Circular Material Valuer Curriculum: Framing, Structure and Definitions (DRAFT for review)

This document is open to comments/suggested edits until 15/08/2025.

Introduction

The Circular Material Valuer Curriculum (CMVC) is designed to equip circular initiatives, zero waste programmes, reuse centres, and other similar organisations with the essential skills, knowledge, and sensibility needed to effectively divert reusable goods and materials from the waste stream.

As a core output of a citizen science research initiative conducted by GIG and Reuse City with support from the Hans Sauer Stiftung, the curriculum fosters a holistic understanding of material reuse. The project was designed to incorporate diverse perspectives, in particular those of reuse workers, repair volunteers, sustainable designers and community organisers experienced in material reuse in various settings.

The view pushed forward by the project integrates material analysis, social awareness, economic evaluation, and environmental responsibility. The CMVC provides a framework that moves beyond conventional linear economic models, empowering participants to design and implement practical, locally-rooted circularity actions. By leveraging the collective intelligence of communities as active agents, this curriculum contributes to the ongoing research and definition of the emerging professional role of the *Circular Material Valuer*, promoting more sustainable material flows and supporting grounded social-ecological transformation.

This curriculum is intended as an open educational resource (OER), freely available for self-study, to inform workshops, or to be adapted and remixed by organisations worldwide to suit their specific contexts and needs. It is released under a Creative Commons Attribution license (CC-BY 4.0), which encourages the sharing, adaptation, and co-creation of knowledge for a more sustainable future.

The Curriculum consists of four modules:

1. Systemic View and Social Value
2. Eyes and Hands of a Circular Valuer
3. Information Systems and Market Value
4. Stories and Personal Value

1. Systemic View and Social Value: Circularity from the Ground-Level

This foundational module aims to provide attendees with a critical understanding of the circular economy, emphasising community-based approaches and the profound social benefits of reuse. It challenges traditional notions of waste and linear production, promoting a more equitable and sustainable interaction with materials, and framing local actions as vital systemic interventions.

- **Rethinking Waste and Circularity:**
  - Learning the core principles of a circular economy, extending beyond the conventional "take-make-dispose" model to focus on "reduce-reuse-recycle."
  - Critically assessing mainstream circular economy discourse, which often prioritises industrial interests and economic value over crucial social and human aspects (Schröder et al., 2020; Vosse, 2020). This includes understanding how current economic incentives can inadvertently devalue objects and simplify material flows towards a linear model, making repair and reuse less attractive - even when some manufacturers adopt limited circularity measures.
  - Understanding the waste management hierarchy as recommended by European legislation - with a strong emphasis on waste prevention and reuse as primary objectives over recycling, incineration, and landfilling, due to their lower environmental impact and higher societal value.
  - Understanding the social and political context positioning repair as an act of resistance against the de-valuing of objects (Jackson, 2014; Oroza, N/D). This also involves understanding the "value of the product as the value of avoiding waste" and the challenges of counteracting huge material flows.
- **Local and Community-Based Approaches:**
  - Focus on ground-level, commons-based waste prevention, highlighting its contrast with top-down industrial models. This includes promoting and supporting initiatives such as repair cafés, scrap shops, and robust community networks. Examples include the Remakery in South London, the Verbund Offene Werkstaetten in Germany, and the repurposing of abandoned spaces like the Jupiter Mall in Hamburg for reuse initiatives.
  - Developing skills to foster "generous cities" that actively encourage care practices and transform excess materials into tangible social value within local contexts. This contrasts with a passive acceptance of "abundance," preferring an intentional "generosity" mindset (Clark & Rockefeller, 2020; Wahl, 2016).
  - Exploring models like the historical SERO System in East Germany, which involved state-organised collection places, and networks like Bauteilnetz (for building materials) and Verbund Offene Werkstaetten (open workshops) in Germany, as well as Anglo-American approaches for providing materials to

schools. Explore also concepts focusing on minimum energy intervention and different states of material transformation from simple cuts to more energy-intensive processes. The idea of bioregions (Thackara, 2017) will be introduced to encourage thinking about material flows on a scale wider than just the city.

- Decentralised vs. Aggregated Approaches: explore the distinctions between these two models. A decentralised approach favours smaller, local initiatives embedded in specific communities, such as neighborhood repair cafés or community co-ops. This model excels at building trust, fostering local knowledge, and reducing transport costs, but can struggle with high volumes and specialised equipment. An aggregated or centralised approach, by contrast, relies on larger, often industrial-scale, hubs like major sorting facilities. This model offers efficiency for high volumes and access to advanced machinery, but can be disconnected from local social needs and may lead to a "lowest common denominator" valuation that promotes downcycling.

- **Social Inclusion and Empowerment:**
  - Learning how to leverage and support existing social groups already involved in material reuse, ensuring they are not marginalised by new developments but are instead empowered and better equipped. This includes recognising that individuals below the poverty line often act as de facto valuers (Noble, 2019).
  - Techniques for augmenting and replicating the skills of experienced individuals, fostering peer-to-peer knowledge sharing and mentorship within communities. This involves understanding the importance of intrinsic motivation and "non-linear education," such as learning from actors or craftspeople, and providing internal education and resources like product design literature.
  - Understanding the cultural context of repair and reuse, recognising how practices and perceptions vary across localities and influence behaviour. This also involves the mapping of potential beneficiary groups and organisations to enable quick redirection of materials and balance supply and demand in a decentralised manner. Consider also the potential for trans-local work exchange programmes, encouraging participants not only to learn from other contexts but also actively contribute to shaping and improving local systems.
  - Learn from international contexts, such as the National Waste Pickers' Movement (MNCR) in Brazil - a powerful example of organised labour from a social inclusion perspective.

2. Eyes and Hands of a Circular Valuer: Materiality and Environmental Value

This module delves into the practical assessment skills, in-depth material knowledge, and manual operations that are indispensable for material valuers. It also covers understanding and articulating the significant environmental benefits of material reuse, framing these skills as crucial for designing and implementing effective material interventions.

- **Material Assessment and Properties:**
    - Training in the role of valuing agent, focusing on developing comprehensive material knowledge and assessing the potential value of discarded items. This includes visual inspection (cleanliness, state, care), manual inspection (build material, integrity, missing parts), and functional inspection (e.g., PAT testing for electrical items, verifying original purpose).
    - Practical methods for evaluating items for repair, reuse, recycling, or upcycling, considering vital factors such as physical condition, functionality, and potential demand. This involves making quick decisions, especially with high volumes of items, and an ongoing process of grading and figuring out an item's potential for reutilisation. It will also explore the challenges of automation of assessment, which can lead to a "lowest common denominator" and reduce true material value. Tim Hunkin's *The Secret Life of Machines* series can inspire a deeper understanding of object modularity and functionality.
    - Understanding materiality in design and manufacturing - shifting from abstract concepts to working directly with available materials, their inherent properties, and potential transformations. This includes applying the Reshape strategy (Sander, 2025) for industrial waste to preserve material integrity by leveraging its function, form, or composition in new products, thereby extending their lifetimes.
    - **Education about Design Products and their Value:** Understanding how products are designed, their intended lifespans, common failure points, and the impact of planned obsolescence. This includes learning to identify high-quality, repairable items versus those designed for rapid disposal, and appreciating the value embedded in craftsmanship and durable design (Sennett, 2008). The film "The Lightbulb Conspiracy" (Dannoritzer, 2010) will be used to illustrate the historical context of planned obsolescence.
- **Manual Operations and Tools:**
    - Hands-on training in practical repair, upcycling, and repurposing techniques. This includes developing hand skills (e.g., using screwdrivers and other tools) and understanding the practicalities of repair cafés and upcycling workshops. Richard Sennett's *The Craftsman* (2008) provides a deep exploration of skilled manual

work, apprenticeship and the importance of physical workshops.
    - Familiarisation with a diverse range of skills for material transformation, from traditional crafts to digital fabrication (e.g., 3D printing, laser cutting), always ensuring practical applicability and relevance. This includes addressing the need for access to spare parts and the challenges of storing items for longer repair times. It will also cover the use of simple tools to allow individuals, including children, to engineer their own items and change their relationship with waste, fostering locally-adapted solutions.
    - Learning from initiatives like the Berlin repair voucher pilot and diverse initiatives promoting the reuse of computers and mobile phones. Touching upon the concept of refurbishing and retrofitting existing products as well, and drawing inspiration from experimental projects sucj as the "Free Universal Construction Kit".
- **Environmental Impact Mitigation:**
    - Understanding the environmental benefits of reuse, such as reducing greenhouse house gas emissions and minimising raw material extraction and waste. This also includes knowledge on how to calculate the environmental cost of discarding or recycling an object, aiming to foster a system-wide approach that values a product based on its ability to avoid waste.
    - Understanding the issues related to "downcycling" where recycled materials are of lower quality than the originals, highlighting the paramount importance of higher-value reuse (McDonough & Braungart, 2002). It also considers whether environmental awareness is a prerequisite for valuers or a skill to be developed, noting that in some contexts (particularly in least developed nations), people engage in reuse primarily for economic survival rather than environmental concern. Explore also how to counter the waste flow through systems redesign and business models that directly challenge the status quo. The documentary *Ilha das Flores* (Furtado, 1989) offers a critical perspective on the societal implications of waste.

3. Information Systems and Market Value

This module focuses on the digital tools, data management, and economic considerations pertinent to material valuation within the progression towards a circular economy. It explores how information and market dynamics influence reuse practices, and how these can be leveraged for effective interventions.

- **Data and Information Management:**
  - Learning to use and contribute to information systems for identifying objects and retrieving reuse information. This includes the idea that sorting involves mapping and generating data on material types and potential beneficiaries.
  - Exploring digital tools to optimise the valuer's work, including the potential for scanning and linking to existing knowledge bases (e.g., product specifications, repair manuals, spare parts information). This involves understanding existing systems already used by reuse centres, as well as the potential for novel solutions, for instance international repair data platforms and AI-enabled tools for self-guided and community-based repair.
  - **Digital Inventories and Materials Banks:** Understanding the role of digital inventories for tracking available materials within reuse centres and materials banks (e.g., for construction materials, industrial scraps). This includes exploring the management of physical storage spaces and the strategic assessment of sorting versus storing materials based on their potential future value and demand. Key tools like The Restart Project's Fixometer (https://therestartproject.org/fixometer-2/) and the Open Repair Alliance Datasets (https://openrepair.org/open-data/downloads/) provide practical examples of collecting and sharing repair data. The concept of Open Know-Where (https://www.internetofproduction.org/openknowwhere) will be introduced for mapping distributed production and repair capabilities.
- **Economic Valuation and Business Models:**
  - Assessing the potential resale price and transactional value of objects, and the factors that influence these, including understanding concepts like use value and exchange value. This also involves considering "shelf time" for products and alternative approaches like auction events for selected objects. Adam Minter's *Secondhand: Travels in the New Global Garage Sale* (2019) offers a global perspective on the economic realities of second-hand markets.
  - Exploring sustainable business models for various actors in the reuse ecosystem, such as charity shops, scrap shops, and social enterprises. This includes addressing the need for more structured funding and flexible, low fixed-cost structures for reuse businesses. There should be a "buffet of options" for business models and the need to make trends in international commodity prices accessible

to grassroots waste pickers, helping them to plan and maximize their income.

- Addressing incentive systems for reuse, recognising how policies and economic structures can encourage or hinder material circulation. This includes understanding the "value of the product as the value of avoiding waste," contrasting it with business models focused solely on manufacturing, distribution and marketing costs (Mazzucato, 2018). It also considers the rise of refurbished product marketplaces and the economic viability of repair versus buying second-hand. Explore also radical business models inspired by biomimicry, such as "forest economics" and the "blue economy," and how to change incentive structures to force evolution towards circularity, leading to impactful interventions. Elinor Ostrom's work on *Governing the Commons* (1990) provides foundational principles for collective action and resource management.
- Understanding logistical challenges like storage space, which can be a significant obstacle for local circular business models, and exploring strategies to mitigate this. Large cities, in particular, often lack affordable space for storing second-hand goods and parts. Finally, consider how global economic shifts and international commodity prices can affect local reuse efforts, particularly in the Global South.
- **Web Services for Pricing and Valuation:** Utilising online platforms and databases (e.g., eBay's sold listings, specialised second-hand marketplaces) to research and determine the market value of specific items, aiding in the strategic assessment of reuse potential. Additionally, resources like Make Works (https://make.works/) will be introduced for connecting with local manufacturers and fabrication resources.

4. Stories and Personal Value

This section emphasises the crucial human dimension of reuse, including the emotional connection to objects and the transformative power of storytelling in fostering a "generosity" mindset towards materials. These elements are vital for fostering community engagement and ensuring interventions are culturally resonant.

- **Emotional and Cultural Connection:**
    - Recognising the "story" and emotional connection that objects hold, and how this deeply influences their perceived value and potential for reuse. This includes understanding the "joy of repair", the concept of “mundane technologies” (Nemer, 2022), and the personal satisfaction derived from extending an object's life, even if it has cosmetic defects (Jackson, 2014).
    - Exploring the broader "maker culture" as powerful drivers for engaging with materials, fostering creativity, and building a sense of belonging within communities. This moves beyond a purely "shabby chic" aesthetic to a deeper appreciation of an object's history and potential.
- **Promoting a Generosity Mindset:**
    - Adopting the concept of "material generosity" as an intentional and active approach to interact with the world and manage excess materials, contrasting it with a passive acceptance of "abundance" (Clark & Rockefeller, 2020). This includes fostering a collective view of the value of things within neighbourhoods and communities. Additionally, explore how a new professional identity for material valuers can be a source of class solidarity, particularly in the context of precarious labour and volunteer initiatives.
    - Learning how storytelling and visual representation can effectively highlight the potential value of discarded materials and inspire broader engagement in reuse initiatives. It connects to the challenge of instilling "tactile skills, curiosity, and imagination" in younger generations, which are crucial for effective material valuation. This includes the idea of "changing our emotional landscape" regarding waste, fostering a deeper connection that drives proactive interventions. Documentaries like *Waste Land* (Walker et al., 2010), *Estamira* (Prado, 2004), and fiction films like *Trash* (Daldry & Duurvoort, 2014) offer powerful narratives on the human dimension of waste.

5. References and Resources

This section provides a curated list of texts, videos, websites, and other relevant materials to support the learning and practice of a Circular Material Valuer.

- **Reading:**
  - Clark, Liesl, and Rockefeller, Rebecca. *The Buy Nothing, Get Everything Plan*. Atria Books, 2020. (Explores material generosity, gratitude, and the existence/regeneration of social bonds through sharing).
  - Freire, Paulo. *Pedagogy of the Oppressed*. Penguin Books, 1970. (For insights into critical pedagogy, empowerment, and human-centred approaches).
  - Gershenfeld, Neil. *How to Make Almost Anything: The Digital Fabrication Revolution*. Basic Books, 2005. (Foundational text for digital fabrication, offering context for its intersection with reuse).
  - Ingold, Tim. *Making: Anthropology, Archaeology, Art and Architecture*. Routledge, 2013. (Explores making as a process of "growing" and the maker's engagement with materials, seeing objects in constant flux).
  - Jackson, Steven J. *Rethinking Repair*. MIT Press, 2014. (Seminal work on repair and maintenance from a critical perspective).
  - Lafuente, Antonio, and Alonso, Alberto. "Right to Know, New Technologies and New Communities of Citizenship." In *Knowledge Communities*. Nevada University, Reno, USA, 2011.
  - Lafuente, Antonio, and Estalella, Adolfo. "Ways of science: public, open, and commons." In *Open Science, Open Issues*, edited by S. Albagli, M. L. Maciel, and A. Hannud Abdo, pp. 27–57. IBICT, Brasília, 2015.
  - Le Guin, Ursula K. *The Carrier Bag Theory of Fiction*. Ignota, 2019. (Challenges traditional heroic narratives, emphasising collection and carrying as fundamental human activities, relevant to the "other stories" of reuse).
  - Shannon Mattern. *Maintenance and Care*. In: Places Journal, November 2018. Accessed 08 Aug 2025. https://doi.org/10.22269/181120
  - Mazzucato, Mariana. *The Value of Everything: Making and Taking in the Global Economy*. Penguin, 2018. (For a critical perspective on value creation and distribution, relevant to incentive systems and business models).
  - McDonough, William, and Braungart, Michael. *Cradle to Cradle*. North Point Press, 2002. (For the concepts of "waste = food" and the design for circularity).
  - McDonough, William, and Braungart, Michael. *The Upcycle: Beyond Sustainability--Designing for Abundance*. Melcher Media, 2013. (Explores adding value through upcycling).
  - Minter, Adam. *Secondhand: Travels in the New Global Garage Sale*. Bloomsbury Publishing USA, 2019. (Provides a global perspective on the economic realities of

second-hand markets).
    - Nemer, David. *Technology of the Oppressed: Inequity and the Digital Mundane in Favelas of Brazil*. MIT Press, 2022. (Provides a grounded understanding of repair as a "mundane technology" and "quiet caring").
    - Noble, P. (2019). Circular economy and inclusion of informal waste pickers. In P. Schröder, M. Anantharaman, K. Anggraeni, & T. J. Foxon (Eds.), The Circular Economy and the Global South: Sustainable Lifestyles and Green Industrial Development (pp. 57–74). Routledge.
    - Ostrom, Elinor. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press, 1990. (Foundational for understanding commons-based governance systems for shared resources).
    - Raworth, Kate. *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*. Penguin Random House, 2017. (Offers a framework for economic models that respect planetary boundaries and social foundations).
    - Sander, N., et al. "Introducing the Reshape strategy: Preserving material integrity." *6th PLATE Conference 2025*. (For a detailed look at the Reshape strategy for industrial waste).
    - Schröder, Patrick, et al. *Circular Economy and the Global South: Towards a Justice-Oriented and Inclusive Transition*. Routledge, 2020. (Provides a critical perspective on circular economy in diverse global contexts).
    - Sennett, Richard. *The Craftsman*. Yale University Press, 2008. (Explores the nature of skilled manual work, craftsmanship, and the material world).
    - Thackara, John. *How to Thrive in the Next Economy: Designing Tomorrow's World Today*. Thames & Hudson, 2017.
    - Tronto, Joan C. *Moral Boundaries: A Political Argument for an Ethic of Care*. Routledge, 1993. (For the deep connection between care, ethics, and politics, relevant to the "quiet caring" of repair).
    - Wahl, Daniel Christian. *Designing Regenerative Cultures*. Triarchy Press, 2016. (Highlights "inter-being" and the shift in narrative needed to realise human agency in creating regenerative cultures).
    - Viña, Victor. "DIY in Context: From Bricolage to Jugaad." *Scribd*, 2012. (Explores diverse forms of DIY and improvisation).
- **Videos & Documentaries:**
    - Daldry, Stephen, and Duurvoort, Christian. *Trash*. 2014. (Film exploring children living in a landfill, touching on the value found in discarded items).
    - Dannoritzer, Cosima. *The Lightbulb Conspiracy*. 2010. (Film illustrating the historical context and practices of planned obsolescence).
    - Cousins, Jay, and Emmett, Jeff, *"Forest Economics - Biomemetic Business Models"* (https://www.youtube.com/watch?v=hmKbFVUd9_I).

- "Free Universal Construction Kit." (https://www.youtube.com/watch?v=qDDcqun9nC8) Demonstrates how digital fabrication can create connectors for disparate toy systems, promoting reuse).
- Furtado, Jorge. *Ilha das Flores* (Isle of Flowers). 1989. (Short documentary offering a poignant critique of waste and social inequality).
- Gershenfeld, Neil. "Unleash your creativity in a Fab Lab." *TED Talk*, 2006. (https://www.ted.com/talks/neil_gershenfeld_unleash_your_creativity_in_a_fab_lab) (Provides foundational insights into the Fab Lab movement).
- Hunkin, Tim. *The Secret Life of Components: A series of eight guides for designers and makers*. (https://www.youtube.com/watch?v=6JAgXz6xO0s&list=PLtaR0lZhSyANYB0Xxb9OSp47pHuQmj3Ol&pp=0gcJCWUEOCosWNin)
- Hunkin, Tim. *The Secret Life of Machines*. Channel 4, 1988-1993. (https://www.youtube.com/watch?v=CJIrbMHLBd4&list=PLtaR0lZhSyAPLuoSbMA29s3Ry8ZUvKff3) (Explores the inner workings of everyday machines, promoting understanding and repair).
- Prado, Marcos. *Estamira*. 2004. (Brazilian documentary about a woman living and working in a landfill, offering a profound human perspective on waste).
- POP-MACHINA Project Webinar (https://www.youtube.com/watch?v=iG7FkgNX6Fc)
- Walker, Lucy, et al. *Waste Land*. 2010. (Documentary following artist Vik Muniz in Brazil working with waste pickers, highlighting the human stories in waste).
- VICE / Motherboard, *Cuba's DIY Inventions from 30 Years of Isolation.* (https://www.youtube.com/watch?v=v-XS4aueDUg) (Featuring the work of designer Ernesto Oroza and the concept of Technological Disobedience).

- **Websites and Other References:**
  - CE Hub Berlin
  - Dsposal (For insights into waste data and GovTech solutions).
  - Gambiarra: Repair Culture
  - IAAC (Institute for Advanced Architecture of Catalonia) - POP-MACHINA Project
  - Local Economies: Circular Economy Aspects
  - Make Works (For connecting with local manufacturers and fabrication resources).
  - The Maintainers Movement
  - Open Repair Alliance
  - Plastic Bank
  - POP-MACHINA EU Project Results
  - Recology's Artist in Residence Program
  - Recycleye - WasteNet

- The Remakery
- reusedeutschland.org
- Salvage Garden - RemakeIt Workshops
- Schwaebische.de - Second-Hand Cafe Challenges
- Verbund Offene Werkstaetten
- What Are You Doing Singapore? - Bridging the Digital Divide