MODELS FOR COOPERATION OF SME AND R&D INSTITUTIONS

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INTRODUCTION

This handbook was developed and made in the scope of Start Circles project. Based on the results of the workshop, where partners of consortium developed draft models, GZS together with consortium and external partners continued the progress together with various R&D organisations and companies.

Five models of cooperation present different ways of matching and collaboration between economy and R&D organisations and all of them were tested in order to find the drawbacks and prepare them as optimal as possible.

We believe that these models, either one or maybe all of them, present an effective way to start the collaborations of various organisations, can be useful tool for attractive matching and as everything – can be updated, upgraded and further optimised.

TEAR DOWN WORKSHOP

The interactive innovation workshop is adapted accordingly to the Ellen MacArthur Tear down laboratory workshop. A short description of the workshop proceedings is available on the YouTube.

The workshop begins with some introductory data on inefficient management of common waste streams (plastic, polymers, wood, electrical and electronic equipment …). This short introduction can be followed with the presentation of specific video clip adapted to the thematic.

The objective of the whole activity is to create awareness of how difficult it is to disassemble current products, determine material components and separate materials and/or components which can be reused or recycled. This increases attention to possible design improvements. The method also creates a comfortable ambient for the participants.

Before the workshop, some broken products must be collected (e.g. computer, video recorder, radio, wooden window, …) that the participants can disassemble. A standard set of tools shown below is required for disassembly.

Figure 1: Set of tools for Tear down workshop

The participants are divided into groups. Each group is allocated a broken object and instructed to collect components and parts made from the same or similar materials together.

Figure 2: The execution of Tear down workshop

After the assigned objects have been disassembled, the participants are given the special worksheet (based on Ellen MacArthur questionnaire) and asked to consider how the design could be improved for better reuse, recovery and recycling.

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Design Checklist

Use this checklist to help you ***design for disassembly*** *and also think about the* ***system as a whole****?*

Designing for disassembly:
for the whole product, think about...

- Is it designed for easy disassembly?
- Minimum number of parts?
- Simple structure and form?
- Requires only a few standard tools to disassemble?
- Minimum number and types of fasteners?
- One fastener holds multiple parts?
- Access fasteners on the same axis?
- Snap, slide fasteners or clips rather than screws or glues?
- Hand-strength only needed to assemble and disassemble?
- Coarse threaded screws for speed; nuts and bolts for strength?
- Fasteners fit for purpose (repeated use, strength)
- Good visual documentation on assembly and disassembly embedded in product?

Designing for easy repair and upgrades:
for the whole product, think about...

- Is the design based on modular assemblies to make whole components easy to replace?
- Is it easy to identify and reach those components likely to need maintenance or upgrade?
- Does the design lend itself to easily installed upgrades?
- Are the diagnostic tools built-in for identifying worn or obsolete parts?

Designing for closing the materials loops -
for each component think about:

- Does each individual component have a defined use period?
- Can the individual materials be recovered easily?
- Is the number of materials kept to a minimum?
- Are parts labelled for easy materials identification?
- Can the materials used be fed back easily into the biological and technical nutrient cycles?
- Are the materials used sourced from 'closed loop' sources?

Designing for optimum business model

- Does the warranty encourage repair, service and replacement of components?
- Is the overall business model based on product-as-service?
- Is the overall business model based on closed-loop principles?

Figure 3: Model of final questionnaire

Each group is invited to present their findings and exchange views on how difficult the disassembly was, what kind of materials and components they encountered and how the design could be improved.

The duration of the event depends on the complexity of the disassembly of specific product, but it should not exceed 1.5 hour all together.

INNOVATION BREAKFAST

Innovation breakfast is a model of business breakfast. As the title already points out, innovation breakfast is organised in the morning and is meant to be an opening of the day. Starting hour of innovation breakfast depends on the location of event and especially the arrival time of each participant. If innovation breakfast takes place locally for all participants it can start as early as 7 AM. If innovation breakfast is meant for participants from entire region or even county, innovation breakfast can start at 9 AM. It is recommended that innovation breakfast does not start later that 9 AM, whereas earlier hour is decided by the organiser. Secondly, innovation breakfast is breakfast. This means that participants come to the event to talk and eat. If the event starts as early as 7 AM you can start with coffee and tea, with some croissant, and finish the event with proper breakfast.

Figure 4: Preparaton for the start of innovation breakfast

The primal goal of the innovation breakfast is to match the participants among themselves with an active role for each one. Each innovation breakfast is always dedicated to specific topic which is determined by moderator in advance. The length of innovation breakfast can vary and depends on the topic of the event, initial speech/lecture, number of participants and model of matching between participants. However, it is recommended that innovation breakfast is not shorter than 60 minutes and not longer than 120 minutes.

The number of participants is not limited but it is important to split participants (in second part, after initial key note speech or lecture) in several groups if entire number exceeds 20 participants. In case of more than 20 participants there is a need of two or more moderators which split the larger group in two or more groups which work together in smaller groups.

Key targeted groups or participants for innovation breakfast are R&D managers, CINOs (Chief Innovation Officers), researchers in public or private organisations and employees in R&D departments of public or private organisations.

Latter does not mean that organiser should not invite other profiles, but due to the nature and purpose of innovation breakfast, these groups are of main consideration. Innovation breakfast is divided into several parts which are explained in following text.

1. **Welcome of the organiser or host with coffee, tea and croissant**

Innovation breakfast is socialising event. This means that participants must feel comfortable, accepted and being like a part of a family. To make this at the very beginning, the role of organiser or host is of great importance. Depend on the roles, both of them or one person should welcome each guest and give him/her a badge with a name, surname and organisation, and invite him/her to grab a tea or coffee. With such gesture participant is initially welcomed and feels more involved and opened for further discussion.

2. **Presentation and welcome word by hosting organisation or host**

Innovation breakfast starts on time. We must keep in mind that such events are a day starter and people expect that they will finish on time to continue with other activities. Innovation breakfast can take place at the same location and is hosted by the same host or the location and host can be changed. When the innovation breakfast takes place at specific location or is hosted by specific host for the first time, we give the host initial 10 minutes for welcoming words and its brief presentation. With such gesture we raise the engagements of the host and also other participants, we increase the hospitality and raise the homeliness of the event.

3. **Key note speech or lecture**

As stated in the introduction, innovation breakfast is dedicated to specific topic which is determined by the organiser or the host. After the topic is determined there is a need to find a key note speaker. This can also be the host or one of the participants. It is important that the key note speaker shares his/her experiences and knowledge about specific topic as his/her role is the introduction into the second part of the event dedicated to the matching. The key note should be 20-30 minutes long and it is advised that speaker gives a motivational and energetic speech to the participant. Have in mind that an event takes place in the early morning.

4. Matching the participants

After the key note speech, it is time for active part of the innovation breakfast. All participants make a circle with chairs so everyone can see anyone. It is advised that circle does not exceed 20 participants. In case of more participants group can split into more groups or adapt time dedicated for each participant.

Figure 5: Second part of innovation breakfast - active matching of participants

Before the start of the first round, moderator asks each participant to pass his/her business card or contact to collect all of them and send contacts to all participants later on. All contacts are distributed to all participants via e-mail, whereas participants can exchange their contacts personally at the event.

The role of moderator is of great importance here. Moderator is a time keeper, motivator, moderator and writes down potential matching opportunities for final wrap-up. In this part, each participant is given 60 second to tell the other participants name, surname, organisation he/she is coming from, position at work, what he/she is looking for and what he/she is offering. Latter two things can be said in the name of the organisation he/she is coming from or can be said personally. Moderator emphasises that each participant should listen carefully to other participant for the next round. The time, dedicated to each participant, can vary depending on the number of active participants (it can be also 40, 90 or 120 seconds) but it is important that moderator explains the rules, rings the bell after the time had elapsed and gives a word to the next participant. In case of 20 participants, first round should be finished in about 20 minutes.

After the first round, participant should know each other and each other's „problems". Moderator again gives the word to all participants, but this time in the opposite way of the circle. Each participant has 60 seconds to give his/her feedback to one or more specific persons and replies to his/her needs. Moderator's role here is to keep the time and positive feedbacks. It is not acceptable by any participant to respond in a negative way to other participant's opinion. If participant does not wish to give feedback or has nothing to say, moderator passes the word to the next participant. Second round also last for about 20 minutes. If some participants would like to add another feedback, we give him/her a chance but we are careful that he/she is no longer than 60 seconds.

5. Final wrap-up

After the finish of both rounds the moderator, who was writing down important notes, gives his/her feedback about what he/she heard and exposes matching opportunities which were not exposed yet. Final wrap-up should be short and concrete and not longer than 5 minutes.

If specific innovation breakfast is one of many in the series and if participants are more or less the same, we can track how many matchings were successful and what were the outcomes (either financial or other benefits) of these. This means that moderator or organiser gives a brief report which emphasises the importance and the success of the matching.

6. Breakfast

After the final wrap-up it is time for final matching, socialising and breakfast. Participants are invited for the breakfast, exchange of business cards and socialising. Organiser and host also take part among participants and get to know them better.

7. Post event feedback

After the event the organiser sends e-mail with thank you notes and feedback with all collected contact details to all participants. As participants were informed in advance, that contacts will be distributed among all participants, it is not problematic to share them. Contacts can be also shared in the form of photo with all business cards where the contacts are clearly visible.

CLOSING THE LOOP

The main purpose of the Start Circles' activities, from the companies' perspective, is to bring stakeholders and companies together in order to seek and find the solutions for selected real cases and finally close the material loop in the sense of circular economy (CiE).

Because companies which are members of Association of chemical industries (ACIS), where also Section of plastic producers is active, wanted to work on their cases, the section for CiE was formed spontaneously in 2017. CiE area was therefore selected as one of the top priorities at ACIS and a working group was established for this purpose. First, the activities of other key stakeholders were examined to gather information and learn from experiences - from the past projects and individual efforts to get an overview of this field.

By gathering different cases of member companies, we took a step forward, recognizing the materials – by-products that were problematic for the companies, because they could still be useful as a material that enters in production for other companies. Some examples: aggregates used for infill, pallets that were still usable, waste solvents or resins … There were six individual cases that were tackled for solving or closing the loop.

At the same time, ACIS participated as a partner in a CiE project *Boosting circular economy among SME's in Europe* and had the opportunity to follow cases of good practice from Netherland, where CiE is very well developed. It was shown that there are quite a lot of possibilities to connect companies with other stakeholders. There were some good examples presented, how a company can make their materials more circular. One of the support actions is a platform or a portal site "Futureproof community", the matchmaking platform for sustainable entrepreneurs, which was financed by the Dutch government. There are already numerous cases of matchmaking and good practices also in the field of plastics. Beside this platform other platforms are also available (MOVECO, SYNERGie 4.0 …).

Cooperation with other international partners was established, which could help companies close the loop. One of such is International synergies 4.0, which helps companies to enter industrial symbiosis, connect with other companies and stakeholders. International Synergies 4.0 differ from other platforms by the fact that it has a foundation in the industry but should have governmental approval or support as well.

Viewing this from a wider perspective and considering all the experiences, a model of different companies' and stakeholders' cooperation emerged. The cooperation model could be defined in different steps. The aim of the model is to boost circularity through plastic recycling using a multi-stakeholder approach: how to tackle plastic (waste) by connecting a national consortium with the involvement of brands, academia, governments and recyclers.

Considering the EU plastic strategy, it is crucial that plastic producers transform their business from linear to circular, which is no longer just a wish, but a demand. The Strategy's vision is that by 2030 all plastic packaging on the EU market can be recycled. Therefore, plastic products should be designed, manufactured, used and recycled differently as they were until now. To achieve this, companies should connect with R&D institutions, who have the knowledge to help them in doing so.

Below, the steps to accomplish this are envisaged for ACIS member companies – plastic producers within the project Start circles and can be used also for other sectors, with some modifications.

1. **Meeting of plastic producers, choosing up to three cases and helping them close the loop.**

Internal meeting of the sector is usually insufficient, more sectors and other stakeholders are necessary. The meeting should not last more than 90 minutes, concrete cases should be exposed and discussed. For the group of plastic producers, some questions should be presented, as for example:

- Do you already use recycling - secondary raw materials in your products?
- Do you obtain the residue from your own production or do you obtain it from other production sites?
- Are your products and components designed to allow materials to be recycled (e.g. by making the right material selection, by deciding about the product design in the design process)?
- What needs to be changed in order to use more recyclate in your products (accessibility, quality, price, laboratory test options, customer requirements, other)?

Figure 6: Meeting of Slovenian plastic producers, networking, finding cases to close the loop.

A representative of a company who already established good practice in the field of CiE should present their case and be available for questions from the audience about how they established it, e.g. connection with other stakeholders.

Figure 7: Good practice of the company AquafilSLO - design of textile from used fishing nets from the sea.

After the meeting there should be 20 minutes for discussion, then networking between companies is a necessary element.

2. **Meeting with the individual company** - after the meeting of plastic producers, it is crucial to get to know the individual case, find the potential solutions, determining which stakeholders are crucial to solve the problem.

3. Inviting other **stakeholders** (academia, government, brands, recyclers, waste collectors…), that would offer support and/or other companies. Up to 2 to 3 sessions, each session is one step forward - every stakeholder envisages the solution and points out the necessary missing links for the case to be solved. It is crucial that competent authorities form part of the stakeholders, because it is often so, that cases could enter a dead end, because they can be complicated considering the legislation.

Support actions

Publishing of the case in the suitable platform, described above – **matchmaking** on the platform. If needed, the case should be also examined from the point of view of the industrial symbiosis – https://www.international-synergies.com/

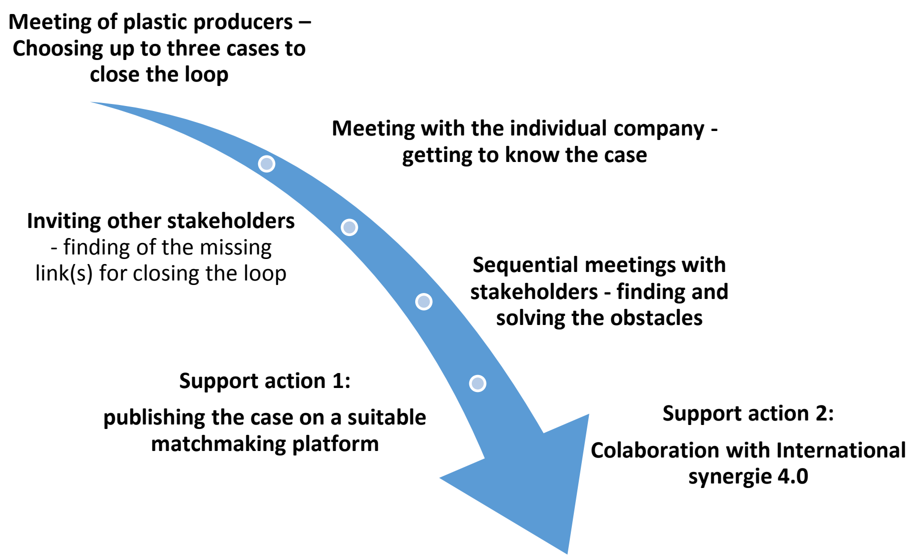

Figure 8: Steps of "closing the loop"

R2B MEETINGS

R2B meetings are a special form of meetings between the research organisations and companies. The meetings are organised with the purpose of finding a potential cooperation between the research organisation and the company in the region. The organiser of the R2B meetings should invite other business support and research organisations from the region to co-organise the meetings in combination with conference (fair) or any other kind of event. These are the partners who promote event and meetings among their clients and help with the organisation of the meetings if necessary, e.g. in the case of high number of participants. Each organised meeting between two organisations should last from 15 to 20 minutes, with one ore more participants from each organization.

The prime goal of the R2B meetings is to find the most perfect match between partners from research and business area with the aim to establish new business models from the field of circular economy and thus to increase the competitiveness of SMEs in the region. Based on partnership profiles or a catalogue of profiles on the internet, participants request meetings with other participants before the event. A few days before the event, each participant receives a schedule showing the exact time and place for each meeting. Integrated tools can be used for profile development, validation and for the planning of meetings but this depends on the main organiser's decision how to best follow up the organisation of the meetings.

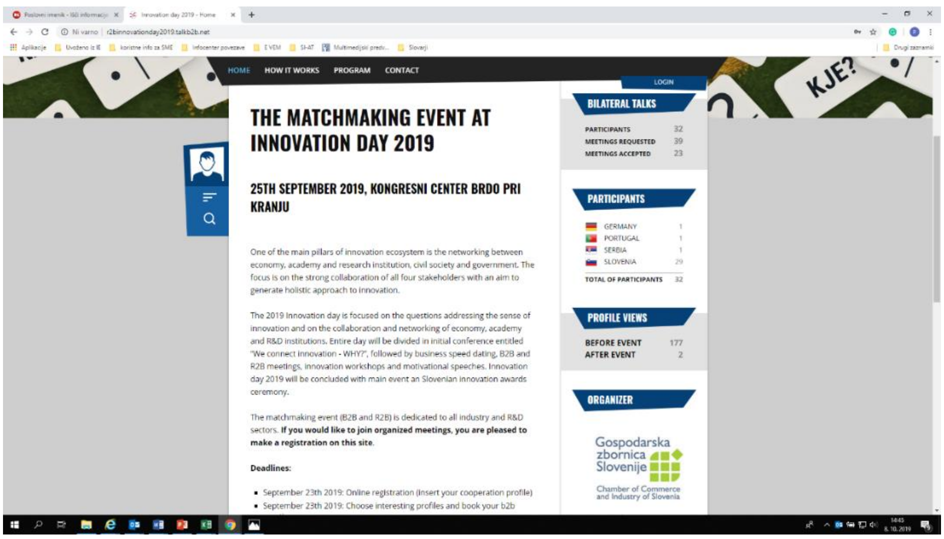

Figure 9: The example of matching tool

The number of participants at meetings is not limited, nor is the number of meetings between participants. Minimum 3 hours of time should be dedicated for R2B meetings in the venue near the main event (conference/fair, seminar, workshop). Each meeting takes place at the table marked with the number. The number of the tables depends on the number of participants and the meetings. It is also recommended that additional tables are prepared in case of additional meetings requested from participants. The organiser of the R2B meetings must be prepared to arrange additional meetings on the spot since the participants who visit this kind of event for the first time only then see the opportunity how to easily approach other participants of the event.

The target group is similar as mentioned in the described Innovation breakfast model.

The main organiser should involve at least 2 persons on the spot for about 6 tables when meetings take place. Each person must register participants of the meetings, that means the participants sign the attendance list. The list of scheduled meetings is prepared and when the meeting is carried out, the organiser marks the meeting is concluded. Each meeting has a time limit so the organiser must pay attention to the duration of the meetings. Since the meetings are meant for a more in-depth conversation about the possible cooperation

between the research and business field, the organiser can also allow a longer meeting if this is ok with all participants.

Figure 10: R2B matching and meetings

The meetings organised on the spot can be a continuation of the matching part of the participants in the innovation breakfast. R2B meetings can also be organised as a session organised at innovation breakfast. The participants of the innovation breakfast already know each other's issues and can continue further discussion in the form of R2B meetings. Though the opportunity for the meeting must also be given to B2B meetings, if it emerges on the spot. This can result in the possible cooperation with research organisations later on.

Figure 11: R2B matching and meetings

The final step, which happens when the meetings are concluded, is that the organiser collects the feedback from all the participants about the possible cooperation between potential partners. The most effective way to collect the feedback would be after each participant carried out all the prescheduled meetings.

The participants must fill in all the data so the organiser will collect all relevant information about the possible cooperation, and will approximately every 2-3 months follow the progress of this cooperation that eventually ends up in a new business model from the circular economy field. The following questionnaire must be handed in to participants of the meeting on the spot or sent by mail.

EVALUATION QUESTIONNAIRE

Name of the company/research organisation:

____

How do you evaluate the chances for cooperation with companies/researchers that you met?

- *cooperation has been established (please name the partner)*_____________
- *cooperation is possible*
- *thanks to meetings we obtained a large portion of useful information, however we do not plan to cooperate*
- *we do not plan to cooperate because presented offer is not interesting for us/we do not plan further contacts.*

Participants at the meetings let us:

- *gain new partners and new contacts*
- *make a presentation of the company*
- *get acquainted with innovative solutions in my branch*
- *get acquainted with competitors's offer*
- *Others? (please specify shortly)* ________________________________

How do you evaluate the meetings as a way to establishing new contacts?

(Please, mark on a scale where 1 stands for very poor and 5 very good)

- *1*
- *2*
- *3*
- *4*
- *5*

What is your opinion about the organisation of meetings ?

- *Very good*
- *Good*
- *Some improvements (please specify)*

____

COMPANY MISSION

Company mission is an entire day event in scope of which a group of participants basically hit the road together, visit specific organisation and return back home. However, the aim of the event is broader, as such opportunity is an excellent way for more informal and personal matching, bonding and establishing business relationships or collaboration.

The role of an organiser is to organise a schedule for the entire day, take care for food and drinks, organise a visit and meeting at a specific organisation and very importantly – organise a matching and socialising activities during the journey to the final destination of the day and on the way back.

The number of participants is not limited but the size of vehicle/s depends on this number. For intensive and effective matching, the vehicle must enable the participants to move simply from seat to seat.

On the bus participants should be split in two groups. For example, participant representing companies can sit by the windows (yellow seats at the figure) and participants representing R&D organisations sit on the blue seats.

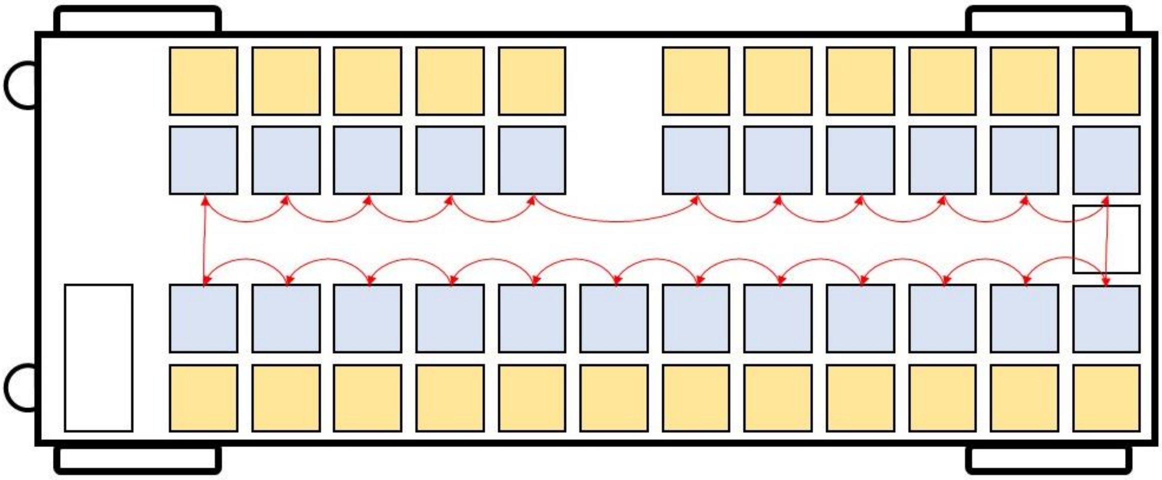

Figure 12: An example of shifting the participant at the bus for active maching of two groups

Participants that seat on yellow seats do not move and remain seated on their seats for the entire duration of the jurney, whereas participants seating on the blue seats are changing their seats in specific direction (e.g. clockwise). The duration of „meetings” depends on the length of the jurney from the starting point to the final location and back, and on the number of participants. It is crucial that all participants get an opportunity to match with other. We can decide if you would like to match just R&D representatives to company representatives or if you would like to match all of them.

Figure 13: Matching at the bus

Example - matching R&D representatives and company representatives

- Duration of entire journey on the bus: 4 hours
- 20 R&D representatives and 20 company representatives
- Duration of one round/meeting: 12 minutes

Matching company representatives among each other and R&D representatives among each other can be done on the way back. The seating plan and meetings/round duration should be changed accordingly to travel plan.

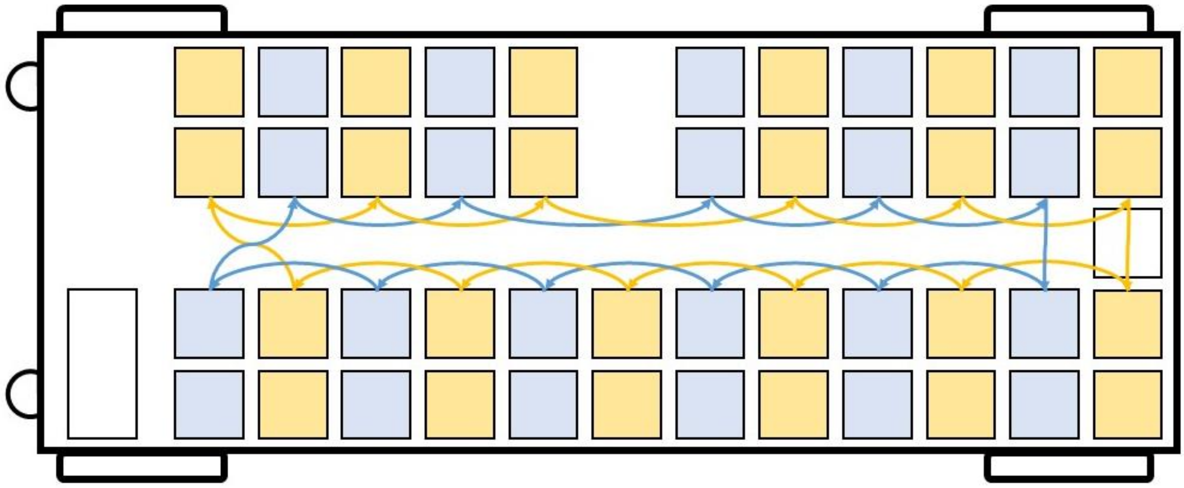

Figure 14: An example of shifting the participant of each group among themselves at the bus for active maching

The visit site and organisation should be selected with care and must fit with the topic of the journey or an event. It is advisable to visit the organisation abroad to get interesting and different view on the specific situations. The visiting organisation does not need to be from the same field where participants are coming from. On the contrary, it is advisable to visit the organisation out of the scope, but the theme should remain in line with the topic of the project, program … For example, participants of Start circles company mission event, coming from wood and polymer sector, could visit specific company from e.g. food or automotive sector which can present very good cases and principles of circular economy which they implemented.

You must keep in mind that the goal of company mission is an effective matching among participants, presentation of good practice from the topic you are targeting, establishing of cosy and positive atmosphere and provide participant with new knowledge.