# INDICATORS AND METHODS FOR MEASURING TRANSITION TO CLIMATE NEUTRAL CIRCULARITY

## Task 5: Case-study group 3

Report for: DG RTD, Directorate B – Healthy Planet, Unit B1: Circular Economy & Biobased Systems

Ref. RTD/2022/OP/0003

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Customer:
European Commission, DG RTD

Customer reference:
RTD/2022/OP/0003

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30th August 2024

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# 1. INTRODUCTION

The transition to a circular economy (CE) needs to occur on multiple levels, from households and individual consumers to national and cross-border ecosystems. Measuring and monitoring the development of this transition is an ambitious task and is ideally supported by indicators relevant to all steps in that process.

This case-study is one of 19 developed for a research project into "*Indicators and methods for measuring transition to climate neutral circularity, its benefits, challenges and trade-offs*". It provides a detailed summary of the development and testing programme conducted for Group 3 of the Cities & Regions sub-policy area during Task 5 of the project. The main purpose of this case-study is:

1. Provide an overview of the testing and monitoring method adopted for each indicator.
2. Outline the key results and performance of each indicator.
3. Highlight any challenges or lessons learnt from the identification, planning, delivery and analysis of the relevant methodology for each indicator.

The aim of Task 5 is to take the learnings of all other Tasks thus far and develop and test the new indicators identified in Tasks 3 and 4 as having potential to enable a deeper understanding of the 3 facets of circularity for the five key approaches. This case-study is a direct output of Task 5.

This case-study focuses on the following 2 indicators outlined in Table 1.

Table 1. Overview of case-study group CR3

| URN | | Indicator name | Methodology | Level of implementation | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | EU | National | City / Region | Companies | Household |
| CR7 | **1** | Number of city resources (public institutions etc) implementing transition agendas | | | | X | | |
| CR9 | **2** | Collaborative spaces equipped with materials and equipment to encourage repair | | | | X | | |

# 2. INDICATOR 1: NUMBER OF CITY RESOURCES (PUBLIC INSTITUTIONS) IMPLEMENTING CIRCULAR TRANSITION AGENDAS

The circular economy (CE) is typically defined as a "systemic approach to economic development designed to benefit businesses, society, and the environment" (Ellen MacArthur Foundation, 2024). Cities play a pivotal role in transitioning away from a take-make-waste linear economy due to their high rates of material consumption and waste production. Within this context, cities have been recognised as key facilitators, promoters and enablers of a transition to a CE through the availability of policy, regulatory and economic levers at their disposal (EU Commission, 2024; OECD, 2020).

The purpose of this indicator is to measure the extent to which city and/or region resources have in place commitments that align with a city and/or region's overall circular objectives. By publicly disclosing their commitment, alongside any available quantifiable metrics and key performance indicators (KPIs), organisations increase their accountability, and provide policymakers with valuable insights into how effectively circularity has been integrated into local decision-making. This information enables stakeholders, including policymakers, businesses, and civil society organisations, to assess the impact of interventions, identify areas for improvement, and inform future circular policy development.

A city's resources can be understood in terms of natural resources, infrastructure, economic resources (e.g. businesses, industries and financial institutions), financial resources (e.g. revenue streams, fiscal policies, and investments that fund public services, etc), however, for the purpose of this study the focus was on the social and cultural, and governmental resources; specifically public sector and/or publicly funded institutions that have committed to a CE (Michel & Robardiere, 2017; Harkness, Katz, Conroy, & Tilchin, 2017). While narrowing the scope to target these two criteria may limit the results generated, this allowed the research team to test the indicator more efficiently, while paying special attention to action areas where municipal and regional administrations are more likely to exert more influence.

There are many benefits to monitoring this indicator, for example:

- It enables administrations to track the awareness of, and alignment with, local and/or regional CE objectives among public and private entities in the region.
- This in turn, will allow stakeholders, including policymakers, businesses, and civil society organisations, to assess the impact of interventions, identify areas for improvement, and inform future circular policy development.
- It creates accountability among local public and private entities. By publicly disclosing organisational commitments to CE objectives alongside any available quantifiable metrics and KPIs, local stakeholders are incentivised to meet their targets.
- It provides visibility to CE practitioners and early adopters of CE approaches. This can be used to reward good practice, demonstrate the feasibility of these approaches, and de-risk perceptions of CE.

## 2.1 KEY METHODOLOGY

### 2.1.1 Testing method

The indicator was tested by ensuring that identified city/regional resources were located within the study's system boundaries, they conformed to the definition of a city resource, and had publicly committed to implementing a circular transition agenda, as indicated through public statements, strategic documents and/or quantifiable metrics and KPIs.

The system boundary refers to public sector institutions within the legal boundaries of the city of Leuven (Belgium), and the autonomous region of Navarra (Spain). Desk-based research was conducted within the two locations to identify public sector and/or publicly funded institutions that had committed to, or support, a CE

transition within the city/region. This was supplemented by one 45-minute interview with CE policymakers for each city.

The scope of city resources was restricted to focus on social and cultural, and governmental resources; specifically public sector and/or publicly funded institutions. These included: Government departments, public sector hospitals and healthcare institutions, public sector schools and educational institutions, emergency services, and cultural institutions. University hospitals were counted as separate organisations to the university itself and therefore listed as two institutions. This excluded any institutions that were not funded or aligned with the local city and/or regional government.

These city resources must have committed to a circular transition agenda, which is typically understood as a strategic document with a time-bound plan that clearly describes how an organisation will reorient its current operations to align with and support the transition to a CE. They usually contain high-level commitments and circular mission statements, alongside quantifiable metrics and publicly disclosed key performance indicators (KPIs) to track progress towards targets defined by themselves or by the local/regional public administrations, which has the competencies and authority to set guiding CE targets. Where there is evidence that an organisation conforming to the criteria of publicly-funded/public sector resource has been implementing a circular transition agenda, they were counted within the indicator. A desk-based review of relevant organisations' website was used to identify such evidence (e.g. publicly disclosed commitments towards regional CE goals, the publication of organisational CE roadmaps, strategies or mission statements, as well as publicly disclosed CE KPIs).

The two case studies, the city of Leuven and the autonomous region of Navarra, were selected to test how this indicator could be measured at two different scales and within two different contexts.

In the case of Leuven, the administration has been actively seeking to harness circularity as a means of achieving climate-neutrality. This has been facilitated by Leuven 2030, founded by the city and a coalition of partners in 2013, which in recent years has worked with local stakeholders, such as policymakers, knowledge institutions, companies, civil-society organisations, and citizens, to support the development of bottom up circular initiatives.[1]

In the case of the autonomous region of Navarra (Spain), the region was selected as the regional government has been working on circular economy policies since 2007 as a means of both achieving climate-neutrality goals and addressing demographic challenges characteristic of rural communities within the EU, namely rural depopulation and an ageing population. A transition to a CE has been adopted as a core strategic priority within the government's Specialisation Strategy for Sustainability (Gobierno de Navarra, 2022), and Navarra's Industrialisation Plan 2021-2025 (Gobierno de Navarra, 2022), and as such, this case study provides an opportunity to measure how these regional objectives have been incorporated into the policies of local institutions.

### 2.1.2 Data collection method

The data collection process was as follows:

- Identification of public sector/publicly funded institutions.
- Determination of whether identified institutions were publicly committed to supporting a transition to a CE within a city/region, through an assessment of publicly available resources (public statements, strategic documents, and/or circular metrics or KPIs).

Data collection was run between 1st January and 15th March 2024.

This involved an initial literature review of municipal/regional circular strategy papers to identify public sector institutions/bodies actively involved in the promotion of CE initiatives, followed by desk-based research to identify other relevant city resources implementing CE transition agendas in each city/region of study in both English and the official language of that region (Dutch and Spanish). The initial search terms used were: "Circular Economy" or "Zero Waste" combined with "statement" or "policy" and then different variations of

[1] Leuven 2030, Roadmap Towards a Climate Neutral Leuven, (Leuven 2030, 2024). https://en.leuven2030.be/roadmap-towards-a-climate-neutral-leuven. Accessed: 16/04/2024

institution category, such as “health care”, “government” or “education”, etc. These were then further tailored for each city/region during data collection to optimise the number of relevant search results.

It is recognised that local and regional administrations have developed activity and support networks to allow local stakeholders to embed circular practices within local organisations. These networks facilitate knowledge-sharing on CE topics relevant to each city and/or region’s specific context, including regional best practice, policies, funding and business support that may be available. It is therefore assumed that members of these networks will either have direct or indirect relationships with, or knowledge of, CE stakeholders and organisations relevant to this indicator. As such, a snowball sampling method was deployed to improve the efficiency with which interview participants and data were identified. Snowball sampling is a non-probability sampling method whereby research participants are asked to assist researchers in identifying other potential subjects relevant to the study. While this method does introduce a risk of selection bias, it complements the research by providing access to context specific information that would have otherwise been challenging to identify through desk-based research alone.

After saturating all available data sources, relevant municipality/regional CE representatives were contacted to gain additional data on the number of public sector/publicly-funded institutions and to sense-check findings through email correspondence and/or a 45-minute semi-structured interview.

The team was successful in securing an interview with representatives of the Government of Navarra’s Circular Economy and Innovation Service, as well as representatives of Gestión Ambiental de Navarra – Nafarroako Ingurumen Kudeaketa (GAN-NIK), a public company that works with the Government of Navarra’s Department of Rural Development and Environment on the development and implementation of CE policies.[2] This occurred on 5th March 2024, and was followed by three rounds of email correspondence.

Unfortunately, the team was not successful in attempts to engage representatives of the City of Leuven. A total of seven emails were sent to representatives involved in CE initiatives led by Leuven2030 and KU Leuven[3] University within the first week to sense-check findings, however no response or a delayed response past the data collection deadline was received.

All results gathered were input into a MS Excel database which recorded the public institutions identified using the above search terms, the type of public institution, whether they had a CE strategy, and whether any CE KPIs were tracked. A brief summary of the CE transition agenda was included to aid later analysis.

### 2.1.3 Calculations

The indicator was calculated as a quantitative sum of the number of public institutions that had committed to a transition to a CE, as evidenced through roadmaps, public statements and publicly disclosed quantifiable metrics or key performance indicators to track their progress.

[2] GAN-NIK, Quienes somos. (GAN-NIK – Gestión Ambiental de Navarra, 2024). https://www.gan-nik.es/es#quienes. Accessed: 16/04/2024.

[3] KU Leuven, Circular economy, Life Cycle Assessment and Policy Research, (KU Leuven, 2024), https://set.kuleuven.be/mrc/Research-lines/circular-economy-life-cycle-assessment-and-policy-research/. Accessed: 16/04/2024.

### 2.1.4 Timeline

The research was conducted in a three-month period from January 2024 to March 2024, as indicated in Table 2.

Table 2: The project timeline for indicator CR7

| Week Commencing | 01-Jan | 08-Jan | 15-Jan | 22-Jan | 29-Jan | 05-Feb | 12-Feb | 19-Feb | 26-Feb | 04-Mar | 11-Mar | 18-Mar | 25-Mar | 01-Apr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Task 1 - Develop data collection form and excel result | | | | | | | | | | | | | | |
| Task 2 – Literature Review | | | | | | | | | | | | | | |
| Task 3 – Desk-based research | | | | | | | | | | | | | | |
| Task 4 – Stakeholder engagement | | | | | | | | | | | | | | |
| Task 5 - Analysis of key themes/trends | | | | | | | | | | | | | | |
| Task 6 - Write up case study template | | | | | | | | | | | | | | |
| Review period | | | | | | | | | | | | | | |
| Key deliverables | | | | | | | | | | | | | | |

### 2.1.5 Data gaps and mitigation

In terms of data gaps, it was expected that the local and regional administration in question (the City of Leuven and the Government of Navarra) did not monitor the number of city/regional resources that were implementing CE transition agendas in a centralised manner. In addition, it was also expected that not all organisations working to implement or align their activities with local or regional transition agendas would have publicly disclosed strategic documents or be monitoring metrics to evidence this fact.

To mitigate these data gaps, the research team carried out an extensive review of the publicly available resources relevant to each city resource to identify the extent to which they had produced a circular commitment, roadmap, or strategy and/or metric. Expert judgement and stakeholder engagement was then used to infer whether the identified city resources were relevant to the indicator of study.

Table 3. Overview of identified data gaps, limitations and mitigation efforts

| | Description of data gap | Mitigation efforts | Level of confidence |
|---|---|---|---|
| 1 | No centralised record of public institutions implementing circular transition agendas. | • Literature review of municipal and regional CE strategies to identify "city resources" implementing CE activities.<br>• Desk-based review of "city resources" using key CE search terms.<br>• Stakeholder engagement with regional administrative CE policymakers. | Medium |
| 2 | Limited publicised information on the characteristics of each city resource's circular transition agenda. | • Expert review of publicly available information to infer presence of quantifiable CE metrics and KPIs (e.g. reference to waste avoided, and/or materials reused).<br>• Stakeholder engagement with regional administrative CE policymakers to sense-check findings.<br>• Recording of presence of CE commitment, roadmap or strategy, and CE metrics. | Medium |

### 2.1.6 Quality review of analysis

To ensure robust and high-quality results, the research team conducted the following data validation and quality control procedures:

- Prior to work beginning, the Project Director reviewed the proposed research methodology to ensure that the data collection plan was fit for purpose. Once the research team had addressed any comments from the review process, they proceeded to the data collection phase.
- The research team presented semi-structured interview guides and a list of stakeholders identified for interview to the Project Director for review prior to interviews being carried out.
- During the write-up phase, each case study went through three stages of Quality Assurance (QA) to confirm factual, technical and grammatical accuracy. The Project Director held responsibility for the quality of the final case study output. At each stage of review, senior CE experts assisted the Project Director in judging the quality of the output and suggesting ways to improve.

## 2.2 KEY ANALYSIS RESULTS

### 2.2.1 Analysis

During the testing phase, the research team were able to monitor a series of public organisations and institutions that were in the process of implementing circular transition agendas aligned with the criteria defined in Section 2.1.2. These results are summarised in Table 4, and for full details of the research results, please see Appendix 4.3. On the whole, the indicator performed moderately well, however, as expected the majority of institutions had no CE KPIs or strategies that were publicly available. This raises questions over the comprehensiveness of their plans, and the ability of this indicator to correctly monitor organisations implementing circular transition agendas using solely publicly available information. As such, a more robust reporting mechanism would be required if this indicator were to be rolled out across EU Member States.

Table 4: Data gathered for indicator CR7

| No of city and regional resources implementing circular transition agendas | | |
|---|---|---|
| City | City of Leuven | Region of Navarra |
| City resources reporting a CE Commitment. Of these: | 21 | 60 |
| • CE Roadmap/Strategy | 9 (42.9%) | 13 (21.6%) |
| • CE KPIs | 14 (66.7%) | 11 (18.3%) |

In the case of the Region of Navarra, 60 regional resources were identified through desk-based research that were implementing or were committed to transition agendas in alignment with the regional CE goals of the Government of Navarra's Circular Economy Agenda 2030.[4] The agenda outlines seven key elements: prioritising regenerative resources, conserving and extending the useful life of products and materials, using waste as a resource, rethinking business model, designing for the future, incorporating digital technology, and collaborating to create joint value (Gobierno de Navarra, 2019).

Of these, 13 entities (21.6%) had publicised a CE roadmap or strategy, and 11 (18.3%) had publicly reported a CE metric or key performance indicator that could be used to track their progress. Recorded in the results were 40 municipalities in the region of Navarra that had published strategic CE objectives within their plans to implement the 2030 Sustainable Development Agenda for Navarra, representing just over 14.7% of the 272 municipalities listed within the region (Gobierno de Navrra, 2023). The majority of these circular objectives were high-level commitments to develop community heating and energy networks, water efficiency and recycling initiatives and programmes to promote recycling and sustainable consumption, rather than easily quantifiable metrics, and as such were excluded from this score.

The regional government stakeholders interviewed during the data collection phase viewed this indicator as an important means of quantifying the total number of regional/administrative resources with targets in alignment with the Circular Economy Agenda 2030 (Gobierno de Navarra, 2019), and Smart Specialisation Strategy for Sustainability (S4), an economic transformation agenda seeking a "just transition" towards sustainable and inclusive growth (Gobierno de Navarra, 2022). It was recognised that there were two key advantages of requesting local entities report on their transition agendas: recognition on the part of the administration, and greater visibility on the part of reporting organisations, which may assist in applications for future funding opportunities.

However, gathering this data in a standardised format was perceived to be a challenge, due to the decentralised way in which responsibility for CE implementation had been distributed across the region, the diverse entities (public companies, government bodies) involved, and the complexity of gaining oversight on the high number of short-lived grass roots initiatives. The public-private partnership Navarra-Zirkular, comprised of regional department bodies and the public companies Sodena[5] and GAN-NIK[6] and La Asociación de Empresas de Merindad de Estella (LASEME)[7], already acts as a central body through which businesses that had subscribed to a circular manifesto could be registered.[8] It was recognised that this partnership could act as a mechanism to monitor regional initiatives implementing CE transition agendas more broadly, however, this would entail higher levels of coordination among governmental departments, which was viewed as potentially challenging. In addition, it was noted that the indicator should include a full range of city resources and avoid limiting the definition to specific sectors (e.g. whether public or private) to ensure organisations working in this area are not left out. It was viewed that the criteria used in this study may have

[4] Gobierno de Navarra, Agenda para el Desarrollo de la Economia Circular en Navarra 2030 (Gobierno Abierto de Navarra, 2019). https://gobiernoabierto.navarra.es/es/gobernanza/planes-y-programas-accion-gobierno/agenda-para-desarrollo-economia-circular-navarra-2030. Accessed: 16/04/2024.

[5] Sodena, Who we are. (Sodena, 2024). https://sodena.com/en/who-we-are/. Accessed: 16/04/2024.

[6] GAN-NIK, Quienes somos. (GAN-NIK – Gestión Ambiental de Navarra, 2024). https://www.gan-nik.es/es#quienes. Accessed: 16/04/2024.

[7] LASEME, Quienes somos?. (LASEME, 2024). https://www.laseme.net/es/laseme/quienes-somos.html. Accessed: 16/04/2024.

[8] Navarra Zirkular, Overview of Navarre Zirkular. (Navarra Zrikular, 2024). https://navarrazirkular.es/en/#vision_general. Accessed: 16/04/2024.

the effect of reducing the buy-in and credibility of monitoring this indicator among the private sector that are working independently within this area.

In the case of Leuven, 21 entities (public institutions, associations and partnership organisations involving one or more public institution(s)) were identified that had either publicly committed to and/or were implementing activities aligned with the region's municipalities' circular transition. Of these, 9 entities (42.9%) indicated the use of any metrics that could be used to track their progress in implementing these activities and 14 (66.7%) had produced or were signed up to an explicit CE strategy or roadmap, such as the Levuen 2030 Roadmap, which encompasses 8 climate-transition ambitions organised into 13 programs addressing CE themes such as energy, mobility, food and circular procurement. These commitments are compiled into the first Leuven Climate City Contract, a collaboration between the city administration, Leuven 2030 (a public-private partnership coordinating the roadmap's implementation), and over 30 key public and private stakeholders, which outlines 86 breakthrough projects aimed at reducing $CO_2$ emissions and overcoming barriers to swift emission reductions.[9]

Similar to the region of Navarra, while the Levuen2030 partnership provides a useful coordinating mechanism to report on and monitor progress in the city's circular transition, it was difficult to verify these findings through desk-based research alone. It should be noted that while 9 entities had publicly disclosed metrics, the majority of these were broadly related to the expected general benefits of specific activities rather than longer term activities. These include projects focused on building retrofits/renovations, which were monitored for energy and heat efficiency, waste reduction and greenhouse gas emission reductions. This includes the Leuven2030 Roadmap, which provides general plans to advance the circularity agenda in Leuven but lacks explicit KPIs or quantitative targets (Leuven 2030, 2019).

If quantifiable metrics are made a key criteria for the monitoring of this indicator, it is likely that this will require significant additional resourcing to allow reporting Cities and Regions to comply with this requirement.

### 2.2.2 Limitations

Due to a lack of information on their websites, it was difficult to determine or confirm the public sector status/nature of some organisations. Moreover, while this metric measures the number of organisations committed to a CE transition, this does not assess the depth or quality of these commitments, and therefore may lead to a misleading representation of actual progress. On the other hand, it should also be acknowledged that this metric might not account for the dynamic nature of organisations commitments, particularly in relation to CE Roadmaps or strategies, where priorities and strategies might evolve over time. Very often these developments might not be made publicly available. As such, there is also a risk of under-reporting progress.

In addition, there was some uncertainty in recording the use of metrics/KPIs. This was largely inferred from the available information on websites, which were largely a high-level overview of CE activities that omitted granular details regarding how activities were monitored during implementation.

These results suggest that, given the substantial variability in how different organisations and Member States interpret and implement CE principles, there will likely be difficulties in comparing progress across institutions and regions without standardised guidelines to guide assessments. It is recognised that some organisations may not have the capacity to develop their own quantifiable CE metrics. As such, it is recommended that this indicator seeks to monitor how each organisation's strategies align with targets deigned by the local/regional public administration that has the relevant competencies and authority to set guiding CE targets.

In the case of Navarra, this limitation was partly mitigated through one 60-minute interview and email correspondence with representatives of the Government of Navarra's Circular Economy and Innovation Services and of GAN-NIK, an entity linked to the Department of Rural Development and Environment and integrated into the Public Business Corporation of Navarra (CPEN).[10] This allowed the research team to sense-check findings and gain further qualitative data on the value and relevance of this indicator in relation to the region's CE transition.

Unfortunately, it was not possible to mitigate this limitation in the case of the City of Leuven, and as such a degree of uncertainty remains over the robustness of the findings in this case.

[9] Leuven 2030, Roadmap Towards a Climate Neutral Leuven, (Leuven 2030, 2024). https://en.leuven2030.be/roadmap-towards-a-climate-neutral-leuven. Accessed: 16/04/2024

[10] CPEN, Public Business Sector. (CPEN, 2024). https://www.sociedadespublicasdenavarra.es/en/cpen#quienes-somos. Accessed: 16/04/2024.

### 2.2.3 Performance

Table 5 compares the RACER score allocated to the original indicator during Task 4 against the final indicator after the Task 5 testing process. During Task 4, the original indicator was allocated a score of 15 against the RACER evaluation process, following testing in Task 5 this has been downgraded to 10, as summarised below:

- **Relevance**: This refers to whether the indicator is closely linked EC CE objectives. Analysis of the indicator indicates this is still highly relevant to allowing city and regional governments to understand the incorporation of circularity as a strategic priority within their urban resources. It is directly linked to the objectives of the Circular Cities and Regions Initiative, which seeks to enhance circular capacity-building and ensure that 'the circular economy [is] more widespread and mainstream'.[11] This indicator provides a discrete data point to monitor the prevalence of CE within local organisations, which in turn can allow policymakers to identify areas where further support may be needed to boost CE at the local and regional level. Nonetheless, the focus on public sector entities, will mean that several important stakeholder groups within the private sector are excluded. Given the essential role of local businesses in implementing CE strategies in alignment with regional CE objectives, this has a limiting effect on the overall relevance of the proposed indicator. As such, the score has been revised to "Neutral" (2).
- **Acceptance**: This refers to whether the indicator is perceived and used by key stakeholders. While on the one hand, representatives of the Government of Navarra, the Office for Circular Economy and GAN-NIK, were very positive about the benefits of monitoring this indicator, some questions remained regarding scope of assessment; specifically, the exclusion of private sector organisations. In addition, it was not possible, to verify findings in the case of Leuven during this research. As such, scoring has been downgraded to "Neutral" (2).
- **Credibility**: This refers to whether the indicator is transparent, trustworthy and is easy to interpret. In this case, scoring has been downgraded to "Neutral" (2). This is due to the fact that there is currently no methodology that can be used to accurately assess the presence or criteria of a circular transition agenda. While the indicator is relatively easy to understand, and currently being applied to monitor the adoption of circular manifestos within the private sector in Navarra, stakeholders contacted requested a more standardised approach to be taken.
- **Ease**: This refers to the easiness of measuring and monitoring the indicator. This has been downgraded to "Neutral" (2). The data is currently not being monitored at the local or regional level. Nonetheless, the cost of data collection is thought to be low to moderate. This would require local administrations to invest time into engaging local stakeholders to report their plans, as well as to assess the credibility of their transition agendas. This could be facilitated through the use of digital reporting mechanisms to allow supporting evidence to be uploaded and assessed more efficiently. As such, the indicator has been downgraded to Neutral.
- **Robustness**: This refers to whether data is based and comprehensively assesses circularity. The scoring has been downgraded to "Poor" (1). While on the one hand, the implementation of a circular transition agenda is requesting a one-dimensional indicator ("Good"), the consistency of how these transition agendas have been developed and evidenced will vary. This is demonstrated through the range of supporting evidence identified during the desk-based research, ranging from organisations that had developed clear strategic roadmaps to organisational 'Mission Statements' that are not substantiated by publicly available targets or time-limited milestones. As noted in Section 2.2, this inconsistency raises a question mark over the comprehensiveness of their circular transition agendas and their level of commitment to implement these in a meaningful way. Given valid concerns over greenwashing, a clear reporting mechanism and methodology is therefore required to ensure a consistent approach is taken across European Member States.

[11] EU Commission, About The Circular Cities and Regions Initiative. (Circular Cities and Regions, 2024). https://circular-cities-and-regions.ec.europa.eu/about. Accessed: 16/04/2024.

Table 5. RACER evaluation

| Stage of project | RACER criterion | | | | | Score |
|---|---|---|---|---|---|---|
| | Relevance | Acceptability | Credibility | Ease | Robustness | |
| Task 4 (original RACER assessment) | 3 | 3 | 3 | 3 | 3 | 15 |
| After Task 5 (following testing) | 2 | 2 | 2 | 2 | 1 | 9 |

## 2.3 CHALLENGES AND LESSONS LEARNED

### 2.3.1 Challenges

During the testing phase, a key challenge found was in terms of classifying the city resources under study. As defined in Section 2.1.1, the city resources that were taken into consideration were restricted to focus on social and cultural, and governmental resources; specifically public sector and/or publicly funded institutions. While the exclusion of "economic resources" (e.g. businesses, industries and financial institutions), reduced the complexity involved in monitoring this indicator, and allowed researchers to focus on areas where local and regional administration are more likely to exercise higher degrees of influence, the exclusion of private sector bodies represents a severe limitation. The alignment of private businesses with local and regional CE policies is essential to achieving the overarching goals of a circular transition. Therefore, it is recommended that future development expands the testing criteria to include a wider spectrum of "city resources". This would produce higher value results that are more likely to be accepted by local and regional policymakers. Their inclusion, however, will also require more time and resourcing to identify organisations implementing CE transition agendas.

Another challenge found was in relation to the classification of the transition agendas themselves. As noted in Section 2.2.2, the quality of corroborating evidence that indicated implementation of transition agendas varied drastically. While overarching regional initiatives, such as the Leuven 2030 Roadmap (Leuven 2030, 2019) and the 2030 Agenda for the Development of a Circular Economy in Navarra (Gobierno de Navarra, 2019), provided frameworks for a circular transition, it was found that there was no requirement for organisations to publicly disclose how they were aligning with these strategies nor was there any mechanism to allow them to do this. To mitigate these data gaps, it is recommended that future studies incorporate an extended stakeholder engagement process to survey each individual organisation to request further detail on whether they had circular policies in place, what metrics they use, and to what extent they believe their activities contribute to the local and/or regional circular transition agenda.

To improve the robustness of the findings, the research team sought to engage with local and regional administrative stakeholders to assess whether they were monitoring this indicator, as well as to sense check the findings from the research. While this produced valuable insights in the case of the Government of Navarra, it produced no results in the case of the City of Leuven as no government representatives were available to participate in the study during the data collection period. Meanwhile, Leuven30 representatives indicated that the team were too busy for correspondence, leading to delayed/no response when members were emailed individually. Attempts were made to mitigate this by directly contacting the institutions in question, however, it was either suggested that any enquiries should be directed to the general inboxes or that the representative/team were unavailable at the time of contact. As such, it is recommended that future studies incorporate a longer lead-in time for stakeholder engagement, and that the EC provides support in gaining the buy-in from key decision-makers within each local and/or regional administration to facilitate access to relevant departments and organisations.

In terms of implementation, it is anticipated that verifying the accuracy and authenticity of the reported data received from institutions might pose a significant challenge for monitoring organisations. While an organisation may be able to provide details on a CE strategy, mechanisms will need to be developed to ensure that these are being consistently and robustly implemented to ensure reported results are credible and accusations of greenwashing are avoided. At the same time, this may also contribute to reporting fatigue for this metric. A large number of organisations would need to be engaged on a regular basis to gather this

information. Requiring organisations to report regularly on their CE activities could lead to engagement fatigue, especially if the perceived administrative burden outweighs the immediate benefits to the organisation. Therefore, to help maintain stakeholder engagement the EC should seek to initially incorporate extended reporting cycles (e.g. once every two years), while also regularly communicating the importance of the metric, ensuring progress is being made in transitioning to a CE from both a policy and economic perspective, and finally sharing best practice and the impacts of these interventions.

### 2.3.2 Lessons learned

This is a challenging indicator to test as it requires both extensive periods of desk-based research, which are likely to yield inconsistent results (as noted in Section 2.2.2), as well as stakeholder engagement to mitigate data gaps and validate findings.

Our research found that early and regular engagement with stakeholders, including a clear understanding of their needs and constraints (resourcing, data availability and time) is crucial for the successful adoption and implementation of this indicator.

Improvements to the data collection methodology could be made through the design of tighter testing criteria and a simplified survey that will allow identified organisations to directly communicate the extent to which they were implementing circular transition agendas. However, this would require the direct support and buy-in from local administrations to ensure that future research teams are able to produce significant results. As noted in Section 2.3.1, a longer data collection and stakeholder engagement period should be incorporated into future studies, extending this period from six to twelve weeks to provide contacted organisations sufficient time to coordinate a response to data requests.

The role of public administrations should be seen as pivotal here for the gathering and centralisation of the necessary data to monitor this indicator. During the research period, examples, such as Navarra Zirkular and Leuven30, illustrate how local authorities can build purpose-built networks to coordinate the uptake of circular practices among local entities in alignment with strategic CE policy objectives. As such, they are more likely to have the connections and local policy knowledge to assess the relevance of individual entities' CE commitments more accurately to a local authority's circular transition agenda.

## 2.4 CONCLUSIONS AND RECOMMENDATIONS

**It is recommended that this indicator is considered for further development, with significant work required to facilitate its progress.**

This indicator provides a quantifiable metric to monitor the extent to which public sector entities have committed to a circular transition in alignment with a city and/or region's CE policies. From a policy perspective, this allows local and regional policymakers to assess the success of circular awareness raising and capacity-building initiatives. For public sector entities reporting on this indicator, this acts as a signal to develop CE strategies, and incentivises closer collaboration with both the local administration and private sector on shared circular objectives. As noted in Section 2.2.1, reporting on this indicator could provide organisations with evidence that may be used to support applications for circular funding support at the local level and the regional level.

The key challenge that remains, however, is linked to the robustness and objectivity of the data that is being recorded. For example, in the case of Leuven only 42.8% of the entities identified had publicly disclosed CE KPIs or metrics to measure their progress. Similarly, in Navarra, while 40 municipalities identified had some kind of circular objective incorporated within their Local Action Plan, the majority of these were high-level commitments and were not easily quantifiable. Reasons for this include the fact that reporting on circular commitments is not a legislative requirement in either case study city/region, and the difficulties organisations face in acquiring the knowledge and resourcing required to develop robust targets. The differences in levels of detail between reported circular commitments and the metrics required to monitor their implementation raises questions over the comparability of data as well as the feasibility of using these as proxies for the implementation of circular transition agendas. Within this context, it is recommended that this indicator should be used to monitor the public commitments made by reporting entities to align with more specific CE targets and policy objectives identified by relevant local or regional public authorities.

To mitigate these issues, the EC should consider the development of a mandatory reporting framework that requires cities and regions within EU Member States to regularly report on their progress in implementing CE

initiatives. As noted in engagement with stakeholders in section 2.2.1, compliance and reporting could be incentivised by linking these to specific EU funding and incentives.

It is important to note that this could be facilitated through the incorporation of the EC's Circular Cities and Regions Initiative (CCRI), which is developing a Self-Assessment Tool that includes a set of predefined KPIs and quantifiable metrics that could be used as a reference tool. Should the EC seek to develop a reporting framework for this indicator, it is recommended that the EC seeks to collaborate with the CCRI to learn from best practice and avoid the duplication of efforts.

To ensure the successful implementation of this indicator, it is important that the EC conducts an extended stakeholder engagement exercise to agree and establish clear, detailed guidelines and criteria for what constitutes a CE commitment, what constitutes a CE transition agenda, and how these should be monitored in terms of frequency and reporting mechanisms. It would also be beneficial to include a qualitative assessment to go alongside the development of the quantitative metric in order to capture the depth of the reported on CE transition agendas and the aspects of their implementation. Not only would this improve the credibility and robustness of the data collected, but it would help understand stakeholder appetite for monitoring this indicator.

Within this context, it is recommended that the EC develops technical guidance and templates that will allow public sector institutions to develop and report on how their circular commitments align with, and support, the local administration's transition towards a CE. This could be facilitated through a digital reporting platform whereby an organisation could upload supporting digital/pdf evidence. Following feedback from the stakeholders from the Government of Navarra, inclusion of non-public sector actors should also be considered in recognition of the broad-spectrum entities that are working within and supporting local and regional administrations' transition to a CE. More specifically, to mitigate potential issues regarding the relevance and acceptability of this indicator, it is recommended that the scope of this indicator should be expanded to include private sector entities that ascribe and/or commit to CE targets set by the local and/or regional public administration. While broadening the scope of the indicator may increase the administrative burden placed on bodies responsible for reporting on this indicator, it would create an incentive for private sector entities (such as SMEs and local business networks) to disclose their activities in regard to broader regional CE transition efforts.

It is therefore recommended to rephase this indicator to reflect this understanding. As the concept of "city resource" may be potentially unclear and challenging to communicate, it is recommended that the indicator is reframed as: "The number of local and regional entities implementing circular transition agendas aligned with regional targets."

In terms of monitoring requirements, these should include specific indication of how an entity's agenda aligns with local, regional or European CE policy, which stakeholder within the entity is responsible for implementing the agenda, as well as clear time-limited metrics and milestones that will allow monitoring bodies to assess progress over time. Nonetheless, it is important that this process should be as efficient and streamlined as possible, so as to incentivise reporting and reduce undue pressures on overstretched administrative resources.

Table 6: Summary of recommendations for indicator CR7

| Type of recommendation | Recommendation | Timeline | Key stakeholders or partners | RACER criteria addressed |
|---|---|---|---|---|
| Research & Development to assess maturity of local and regional CE transition agendas. | Gap analysis of local and regional CE transition agendas, policy levers and related metrics and KPIs. Should include close consultation with the EC's Circular Cities and Regions Initiative regarding their Self-Assessment tool. | Medium (1.5-5 years) | Responsible (R): EU Commission<br>Accountable (A): Municipality and Regional stakeholder groups responsible for CE policy development<br>C: Regional development agencies and CE consultancies, the Circular Cities and Regions Initiative<br>Informed (I): Regional Business networks | Relevance<br>Credibility<br>Robustness |
| Development of technical guidance for development and monitoring of circular transition agendas | Following Gap analysis mentioned above, EU Commission to develop technical guidance on how local organisations should align strategies with regional/EU circular targets. | Medium (1.5-5 years) | R: Circular Cities and Regions Initiative<br>A: Municipality and Regional stakeholder groups responsible for CE policy development<br>C: Regional development agencies and CE consultancies I: Regional Business networks | Credibility<br>Ease<br>Robustness |
| Development of detailed criteria for characteristics of CE commitments, CE transition agendas to enable indicator monitoring. | EC conducts an extended stakeholder engagement exercise to agree and establish clear, detailed guidelines and criteria for what constitutes a CE commitment, what constitutes a CE transition agenda, and how these should be monitored in | Medium (1.5 – 5 years) | R: EU Commission<br>A: Circular Cities and Regions Initiative, Municipality and Regional stakeholder groups responsible for CE policy development | Acceptability<br>Ease<br>Robustness |

| Type of recommendation | Recommendation | Timeline | Key stakeholders or partners | RACER criteria addressed |
|---|---|---|---|---|
| | terms of frequency and reporting mechanisms. It would also be beneficial to include a qualitative assessment to go alongside the development of the quantitative metric in order to capture the depth of the reported on CE transition agendas and specific aspects of their implementation. | | C: Regional development agencies and CE Economy consultancies<br>I: Regional Business networks | |
| Development of reporting platform for monitoring of circular transition agenda implementation | Digital monitoring platform to be developed to allow reporting organisations to disclose CE targets, how they specifically align with regional and EU-wide policies and targets.. | Medium (1.5-5 years) | R: Circular Cities and Regions Initiative<br>A: Municipality and Regional stakeholder groups responsible for CE policy development<br>C: Regional development agencies and CE consultancies I: Regional Business networks | Acceptability<br>Ease |
| Development of mandatory reporting framework | EC to develop a mandatory reporting framework that requires cities and regions within EU member states to regularly report their progress on CE initiatives. And compliance and reporting is linked to specific EU funding and incentives to encourage reporting. | Long (>5 years) | R: EU Commission<br>A: Circular Cities and Regions Initiative, Municipality and Regional stakeholder groups responsible for CE policy development<br>C: Regional development agencies and CE Economy consultancies<br>I: Regional Business networks | Acceptability<br>Credibility |

# 3. INDICATOR 2: COLLABORATIVE SPACES EQUIPPED WITH MATERIALS AND EQUIPMENT TO ENCOURAGE REPAIR

The aim of this indicator is to measure the number of collaborative spaces equipped with materials and equipment to encourage repair. Repairing is a Value Retention Process (VRP) which prevents goods from being discarded after presenting an issue or damage, thereby keeping products in use for longer. Organisations, such as tool libraries and repair cafés, promote repairs within communities by giving members of the public access to materials and equipment, which they might not otherwise own. In terms of materials, these may include technical repair guides, manuals or parts lists, as well as consumables, such as screws, nails, needles and thread, patches of fabric, connectors spare parts, tapes, such as electrical, and duct tape, as well as a variety of glues and lubricants. In terms of equipment, these may include items such as screwdrivers, pliers, mallets, hacksaws, utility knives, cordless drills, wire strippers and wire cutters, soldering irons, voltage tests, universal chargers, heat guns and bicycle pumps.

By providing access to these materials and equipment, these repair spaces empower members of the public to repair their own goods at little or no cost and with some possible assistance; thus, lowering the barrier to engage with the repair activity. For this case study, research was conducted to evaluate the practicality of accessing information on such spaces, and how easily the information could be accessed.

This indicator reflects a fundamental aspect for promoting the circular economy (CE) within a certain city or region as repair spaces help redevelop the traditional 'linear' approach to waste materials into a more 'circular' pathway. Monitoring the presence of repair spaces would help provide stakeholders, policymakers and both public and private organisations with accessible information on their approach to adopting CE implementation strategies for both areas of process improvement and policy development.

There are many benefits to monitoring this indicator, for example:

- It is supportive of the EUC's "Right to Repair" Directive and the aim to develop a European online platform where consumers can easily find repair services.[12]
- The number of repair spaces and number or repairs conducted indirectly supports improvements across the above noted macro level indicators.
- Repair is an essential approach to reducing resource consumption and the generation of waste. Repair is always more preferable than replacing a product, as valuable materials and their related embodied carbon are kept in circulation for longer, resources used more optimally and the lifetime environmental impacts are reduced (Baxter, Callewaert, & Danielsen, 2024).
- It provides cities and regions with a clear indication of the availability of infrastructure required to enable citizen-led repairs within their jurisdiction.

[12] Council of the EU, Circular Economy: Council gives final approval to right-to-repair directive (European Council, 2024). https://www.consilium.europa.eu/en/press/press-releases/2024/05/30/circular-economy-council-gives-final-approval-to-right-to-repair-directive/#:~:text=2024%2010%3A57-,Circular%20economy%3A%20Council%20gives%20final%20approval%20to%20right%2Dto%2D,repair%20(or%20R2R)%20directive. Accessed: 19/07/2024.

## 3.1 KEY METHODOLOGY

### 3.1.1 Testing method

*System boundary*

The investigation sought out to test the effectiveness of measuring this indicator at the municipality level across three specific EU cities. Conducting research through various sources, mainly the Repair Café Monitor Dashboard (RCMD)[13] and the Repair Café International Foundation (RCIF)[14], the desirable data is expected to supply a view of the services that are active in supporting reuse practices within the cities of Berlin in Germany, Ghent in Belgium and Prague in the Czech Republic.

The selected cities were chosen as each has made a commitment to enabling repair and reuse through the promotion of REUSE Centres, in the case of Prague (Prague Innovation Institute, 2019); repair campaigns, in the case of Berlin (Senate Department for Mobility, Transport, Climate Protection and the Environment, 2021); and by supporting the development of repair cafés, as in the case of Ghent[15].

As such, these case studies offer an opportunity to test the feasibility of testing this indicator at three different scales, ranging from Ghent, with a population of 265,000, Prague, with a population of 1.3 million, and Berlin, with a population of 3.6 million, and at different points along their circular transition.

*Methodology*

Desk-based research was conducted to identify the number of collaborative spaces equipped with materials and equipment to encourage repair within their city. 'Collaborative spaces' refers to permanent collaborative spaces and temporary (e.g. event-based or seasonal) spaces that have been operational within the prior 12 months of study.

Criteria for inclusion were these operate as "tool libraries" or "repair cafés", as defined below:

- **Tool libraries:** A tool library or shared workshop is an example of a library of things. Tool libraries allow patrons to check out or borrow tools, equipment and "how-to" instructional materials, functioning either as a rental shop, with a charge for borrowing the tools, or more commonly free of charge as a form of community sharing[16].
- **Repair Cafés**: Repair Cafés are meeting places that allow members of the public to repair items individually or with the assistance of a specialist. Access is typically free or paid for on a one-time or subscription basis. In the place where a Repair Café is located, there are tools and materials to help make any repairs needed[17].

This indicator excludes established and/or conventional privately operated repair businesses, such as electronic, mobile-phone and vehicle repair services, where repairs are performed exclusively by engineers/service providers in each store and do not facilitate a collaborative approach with members of the public. This exclusion covers business to customer and business to business repair operations.

Once a repair space was identified, an online review of that space's website and any additional open-source information (e.g. press releases and listing in online repair café databases) was conducted to assess whether they were still operational and met the above definitions of either tool library or repair café. To validate findings, stakeholder interviews with representatives of each city's CE departments and other relevant stakeholders (e.g. repair organisations and/or networks) was planned to take place in February 2024 to sense-check whether the organisations and information gathered were relevant and up-to-date.

[13] Repair Monitor, Welcome to the RepairMonitor. (RepairMonitor, 2024). https://www.repairmonitor.org/. Accessed: 16/04/2024.

[14] Repair Café, About. (Repair Café, 2024). https://www.repaircafe.org/en/about/. Accessed: 16/04/2024.

[15] Repair Together, Ghent Repair Café. (Repair Together, 2024). https://repairtogether.be/nl/group/gent-repair-cafe/. Accessed: 19/04/2024.

[16] Zero Waste Scotland, What is a tool library?. (Zero Waste Scotland, 2021). https://www.zerowastescotland.org.uk/resources/what-tool-library;. Accessed: 19/04/2024; Library of Things, Our Mission. (Library of Things, 2023). https://participate.libraryofthings.co.uk/mission. Accessed: 19/04/2024.

[17] Repair Café, What is a Repair Café?. (Repair Café, 2023): https://www.repaircafe.org/en/about/. Accessed: 19/04/2024.

### 3.1.2 Data collection method

*Desk-based research*

Desk-based research was conducted in a three-month period between January and March 2024, following the approved data collection plan that is summarised in this section.

As an initial step, the information contained within the RCIF database[18] was reviewed along with the related RCMD[19] produced by the RCIF. At the testing stage, it was decided that the focus of the testing should be only Repair Cafes, as the existence of consolidated databases would improve the consistency of results across cities, making them comparable. Once a potential collaborative space equipped with material and equipment to encourage repair was identified, a review of the organisation's website was conducted to assess the following:

- Whether if they were still operational.
- Whether if they operated on a temporary or permanent basis.
- Any other relevant information such as number of employees and number of repairs conducted.

This information was stored in a database created using MS Excel for further analysis. This document can be found in Appendix 4.3. The RCIF was taken as the base of research, due to it having comprehensive and consistent information; however, it lacks information on tool libraries and thus the testing of this indicator was focused on repair cafes.

Following this initial review, a broader search of open-source information was conducted to identify any additional collaborative repair spaces that were not listed on the two databases mentioned above. The web-based research was conducted in English and in the official language of the city of study to identify additional repair spaces. Key search terms used to identify these collaborative repair spaces included: "repair cafe" and "repair space", "collaborative" OR "community", and "circular economy", "sharing economy" and "social enterprise".

*Stakeholder engagement*

To supplement data gathered during desk-based research the research team sought to engage municipal stakeholders involved in CE policy development and/or SME business support programmes focused on community-based repair spaces. Given the interdependencies present in municipal CE support networks, a snowball sampling method to identify further repair spaces not already identified through desk-based research, as well as candidates for interview to gather qualitative data that would otherwise be unavailable through desk based research alone. Snowball sampling is a non-probability sampling method whereby research participants are asked to assist researchers in identifying other potential subjects relevant to the study, so that they can be conducted for further data collection. While this method does introduce a risk of selection bias, it complements the research by providing access to context specific information that would have otherwise been challenging to identify through desk-based research alone. The purpose of the interviews was to review the data points gathered, understand if these organisations have undertaken similar exercises to map collaborative repair spaces, and to understand from their perspective what the challenges and opportunities of monitoring this indicator would be for each city of study.

During the period of study, two rounds of emails were sent to contact relevant stakeholders, but these efforts were unsuccessful in receiving a response. As such, this part of the data collection plan could not be implemented.

### 3.1.3 Calculations

Once all available sources of information were investigated, the total sum of collaborative repair spaces in each target city was quantified through a basic sum of the number of temporary and permanent collaborative repair spaces in each target city:

*Temporary collaborative repair spaces + Permanent collaborative spaces = Total sum of collaborative repair spaces*

[18] Repair Café, About. (Repair Café, 2024). https://www.repaircafe.org/en/about/. Accessed: 16/04/2024.
[19] Repair Monitor, Welcome to the RepairMonitor. (RepairMonitor, 2024). https://www.repairmonitor.org/. Accessed: 16/04/2024.

### 3.1.4 Timeline

The research was conducted over a three-month period from January 2024 to March 2024 as shown in Table 7.

Table 7. Gantt chart

| Week | 08-Jan | 15-Jan | 22-Jan | 29-Jan | 05-Feb | 12-Feb | 19-Feb | 26-Feb | 04-Mar | 11-Mar | 18-Mar |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Review Repair Café International Foundation databases | | | | | | | | | | | |
| Conduct Follow-up Searches of Repair spaces | | | | | | | | | | | |
| Stakeholder Engagement | | | | | | | | | | | |
| Analysis of Key Themes | | | | | | | | | | | |
| Write of Case Study | | | | | | | | | | | |

### 3.1.5 Data gaps and mitigation

Table 8 below summarises the data gaps and mitigation identified during the testing of this indicator.

Table 8. Overview of identified data gaps, limitations and mitigation efforts

| | Description of data gap | Mitigation efforts | Level of confidence |
|---|---|---|---|
| 1 | Only the businesses that registered with the RCIF are listed on their on-line platforms, therefore tool libraries and any unregistered repair spaces are missing. | • Open-sourced desk-based review of “repair cafes” and “reuse practices” using key CE search terms was conducted.<br>• Stakeholder engagement with municipal CE policymakers was undertaken. | High |
| 2 | Inconsistencies between the number of repair cafés listed on the RCIF’s website and those listed on the RCMD, as well as in the level of detail reported by each registered repair café were identified. | • The information found on both websites was cross-referenced with a review of each registered repair café’s website. | Medium |
| 3 | A review of entries revealed a much higher proportion of repair café entries located in the Germany and Belgium than in other countries. | • Open-sourced desk-based review of “repair cafes” and “reuse practices” using key CE search terms was conducted.<br>• Stakeholder engagement with municipal CE policymakers was undertaken. | Medium |
| 4 | Identified spaces are not being monitored as there is no existing centralised reporting system / engagement policy. | • Stakeholder engagement with municipal CE policymakers. | High |

| | Description of data gap | Mitigation efforts | Level of confidence |
|---|---|---|---|
| 5 | Lack of information available on the number of repairs undertaken and on the number of employees. | • Review of identified spaces' website and stakeholder engagement.<br>• However, due to a lack of engagement from the businesses assessed, this data could not be collected for the testing of this indicator. | Low |

### 3.1.6 Quality review of analysis

To ensure robust and high-quality results, Ricardo conducted the following data validation and quality control procedures:

- Prior to work beginning, the Project Director reviewed the proposed research methodology and ensured that the data collection plan was fit for purpose. Once the research team had addressed any comments from the review process, they proceeded to the data collection phase.
- The research team then built an MS Excel database to record each identified collaborative repair space within each case study city. This was reviewed by the Project Director prior to analysis being conducted.
- The research team set out to present semi-structured interview guides and a list of stakeholders identified for interview to the Project Director for review prior to interviews being carried out.

## 3.2 KEY ANALYSIS OF RESULTS

### 3.2.1 Analysis

Overall, the indicator performed moderately well, supplying some insightful information regarding the number of available collaborative spaces, specifically Repair Cafes, equipped with materials and equipment to encourage repair per city. However, other target aspects such as number of repairs undertaken in the year 2023, as well as the number of employees working at these sites could not be assessed.

Table 9 below provides a snapshot overview summarising the results, highlighting how many Repair Cafes were identified within each city and in total.

Table 9. Number of repair cafes per city

| City | Berlin | Ghent | Prague | TOTAL |
|---|---|---|---|---|
| Number of repair cafés | 31 | 21 | 3 | **55** |
| Share of total | 56.36% | 38.18% | 5.45% | **100%** |

Data was then split to determine whether these facilities were operational on a permanent or temporary basis. Permanent repair spaces were identified as being operational at least one day per week throughout the entire year. Temporary repair spaces were identified as either being operational on an irregular, seasonal or project/initiative linked basis, and did not have a predictable or annual schedule of activities available for analysis. The inclusion of this aspect was important to understand how consistent and available these repair initiatives were in their community. This is an important consideration for municipal policy makers seeking to understand the distribution of repair initiatives in the city, as well as to develop policies that support their further expansion. A summary of results can be found in Table 10, with a full list of findings found in the document provided in Appendix 4.3.

Table 10. Analysis of the total number of repair cafés per city, type and population size

| City | Permanent | | | Temporary | | | Unclassified | | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | Share per city | Per 10,000 residents | Number | Share per city | Per 10,000 residents | Number | Share per city | Per 10,000 residents | Total number | Per 10,000 residents |
| **Berlin** | 11 | 35.48% | 0.03 | 6 | 19.35% | 0.02 | 14 | 45.16% | 0.04 | 31 | 0.09 |
| **Ghent** | 7 | 33.33% | 0.26 | 4 | 19.04% | 0.15 | 10 | 47.61% | 0.38 | 21 | 0.79 |
| **Prague** | 1 | 33.33% | 0.01 | 2 | 66.67% | 0.02 | NA | NA | NA | 3 | 0.02 |
| **TOTAL** | 18 | 32.72% | NA | 13 | 23.63% | NA | 24 | 43.63% | NA | 55 | NA |

Berlin was shown to be the city with the largest number of repair spaces identified during research. While this is to be expected due to the sheer population size (estimated at 3,677,472 in 2021[20]), it is notable that the majority of these have incorporated Repair Cafe into their name, explicitly aligning themselves with the principles of Repair Cafes, indicating that this is a relatively well-known concept within the city. Despite this, if these results are analysed in terms of number of repair cafés per residents, it is found that a significant proportion of the population is underserved, with only 0.09 repair cafés available per 10,000 residents.

Nonetheless, our results would indicate that these repair cafés are mostly informal, project-based initiatives with only 11 out of 31 (35.48%) found to have information that suggests they operate on a permanent or full-time basis, with the remaining 20 out of 31 (64.52%) either being temporary/seasonal repair cafés or without any information one way or the other. This analysis is further supported by information on the Reparatur-Initiativen network's platform.[21] The Reparatur-Initiativen are a coordination network for repair initiatives and events. Interestingly, their website places equal emphasis on the "volunteer helpers and repairers who voluntarily and free of charge" operate repair events, as well as the way these repair events provide opportunities for inter-generational dialogue, which "strengthen neighbourly communication and mutual support".[22]

While Ghent was found to come second in terms of total number of repair cafés identified in the city (21), the results indicate that these are found at a much higher rate of 0.79 per 10,000 residents.[23] Thereby suggesting higher accessibility to these repair cafés, and by extension greater success in enabling community-based repairs. However, analysis showed similar findings as in Berlin regarding the lack of information attributed to whether they were permanent or not. Available information suggested 7 (33%) of these initiatives operated on a permanent basis, 4 (19.05%) were temporary or project-based repair initiatives, while 10 (47.62%) of identified repair spaces had limited to know information to classify them further. In addition, few of the repair space's websites revealed information around the number of repairs conducted and the number of employees, but not enough could be gathered to ensure an accurate evaluation for this indicator. For example, Repair Café Ghent[24] revealed they had 263 registered repairs as of 2024, with 36 repairers listed at the café, however it is unclear whether these repairers are full- or part-time or volunteers.[25] A review of their website found 18 repair café events distributed at irregular intervals and locations across 2024 and 2025, suggesting this is more likely to be an informal network of repairers, which may pose a challenge for consistent data collection for this indicator.[26]

[20] City Population, Germany: States and Major Cities. (City Populatin, 2024). https://www.citypopulation.de/en/germany/cities/. Accessed: 20/04/2024.

[21] Tom Hansing, Netzwerk Reparatur-Initiativen, (Reparatur-initativen.de, 2024.). https://www.reparatur-initiativen.de/seite/ueber-uns. Accessed: 08/04/2024.

[22] Ibid.

[23] The population of Ghent is estimated to be 265,086 in 2022. City Population, BELGIUM: Major Cities and Municipalities. (City Population, 2024). https://www.citypopulation.de/en/belgium/cities/. Accessed: 20/04/2024.

[24] Repair Together, Gent Repair Café, (Repaire Together, 2024). https://repairtogether.be/en/group/gent-repair-cafe/ Accessed: 16/04/2024.

[25] Repair Connects, Repair Café Gent. (Repair Connects, 2024). https://www.repairconnects.org/nl/herstelorganisatie/gents-milieufront. Accessed: 16/04/2024.

[26] Ivago, Repair Café Ghent. (Ivago, 2024). https://www.ivago.be/nl/particulier/afval/wat-kan-je-zelf-doen/repair-cafe. Accessed: 16/04/2024.

Finally, the city of Prague appeared to display the most underdeveloped network of repair cafes across the three cities assessed, with only 3 repair cafés found in total. Considering the population of Prague was estimated to be 1,301,432 in 2021, this equates to 0.02 per 10,000 residents.[27] Within the City of Prague's 2030 Circular Economy Roadmap, there is a recognised need to facilitate the development of bottom-up/grass roots repair spaces within the city to enable citizens to extend the useful lifetime of their possessions (Prague Innovation Institute, 2019). While strategic objectives to open twelve "REUSE centres" within this roadmap, alongside a municipal reuse/resale platform[28] suggest that there is some activity to extend the useful life of products among the public, there was limited evidence of repair spaces that met the criteria of this indicator. This could either reflect a lack of repair infrastructure in the city, a lack of public engagement in the need for repair spaces, or perhaps that grassroots repair spaces are simply not a priority for the municipal policymakers implementing their CE strategy. This could be an opportunity to establish a more interconnected relationship between organisations, local authorities, and local governments. This relationship could stimulate a development in incentivising reporting methods to promote more accessible and robust information.

In conclusion, the data reveals that a substantial proportion of repair cafés operate on a temporary or project-based basis suggests that while the concept of repair is accepted, there are likely challenges in sustaining long-term, permanent repair spaces. While analysing the number of repair spaces per 10,000 residents provides a clearer perspective on their distribution relative to the size of the city, the lack of detailed data on the number of repairs and nature of employment within these spaces also point to the potential difficulties in measuring their impact within the community.

### 3.2.2 Limitations

Stakeholder interviews were planned as part of sense checking and validating the findings of the desk research. However, due to lack of engagement from the identified stakeholders, it was not possible to conduct these and thus the results may be missing some nuances or clarifications that ideally would result from this engagement process.

During the monitoring process, one key limitation was found with regards to the access to data listed on the RCIF website and the RMD. As these platforms were an initial reference platform for collating data on Repair Cafes within the cities of Berlin, Ghent and Prague, it was acknowledged that the data was limited with a lack of assurance to validate the results. A review of the registered Repair Cafes listed on these websites suggested they represent informal activity networks, which may operate sporadically. It was also unclear whether some of these remained operational or if they had stopped altogether. There is a risk therefore that without validation of the results, the use of these platforms may inflate the results generated for this indicator. As such, this approach may not accurately reflect temporary closures of seasonal operations.

A review of entries for the countries of the target cities revealed a much higher proportion of repair café entries located in the Germany and Belgium than in other countries, and very few for the Czech Republic. A possible reason for this is that the main data source used for the research belongs to an initiative which is originally Dutch. Therefore, results for some regions may be under-represented.

It was not possible from the research to obtain accurate information on the number of repairs taken on each of the sites and the number of employees. Therefore, these intensity aspects of the indicator were not possible to assess or measure.

The decision of using a specific data source to get consistent data from repair spaces meant there was no data collection from tool libraries, and this may be reflected in some skewing of the results, which would have to be acknowledged in the implementation of the indicator.

[27] The results of the 2021 census indicates the population of Prague is 1,301,432. City Population, Czech Republic: Regions and Major Cities. (City Population, 2024). https://www.citypopulation.de/en/czechrep/cities/. Accessed: 20/04/2024.
[28] Nevyhazujto, Latest Stuff. (Nevyhazjuto, 2024). https://praho.nevyhazujto.cz/. Accessed: 16/04/2024.

### 3.2.3 Performance

Table 11 compares the RACER score allocated to the original indicator during Task 4 against the final indicator after the Task 5 testing process. During Task 4, the original indicator was allocated a score of 15 against the RACER evaluation process, following testing in Task 5 this has been downgraded to 9.

Table 11. RACER evaluation

| Stage of project | RACER criterion | | | | | Score |
|---|---|---|---|---|---|---|
| | Relevance | Acceptability | Credibility | Ease | Robustness | |
| Task 4 (original RACER assessment) | 3 | 3 | 3 | 3 | 3 | 15 |
| After Task 5 (following testing) | 2 | 1 | 1 | 2 | 2 | 8 |

The post testing assessment in accordance with the RACER evaluation criteria shows the following:

- **Relevance**: Research found this indicator to be relevant throughout the investigation, highlighting its importance in supporting circularity across EU cities. Nonetheless, as noted in section 3.2, a focus purely on the number of per repair spaces, without reference to population size may provide a misleading impression of the reality on the ground as one repair space may be sufficient for a small to medium sized town, but insufficient for a larger city. Nonetheless, the data could be relevant for decision makers to take the research further by creating an official database that records accurate and reliable data attributed to the different repair spaces recorded across each city. Within this context, the RACER scoring has been downgraded from Good (3) to Neutral (2).
- **Acceptability**: There were mixed results from the research with the Repair Café Foundation website's data availability. Additionally, the necessary follow-up research, and the need to engage with stakeholders highlighted the restricted access to information within this indicator. Moreover, the lack of engagement stifled the approach to gathering a more accurate account of the reuse services provided. Thus, the score has been downgraded from Good (3) to Poor (1) to reflect this insight.
- **Credibility**: The credibility of the research has also been downgraded in accordance with the lack of validation. The credibility of this indicator will depend on how accurately the presence of repair spaces can reflect the repair activity happening in a city, and in the testing it was clear that that relationship is difficult to estimate. As a result, it was decided to lower the rating of the credibility for this indicator from Good (3) to Poor (1).
- **Ease:** Initially, the desk-based research was collated with moderate ease, utilising the information within the repair café Foundation website, and using various website tools to gain results. We were able to establish findings and collate information via an MS Excel spreadsheet with the data available. However, it is acknowledged that this route was taken to get comparable results, and that a more thorough exercise including a broader search of repair spaces beyond repair cafes could have resulted in significant more effort. As such, the rating was downgraded from Good (3) to Neutral (2).
- **Robustness:** The indicator was relatively robust, as it provided a consistent, yet limited methodology. The inability to verify disrupted the validation and reliability of the data collected. Thus, the indicator faced various challenges with limited data available able to match the data criteria for the repair cafes in each city. Along with the inability to engage with suitable stakeholders, the reliability of data was compromised, resulting in the robustness scoring being scored lower in the RACER metric table. As such, the rating was downgraded from Good (3) to Neutral (2).

## 3.3 CHALLENGES AND LESSONS LEARNED

### 3.3.1 Challenges

**Data availability and quality**

The most notable challenge in the testing of this indicator was the access to centralised data sources that would contain consistent and comparable information on several repair spaces. This challenge led to the selection of specific data source with the caveat of only containing Repair Cafe data. Additionally, the information that was accessible on these sources was notably light, with a lack of transparency affecting the validation of the data. For example, there was a lack of information highlighting the presence of these Repair Cafes, and whether they were permanent or temporary features within their respective city. As a result, follow-up research had to be conducted with in-depth desk-based research to fill these gaps in data. This data collection approach was very resource-intensive, and in future there would need to be a requirement for cities, regions and Member States to report this data.

To help policy makers and cities in assessing the prevalence of repair activities, it would be useful for this information to be more easily accessible and even reported on in a standardised manner. Given the dynamic nature of these repair spaces, this could be quite challenging. Repair spaces can rapidly evolve, with new ones opening and others closing frequently, which can make data quickly outdated. So there would need to be regular monitoring, perhaps on a quarterly rather than annual basis.

It is also important to keep in mind the different variables that may affect the impact that repair spaces have. If, for example, a repair space is part of a broader space (e.g. a community centre, or a school), then its operation may be subjected to different opening hours or even audience and therefore it cannot be directly compared to a dedicated repair café. Therefore, the need for intensity measures (such as employees and number of repairs) becomes important to differentiate not only the size but also the nature of these spaces. Any further development of the indicator should try to account for such nuances.

**Stakeholder engagement**

Lastly, to ensure that the findings throughout the monitoring phase of research were robust, stakeholders were sought to sense check the data attained. A list of representatives from government authorities in each respective city was drawn up and they were contacted to potentially provide additional information to the investigation. Unfortunately, the attempts to engage these stakeholders were unsuccessful with no response from the individuals. Despite follow up attempts, contact with these representatives was not possible, as it was either suggested that any enquiries should be directed to the general inboxes or that the representative/team were unavailable at the time of contact. As such, it is recommended that future developments include incentives or communication for ensuring the buy in from all stakeholders involved, as it is considered crucial for these stakeholder engagement activities to take place for supporting any data collection.

### 3.3.2 Lessons learned

The following lessons learnt were drawn from this research.

**Desk-based research**:

Conducting in-depth investigations over extended time periods is essential for researchers to identify and verify data sources. However, the results obtained from such research may exhibit varied levels of consistency due to the inherent complexities of conducting research into context-specific and typically informal, grassroots repair organisations. In both the Belgium and Germany, research found the presence of national repair café networks seeking to establish a culture of repair in each location, whereas in Prague there was limited indication that such social movements existed. If the EC seeks to roll out monitoring of this indicator, it is expected that there will be significant regional differences between contexts where networks have established themselves and gained a sense of legitimacy, and countries where they have not been established or gained a sense of legitimacy.

**Sources**:

From the limitations and challenges found in the desk research it is clear that for a more accurate testing of the indicator, a variety of sources should be used. The research suggests that where repair café activity networks exist, research teams may be able to gain access to registries of information on repair spaces. This would help uncover information on other types of repair spaces and provide further insights in the working of

these spaces. In other contexts, researchers may be able to identify spaces through web-based research using predefined search terms or by searching map-based software, such as Google Maps. However, this provides limited insights into the impact these repair spaces are having in their local environments, either in terms of jobs created (or hours volunteered), or in terms of items repaired, and is limited by how recently the information source has been updated.

**Stakeholder engagement**:

To address data gaps and enhance the reliability of findings, active involvement with relevant stakeholders would be crucial. While the research team sought input from municipal stakeholders to understand the number of repair spaces in each location as well as the feasibility of monitoring this indicator, future research may seek direct input from repair organisations themselves. Validating the collected data through collaboration with these stakeholders would ensure a more robust assessment process. While this would necessitate an extended data collection period, by directly contacting these organisations, it may be possible to address the previously identified data gaps.

## 3.4 CONCLUSIONS AND RECOMMENDATIONS

**It is recommended that this indicator is considered for further development, with significant work required to facilitate its progress.**

This is a relevant indicator with the potential to widen the scope of information available for implementing CE practices, such as providing important information about the contribution of repair activities, which are high in the waste hierarchy, within the EU. With regards to policy change, this indicator enables local and municipal decision makers to evaluate the effectiveness of circular awareness campaigns. Despite the limitations identified during research, it is recommended that this indicator is suitable for further development across the EU. The conclusion of the research proved that accessing complete and comparable information on this matter is challenging, in part due to the informal nature of the repair spaces identified. This is due to the moderate supply of verifiable information on repair spaces that is publicly available.

It is recommended that this indicator should measure the total number of collaborative repair spaces according to population and/or size of a city or region. This is in recognition of the fact that while one repair space would be considered sufficient for a small- to medium sized town, it would be insufficient to service a larger city. As demonstrated in Table 10, Berlin only has ten fewer repair spaces compared to the city of Ghent, standing at 21 repair spaces to 31; a difference of 33%. If the scale of measurement is shifted to the number of repair spaces per 10,000 residents, Berlin is found to have 0.09 repair spaces per 10,000 residents; substantially fewer than the 0.79 repair spaces per 10,000 residents in Ghent. As such, it is clear that simply focusing on the number of repair spaces may give a misleading understanding of the reality on the ground.

While it was possible to identify examples of repair cafés and other spaces through registries maintained by relevant repair networks, the data contained within these were often not complete, inconsistent, and it was often unclear how up to date the lists of repair spaces were. This was complicated by the fact that the repair cafés identified were often not physical spaces, but volunteer-led initiatives that ran repair workshops on a temporary or seasonal basis, and in a variety of locations. Without an understanding of the impacts of these initiatives (such as the number of full-, part-time, or volunteer-hours, and number of repairs), these differences reduce the certainty in how comparable the results are. This may skew the results in favour of reporting cities which have a high number of low-impact repair initiatives, and disadvantage reporting cities which have a low number of high-impact repair spaces. These data gaps can only be mitigated through stakeholder engagement with organisers of these repair initiatives to request data, as well as with public or governing bodies that may have already conducted similar assessments of repair initiatives.

Therefore, it is recommended that future monitoring efforts conducts an extended the stakeholder engagement process to access this data. This can help achieve help achieve a higher-response rate from target stakeholders, as well as facilitate re-engagement opportunities should there be a need for follow-up additional information. The ultimate objective of this exercise would be to better understand how different repair spaces work and what kind of information needs to be recorded to develop this indicator.

Nonetheless, the RCIF, RMD, and the Reparatur-Initiativen platforms, provide useful frameworks for how this indicator can be monitored. The EC should consider replicating, or funding the expansion of similar, national networks of repair cafés which can be used as robust, standardised reporting platforms to monitor this indicator

in a more systematic manner. Information that should be recorded within these platforms include: the location, type of initiative (e.g. repair space/café, a tool library, repair network), number of repairs conducted, and number of full- and part-time employees and volunteers providing repairs. As acknowledged in Section 3.3.1, the dynamic nature of repair spaces, with new ones opening and others closing frequently, can make data outdated quickly. Therefore, there may be a need for regular monitoring (on a quarterly or half-yearly basis) of the data, which in turn would entail regular updating of the platform.

To incentivise participation in these reporting platforms the EC should consider introducing impact-linked funding for the development of city-based repair networks. To avoid replication of efforts with other pre-existing initiatives, the EC should consider future research to map the prevalence and impact of repair networks within each Member State. This may require moderately significant work as the platform will need to be developed and training provided to ensure the relevant target data is recorded and updated on a regular basis by reporting administrations. Gaining sufficient engagement and buy-in from repair organisations to regularly report via this platform will likely be challenging. Therefore, the EC should encourage cities and regions to pilot different strategies to engaging repair spaces, and share outcomes and best practices.

To improve the robustness and acceptability of the indicator it is recommended that the title of the indicator is changed to the more self-explanatory “The number of repair spaces by population size”. This would make the purpose and parameters of the indicator more easily understood and communicated to policymakers and the public.

To ensure municipal administrations take a consistent approach to monitoring this indicator, it is recommended that the EC develops technical guidance on the selection criteria for identifying and classifying collaborative repair spaces. In the long-term, this would support monitoring efforts by improving the accuracy of the data reporting, and in the short term, this could provide guidance on how municipalities can foster bottom-up repair initiatives and support local businesses to implement circular repair-focused practices. There is not any direct crossover with this indicator and those within the new EU monitoring framework for CE. However, quantifying the number of repair spaces within cities and regions, and more importantly, the number of repairs that take place in them would indirectly support improvements across the following macro level indicators:

- **Material footprint:** i.e., Encouraging the repair of consumer goods would support the reduction of material footprints as goods are being reused by consumers, as it would ideally reduce the number of new goods that are needed on the market to meet demand, at least for some categories of products.
- **Total waste generation per capita:** Encouraging the repair of consumer goods will reduce the number of new goods placed on the market, thereby reducing waste generation when these goods reach end of life. However, as repair is an activity performed on durable goods rather than on fast moving consumer goods, the impact may be minimal.
- **Generation of municipal waste per capita:** As with total waste generation, the repair of consumer goods would be expected to reduce the number of new goods placed on the market, reducing municipal waste generation but with a small impact.
- **Consumption footprint:** Encouraging the repair of consumer goods will reduce consumption footprint as fewer new goods will be purchased.
- **Persons employed:** Circular activities such as repair, are expected to positively impact employment, as they require local labour for repairing (or facilitating repair), instead of foreign manufacturing of new goods.

Table 12: Summary of recommendations for indicator CR9

| Type of recommendation | Recommendation | Timeline | Key stakeholders or partners | RACER criteria addressed |
|---|---|---|---|---|
| Stakeholder Engagement | Engaging with stakeholders of whom that collaborate in the market of circularity. Contacting municipal authorities and decision makers that support the promotion of reuse and repair can bridge gap in data, whilst providing additional qualitative information. | *Short (0.5 – 1.5 years)* | R – EC and public authorities<br>A - Municipal administrative stakeholder groups responsible for CE policy development<br>C - Regional development agencies<br>I - Regional Business networks. | Relevance<br>Acceptability<br>Credibility |
| Develop technical guidance | This technical guidance should stem from the stakeholder engagement exercise and aim to harmonise the definitions of activities and capabilities related to repair spaces that can be reported on a consistent manner | Medium (1.5-5 years) | R - EC<br>A - Municipal administrative stakeholder groups responsible for CE policy development and other interested EU bodies<br>C - Regional development agencies<br>I - Regional Business networks. | Relevance<br>Credibility<br>Robustness |
| Develop a better reporting system between monitoring dashboard and target data sources (Repair Café) | Implement reporting system that sets up a collaborative engagement between repair and municipality/regional government stakeholders. This technical guidance can act as a reference to support these repair spaces to disclose specific criteria that was previously absent during | Medium (1.5-5 years) | R - EC<br>C - Municipal administrative stakeholder groups responsible for CE policy development<br>C - Regional development agencies<br>Circular Economy consultancies | Acceptability<br>Ease<br>Robustness |

| Type of recommendation | Recommendation | Timeline | Key stakeholders or partners | RACER criteria addressed |
|---|---|---|---|---|
| | research (e.g. number of repairs, number of employees). EC to consider quarterly rather than annual frequency of reporting to monitor data. | | I - Regional Business networks | |

# 4. APPENDICES

## 4.1 RACER ASSESSMENT MATRIX

| Criterion | Description | 1 (Poor) | 2 (Neutral) | 3 (Good) |
|---|---|---|---|---|
| Relevance | Refers to whether the indicator is closely linked to the objectives to be reached. | Does not support a better understanding of true circularity. | Supports a better understanding of true circularity. | Highly supportive towards gaining a better understanding of true circularity. |
| | | Supports no value-added circular opportunities. | Supports lower value-added opportunities (i.e. metrics related to waste generation, recycling, waste management, etc.) | Supports higher value-added opportunities (i.e. all R-strategies above remanufacturing) and wider systemic change (e.g. indicators that encourage PSS or circular design). |
| | | Not linked to the project objectives and/or European policy objectives (existing or upcoming). | Linked to the project objectives, but not to European policy objectives (existing and/or upcoming). | Fully aligned with project objectives and European policy objectives (existing and/or upcoming). |
| Acceptance | Refers to whether the indicator is perceived and used by key stakeholders (such as policymakers, civil society, and industry). | Poorly accepted by key stakeholders, e.g. due to the use of confidential data. | Relatively accepted by key stakeholders as the benefits of measuring are clear. | Key stakeholders are motived to report this indicator, due to mandatory legislative requirements (current or upcoming), potential commercial benefit or being in the public interest. |
| Credibility | Refers to whether the indicator is transparent, trustworthy and easy to interpret. | No defined methodology associated with this indicator and/or interpretation of the indicator is ambiguous. | Methodologies have been proposed or currently existing, but not for this particular indicator (e.g. in a research article). | There is an EU defined methodology. |
| | | Difficult to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders are not familiar with). | Moderately easy to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders are aware of but are not confident in practical use). | Easy to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders already use and are confident in applying). |
| Ease | Refers to the easiness of measuring and monitoring the indicator. | No defined methodology associated with this indicator and/or interpretation of the indicator is ambiguous. | Methodologies have been proposed or currently existing, but not for this particular indicator (e.g. in a research article). | There is an EU defined methodology. |
| | | Difficult to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders are not familiar with). | Moderately easy to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders are aware of but are not confident in practical use). | Easy to understand and communicate to stakeholders (e.g. units or measurement of something that stakeholders already use and are confident in applying). |
| Robustness | Refers to whether data is biased and comprehensively assesses circularity. | No consistent methodology and dataset are available. | A consistent methodology and dataset available. | A consistent methodology and dataset available. |
| | | | A composite/aggregated indicator (based on multiples dimensions). | A one-dimensional indicator. |
| | | | A proxy indicator. | |

## 4.2 CR7 – DATA COLLECTION TEMPLATE

See MS Excel document “DGRTD_CR7_Number of city resources implementing circular transition agendas_V1.00” provided alongside this report.

## 4.3 CR9 – DATA COLLECTION TEMPLATE

See MS Excel document “DGRTD_CR9_Collaborative Spaces that Encourage Repair V1.01” provided alongside this report.

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