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CIRCE2020



European Union
European Regional
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TAKING
COOPERATION
FORWARD



Project Meeting - Innsbruck, 26th MARCH 2019



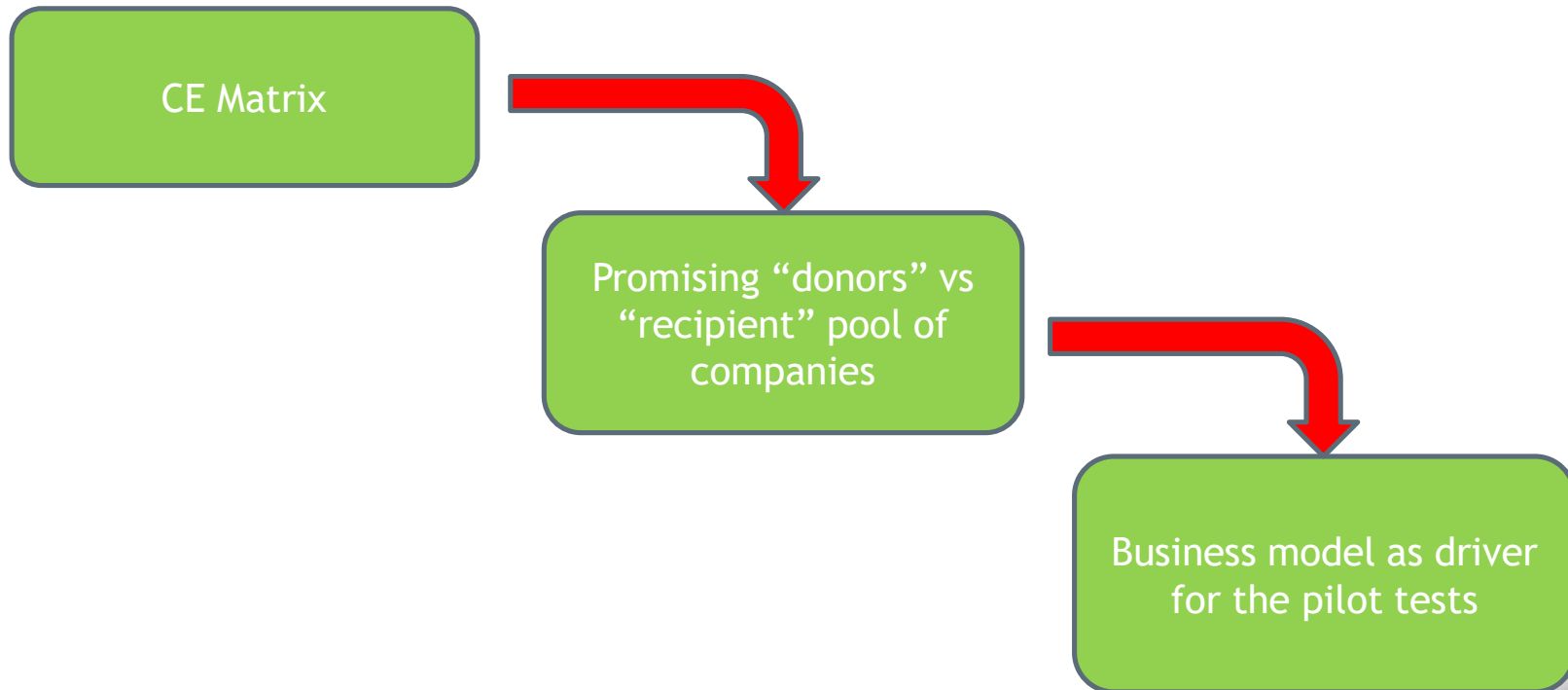
Circular economy business models supporting cross value chain by-products
remanufacturing: guidelines to implement it (AT2.4)



CIRCE2020 | ETRA

FROM CE MATRIX TO BUSINESS MODEL

Activity A.T2.4	<i>Activity title</i> Circular economy business models supporting cross value chain by-products remanufacturing	<i>Start date</i> 02.2019	<i>End date</i> 05.2019
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Description of the deliverable

According to:

- plan for prioritization (DT1.4.2);
- available/cost-effective technologies (AT2.1)
- environmental scenarios (AT2.2);
- economic scenarios (AT2.3);

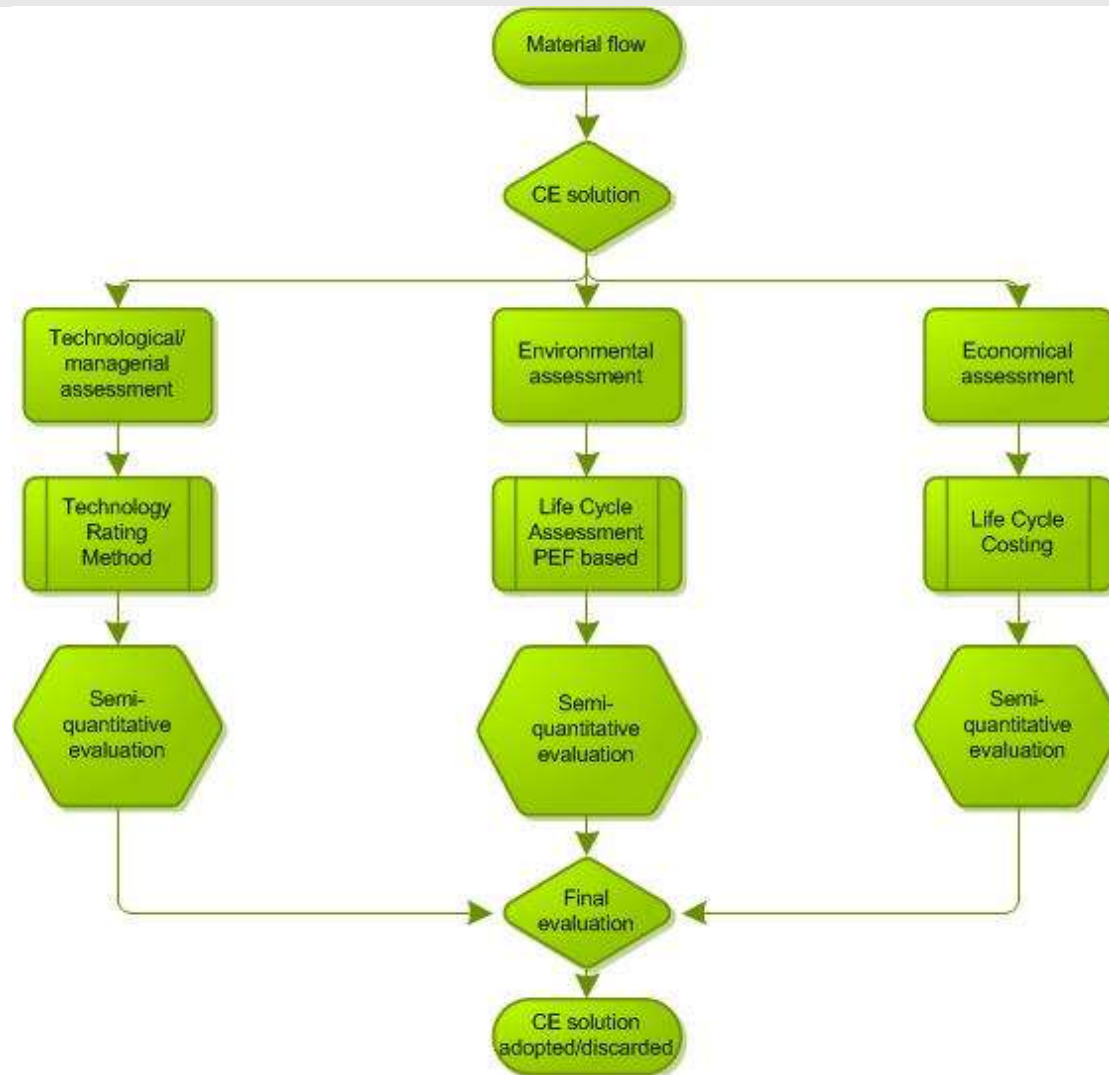


Each PP elaborates 1 MATRIX of concrete circular economy matchmakings in each industrial area

Decision support tool intended for internal usage but also for dissemination and communication actions



CIRCULAR ECONOMY MATRIX FLOWCHART



Get the result of TRM method applied to the selected CE solution.
The score obtained from TRM may vary within a certain range.

Calculation of TRM Index:

$$\Sigma \text{TRM}_i * W_i$$

Use the evaluation grid to determine a semi-quantitative assessment for the CE solution.





Note 1: Referring to TRM1 consider that when TRL index < 5 points (= TRL9) the solution is not applicable at all.

**DT2.1.4 - • SHARED TECHNOLOGY RATING
METHODOLOGY (TRM) TO CHECK OUT READINESS OF
NEW TECHS AND PROCESSES**

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TRM1: TRL index (1-5 points):

- 1 point: TRL 1 - basic principles observed
TRL 2 - technology concept formulated
□
- 2 points TRL 3 - experimental proof of concept
TRL 4 - technology validated in lab
□
- 3 points TRL 5 - technology validated in relevant environment
TRL 6 - technology demonstrated in relevant environment
□
- 4 points TRL 7 - system prototype demonstration in operational environ.
TRL 8 - system complete and qualified
□
- 5 points TRL 9 - actual system proven in operational environment

 TAKING COOPERATION FORWARD 



Note 2: In case TRM 7 Others - specific requirement depending of the partners (1-5 points) - is not assessed, use option 2.

Option 1	Evaluation Grid			
TRM index	from 88 to 126 points	from 127 to 164 points	from 165 to 202 points	from 203 to 240 points
Qualitative evaluation	not recommended	partially not recommended	limited recommended	recommended
Score	1	2	3	4

Option 2	Evaluation Grid			
TRM index	from 88 to 120 points	from 121 to 152 points	from 153 to 183 points	from 184 to 215 points
Qualitative evaluation	not recommended	partially not recommended	limited recommended	recommended
Score	1	2	3	4



5 minutes of brainstorming and discussion...

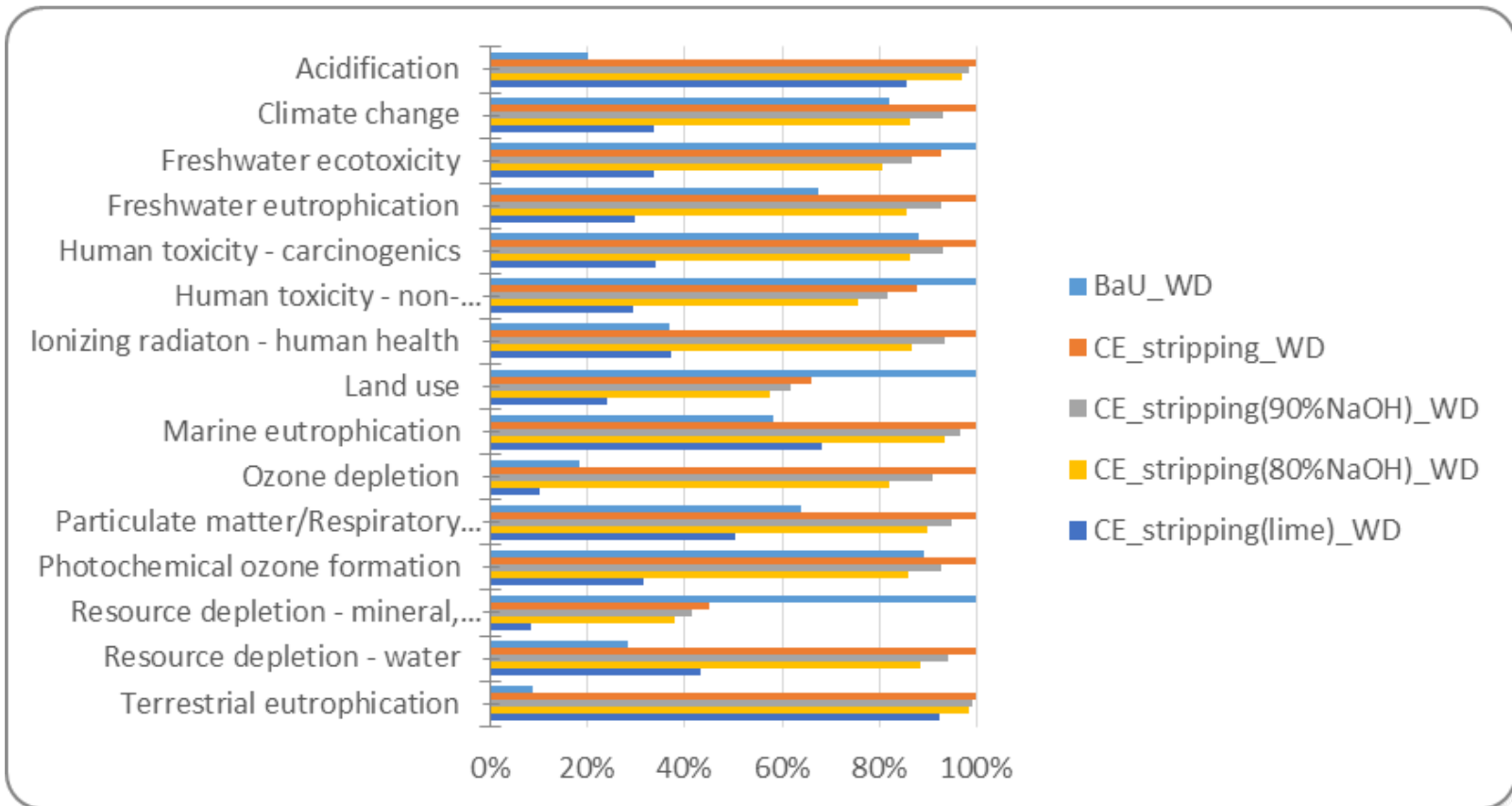


Aims to quantify the current and the expected potential environmental improvements connected to the implementation of the chosen solution.

ETRA elaborated a procedure to evaluate the results of the environmental analysis comparing the CE scenario and the BaU scenario:



1) Get the PEF profile of the LCA applied to the selected CE solution and the profile of the current situation.



2) Focusing on the main environmental aspects (soil, air, water) and considering the values (I, II) for impact assessment robustness, inventory cover completeness, inventory robustness, select only the following 5 categories:

- > Climate change
- > Particulate matter
- > Acidification
- > Eutrophication, terrestrial
- > Resource use, minerals and metals

3) Normalize the results of LCA in terms of impact/person and consider a weighting factor to these impact categories = 1.



4) Sum the normalized impacts for the 5 categories for the CE scenario and for the BaU scenario; then calculate the environmental index using the formula:

$$ENV\ index = \frac{ENV\ impact\ (BaU\ Scenario) - ENV\ impact\ (CE\ Scenario)}{|ENV\ impact\ (BaU\ Scenario)|}$$

5) use the evaluation grid to transpose the ENV index into a qualitative evaluation and into a score

	Evaluation Grid qualitative evaluation			
ENV index	ENV index < -20%	-20% < ENV index < 0	0 < ENV index < 20%	ENV index > 20%
Qualitative evaluation	not recommended	partially not recommended	recommended	highly recommended
Score	1	2	3	4



5 minutes of brainstorming and discussion...



Aims to quantify the current and the expected potential economic improvements deriving from the implementation of the chosen solution.

Based on the calculation of the LCC index→
parameter which measures the variation of LCC shifting from BaU scenario to CE scenario.

$$LCC\ index = \frac{LCC\ (BaU\ Scenario) - LCC\ (CE\ Scenario)}{|LCC\ (BaU\ Scenario)|}$$



Possible different options to manage this indicator:

- Binary interpretation:
 - > LCC index negative = red light;
 - > LCC positive = green light
- Interpretation with ranges:
 - > Gives more information about LCC variations
 - > Need to build up a grid with defined ranges
 - > Grid definition:
 - > through a benchmark created by Circe2020 partnership
 - > case by case for each specific flow



Critical issues related to LCC evaluation:

- Binary interpretation:
 - > Simplifies the information to be interpreted
 - > Huge gains or losses seem to be equal to small ones
- Interpretation with ranges:
 - > LCC index depends on many variables: e.g system boundaries, donor vs recipient approach!
 - > A benchmark is usually defined within a specific economic sector



Evaluation grid:

LCC index value	Evaluation Grid			
	LCC index < - 0,2	- 0,2 < LCC index < 0	0 < LCC index < 0,2	LCC index > 0,2
Qualitative evaluation	not recommended	partially not recommended	recommended	highly recommended
Score	1	2	3	4

Pilot case ETRA-ARPAV - Landfill leachate treatment:

LCC (CE scenario)/F.U. = 12,69

LCC (BaU scenario)/F.U. = 27,22

LCC index = 0,53 → recommended

Describe the rational behind the choice of ranges!



5 minutes of brainstorming and discussion...



MATRIX OF CONCRETE CE MATCHMAKINGS

	Technological driver	Environmental driver	Economic driver
qualitative evaluation score			
driver weight (qualitative)			
Final assessment			



MATRIX OF CONCRETE CE MATCHMAKINGS

	Technological driver	Environmental driver	Economical driver
qualitative evaluation score			

Use the values determined for each driver to fill in the "qualitative evaluation score" row.

Score: from 1 to 4 points

Note: translating the qualitative evaluation into a score falling within a common range, allows the comparability among heterogeneous drivers



MATRIX OF CONCRETE CE MATCHMAKINGS

	Technological driver	Environmental driver	Economical driver
driver weight (qualitative)			

Driver weight:

- option 1: the 3 drivers have equal weights;
- option 2: personalised weights according to the specific case and chosen by the PP.

In a decisional process there are a lot of factors which may influence the final choice.

Personalised qualitative weights are more meaningful!

Our proposal is to adopt qualitative weights defined as follows:

- Low relevance
- Medium relevance
- High relevance

Please insert the rational behind the choice of the driver weights in the Criteria section



MATRIX OF CONCRETE CE MATCHMAKINGS

	Technological driver	Environmental driver	Economic driver
Final assessment			

Final assessment:

synthesize the weighted qualitative evaluations of the 3 drivers and underlines the decision of adopting or discarding the CE solution, taking into account other relevant factors.

Please insert the rational behind the choice in the section «Criteria»



MATRIX OF CONCRETE CE MATCHMAKINGS

5 minutes of brainstorming and discussion...



Title:

Analysis & interpretation and interpolation of remanufacturing donors & recipient companies

Description:

Once profiled the matchmaking, experts map out promising “donors” vs “recipient” pool of companies interactions in each pilot areas that have characteristics for cross-chain & cross-sector collaboration to kick off secondary raw material exchanges



What shall we do actually?

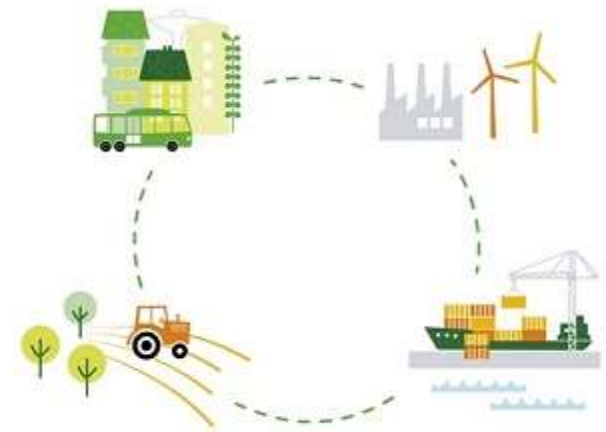
This deliverable is complementary to DT 241

For each material flow analysed, list the companies in the pilot area defined as:

- ☐ material producers (donors);
- ☐ material receivers (recipient).

Note: should we include both actual and potential donors & recipient?

A specific template will be provided



Title:

Design of the circular economy business model as driver for the pilot tests (AT3.2) for each area

Description:

*BM characterized by A) quantification of cut from use of raw materials, B) a reduced dependence from natural resources, C) cost/effective tech & attitude to investment of the business sector D) fulfilment of loc/nat waste regulation. 1*area developed*



New approach: as companies and flows have been already selected, BM is referred to the specific loops to be closed

CE matrix → Circular solution to be adopted

→ 1 Business Plan for each loop to be closed

→ At least 2 Business Plans for each pilot area

→ At least 10 Business Plans for Circe2020 project



Description of the business plan related to the introduction of a modification, whether technological or managerial, in a specific industrial process and its consequences in terms of circularity improvement.

Definitely this business plan derives from a series of analysis and evaluations taking into account different aspects affecting the manufacturing process when the circular solution is implemented.



See the template...



5 minutes of brainstorming and discussion...

