CIRCVET

CIRCULAR ECONOMY PRACTICAL TRAINING MATERIALS
FOR PLASTIC MANUFACTURING INDUSTRIES

D 1.4 – Needs and competencies assessment report

Co-funded by
the European Union

Document status			
Version	Date	Author	Description
V0.1	27/02/2023	Torsten Urban (P13 - KIMW)	Final Version
Reviewed	**YES** - ~~**NO**~~		
Dissemination Level	☒ PU - Public ☐ PP - Restricted to other program participants (including Commission Services and project reviewers) ☐ CO - Confidential, only for members of the consortium (including EACEA and Commission Services and project reviewers)		

Cite As:
If the Deliverable is Public, you retrieve it from CIRCVET Project website.

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1. Introduction

The aim of this Work Package was to determine whether, and to what extent, the training modules formulated in the project application would meet with acceptance from different interest groups.
Since the project consortium includes experts in education and training as well as in circular economy, it can be assumed that the modules mentioned in the project proposal will meet the needs of the market and the industry.
Nevertheless, as an element of Work Package 1, it was defined that a dedicated query of companies, teachers and target group representatives should take place.
On one hand, this allowed the defined modules to be reviewed (validated) in terms of their applicability, scope and importance to the course.
On the other hand, at this early stage of the project, there is room for improvement in the number and thematic focus of the course modules as input from the survey.
The methodology of the implementation, the results and the outcome evaluation are presented in the following sections.

1.1 Assessment Methods

The quantitative objectives of the survey included 40 companies, 30 teachers and 5 target group representatives.
To systematize the survey regarding its application by the partners in their home countries and the subsequent evaluation, a standardized question list was created that was available to all partners.
This was a software-guided input mask in the form of an Excel file which, in addition to master data, also contained the individual modules intended for the course.
The project partners had the choice of sending the question list to the candidates concerned and asking for the completed question list to be returned, or of completing it together with the candidates in a face-to-face or online meeting.
Interviewing candidates either in person or in an online meeting proved to be the more purposeful method for the following reasons:

1. candidates had a direct opportunity to ask questions and make comments that could be clarified on the spot.
2. the time required for interviewing a candidate was 20-30 min, so that the time required for this could be assessed as relatively short.
3. the return of the completed question list was not subject to any further time delay, because the results were available immediately after the interview.

1.2. Assessment Criteria

As Figure 1 shows, the initial screen of the question list asks for some master data of the company, such as company size, industry, materials used, machine equipment and experience with circular economy courses. The experience value and the use of courses should be expressed by the company in a numerical value between 0 and 100 by simply moving the slider.
This method was chosen to generate quantitatively assessable key figures in a quick and simple way that can be compared with each other and across countries.

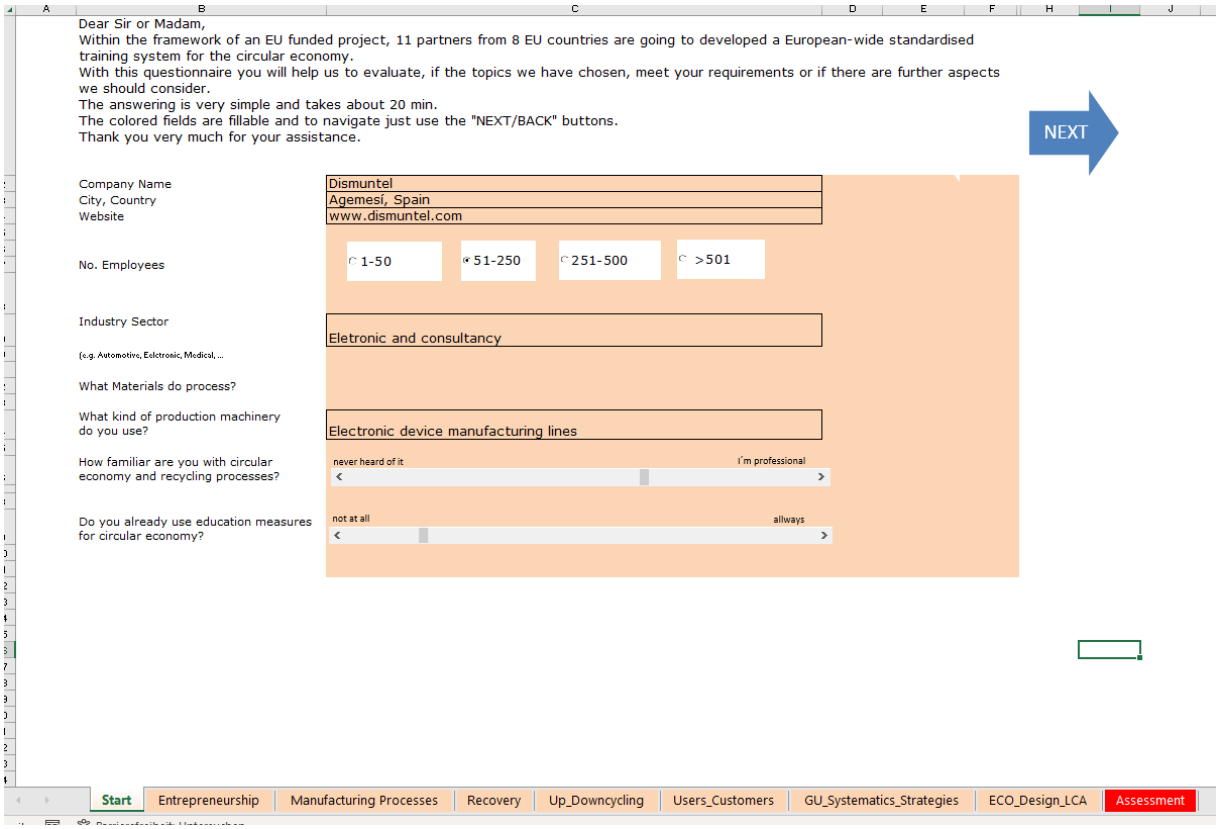


Figure 1: Starting Screen of the questionnaire.

In the lower area of the starting screen of Figure 1, the modules formulated in the project application are already listed. These are called up and evaluated one after the other in the subsequent steps.
The "Assessment" tab on the right is used for numerical and graphical evaluation of the individual questions for the respondent.
An overall evaluation of all respondents will be shown later.
After the master data has been entered, the interviewer is taken to the page for the first module, shown in Figure 2 as an example for the "Entrepreneurship" module.
Here, the candidate is invited to express his or her opinion on the module in question by moving the slider to the right or left and thus entering a numerical value between 0 and 100. The value can of course also be saved by direct entry.

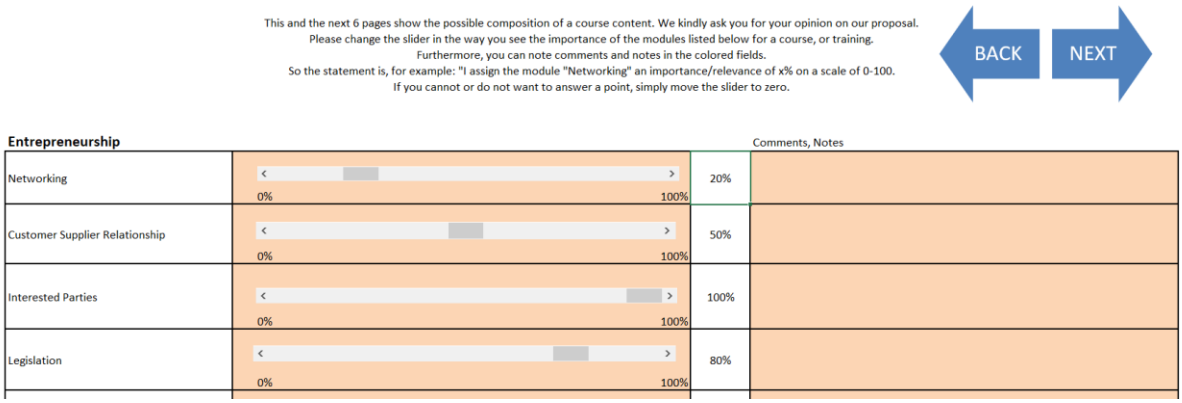
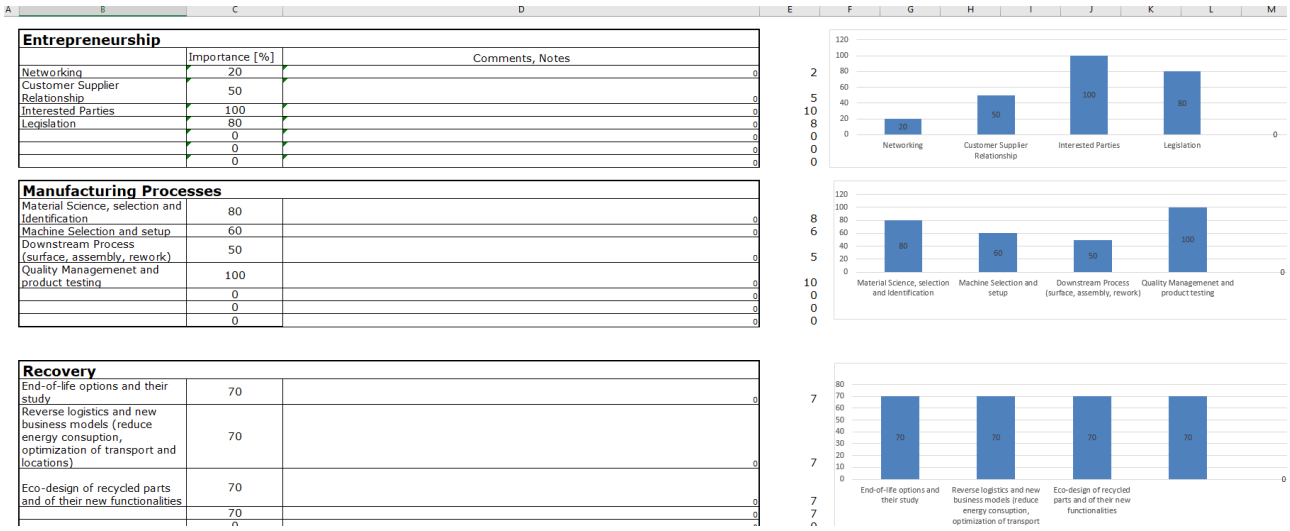


Figure 2: Assessment Mask for one Criteria

The box in the right of the evaluation cell has further space for making comments or recommendations for future course design.
In this way, all modules were handled by navigating with the "BACK" or NEXT" button.
Figure 3 shows an example of how the evaluation of the questions for a respondent is presented in graphical form.
The tab field "Assessment" is deliberately coloured red and provided with the urgent note to the project partners not to change anything in the format and sequence of the default data, since these are needed later for the automated evaluation of all candidates.



Entrepreneurship

	Importance [%]	Comments, Notes
Networking	20	
Customer Supplier Relationship	50	
Interested Parties	100	
Legislation	80	
	0	
	0	
	0	

Manufacturing Processes

Material Science, selection and Identification	80
Machine Selection and setup	60
Downstream Process (surface, assembly, rework)	50
Quality Managemenet and product testing	100
	0
	0
	0

Recovery

End-of-life options and their study	70
Reverse logistics and new business models (reduce energy consuption, optimization of transport and locations)	70
Eco-design of recycled parts and of their new functionalities	70
	70

Figure 3: Assessment per Respondent

After completion of the survey and sending of the completed question lists, all question lists were analysed with a self-developed evaluation tool.
It is irrelevant which file name was assigned to the question list by the partners. The individual question lists are read out and the numerical values are listed for analysis as shown.
As Figure 4 shows, the number of questions and the number of candidates generate a considerably large amount of data that can only be efficiently analysed automatically.

Get Data

	Entrepreneurship				Manufacturing Process				Recov.		Up- and Down -cycling		Users and Customers			Systematic Strategies			Desing & LCA	
File Name	Networking	Customer Supplier Relationship	Interested Parties (Entrepreneur)	Legislation	Material Science, selection and ID	Machine Selection and Setup	Downstream Equipment	Quality Management	Sorting and ID	Labelling	Up- and Downcycling	Decision Aids	Identification of Customers	Knowledge of the market	Usability of recycled products	Strategic business planning	Globalization	Intersted Parties (Strategy)	Design guidelines	Take-back and recycling concepts
CIRCVET_Questionaire_2022_10_24_Casa Vigar.xlsx	80	80	50	50	100	100	100	100	100	100	100	70	50	50	100	100	100	50	70	100
CIRCVET_Questionaire_2022_10_24_Dismuntel.xlsx	80	80	80	80	80	100	100	100	80	80	100	100	100	80	80	100	100	80	100	80
CIRCVET_Questionaire_2022_10_24_Fabricas Agrupadas de muñeca	30	100	100	100	100	80	80	100	100	100	100	80	100	100	100	100	100	100	100	80
CIRCVET_Questionaire_2022_10_24_Hegahogar.xlsx	80	100	100	100	100	80	100	80	100	80	100	100	80	80	100	100	100	100	100	100
CIRCVET_Questionaire_2022_10_24_Hegahogar2.xlsx	50	100	100	100	100	100	100	100	100	100	100	100	100	50	100	100	80	100	100	100
CIRCVET_Questionaire_2022_10_24_Industria de Plasticos Bañeres	50	80	50	80	80	80	80	80	80	80	80	80	100	50	80	80	50	50	80	80
CIRCVET_Questionaire_2022_10_24_Jimten.xlsx	80	80	80	100	100	100	80	100	80	80	100	80	100	80	80	100	100	80	50	50
CIRCVET_Questionaire_2022_12_20_Benvic.xlsx	100	100	100	100	100	100	100	100	100	100	0	0	100	80	100	80	100	100	100	100

Figure 4: Assessment Tool for all Respondents

The graphical evaluation is presented, described and evaluated in the next section.

1.3. Assessment Results

As mentioned, one of the purposes of the start mask was to examine and present the size of the companies surveyed. Figure 5 shows that the small and very small companies are most strongly represented with 78%.
This result can be considered good according to the Pareto rule (80/20 rule), as it reflects the distribution of European SMEs in a representative way.

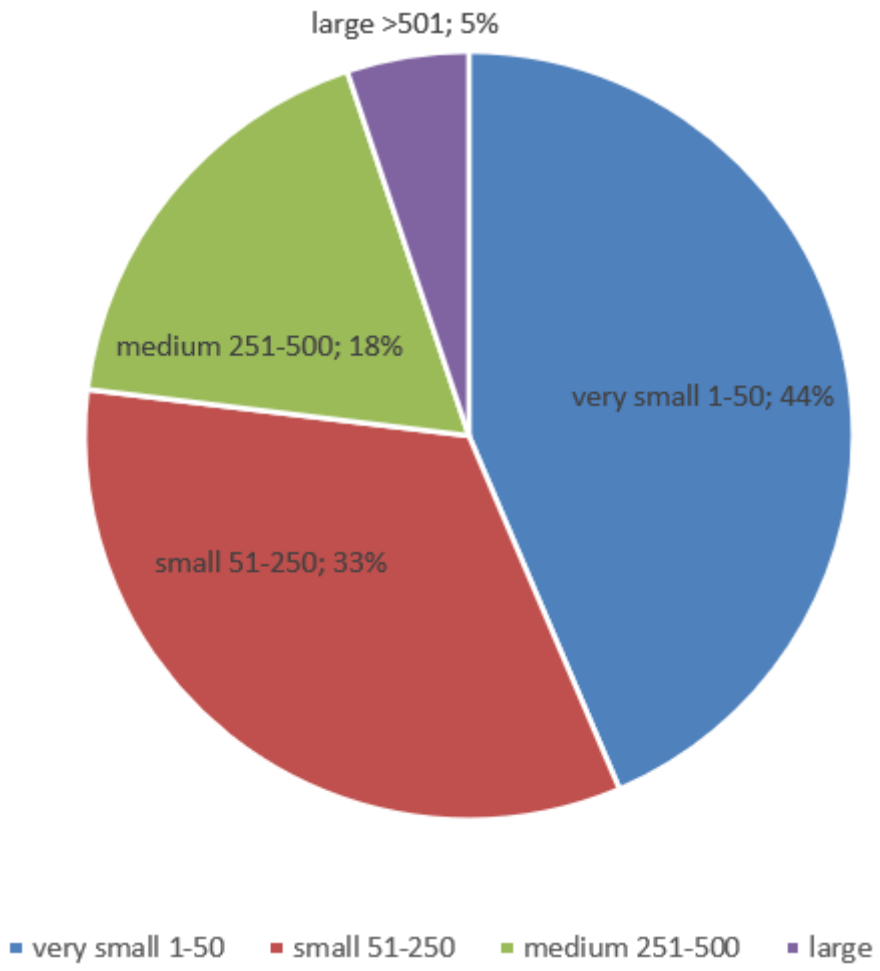


Figure 5: Distribution of Company Size

The next graph (Figure 6) shows how the main modules were rated in terms of interest by the respondents.

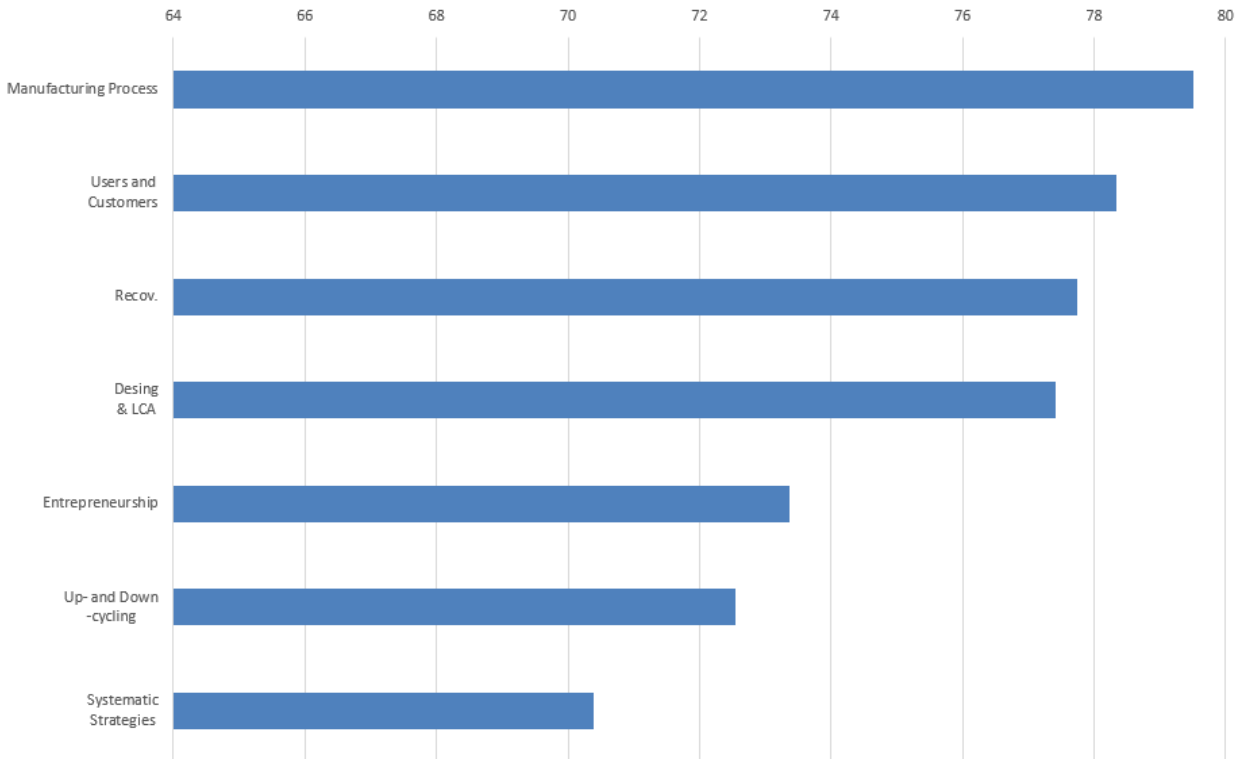


Figure 6: Interest shown in the CircVet training course modules.

Shown are the average points achieved according to the list of questions generated by moving the slider.
Here it can be seen that the greatest interest in the training course is in the implementation of production steps, Identifying users and customers and the Recovery Process, i.e., the practical application of the techniques and the daily work.
Strategic aspects have been rated as less important, suggesting that many respondents are already well connected.
It should be noted here that the lowest value is still above 70 (Systematic Strategies) and thus occupies a very high level overall.
This suggests that the choice of the CircVet training course modules was the right one.

If we continue with the detailing of the modules and look at the subgroups in the individual modules (see Figure 7), we can see that they are also very close together at a very high level (lowest value is 65, highest value 85).
As already shown in Figure 6, the interest in the practical implementation of the circular economy also continues here, while "Interested Parties, Globalization and Networking" tend to rank at the bottom.
This finding is important for the design of the course in terms of its thematic focus.

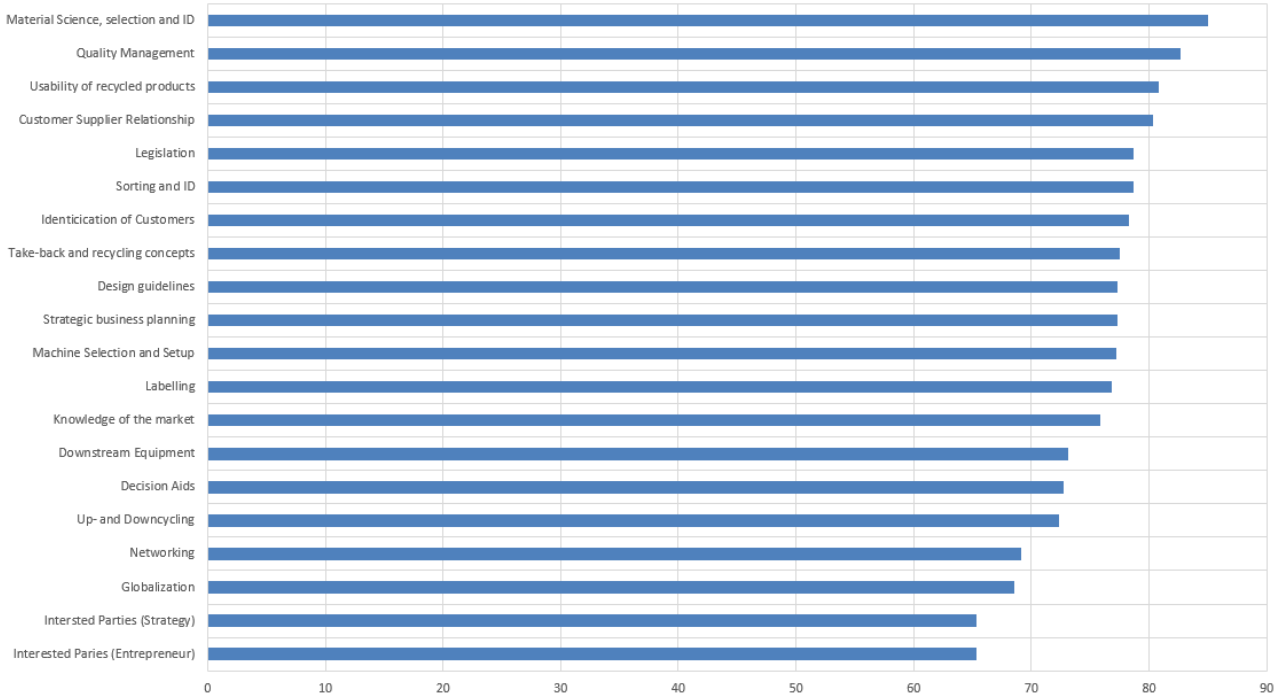


Figure 7: Detailed Modules Elements

1.4. Result Evaluation and Recommendations

This section discusses the lessons learned during the survey and identifies recommendations that may be relevant to the training course development. These are highlighted in **bold** below.

Good experience with the interview

- The duration of the interview was about 20 minutes per respondent. All respondents rate this as a very positive and appropriate duration.
- The surveys are very easy to conduct online with a good communication tool (e.g., MS Teams).
- The evaluation of the individual modules by simply pressing a slider was very pleasant for the respondents, as they were thus able to express their subjective opinion in a simple way with an objective and thus evaluable key figure.

Difficulties with the questioning

- Respondents (whether they were companies, teachers or target groups) tended to talk more about their own skills given the modules they were asked about. The fact that this survey was not asking about their own skills and experience, but rather their opinion on a training course that would be available in the future, required some lengthy explanation during the interview.
- It proved difficult to have the respondents complete the question list on their own. For reasons of efficiency and avoid misunderstandings (see previous point), this should always be done in personal conversation and dialogue.

Target group oriented insights

Companies

- Most companies are aware of the issue but have so far done little in terms of training courses and seminars.

- Many companies see the topic as a necessary evil that must be dealt with due to legal requirements. Only a few also recognize the good opportunities for business. **Therefore, the training course to be developed in CircVet should strongly focus on the economic benefits. How much money can be earned or saved?**

- Small companies operate very locally and without systematic and planned network activities. Large firms make this a strategy. **Accordingly, if small firms can be persuaded to make networking a strategy as well, they can gain a significant competitive advantage.**

- Service companies without production (design offices, management service providers) would like to offer their customers advice and support in recycling, so there is great interest on the part of these companies for training. **Here, the survey revealed a whole new target group that should be considered in course development.**

- There is great distrust in the quality of recycled materials. No one knows what components are included. **Therefore, a focus of the course should be on identification and how the composition of the material affects its properties.**

Teachers

- There is a lack of objective overarching materials for neutral training. Most materials come from industry or consultants, most of whom pursue their own interests. On the other hand, it is expressly desired that teaching be supported by industry, e.g., by having industry representatives act as teachers or by offering field trips and/or internships. **However, it is essential to ensure neutrality here.**

Students

- Recycling is currently treated as a marginal topic in current courses of study. It is included in many courses of study as an elective subject. The actual know-how must be acquired by the new bachelor's or master's graduates themselves during their professional activity. **Therefore, a planned course like the one in this project is very welcome.**

2. Glossary of terms[1], abbreviations, and acronyms

Short Name of Partners	
P1-AIJU	Partner 1 – ASOCIACIÓN DE INVESTIGACIÓN DE LA INDUSTRIA DEL JUGUETE CONEXAS Y AFINES (Spain)
P2-CENTIMFE	Partner 2 – CENTRO TECNOLOGICO DA INDÚSTRIA DE MOLDES, FERRAMENTAS ESPECIAIS E PLÁSTICOS – CENTIMFE (Portugal)
P3-KIMW-Q	Partner 3 – Gemeinnützige KIMW-Qualifizierungs GmbH (Germany)
P4-POLYMERIS	Partner 4 – POLYMERIS (France)
P5-PROPLAST	Partner 5 – Consorzio per la promozione della cultura plastica – PROPLAST (Italy)
P6-LINPRA	Partner 6 – LIETUVOS INZINERINES PRAMONES ASOCIACIJA LINPRA (Lithuania)
P7-ULPGC	Partner 7 – Universidad de las Palmas de Gran Canaria (Spain)
P8-IDL	Partner 8 – Infinitivity Design Labs (France)
P9-APRC	Partner 9 – ALYTAUS PROFESINIO RENGIMO CENTRAS (Lithuania)
P10-UNITR	Partner 10 – Università degli Studi di Trento (Italy)
P11-HIT	Partner 11 – HUB INNOVAZIONE TRENTINO – Fondazione (Italy)
P12-VPM	Partner 12 – VISAGINO TECHNOLOGIJOS IR VERSLO PROFESINIO MOKYMO CENTRAS (Lithuania)
P13-KIMW	Partner 13 – Kunststoff-Institut Lüdenscheid (Germany)

[1] According https://op.europa.eu/en/publication-detail/-/publication/da7467e6-8450-11e5-b8b7-01aa75ed71a1

PROJECT INFO

Grant Agreement	Project: 101055916 — CIRCVET — ERASMUS-EDU-2021-PI-ALL-INNO
Programme	Erasmus+
Key Action	EACEA.A – Erasmus+, EU Solidarity Corps A.2 – Skills and Innovation
Action Type	ERASMUS Lump Sum Grants
Project Title	CIRCVET – Circular Economy Practical Training Materials for Plastics Manufacturing Industries
Project starting date	01-09-2022
Project end date	31-08-2025
Project duration	3 years

This project has received funding from the European Union

PROJECT CONSORTIUM

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