021) which corresponds to the feedback received during industrial consultations.

As identified during the consultation with industry and from the consumer survey, there is a wide belief that multilayer packaging such as blister packs are not recyclable. Approximately 78% of responders to the consumer survey (D1.1) believe that blister packs are currently non-recyclable (Figure 8). There is also willingness amongst consumers to reduce plastics consumption in packaging as 72% of the survey responders supported the idea of plastic-free aisles in supermarkets (Figure 9). The move of the industry to paper based packaging and mono-materials corresponds to the needs and desires of the consumer market as identified in D1.1

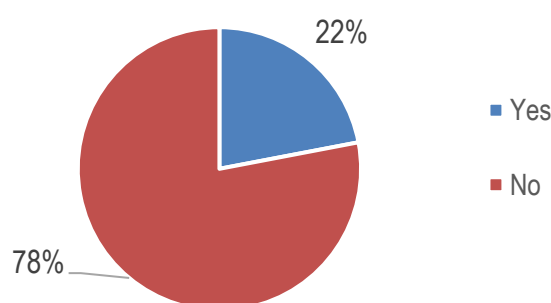


Figure 8 Responses to the consumer survey question (D1.1) “Do you know if plastic medicine blister packs are recyclable using normal recycling methods?”

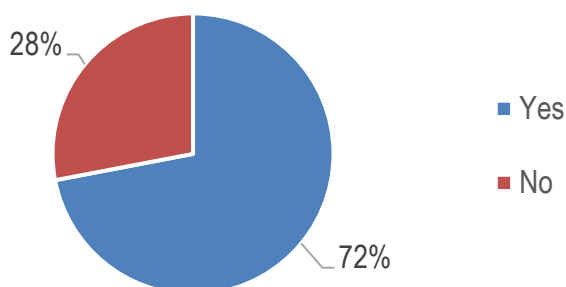


Figure 9 Response to the consumer survey question (D1.1) “Would you like to see plastic-free aisles in shops/supermarkets?”



According to the members of industry (from discussions in D1.2) “mono-materials” provide the advantage of easier recyclability compared to multilayer materials. Materials such as PE, PET, PP and paper are considered for “mono-material” applications with the polyolefin-based packaging (PE and PP) being preferred as this is easier to recycle. However, mono-materials are bulkier, use more materials and have inferior mechanical and barrier properties compared to multilayers. To satisfy the required barrier properties for packaging coatings, adhesives or additional thin layers are incorporated into these “mono-material” systems. These additional coatings/thin layers transform “mono-material” into multilayer systems with the exception that the overall concentration of different layers is within the accepted contamination levels for reuse in the same application areas following recycling. The Sol-Rec2 consortium believes that this approach will lead to material downcycling after a critical number of recycling iterations leading inevitably to landfill disposal or incineration at the end of life.

The existing technical gap for the delamination and recycling of multilayer systems, creates an ambition for industry to move towards the adaptation of “mono-materials” for packaging. However, industry agrees that for certain applications multilayer packaging will not be able to be replaced with “mono-material” alternatives. The Circular Economy for Flexible Packaging (CEFLEX) initiative published a roadmap for the transition of flexible packaging market towards a circular economy. CEFLEX encourages design for recyclability, it also highlights that compromising protective properties of packaging will result in higher costs and environmental impact compared with producing unrecyclable packaging that delivers the required level of product protection (Designing for a Circular Economy for Flexible Packaging | CEFLEX D4ACE, 2022).

Technology developed within the Sol-Rec2 project can provide approach towards achieving circularity for multilayer materials. Sol-Rec2 aims to provide the required toolbox that will allow the delamination of the combined layers and the recovery of the polymers from multilayer packaging systems. This could encourage the use of multilayers and avoid compromising barrier and mechanical properties by choosing “mono-material” packaging and therefore will reduce costs and associated environmental impact.

### 3.3 Sol-Rec2 Workshops on Multilayer Packaging and its Recycling

As reported in deliverable D1.3, the Sol-Rec2 consortium organised webinars and workshops in order to present information on multilayer plastic waste generation, disposal, and environmental impacts. Events were aimed at improving consumer attitudes and behaviours towards multilayer packaging waste and its recycling. Detailed information on the organised events is available in Section 7 of this report.

The consortium organised a workshop during the PRSE 2022 exhibition and invited relevant industry contact/companies. During the PRSE Sol-Rec<sup>2</sup> workshop, several trends in industry were highlighted by company representatives. Some of the challenges in the market that recyclers and the Sol-Rec2 consortium will need to address were highlighted, these include:

- There is a need for a change in the legislation, to allow recycling of certain blister packages. Currently, these can be classed and managed as hazardous waste due to contact with pharmaceutical compounds.
- Industry is moving towards a reduction of PVC use and shifting towards polypropylene. This transition will reduce packaging cost and will eliminate issues when reclaiming feedstock material through pyrolysis and other thermochemical recycling methods.
- Polymer stabilisation and additive content is a challenge during the recycling process. Repeated recycling leads to the depletion or reaction of additive content negatively impacting the stability of the material and product performance. There is a need to monitor additive content and, if required, reload additives after recycling to prevent material degradation.
- It is important to consider production processes when recycling, since it could indicate additive content and

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lead to limitation or expansion of market use of the reclaimed product.

## 4 Dissemination Strategy

### 4.1 Overview

The Sol-Rec2 dissemination strategy outlines the consortium's approach to raise awareness and community endorsement of the economic and technological benefits of the project. It describes the profiling of the potential adopters/stakeholders and planning about how the engagement will take place over the course of the project to facilitate exploitation and maximise impacts.

### 4.2 Stakeholder Engagement

Stakeholder management is key to a project's dissemination strategy for its acceptance and subsequent adoption by the user community. As part of the stakeholder profiling, the consortium has identified target groups across a wide spectrum of application domains ranging from ultimate end users such as packaging industries until academia and public. Although identified early in the project, the consortium will continue to assess the market trends to identify new prospective/alternatives to the existing stakeholder groups. This will also include emerging cross-domain market sectors that can potentially benefit from the technology being developed under this project thus broadening the impact.

The consortium dissemination strategy ensures frequent communication (using tools as described in Section 6.3) with the stakeholder groups as part of the stakeholder engagement throughout the lifetime of the project. A detailed plan on a) who will receive communications, b) how the communications will be delivered, c) what information will be communicated, d) who communicates and, e) the frequency of communication is included under Section 6: *Sol-Rec2 Communication Strategy*.

### 4.3 Dissemination Tools

Established on the basis of the targeted audience, the consortium plans to use a variety of dissemination tools, both virtual and face-to-face, for outreach to the broader user community — targeting the stakeholder groups with relevant information at appropriate intervals of time. See Section 7 for a list of dissemination activities using the tools mentioned below

#### 4.3.1 Project website and social media

The Sol-Rec2 website (<https://Sol-Rec2.eu/>) was launched in June 2021 (Figure 10) and has since been used to communicate the latest information regarding the project in the form of blog posts (Figure 11). These blog posts are then re-shared by partner websites (Figure 12) for wider communication and engaging with targeted audience. The website also hosts a 'repository' for publication of rs articles, publications and reports that can be released into the public domain.

The Sol-Rec2 website also incorporates a Google Analytics tool that monitors user traffic/engagement with the user community (Figure 13). Analytics of the social media channels (eg: LinkedIn) have also been established and are also monitored to evaluate the dissemination measures being employed (Figure 14). Figures 15 and 16 provide an overview of the website and social media stats

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<sup>1</sup> Refer II in section 3.2 for the stakeholder groups identified



**BREAKING NEWS** SOL-REC2 Webinar: Multi-layer material recycling

Home / Presentations / About SOL-REC2 project

## ABOUT SOL-REC2 PROJECT

This 36-month Sol-Rec2 project targets the development and implementation of ground-breaking strategies for improving the sorting, separation and recycling of pharma blister packs and laminate consumer packaging waste consisting of multiple layers of polymers and aluminium. Innovative digital watermark technologies will be further developed and progressed to TRL6 through successful demonstration of rapid and efficient sorting of multi-layer packaging.

Experience from working in the field of ionic liquids will be leveraged to develop a toolbox of novel green solvent systems (TRL5) that can delaminate multi-layer packaging material and selectively dissolve target polymers – reducing demand for virgin raw materials through efficient separation and recovery of high purity PE, PP and PVC polymers and aluminium. Socioeconomic and environmental benefits of Sol-Rec2 will be established through detailed life cycle analyses.

An exciting consortium of SMEs, research organisations and universities from 6 EU countries has been established, consisting of IPM2 (FR-SME), Aimplas (ES-RTO), FiliGrade (NL-SME), TWI (UK-RTO), University of Leicester (UK-UNT), Solvionic (FR-SMF), Plastipam (CZ-SMF) and Mikrolin (HU-SMF). Partners bring a

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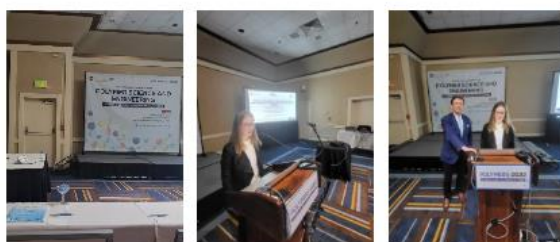
Figure 10 Sol-Rec2 Website

**BREAKING NEWS** Report of the Public Survey from 01/08/2021 to 31/03/2022

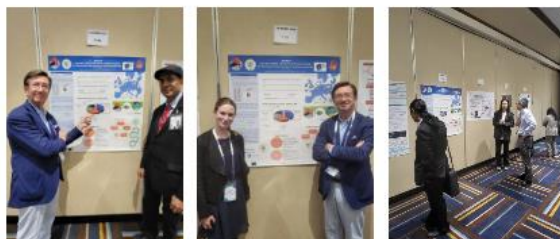
Home / Blog / Polymers Conference 2022

## POLYMERS CONFERENCE 2022

Last October 19<sup>th</sup>, 2022 at Polymers conference, LA (USA): Berenika Syrek-Gerstenkorn from Leicester University (ULEIC), partner of our EU funded project has chaired the session where Sol-Rec 2 has been co presented by her and Pascal Nègre from IPMP as coordinator.



The project has been also introduced by Berenika Syrek-Gerstenkorn (ULEIC) and Pascal Nègre (IPMP) during a poster presentation to science and engineering attendance.



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Standing  
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Figure 11 Sol-Rec2 'Latest News' announcing latest project updates and events



Figure 13 Sol-Rec2 website google analytiics

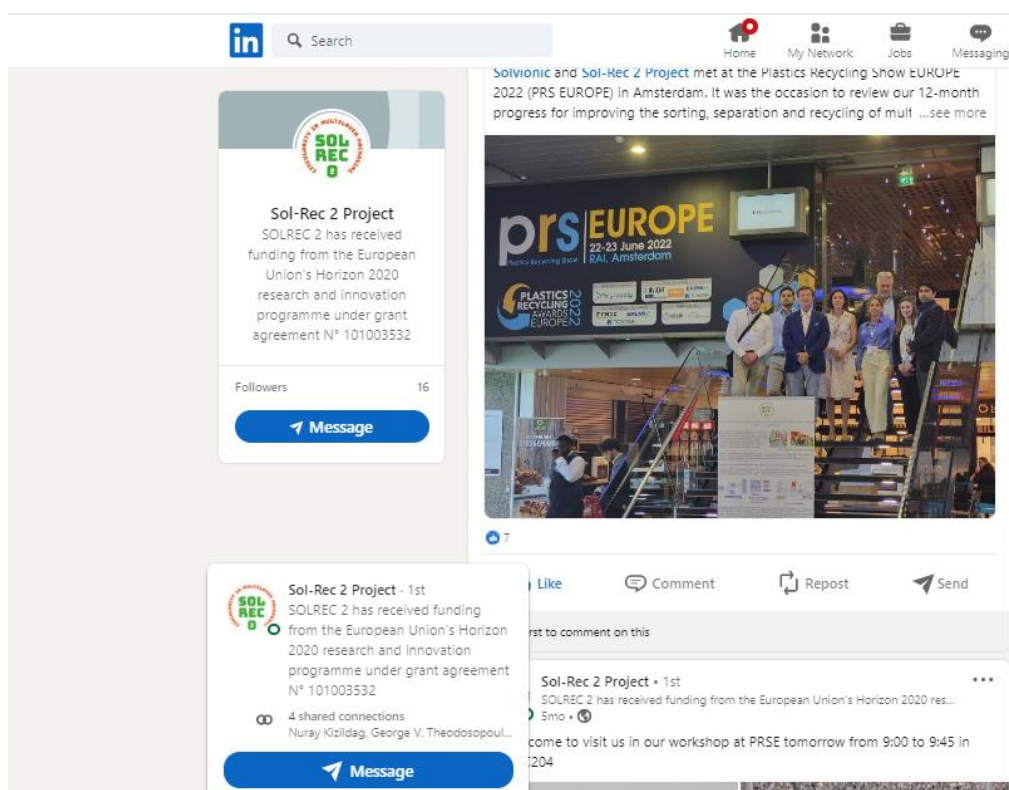


Figure 14 Post analytics to monitor to evaluate dissemination

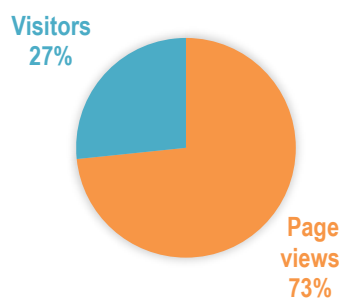


Figure 15 Sol-Rec2 website statistics distribution based on the number of visitors and views

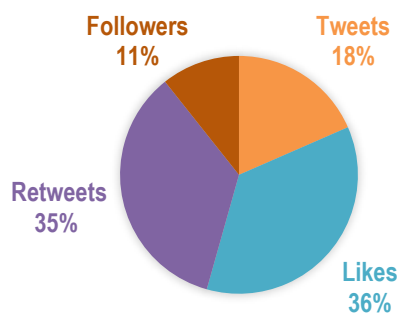


Figure 16 Sol-Rec2 twitter statistics



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#### **4.3.2 Press Releases**

Sol-Rec2 publishes formal announcements on key achievements and events as press releases that will/can be redistributed by other organisations/consortia in the plastic recycling community. In the reporting period, the consortium has published press releases distributed via websites and social media.

#### **Flyers/brochures**

Printed dissemination materials in the form of flyers and brochures are released for distribution at booths in conferences/workshops etc. Electronic versions are available for download from the project website as well as sharing via social media.

#### **4.3.3 Workshops/Programme meetings/Conferences/Webinars**

The consortium has participated in 10 events, hosted 2 workshops and the details are listed below in events (Table 5). Participation in future dissemination events is planned and a workshop will be organised in the next year at the Plastic Recycling Show Europe, 2023. Besides, a webinar on the delamination of polymers using the tool box of solvents developed in the project will be organised. The events are an excellent opportunity to showcase project results, discuss similar issues and explore synergies. The consortium also plans to host workshops to demonstrate the Sol-Rec2 technology and impacts on the plastic industry and circular economy including cross-domain applications.

#### **4.3.4 Publications**

Sol-Rec2 aims to publish its work in peer reviewed journals and magazines for targeted outreach to the broader user community. Publications in peer reviewed journals will ensure maintenance of a high level of scientific quality as well as provide its targeted stakeholders with confidence that the innovative aspects of the project are supported by reliable science. Journal articles also represent an important exploitation metric for the research technological organisations (RTOs) and universities involved in the project, as they can form the basis of future grant funding for continued sustainability.

#### **4.3.5 Case Studies/Reports**

The consortium aims to publish its reports on the project website. Work on policy issues and integration opportunities (WP8) resulting in publication of reports on techno-socioeconomic studies on the Sol-Rec2 technology (WP7), and the future of circular economy will be disseminated to targeted stakeholders (policy makers) as reports for distribution in the public domain. It is important to note that appropriate measures will be taken to safeguard all intellectual property (IP) developed during the project and that no information, considered confidential by the consortium is released into the community.

#### **4.3.6 Project Mailing List**

The project website provides a link to the generic contact form for user related queries and guidance. This address is monitored by iPM<sup>2</sup> who provide a reply within 5 working days.

### **5 Evaluation of Dissemination Strategy**

#### **5.1 Key Performance Indicators (KPIs)**

The consortium has identified dissemination specific KPIs to measure the success of its dissemination strategy in leading to its impacts on the user community. Table 1 outlines the list of indicators, provides a definition for each indicator, details the type of data required and provides the target at the end of the project. The status of the KPI for each work package is given in Tables 7 - 15 in section 8 of this report.

Table 1 SolRec2 Key Performance Indicators

#	KPI	DESCRIPTION	METRIC	TARGET <sup>2</sup>
1	Publications	Articles in peer reviewed journals, sustainability, polymers, Green chemistry, newsletters, trade magazines and conference proceedings	Number of publications	>8
2	External outreach activities	Participation in external dissemination activities (conferences, workshops, trade shows, program meetings organised by PRSE)	Number of events attended	>8
			Number of persons reached	50-100
3	Project workshops and webinars	Organisation of workshops and webinars by the consortium	Number of workshops	2
			Webinars organised	2
			Number of attendees	>50 per event
4	Website and social media	Engagement of users with the website and social media	Number of visitors on the website	>200
			Number of engagements with the social media posts	>100 views
			Number of posts on website/social media	≥1
5	Press releases	Formal announcement of project achievements	Number of engagements with the press release	>50
6	Flyers and brochures	Printed or electronic version	Number of handouts in conferences	50-100
7	Case studies and reports	Project deliverables suitable for public dissemination	Number of reports for public dissemination	11 <sup>3</sup>
8	Synergies with similar H2020 or Horizon Europe initiatives	Interaction with other projects to increase visibility and synergies between H2020 supported actions	Number of joint ventures (including meetings, workshops etc) with other projects	2-3

<sup>2</sup> The targets will be monitored during the consortium plenary meetings and will be updated depending on the project progress

<sup>3</sup> The number is taken from the grant agreement and includes deliverables (including case studies) that will be available for dissemination in the public domain

## 5.2 Monitoring

The consortium ensures continuous monitoring to ensure implementation of its dissemination strategy. Members of the advisory panel are consulted for periodic reviewing to determine the effectiveness of the strategies.

## 6 Sol-Rec2 Communication Strategy

### 6.1 Scope

The project Sol-Rec2 aims to optimise and demonstrate innovations to improve the sorting and separation efficiency of multilayer material systems such as pharma blister packs specifically:

- Development of a toolbox of novel green solvents, capable of selective dissolution or delamination of targeted components from multilayer and multi-component materials.
- Recovery processes for isolating poly vinyl chloride (PVC) and aluminium (Al) from packaging waste
- Recovery processes for isolating polyethylene/ polypropylene/polyethylene terephthalate (PE/PP/PET) from multilayer packaging pouches
- Digital watermarks for multilayer packaging – innovative digital codes will be embossed into packaging material, enabling improved sorting of post-consumer multilayer packaging waste whilst providing traceability of the plastic products from point of manufacture to end of life disposal

The project's communication strategy will ensure continuous communication with the interested end users throughout the project to spread the generated technology into the market, as well as reaching out to society in order to alleviate concerns and encourage public acceptance.

#### 6.1.1 PESTLE Analysis

As part of the communication strategy, a PESTLE (Political, Economic, Social, Technological, Legal and Environmental) analysis of the project was performed as part of macroeconomic assessment of project impacts (see Figure 15).

Political	<ul style="list-style-type: none"> <li>• Energy security</li> <li>• EU circular economy</li> <li>• EU decarbonisation??</li> </ul>
Economic	<ul style="list-style-type: none"> <li>• Cost reduction of recycling and separation</li> <li>• Lower installation cost</li> <li>• Reduction of net capital investment over life cycle of plant</li> </ul>
Social	<ul style="list-style-type: none"> <li>• Sustainability</li> <li>• New job opportunities</li> </ul>
Technology	<ul style="list-style-type: none"> <li>• Use of 'green' solvents to separate multilayer material systems</li> <li>• Innovative digital water marks for 'multilayer' packaging</li> </ul>
Legal	<ul style="list-style-type: none"> <li>• Patents</li> <li>• Health and safety</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>• Reduction in carbon foot print?</li> <li>• Reduction in toxic chemicals</li> <li>• Environmental friendly recycling</li> </ul>

Figure 15 Figure showing the PESTLE Analysis of Sol-Rec2 project



### 6.1.2 Stakeholder Engagement

Target groups including stakeholders from industry, primary influential bodies and academia and the public were identified as part of consortium stakeholder engagement strategy (see Figure 16).

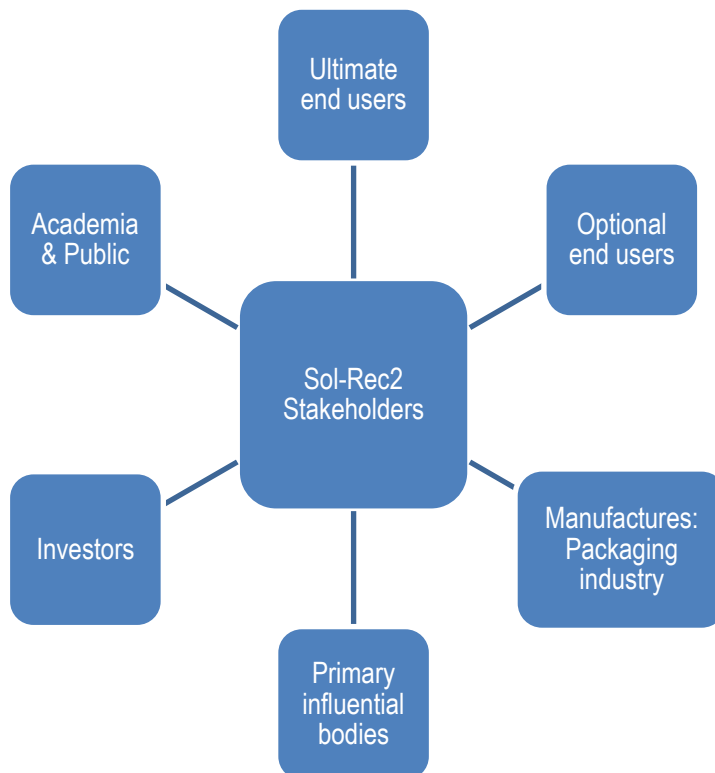
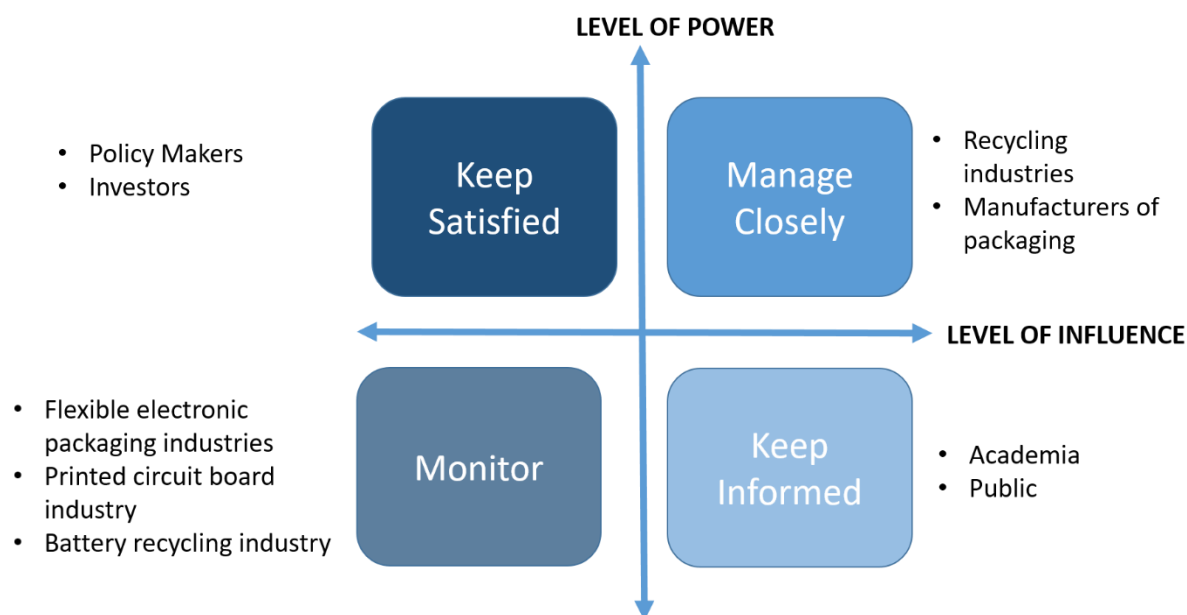


Figure 16 Figure showing Sol-Rec2 stakeholder groups

The initial analysis as part of the consortium's plan for exploitation and dissemination of results (PEDR) has identified that the stakeholders include, but are not limited to, the following stakeholder groups:

- **Group 1:** Ultimate end users and beneficiaries: Packaging industry (pharmaceutical, laminate consumer packaging, recycling industries vertically integrated operators such DOW, GE, etc.)
- **Group 2:** Optional end users: Metal recycling industries, flexible electronic packaging industries, printed circuit board industry, battery recycling industry
- **Group 3:** Manufacturers of packaging
- **Group 4:** Primary influential bodies/industry association: European Recycling Industries' Confederation (EuRIC), Plastics Recyclers Europe (PRE), Circular Plastic Alliance (CPA), Plastic News, Plastics Europe, The Association of Plastic Recyclers (APR), European Association of Plastic Recycling and Recovery Organisations (EPRO), European Environment Agency (EEA), United Nations Environment Programme (UNEP, The Intergovernmental Panel on Climate Change (IPCC) and policy makers.
- **Group 5:** Investors: vertically integrated operators of plastic recycling, banks, venture capitalists, public (EC) and regional fund providers.
- **Group 6:** Others: Academia and public

The stakeholders, as identified above, were mapped based on the 'Power - Influence matrix' (represented in Figure 17) to manage target audience and communication frequency.



*Figure 17 Stakeholder engagement – Power Influence matrix*

The matrix in Figure 17 will be used as part of mapping out a baseline for communication intervention:

- Who will receive communication;
- How the communications will be delivered;
- What information will be communicated;
- Who communicates, and;
- The frequency of communication.

## 6.2 Communication Objectives

The consortium has established SMART (**S**pecific, **M**easurable, **A**chievable, **R**elevant and **T**ime-bound) objectives focussing on the engagement level of the audience and the action needed for implementation (see Table 2).

*Table 2: Communication objectives*

AUDIENCE*	COMMUNICATION AIM	SMART OBJECTIVE	ACTION REQUIRED
Group 1	Inform	To build awareness on flexibility need of plastic recycling and sustainable approaches to recycle and reuse plastic.	Email, Direct contact, Journals, Newsletter, Project website, workshops, Sharing of project results.
Group 1	Engage	To perform field survey and case study.	Email, Direct contact, questionnaire
Group 4, 5, 6	Inspire	To propagate research results.	Journal, Newsletter, Project website, Conference
All	Inspire	To demonstrate the potential of Sol-Rec2 in rapid and efficient sorting and separation of multilayer material packing system (blister packs and laminate consumer packaging)	Press release, Project & Partners website, Workshop, Publication of case studies, Public media, Press, leaflet
Group 1,2, 3, 4, 5	Persuade	To attract investors and industry stakeholders to Sol-Rec2 innovative recycling technology with digital water marks and its associated technology components.	Direct contact, Email, Sharing of results of case studies, Workshop, Sharing of Exploitation & Business plan

\* based on the stakeholder groups identified in Section 6.1.2

### Message/Content

In order to achieve the communication objectives (as mentioned above), the consortium has established the key messages and/or 'calls to action' depending on the target audience and the platform (see Section 3.3) being used to deliver the message. These will be reviewed and revised based on evaluation of stakeholder engagement and progress of the project. Table 3 defines the key messages depending on the target audience.

*Table 3 Key messages for general and target audiences*

<p><b>Key messages for general audience</b></p> <ul style="list-style-type: none"> <li>• Multilayer material package separation technology with innovative digital water marks to enhance competitiveness in smart and flexible recycling operation.</li> <li>• Improving environmental performance and energy security (less energy intensive than the current separation and recycling methods).</li> </ul>	<p><b>Key messages for Group 1</b></p> <ul style="list-style-type: none"> <li>• Demonstration, in working multilayer material package separation technology, of two variants (ionic liquids, deep eutectic solvents) of Sol-Rec2 technology with pharmaceutical blister packaging and laminate consumer packaging, meeting the different flexibility needs of rapid sorting and efficient separation.</li> <li>• Provision of tailored methodology to selectively separate target polymer depending on packaging requirements.</li> <li>• Knowledge base of design principles that will enable provision of cost effective flexible and controllable separation of multilayer material and solvent recovery processes</li> <li>• Improved system and process efficiency right from sorting through innovative digital marks till separation of multi layered materials and recovery, reuse of green solvents</li> <li>• Removal of contaminants and fine particles through solvent recovery technology to allow higher utilisation of energy from fluid streams.</li> </ul> <p><b>Key messages for Groups 4, 5 and 6</b></p> <ul style="list-style-type: none"> <li>• Sol-Rec2 aims to reduce the lifecycle investment cost for multilayered material recycling and packaging recycling plants.</li> <li>• Reducing carbon footprint contributing to decarbonisation (through less energy intensive operations?)</li> <li>• Improve overall system process efficiency</li> </ul>
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### 6.3 Implementation of Communication Plan – Platforms

The consortium plans to use the following platforms and dissemination tools for communication:

#### I. Events/workshops, seminars and webinars

The consortium will make every effort to mark its presence in various national and international activities in the areas of plastic recycling, multilayer material sorting and separation. Workshops and webinars will be hosted as appropriate project progress has been achieved.

#### II. Project website

A project website<sup>4</sup> (Figure 18) was launched in the first quarter of the project and has since been used to communicate project relevant information in the form of blog posts.

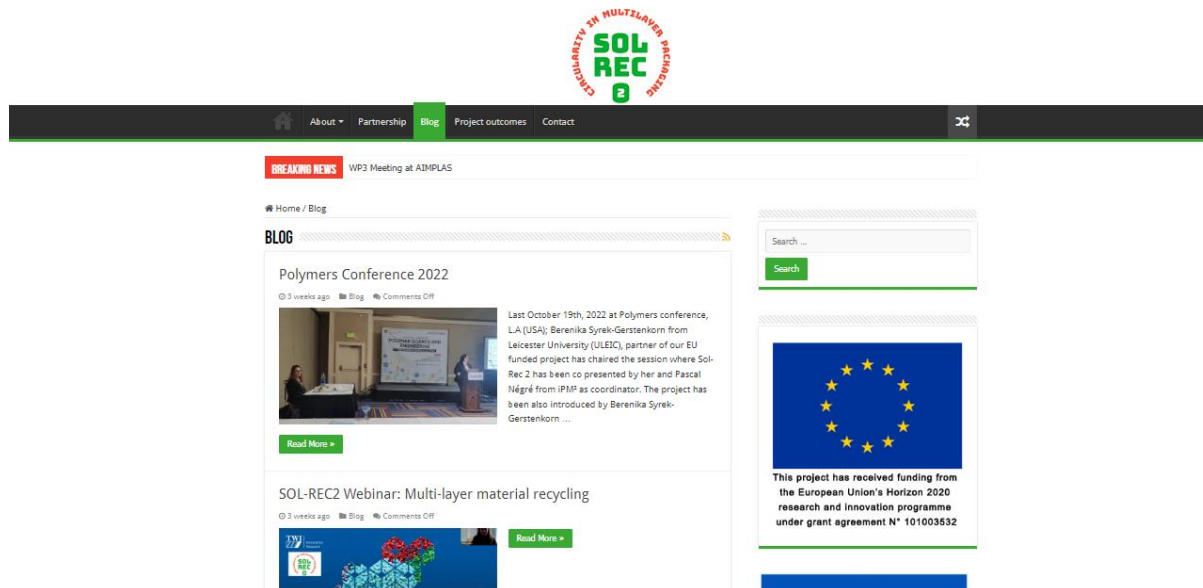
#### III. Social media channels

Twitter<sup>5</sup>, LinkedIn<sup>6</sup>, Youtube<sup>7</sup> have been set up as social media channels, and are currently been used to relay project-related information.

#### IV. Journals

Project achievements will be published in peer reviewed journals.

A detailed timeline will be established as part of the dissemination strategy and a dissemination plan included in the below section.



<sup>4</sup> <https://solrec2.eu/>

<sup>5</sup> [https://twitter.com/sol\\_rec2](https://twitter.com/sol_rec2)

<sup>6</sup> [https://fr.linkedin.com/in/sol-rec-2-project-4aa60b226/en?trk=public\\_profile\\_locale-url](https://fr.linkedin.com/in/sol-rec-2-project-4aa60b226/en?trk=public_profile_locale-url)

<sup>7</sup> <https://www.youtube.com/@sol-rec2projet949>

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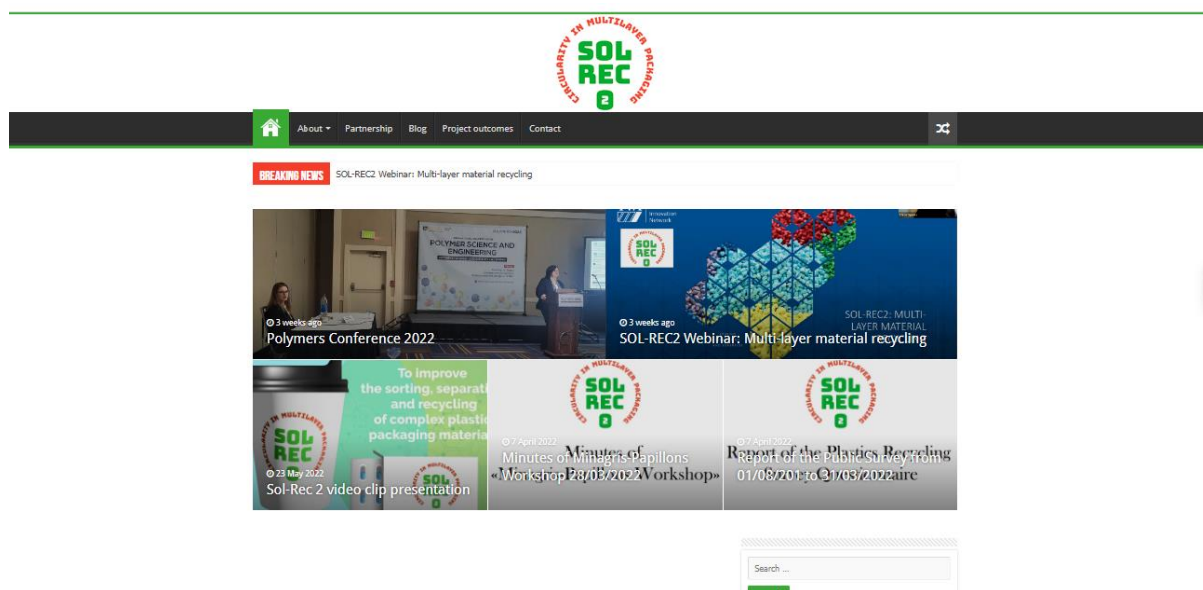


Figure 18 Project website with information on latest news on Sol-Rec2

## 6.4 Evaluation

The consortium has identified dissemination/exploitation specific Key Performance Indicators (KPIs) to measure the project success and impacts on the user community. Table 1 outlines the KPIs, the definition of each indicator, type of data required and target at the end of the project.

## 6.5 Sol-Rec2 Communication Framework

The Sol-Rec2 communication policy is based on the best practices for communication with emphasis on continuous learning and improvement based on scope (aims and audience), develop (objectives and messages), implement (communication platforms) and evaluation (benchmarking success with KPIs established) as described above. To summarise, the Sol-Rec2 communication policy includes a) who will receive the communication, b) how the communication will be delivered, c) what information will be communicated, d) who communicates, and e) the frequency of the communication as shown in Table 4.

Table 4 Sol-Rec2 Communication Policy

MAIN AUDIENCE (see Section 6.1)	COMMUNICATION PLATFORM	MESSAGE	WHO COMMUNICATES	FREQUENCY OF COMMUNICATION
All	Project website and social media	Project updates	TWI	1 per month and updated regularly
	Project newsletters	Project updates	TWI in collaboration with project partners	2 per year
1, 3, 5	Internal Workshops /training sessions/webinars	<ul style="list-style-type: none"> <li>Webinar on Plastic Recycling and Sol-Rec2 project</li> <li>Sol-Rec2 Technology updates</li> </ul>	All	At least 2 workshops and webinars demonstrating of Sol-Rec2 technology and innovations respectively
1, 2, 3, 4, 5	External events (conferences/workshops)	Raise awareness and demonstrate Sol-Rec2 innovations	All	Participation in major national and international plastic recycling, circular economy events
1, 3, 4	Articles and publications	Demonstrate Sol-Rec2 innovations	All	1 announcement per major technical achievement

## 7 List of Dissemination Activities

Table 5 details all dissemination activities carried out by consortium partners in the first reporting period (M1 - M18) and the photographs taken during the events representing the Sol-Rec2 project are collectively shown in Figure 19

*Table 5 List of dissemination activities in Period 1 for Sol-Rec2 Project.*

#	PARTNER	DISSEMINATION ACTIVITY	EVENT/PLATFORM	LOCATION	DATE
1	iPM <sup>2</sup>	Poster session and presentation	Global Industrie 2021	Lyon (FR)	6 <sup>th</sup> – 9 <sup>th</sup> Sept 2021
2	TWI & FIL	Poster session and Booth Attendance	Plastics Recycling Show Europe 2021	Amsterdam (NL)	4 <sup>th</sup> – 5 <sup>th</sup> November 2021
3	iPM <sup>2</sup>	Participant at Workshop	Minagris-Papillions Workshop	Online	28 <sup>th</sup> March 2022
4	AIM	Seminar	International Seminar on Bio-technologies Applied to the Plastic Sector	Online	March 2022
5	iPM <sup>2</sup>	Presentation	EuroQCharm Cluster Meeting	Copenhagen (FN)	17 <sup>th</sup> – 18 <sup>th</sup> May 2022
6	AIM	Newsletter	Plastic Industry Monthly Newsletter	Online	May 2022
7	AIM & FIL	Poster Session	Plastics Recycling Show Europe 2022	Amsterdam (NL)	22 <sup>nd</sup> – 23 <sup>rd</sup> June 2022
8	ALL	Workshop Organised by Sol-Rec2	Plastics Recycling Show Europe 2022	Amsterdam (NL)	22 <sup>nd</sup> June 2022
9	AIM	Industry Training	Training to Plastic Industry	AIMPLAS	July 2022
10	ULEIC	Poster Presentation	Eurocorr 2022 Conference	Berlin (DE)	Aug 28 <sup>th</sup> - 1 <sup>st</sup> Sept 2022
11	AIM	Industry Training	Bio-plastic Compounding and Formulation	AIMPLAS and Online	August 2022
12	TWI & ULEIC	Presentation & webinar	Sol-Rec2 webinar - Multilayer Material Recycling	Online	30 <sup>th</sup> September 2022
13	AIM	Industry training	AIMPLAS Training to plastic industry	Online	September 2022



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Table 5 List of dissemination activities in Period 1 for Sol-Rec<sup>2</sup> Project (continued).

14	AIM	Webinar	Incorporation of Anti-microbial Agents in Polymers	Online	September 2022
15	AIM	Industry Training	The Art of Mixing, Reinforcing and Incorporating Additives in Plastic	Online	September 2022
16	SOL	Presentation	IBA Conference 2022	Bled (SL)	4 <sup>th</sup> October 2022
17	ULEIC & iPM <sup>2</sup>	Presentation and Poster Session	Polymers Conference	Los Angeles (USA)	19 <sup>th</sup> October 2022
1918	iPM <sup>2</sup> , ULEIC & TWI	Presentation	EU H2020/HE Cluster Meeting	Rimini (IT)	8 <sup>th</sup> November 2022
20	AIM	Industry Training	AIMPLAS Training to Plastic Industry	AIMPLAS	November 2022



Plastics Recycling Show Europe 2021



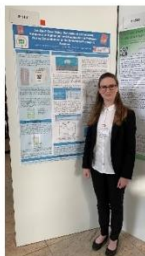
EuroQcharm Cluster Meeting, Copenhagen (DN), May 2022



Plastics Recycling Show Europe 2022



SOL-REC2 Webinar  
Multi-layer material recycling



EuroCorr'22, Germany



Polymer  
Conference'22, USA



ECOMONDO 2022  
Rimini (IT)

Figure 19 Photographs taken during various dissemination activities representing Sol-Rec<sup>2</sup> project.

## 8 Key Performance Indicators

Key Performance Indicators (KPI) for Sol-Rec2 were first detailed in deliverable report D8.1. The quarterly collations of KPI metrics against each work package and task covering Period 1 are presented, respectively, in Tables 6-14.

Table 6 KPI metrics for WP1.

WP1 CONSUMER SURVEYS AND CONSULTATION WITH KEY INDUSTRIAL PLAYERS											
LEAD	PARTNERS	KPI	TARGET	MILESTONE	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
T1.1 INITIAL CONSUMER SURVEYS TO DETERMINE PLASTIC WASTE RECYCLING BEHAVIOUR											
iPM <sup>2</sup>	AIM-TWI-PLA	Survey size/Number of public responses to questionnaire per state	Average 300 participants per state (8 states)	MS1	108	91	74	66	60	80	479
		Diversity of participants	Achieved demographic as per DoA (Total number of states)		16	1	0	1	0	1	19
		Total Responses	>2000 (~300 x 8 states)		649	545	442	398	361	479	2874
T1.2 CONSULTATION WITH KEY INDUSTRIAL PLAYERS											
TWI	ALL	Number of companies contacted	>7		Total for Period 1						28
		Number of company responses received			Total for Period 1						7
T1.3 PRACTICAL WORKSHOPS											
iPM <sup>2</sup>	TWI-AIM	Number of workshops							1	1	2
		Number of attendees	Attendance of >50% of registrations						2	38 (32%)	40

Table 7 KPI metrics for WP2.

WP2 DETERMINE COMPOSITION OF LAMINATE POUCHES AND PHARMA BLISTER PACKS											
LEAD	PARTNERS	KPI	TARGET	MILESTONE	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
T2.1 COLLECTION OF MULTIPLE SAMPLES OF LAMINATE POUCHES AND PHARMA BLISTER PACKS (M1 – M4)											
PLA	AIM-TWI-MIK	Number of obtained samples of laminate packaging			80 samples of 13 different structures including: PA/PET/ALU, PAB/PP/ALU, Paper/ALU, Paper/ALU/PE, Paper/ALU/PET, Paper/ALU/PP, PE/ALU, PE/ALU/PET, PE/PP/ALU, PET/ALU, PP/ALU, PP/ALU/PET, PVC/ALU					80	
		Number of obtained samples of blister packaging			22 samples of different blister packaging					22	
T2.2 ANALYSIS OF LAMINATE PACKAGING - TYPE OF POLYMER FILMS USED, NUMBER AND THICKNESS OF LAYERS (M3 – M8)											
AIM	PLA	Number of laminate packaging samples analysed	Identification of material layers	MS4 (M6)		Totals available for Period 1					6
		Number of test methods/analysis used on laminate packaging				FTIR				3	
						Micro-FTIR					
						Microscopy					
T2.3 ANALYSIS OF PHARMA BLISTER PACKAGING - TYPE OF PLASTIC, GRADE AND QUANTITY OF ALUMINIUM USED (M3 – M8)											
AIM	PLA-TWI	Number of blister packaging samples analysed	Identification of material layers			Totals available for Period 1					8
		Number of tests methods/analysis used on blister packaging				FTIR				3	
						Micro-FTIR					
						Microscopy					

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Table 8 KPI metrics for WP3.

WP3 WASTE SORTING, WASHING AND SHREDDING OPTIONS											
LEAD	PARTNERS	KPI	TARGET	MILESTONE	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
T3.1 DEVELOPMENT OF DIGITAL WATERMARKS FOR MULTI-LAYER PACKAGING POUCHES (M1 – M4)											
FIL	PLA-AIM	Number of digital watermarks developed	Fabrication of 500 pouches		600 laminate pouches (200 pouches for each of 3 different material structures) carrying digital watermarks which can be used to demonstrate effectiveness of digital watermarking sorting technology					3	
		Number of examples of different packaging types with successful application of digital watermark								3	
		Number of pouches produced with digital watermark of each example								200	
T3.2 DEVELOP IMPROVED METHODS OF SORTING LAMINATE AND PHARMA BLISTER PACKAGING WASTE (M1 – M10)											
AIM	FIL-MIK	Number of sorting technologies evaluated		MS2 (M5)		NIR				5	
						Triboelectric					
						Elutriation					
						Density					
						Hyperspectral Camera					
		Number iterations of sorting trials						Total for Period 1		21	
		Sorting efficiency for each method and packaging type				NIR: PE/ALU = 88%; PE/ALU/PET = 20%; PAPER/ALU/PET = 0%				88% (max.)	
Triboelectric = 0% (ALL)											
Elutriation = 0% (ALL)											
Density = 0% (ALL)											
Hyperspectral Camera = TBC											

Table 8 KPI metrics for WP3. (continued)

T3.3 DECONTAMINATION OF POST-CONSUMER LAMINATE AND PHARMA BLISTER PACKAGING WASTE (M5 – M8)										
AIM	MIK-PLA	Number of decontamination technologies evaluated for laminate packaging and blister packaging							Washing Process	1
		Decontamination efficiency for laminate packaging								n/a
		Decontamination efficiency for blister packaging								n/a
T3.4 SHREDDING AND GRINDING OF LAMINATE AND BLISTER PACKAGING WASTE (M8 – M12)										
AIM	MIK-PLA	Number of size reduction technologies evaluated for laminate and blister packaging		MS5 (M10)					Blade	3
									Cutting Mill	
									Shredding Mill	
		Number of size reduction trials for laminate packaging							Blade	3
									Cutting Mill	
									Shredding Mill	
		Number of size reduction trials for blister packaging							Blade	1

Table 19 KPI metrics for WP4.

WP4 DEVELOPMENT OF TOOLBOX OF SOLVENTS FOR SELECTIVE POLYMER DISSOLUTION											
LEAD	PARTNERS	KPI	TARGET	MILESTONE	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
T4.1 PROCUREMENT OF CHEMICALS (M1 – M5)											
ULEIC	SOL-TWI	Number of ILs synthesised	Prepare a toolbox of low-cost IL solvents suitable of selective polymer dissolution. >50 recipes	MS3 (M5)	4	5		8	6		23 (SOL)
		Number of DES synthesised			Total for Period 1						41 (ULEIC) 4 (TWI)
T4.2 PRIMARY SCREENING FOR SOLVENTS CAPABLE OF DISSOLVING PVC,PE & PP (M2 – M9)											
ULEIC	SOL-TWI	Number of dissolution trials with IL or DES with PE/PP/PVC	Selective dissolution of PVC, PE and PP				40				40
		Number of successful IL for PE dissolution					0				0
		Number of successful IL for PP dissolution					0				0
		Number of successful IL for PVC dissolution					0				0
ULEIC	SOL-TWI	Number of dissolution trials with DES with PE/PP/PVC	Selective dissolution of PVC, PE and PP.		Totals for Period 1					17	
		Number of successful DES for PE dissolution	Dissolution kinetics - normalised dissolution		Totals for Period 1					5	

Table 9 KPI metrics for WP4. (continued).

		Number of successful IL/DES for PP dissolution			Total for Period 1					0	
		Number of successful IL/DES for PVC dissolution			Total for Period 1					1	
T4.3 OPTIMISATION OF POLYMER DISSOLUTION CONDITIONS (M8 – M13)											
ULEIC	SOL-TWI	Number of experiments/ improvement methods/iterations for dissolution of PE/PP/PVC	Desirable temperature, stirring time, ultrasonication time and solid loading	MS6 (M13)	Optimisation work focused on delamination of multilayers as opposed to dissolution of individual polymers due to the inefficient outcomes seen for IL and DES						n/a
		Most efficient dissolution time for PE/PP/PVC									n/a
		Number of IL delamination experiments with laminate and blister packaging						32	74	15	121
		Number of successful IL delamination experiments						12	18	5	35
		Successful IL delamination timeframe						2 h	15 min	15 min	15 min (best performance)
		Number of DES delamination experiments with laminate and blister packaging						Total for Period 1			>200
		Number of successful DES delamination experiments						Total for Period 1			>100
		Successful DES delamination timeframe						Best Performance			15 min



Table 9 KPI metrics for WP4. (continued).

T4.4 TRIALS USING POLYMER MIXTURES TO ENSURE SELECTIVE DISSOLUTION OF TARGET POLYMERS (M12 – M16)												
ULEIC	SOL-TWI	Number of selective dissolution experiments with mixtures of polymers	Convenient dissolution rates		Optimisation work focused on delamination of multilayers as opposed to dissolution of individual polymers due to the inefficient outcomes seen for IL and DES						n/a	
		Number of successful selective dissolution experiments									n/a	
T4.5 DISSOLUTION TRIALS USING REPRESENTATIVE SAMPLES OF LAMINATE & BLISTER PACKAGING WASTE (M16 – M18)												
ULEIC	SOL-TWI	Number of laminate packaging samples evaluated								3	3	
		Number of blister packaging samples evaluated								0	0	
		Number of IL/DES dissolution trials with laminate packaging samples	Optimised dissolution/ delamination rates	Optimisation work focused on delamination of multilayers as opposed to dissolution of individual polymers due to the inefficient outcomes seen for IL and DES						n/a		
		Number of IL/DES dissolution trials with blister packaging samples								n/a		
		Number of IL/DES evaluated in delamination trials	Evaluation of 6 solvent formulations						7	7		
		Number of IL/DES delamination trials with laminate packaging samples							54	54		
		Successful DES delamination timeframe							< 15 min	< 15 min (best performance)		



Table 10 KPI metrics for WP5.

WP5    DESIGN OF NOVEL POLYMER RECOVERY AND PURIFICATION PROCESS											
LEAD	PARTNERS	KPI	TARGET	MILESTONE	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
T5.1    POLYMER DISSOLUTION PROCESSES SCALED-UP IN 1 L REACTORS (M16 – M21)											
TWI	ULEIC-SOL	Successful dissolution trials	Effective dissolution (in 1L scale up), within desirable conditions	MS7 (M21)	In progress for Period 2 reporting					Completed 1 × 1 L synthesis of IL	
T5.2    DEVELOPMENT OF FILTRATION/PRECIPITATION METHODOLOGY FOR POLYMER RECOVERY (M19 – M25)											
TWI	ULEIC-PLA-AIM	Amount of polymer recovered in each trial / Amount of IL, organic solvent, or additive remaining after filtration	Efficient recovery system	MS8 (M27)	In progress for Period 2 reporting						
T5.3    ESTABLISH METHODOLOGY FOR SEPARATING ALUMINIUM FROM PLASTIC RESIDUES (M22 – M27)											
TWI	ULEIC-PLA-AIM	Separation efficiency per trial	Effective separation/ isolation of Al from the mixture	MS9 (M27)	Activity start in Period 2						
T5.4    DEVELOPMENT OF SOLVENT RECYCLING PROTOCOLS (M22 – M27)											
SOL	TWI-ULEIC			MS9 (M27)	Activity start in Period 2						
T5.5    ANALYSIS OF ISOLATED POLYMERS - PURITY & PHYSICAL FORM (M25 – M27)											
TWI	WI-ULEIC	Number of analyses	Development of analysis method	MS9 (M27)	Activity start in Period 2						

Table 11 KPI metrics for WP6.

WP6    PROCESS SCALE-UP AND PILOT PLANT VALIDATION STUDIES											
LEAD	PARTNERS	KPI	TARGET	MILESTONE	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
T6.1    SCALE-UP SYNTHESIS OF SELECTED IONIC LIQUIDS (M25 – M36)											
SOL	TWI-ULEIC	IL synthesis efficiency, QA/QC data (more of a milestone will be monitored to manage risks)	100 litres of the selected IL		Activity start in Period 2						
T6.2    DESIGN & INSTALLATION OF 50-100 L PILOT REACTOR (M26 – M28)											
iPM <sup>2</sup>	AIM-PLA-ULEIC-TWI	Pilot reactor	50 - 100 L reactor to be built.		Activity start in Period 2						
T6.3    VALIDATION TRIALS OF POLYMER DISSOLUTION AND RECOVERY TECHNOLOGY (M29 – M36)											
AIM	iPM <sup>2</sup> -PLA-ULEIC-TWI	Validation results obtained per study subject and trial	A minimum of 2 validation batches per material (specimen size of >5kg) will be carried out	MS10 (M31)	Activity start in Period 2						
T6.4    QUALITY & PERFORMANCE ANALYSIS OF RECOVERED MATERIALS (M31 – M36)											
MIK	SOL-ULEIC-PLA-TWI-AIM	Quality analysis performed, number of performance comparison	Quality report, indicating the comparative results of the obtained and commercially available products		Activity start in Period 2						

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Table 11 KPI metrics for WP6 (continued).

T6.5 FABRICATION OF HIGH-QUALITY PRODUCTS USING RECOVERED POLYMERS (M35 – M36)						
MIK	AIM	Number of products fabricated	Lighting insulation, sewage covers etc	MS11 (M36)	Activity start in Period 2	

Table 23 KPI metrics for WP7.

WP7 SUSTAINABILITY FROM A LIFE-CYCLE PERSPECTIVE											
LEAD	PARTNERS	KPI	TARGET	MILESTONE	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
T7.1 SAFETY AND HEALTH RISK MANAGEMENT PROCEDURE (M1 – M14)											
iPM <sup>2</sup>	ALL	D7.2	MS12 (M36)						1		1
T7.2 MATERIALS FLOW ANALYSIS (M7 – M36)											
iPM <sup>2</sup>	ALL	D7.3	MS12 (M36)		In progress for Period 2 reporting						
T7.3 LCA-LCC OF INNOVATIVE Sol-Rec2 PROCESSES AND COMPARISON TO STATE-OF-THE-ART (M7 – M36)											
iPM <sup>2</sup>	ALL	D7.1	MS12 (M36)					1			1
T7.4 SOCIATAL IMPACT ANALYSIS (M7 – M36)											
AIM	ALL	D7.4	MS12 (M36)		In progress for Period 2 reporting						
T7.5 SWOT ANALYSIS FOR Sol-Rec2 PILOT REACTOR (M19 – M36)											
iPM <sup>2</sup>	ALL	D7.5	MS12 (M36)		In progress for Period 2 reporting						

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Table 13 KPI metrics for WP8.

WP8 SUSTAINABILITY FROM A LIFE-CYCLE PERSPECTIVE											
LEAD	PARTNERS	KPI	TARGET	MILESTONE	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
T7.1 DISSEMINATION OF PROJECT RESULTS THROUGH WEBSITE, PUBLICATIONS AND CONFERENCES (M1 – M14)											
iPM <sup>2</sup>	ALL	Webpage traffic	Increase engagement		Totals available for Period 1					2737	
		Social media releases								23 (iPM <sup>2</sup> ) 2 (SOL)	
		Page ‘Likes’ and ‘Follows’								98 (iPM <sup>2</sup> )	
		Results and items published								1 (SOL)	
		No. of conferences, dissemination events (e.g. webinar, exhibitions)								25	
		Total no. of attendees								>43000	
T7.2 PROTECTION OF INTELLECTUAL PROPERTY RIGHTS (M7 – M36)											
iPM <sup>2</sup>	ALL	Patent Applications			In progress for Period 2 reporting					0	
T7.3 BUSINESS PLAN AND EXPLOITATION (M7 – M36)											
iPM <sup>2</sup>	ALL	No. of exploitation activities	High market interest	MS13 (M36)	In progress for Period 2 reporting					0	
		Responses or interest received								0	

Table 14 KPI metrics for WP9.

WP9 PROJECT MANAGEMENT											
LEAD	PARTNERS	KPI	TARGET	MILESTONE	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
T7.1 TECHNICAL COORDINATION INCLUDING RISK AND INNOVATION MANAGEMENT (M1 – M36)											
iPM <sup>2</sup>	ALL	Technical performance and report submissions	Technically credible on-time Deliverable Reports		4	1	4	3	2	2	16
T7.2 FINANCIAL AND ACCOUNTING MANAGEMENT (M1 – M36)											
iPM <sup>2</sup>	ALL	Financial monitoring	Delivery according to budgets		1	1	1	1	2	3	9
		Collection of on-time quarterly statement from Partner's			8	8	8	8	8	8	48
T7.3 BUSINESS PLAN AND EXPLOITATION (M7 – M36)											
iPM <sup>2</sup>	ALL	No. of consortium/plenary meetings	Project Delivery	MS13 (M36)	3	2	2	2	1	2	12
		Risk registry entries			Totals available for Period 1						2
		Number of issues solved									2
		Milestones achieved			1	2	n/a	0	1	n/a	4
		Frequency of project monitoring			16	22	24	30	24	34	150

## 9 Conclusions

The current deliverable (D8.3) reported on the results obtained from the market analysis, feedback from industry and the targeted markets. A preliminary marketing strategy on the Sol-Rec2 technology is provided including communication strategy on targeted end users. Consultation with targeted end users and the industry survey results displayed a positive impact towards achieving the circular economy and the plastic recycling. The report also covered the consortium's dissemination strategy with the list of all dissemination activities and KPI results covering the period from M1 - M18. The initial KPI results indicated good progress in the ongoing WPs and the results achieved during the period M1 - M18 are presented through participation in various dissemination activities, demonstrating enhanced visibility of the Sol-Rec2 project and the technology.

	Co-Funded by the European Union's Horizon 2020 research and innovation programme	DELIVERABLE N°8.3	Proj. Ref.: SOL-REC2 101003532 Page <b>38</b> of <b>53</b>
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## 10 References

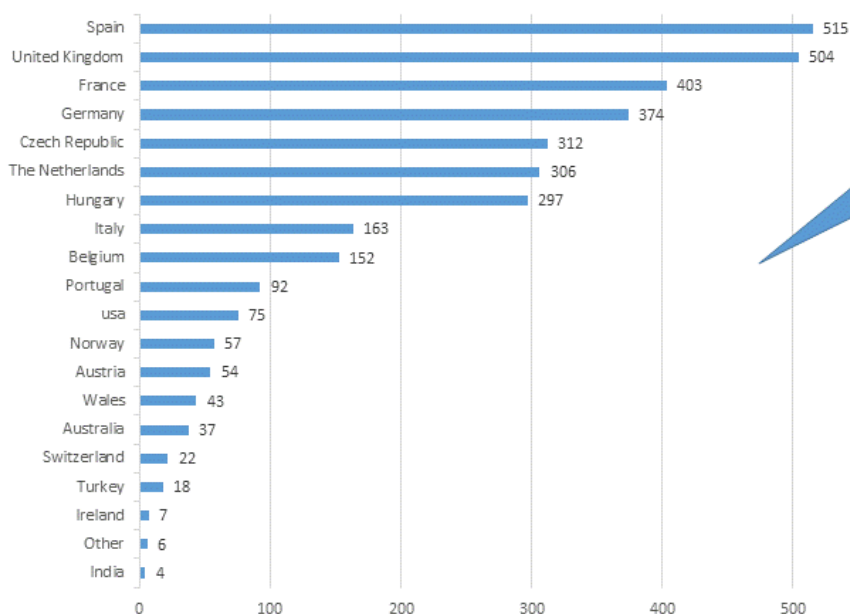
- 1) CEFLEX D4ACE. 2022. Designing for a Circular Economy for Flexible Packaging | CEFLEX D4ACE. [online] Available at: <<https://guidelines.ceflex.eu/>>
- 2) Global Commitment 2021 Progress Report. [online] Available at: <<https://ellenmacarthurfoundation.org/global-commitment/overview>>



## 11 Appendix A – Survey Responses (UPDATED TO-DATE)



### Where do you live?

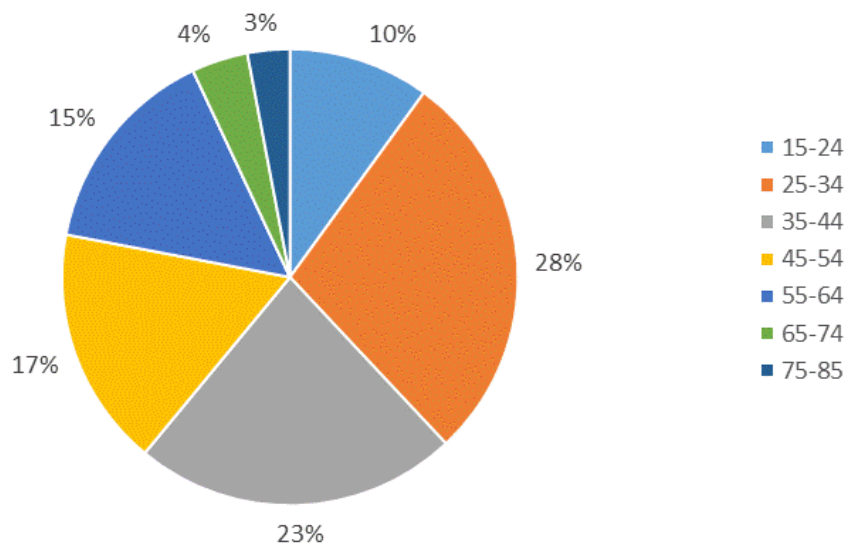


TOTAL of answers to date: 3442

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### How old are you ?

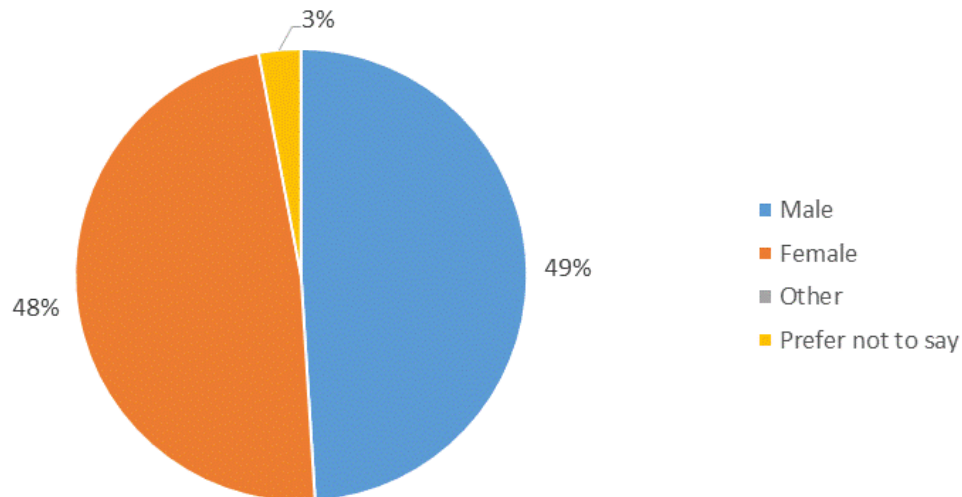


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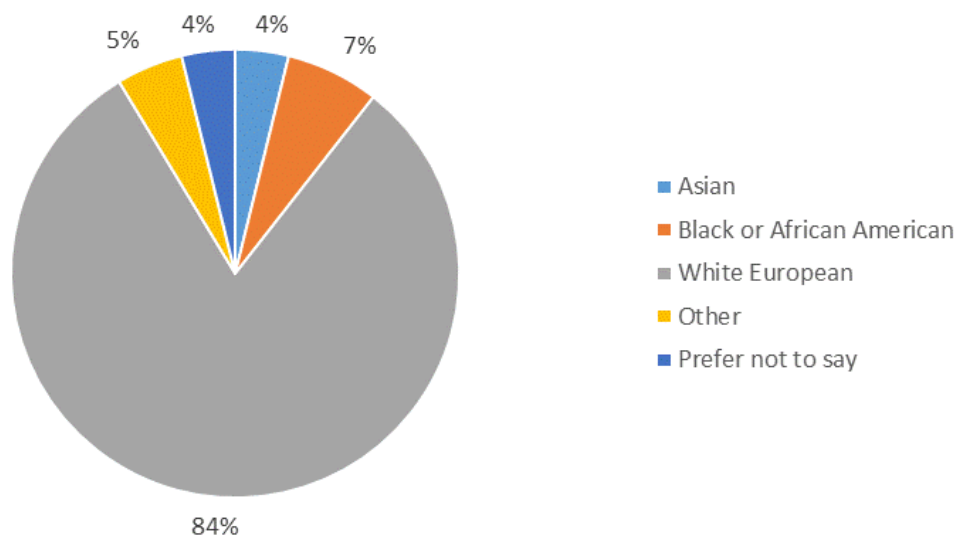
## To which gender do you identify?



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## What is your ethnicity

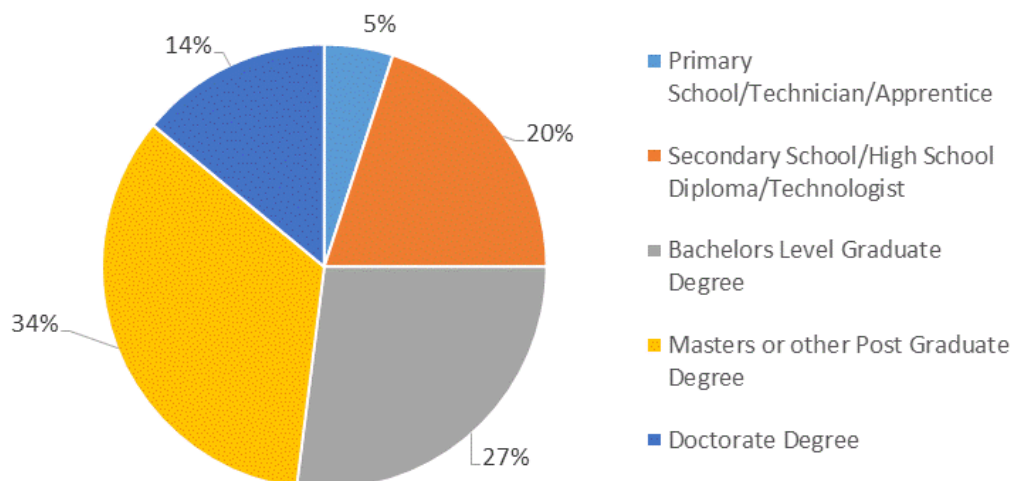


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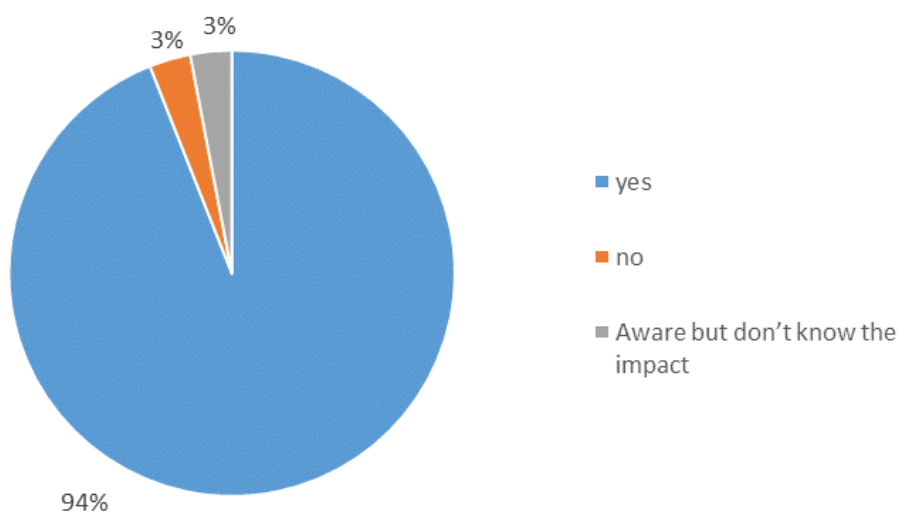
## What is your level of education?



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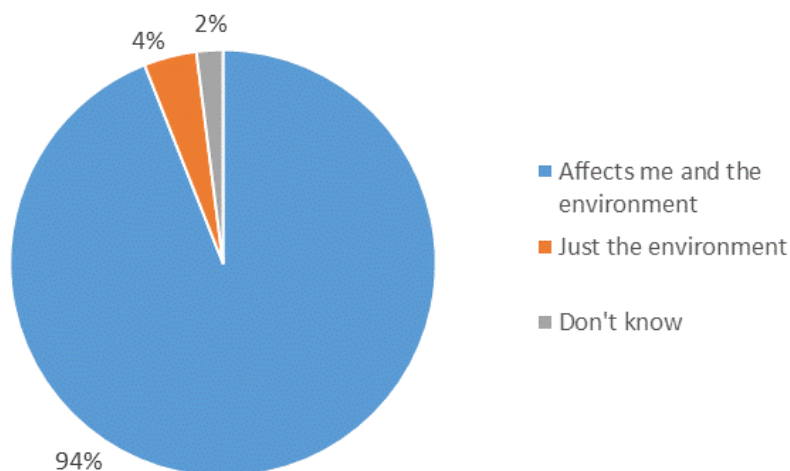
## Are you aware of plastic pollution and the impact it has on the environment ?



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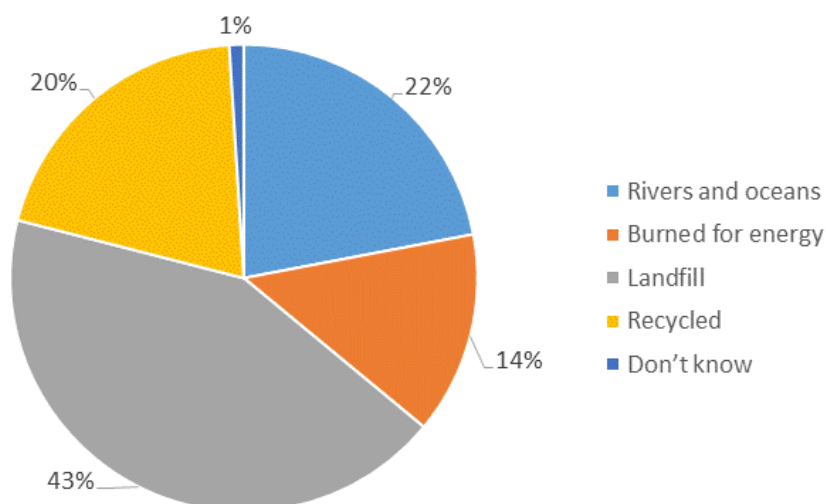
## Do you think that plastic pollution affects you or just the environment?



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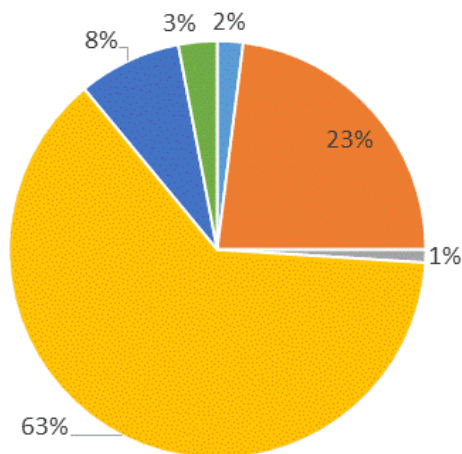
## Where does the majority of European plastic waste end up?



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## Do you know what happens to plastic waste?

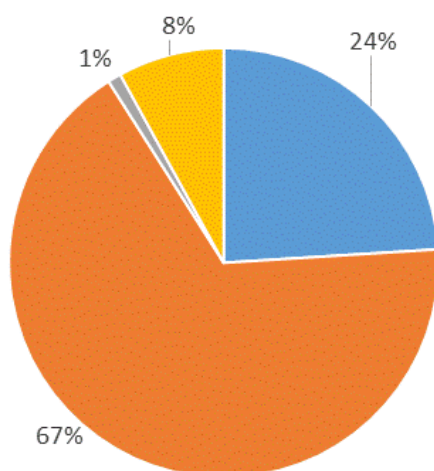


- It is a biodegradable material so it eventually disintegrates
- It never fully goes away; it just breaks into little pieces
- There is no such thing as plastic waste, all plastic is recycled
- Part of it is recycled, the rest goes into landfill or pollutes the environment
- It is dumped in rivers, lakes and the sea
- I don't know what happens to it

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## Do you help at all with reducing plastic pollution?

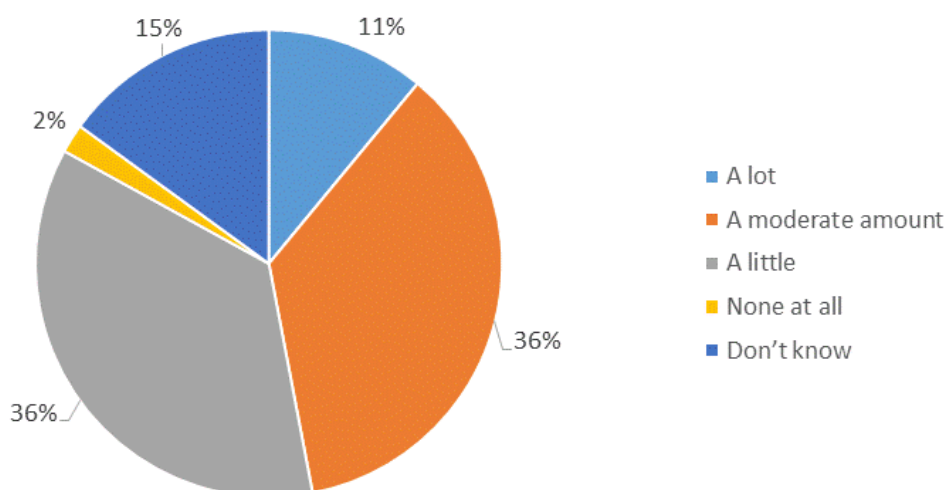


- I help a lot
- I help a little
- I don't help
- I would like to help but don't know how

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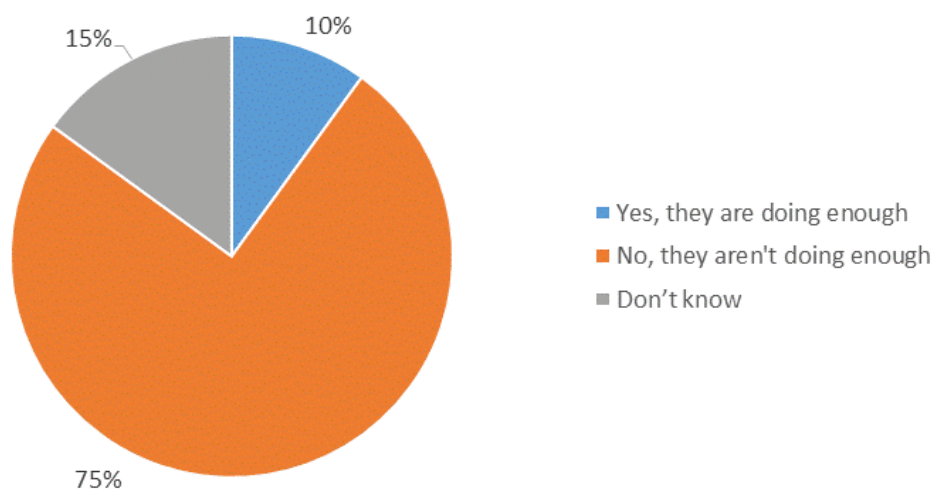
## Is there much plastic pollution around where you live?



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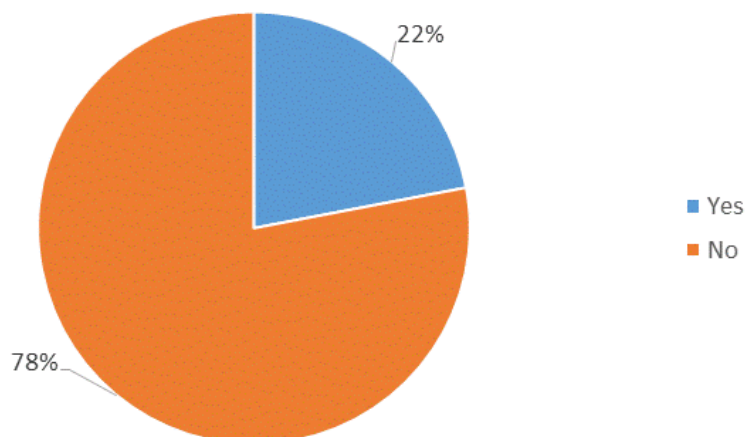
## Do you think that your government is doing enough to address plastic pollution?



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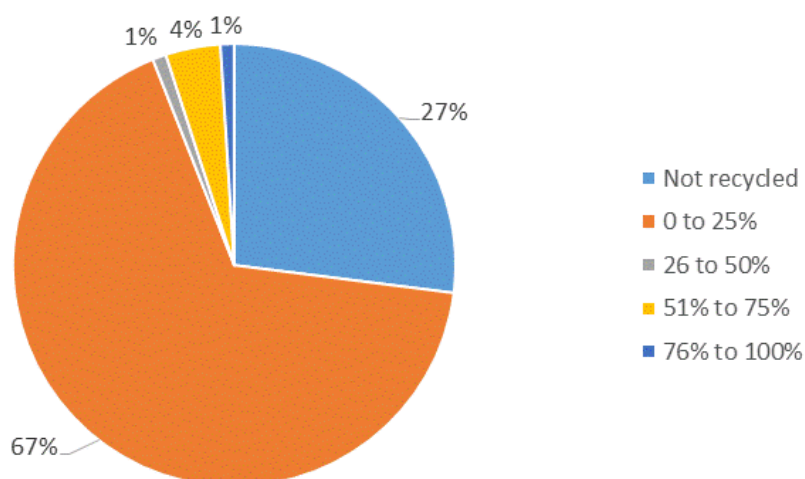
## Do you know if plastic medicine blister packs are recyclable using normal recycling methods?



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## What share of medicine blister packs do you think are recycled at the moment?

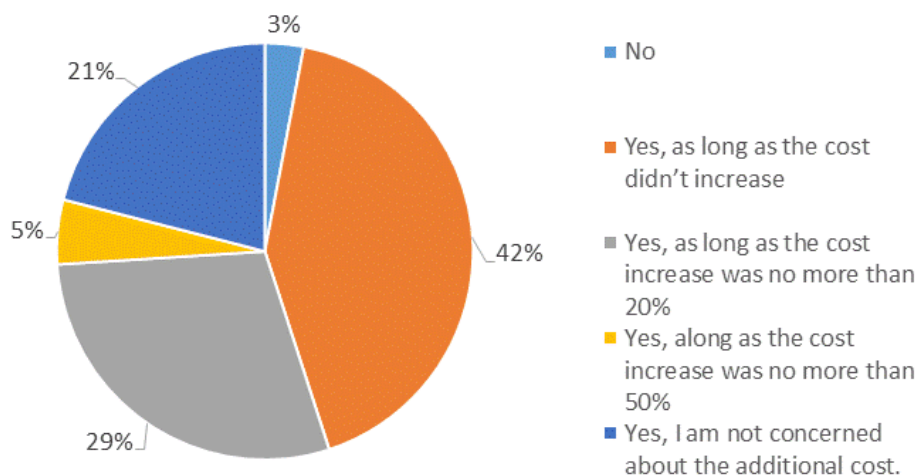


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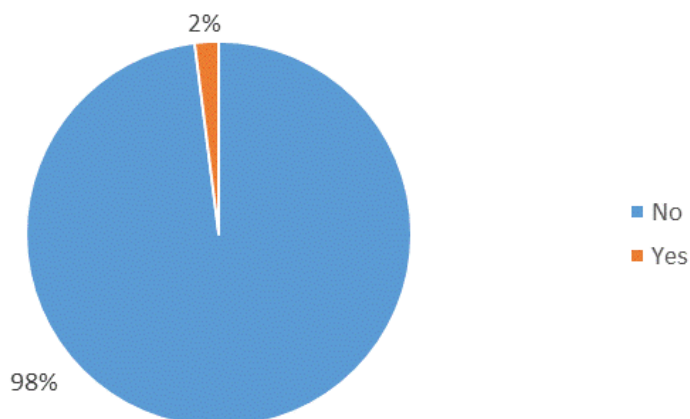
### Would you like to see plastic medicine blister packs replaced with a more environmentally friendly alternative packaging approach?



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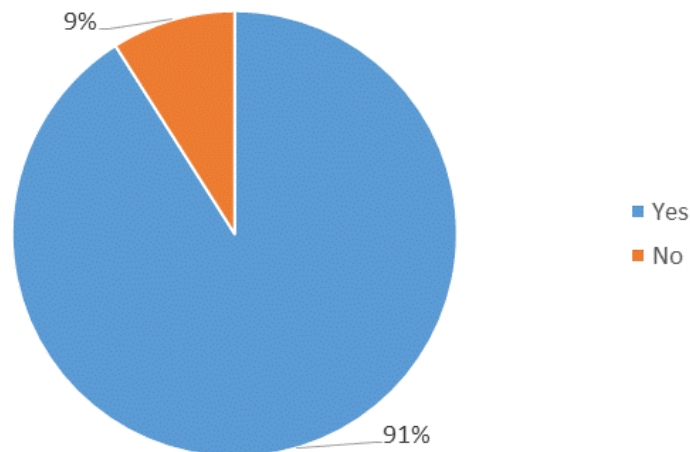
### Would you be willing to recycle your plastic blister packs via a suitable scheme?



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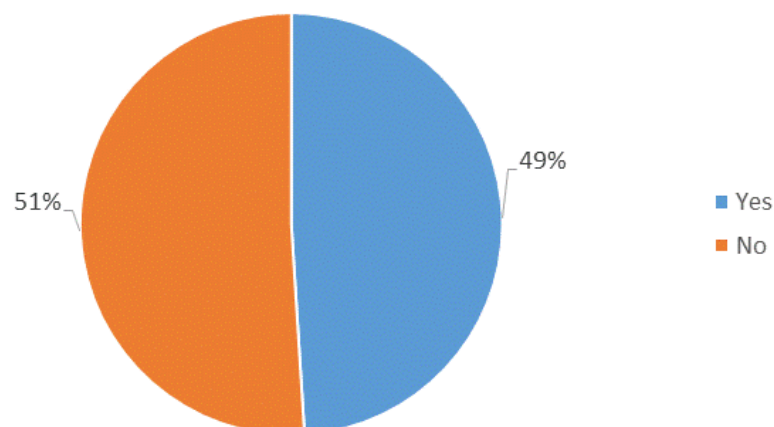
### Would you be willing to drop off blister packs at your local pharmacy for recycling?



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### Would you agree with increasing taxes to encourage the recycling of more medicine packaging?

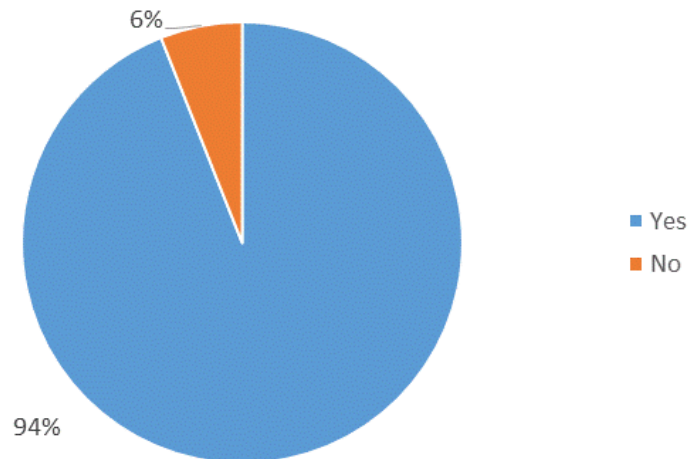


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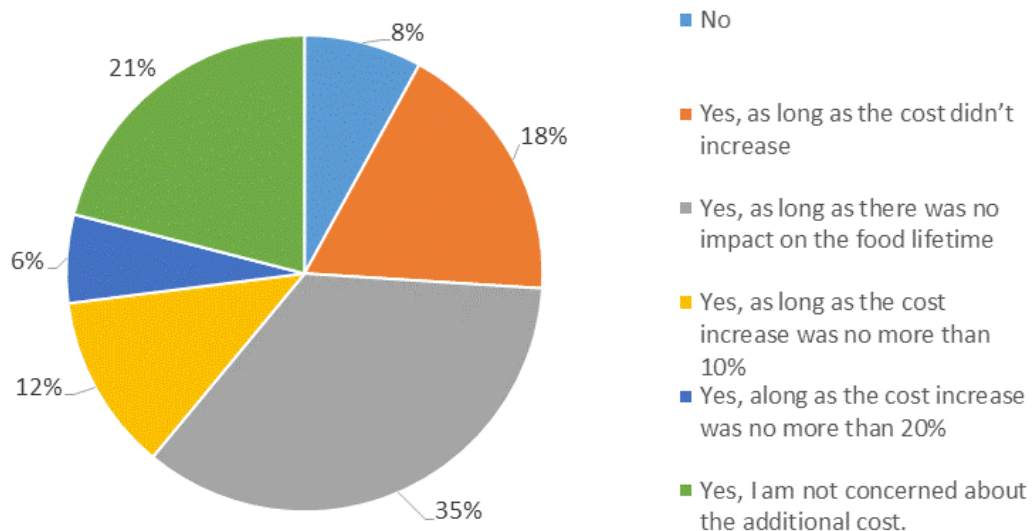
**Would you support a deposit scheme to encourage recycling of medicines and packaging ? A refund would be given when the unused medicine and packaging is returned for recycling.**



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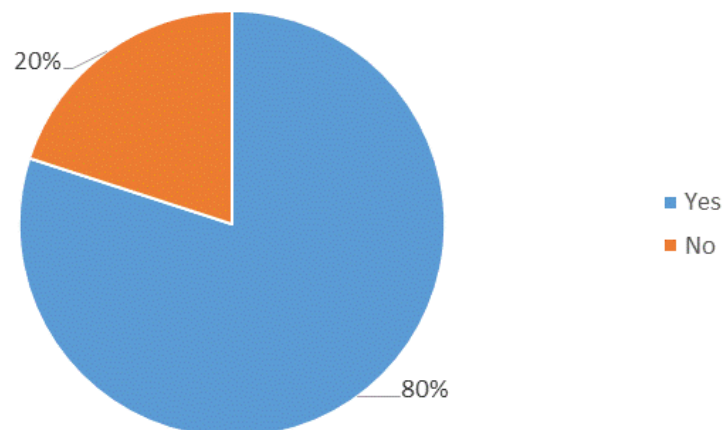
**Would you prefer the use of biodegradable (compostable) food packaging over the use of traditional fast-food packaging?**



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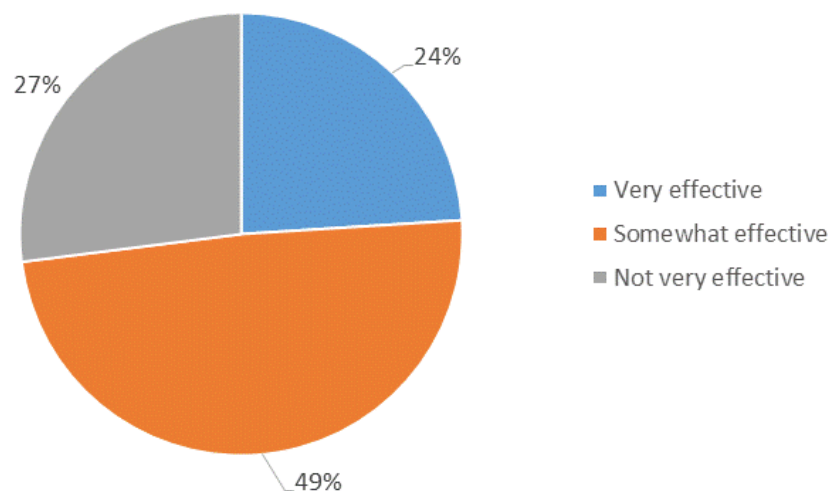
### Would you be willing to pay a little more for environmentally sustainable food packaging.



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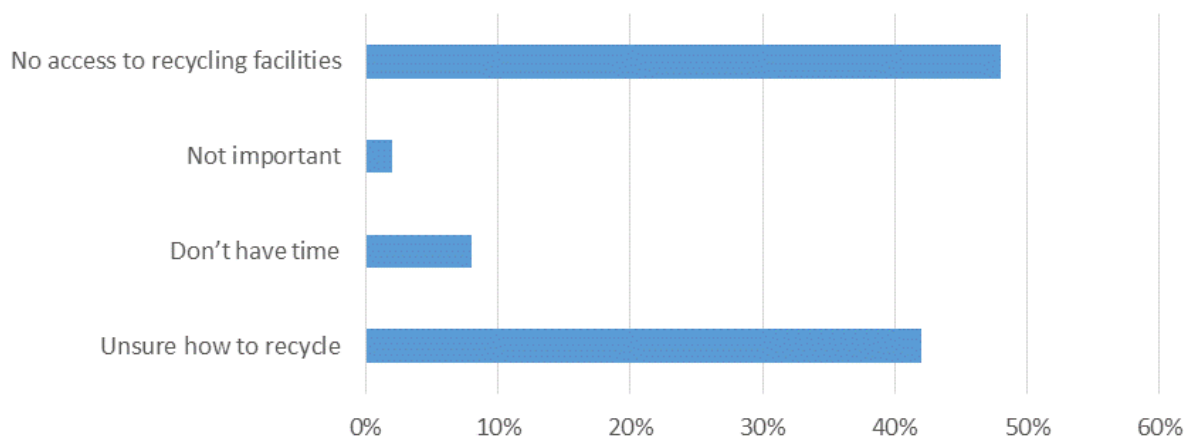
### How effective do you believe recycling is in preventing plastic multilayer food packaging waste?



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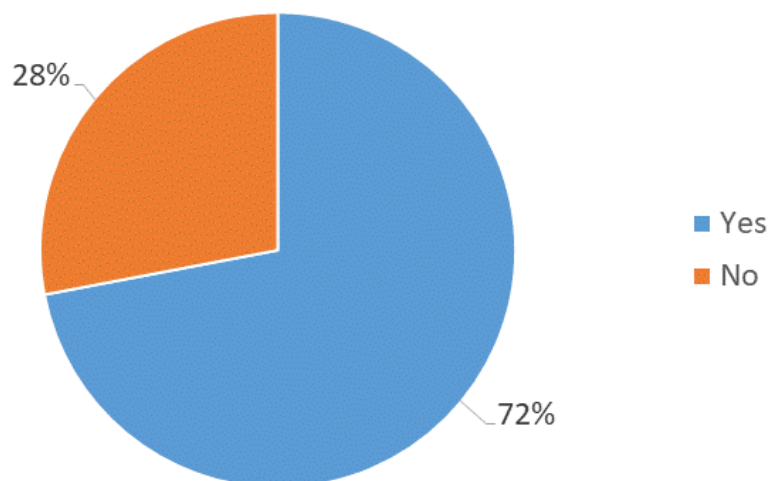
### What reasons would discourage you from recycling food packaging? Please tick all that apply?



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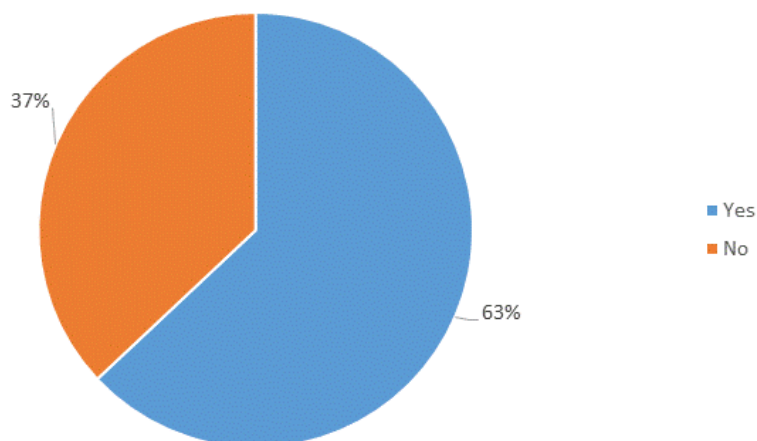
### Would you like to see plastic-free aisles in shops/supermarkets?



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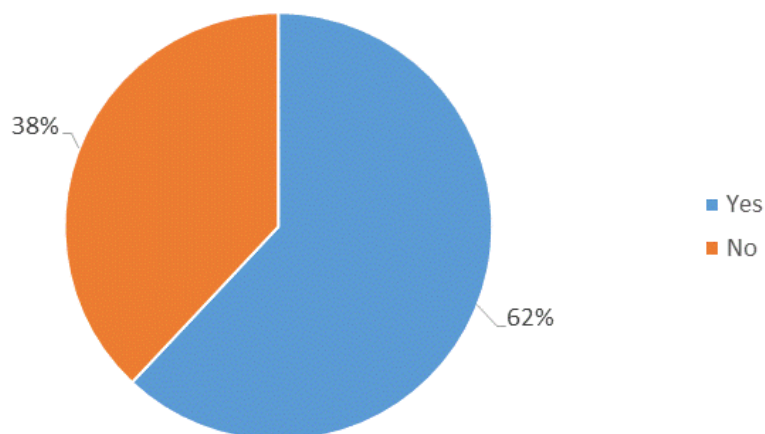
### Do you look at food packaging to see if it can be recycled?



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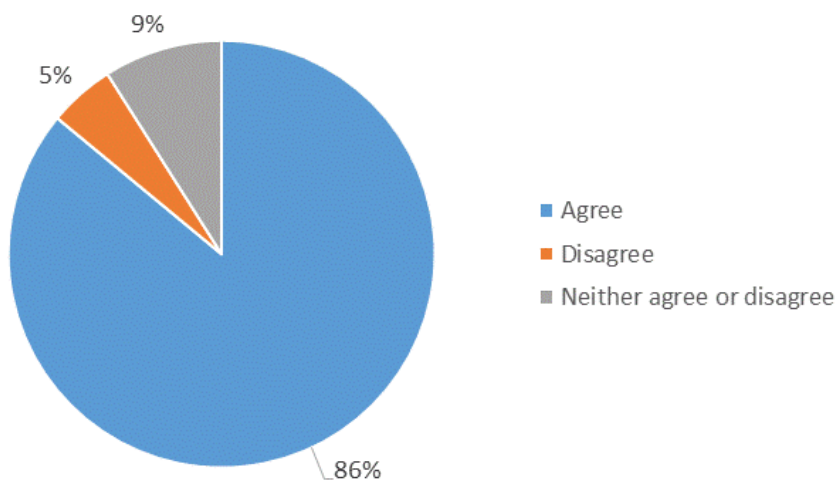
### Would you support the introduction of tax/surcharge system to encourage the recycling of more food packaging?



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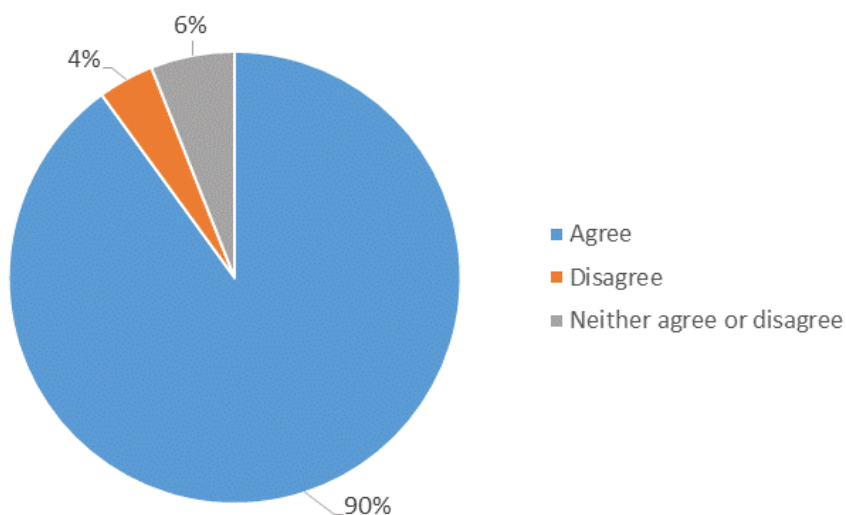
**We use too much plastic; alternatives should be used  
where possible.**



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**Europe must take urgent action to protect the  
environment and reduce the amounts of plastic waste  
and waste mismanagement.**

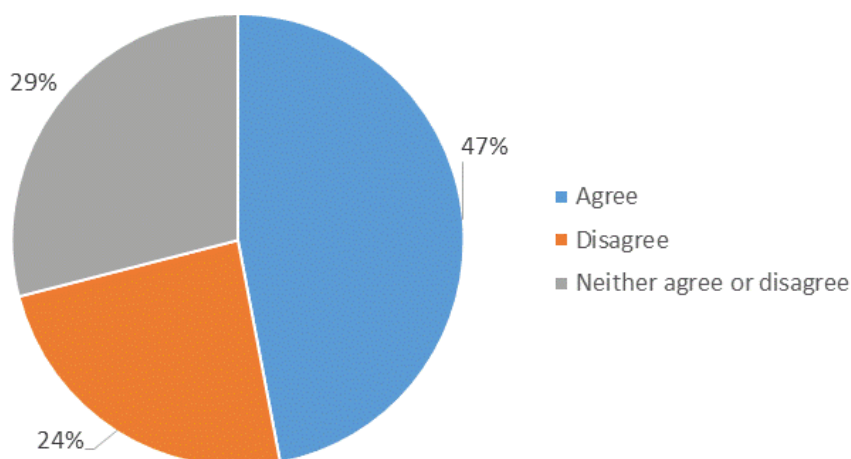


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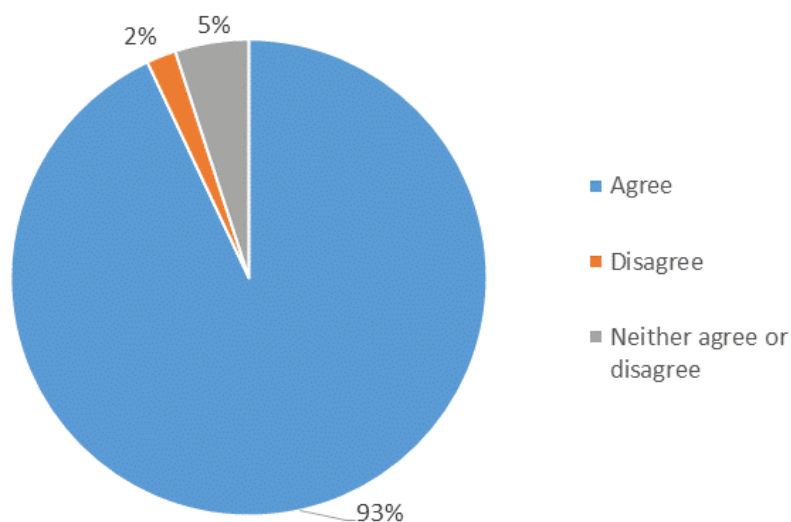
**I would be willing to pay more for alternatives to current plastic packaging.**



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**There should be stricter legislation to ensure more plastic is recycled.**



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