Supplementary material A

Focus group statistics and protocol

A. Focus group statistics

A.1.Time and place: 28th/30th April 2020, two sessions per day; virtually on the Zoom platform

A.2.Sample: four groups of six construction SME managers, with a final sample of 24 managers

A.3.Duration: about 90 minutes per session

A.4.Language: Italian

A.5.Transcriptions: about 15 pages per session, resulting in 60 total pages

B. Focus group protocol

B.1 Management

B.1.1. Invitation of focus group participants through direct email using the professional association territorial offices;

B.1.2. Selection of focus group participants to balance Northers, Center Southern managers;

B.1.3. Confirmation of the list of participants through professional association office, and reception of selected managers' direct contact (phone number);

B.1.4. Creation of WhatsApp groups for each focus group, where the participants were inserted in, to coordinate focus groups' timing, confirmations, and preliminary material on the topic;

B.1.5. Focus groups' questionnaires development: (1) a preliminary questionnaire was administered to the participants in the first part of the focus group session, to identify the preliminary knowledge on CE approaches and definitions, and to collect details of the assessed SME; (2) a final evaluation questionnaire was delivered at the end of each session, to evaluate the technical quality and efficacy of the virtual platform used for the discussion, and to appreciate the increase in knowledge and interest on CE-related topics and OL solutions.

B.1.6. Focus group presentation and coordination: Researcher A

B.1.7. Focus group time management: Researcher B

B.1.8. Focus group data analysis: Researchers A, B and co-authors

B.2 Focus group session

B.2.1. Introduction: focus group objectives were presented by Researcher A, i.e., the evaluation of organizational learning (OL) processes for circular business model (CBM) implementation inside small and medium enterprises (SMEs), and relative contextual factors acting as barriers and/or enablers;

B.2.2. Privacy disclaimer and agreement for focus groups' video and audio recording: who participate gives the authorization of the internal use/analysis of video/audio recordings and the development of related studies;

B.2.3. Administration of the preliminary questionnaire [see above, B.1.4 (1)];

B.2.4. Introduction on the definition of circular economy (CE), and of CBMs (according to the BS 8001:2017 standard and Lacy & Rutqvist, 2015), to guarantee a shared conceptualization of the treated topics;

B.2.5. In depth presentation of seven CBMs, with their definition, and one example for the construction sector per each CBM. The CBMs presented are the followings: (1) "product life cycle extension" – repair, reuse, resell products for an extended durability; (2) "recovery of

secondary raw materials" – recovery of useful resources from secondary materials, waste or by-products; (3) "product–service system (PSS)" – considering product as a service; (4) "collaborative consumption" – C2C or B2B business model oriented to connect actors to share resources and create synergies in product use; (5) "Circular supply", focused on the use of renewable resources, bio-based and recyclable materials; (6) "dematerialization" - replacing physical infrastructure and assets with digital/virtual services; (7) "on-demand" – production based on customers' demand;

B.2.6. For each CBM, the discussions among focus groups' participants was directed on the following questions:

- o In the context of the presented CBM, which barriers to the activation of OL processes might you find in your activity?
- o In the context of the presented CBM, which enablers to the activation of OL processes might you find in your activity?
- o Which OL processes would be useful for the implementation of the presented CBM?

B.2.1. Administration of the final evaluation questionnaire [see above, B.1.4 (2)]

B.2.2. Acknowledgments and closure of the focus group

Supplementary material B

Table S1. Descriptive statistics on KC items.

	N	Mean	Std deviation	Skew		Kurtosys	
	Statistics	Statistics	Statistics	Statistics	Std error	Statistics	Std error
Job rotation	127	2.69	1.166	0.183	0.215	−0.833	0.427
Simulation	127	2.76	1.065	0.247	0.215	−0.636	0.427
Brainstorming	127	3.20	1.141	−0.200	0.215	−0.522	0.427
Benchmarking	127	3.27	0.996	−0.317	0.215	−0.319	0.427
Consultant	127	3.61	0.856	−0.376	0.215	−0.079	0.427
Learning by doing	127	3.62	0.844	−0.231	0.215	−0.089	0.427
Professional service firm	127	3.86	0.753	−0.779	0.215	1.430	0.427
Valid responses	127						

Source: Authors elaboration.

Table S2. Descriptive statistics on KT items.

	N	Mean	Std deviation	Skew		Kurtosys	
	Statistics	Statistics	Statistics	Statistics	Std error	Statistics	Std error
Virtual CoP	127	1.88	1.066	1.117	0.215	0.305	0.427
Seminar	127	2.20	1.108	0.723	0.215	−0.173	0.427
Coaching	127	2.29	1.077	0.516	0.215	−0.549	0.427
Focus group	127	2.35	1.124	0.525	0.215	−0.532	0.427
CoP	127	2.46	1.125	0.395	0.215	−0.579	0.427
Multi-project team	127	2.62	1.228	0.288	0.215	−0.790	0.427
Working group	127	2.80	1.113	0.223	0.215	−0.737	0.427
Single project team	127	2.94	1.167	0.033	0.215	−0.855	0.427
Meeting	127	3.05	1.007	0.094	0.215	−0.707	0.427
Internal training	127	3.05	1.105	0.049	0.215	−0.621	0.427
Research R&D	127	1.61	0.837	1.430	0.215	1.920	0.427
University R&D	127	1.74	0.945	1.118	0.215	0.486	0.427
Partner R&D	127	1.75	0.943	1.220	0.215	1.109	0.427
Network contract	127	2.32	1.147	0.428	0.215	−0.791	0.427
Alliances	127	2.80	1.127	−0.076	0.215	−0.861	0.427
Prof. Association	127	2.83	1.153	0.014	0.215	−0.920	0.427

External training	127	3.20	1.091	−0.289	0.215	−0.675	0.427
Valid responses	127						

Source: Authors elaboration.

Table S3. Descriptive statistics on KR items.

	N	Mean	Std deviation	Skew		Kurtosys	
	Statistics	Statistics	Statistics	Statistics	Std error	Statistics	Std error
Knowledge mapping	127	2.66	1.056	0.347	0.215	−0.385	0.427
Process mapping	127	2.94	0.986	0.061	0.215	−0.415	0.427
Problem solving	127	2.94	1.071	−0.086	0.215	−0.751	0.427
Network analysis	127	3.03	1.076	0.092	0.215	−0.543	0.427
Best practices (BP)	127	3.08	1.193	0.074	0.215	−0.899	0.427
Lesson learnt (LL)	127	3.13	1.260	−0.024	0.215	−0.992	0.427
Valid responses	127						

Source: Authors elaboration.

Table S4. Intraorganizational learning processes evaluations, mean and median.

Intraorganizational learning procesess	Mean
	Statistics
Professional service firms (PSF)	3.86
Learning by doing	3.62
Consultant	3.61
Benchmarking	3.27
Brainstorming	3.20
Lesson learned (LL)	3.13
Best practice (BP)	3.08
Internal training	3.05
Meeting	3.05
Network analysis	3.03
Process mapping	2.94
Problem-solving	2.94
Single-project team	2.94
Working group	2.80
Simulation	2.76
Job rotation	2.69
Knowledge mapping	2.66
Multi-project team	2.62
Community of practice	2.46
Focus group	2.35
Coaching	2.29
Seminar	2.20
Virtual community of practice	1.88
Mean	*2.89*
Median	*2.94*

Source: Authors elaboration.

Table S5. Interorganizational learning processes evaluations, mean, and median.

Interorganizational learning processes	Mean

	Statistics
External training	3.20
Best practice (BP)	3.08
Professional Association	2.83
Alliances	2.80
Community of practice	2.46
Network contracts	2.32
Virtual community of practice	1.88
Partner R&D	1.75
Research R&D	1.74
University R&D	1.61
Mean	*2.37*
Median	*2.39*

Source: Authors elaboration.