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## Preferable, Contextual and Sustainable... Climate Futures for Ecological Citizens.

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## Preferable, contextual and sustainable climate futures for ecological citizen(s)

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**Abstract:** The responsibility for sustainable futures extends beyond individual disciplines, necessitating the adoption of diverse approaches across various fields. Water pollution is at epidemic levels, valuable materials go to landfill, ocean detritus grows, many people are disconnected from green space, and biodiversity is plummeting. We need new modes of climate futures, championing citizen agency. Societies require cross-collaborative, inclusive approaches to navigate climate future challenges. We seek to foresee 'climate futures' that signpost challenges, unpicking (appropriate) opportunities, benefits, and pitfalls. Through an *Ecological Citizenship* lens, the authors traverse situations, through preferable futures. It is an entry point for transition design, creating climate tangibility surrounding our everyday lives. The article unpicks and communicates 'preferable futures', conceptualising how *Ecological Citizenship* could be deployed. We report on workshops which yielded insights from different organisational perspectives. Insights were illustrated for public audiences. Narratives navigate ecologically engaged forms of citizenship.

**Keywords:** Sustainability, Communities, Ecological Citizenship, Imagination

### 1. Introduction

This article employs imaginative narrative methods, to actively navigate contemporary preferable actions towards climate futures, involving leading interested parties. We all face uncertain financial times (Centre, 2023), climate change, decreasing biodiversity (UNEP, 2023), disconnection from the natural world (Beery, *et al.*, 2023), and an entrenched consumer culture (Waters, 2021), as our generation grapples with multifaceted challenges. The term 'climate crisis,' as defined by *The Climate Dictionary* (2023), refers to "serious problems caused by changes in the planet's climate, including weather extremes and natural



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disasters, ocean acidification and sea-level rise, loss of biodiversity, food and water insecurity, health risks, economic disruption, displacement, and even violent conflict". Currently, there is a lack of timely action and intervention by governments and industries in the UK. As such, community groups are increasingly taking action on their own through volunteering, citizen advocacy, and transition town movements (Campos & Marín-González, 2020). These groups often depend on voluntary mechanisms to generate evidence, protest, or lobby councils for local change.

Our design and community-led work has multiple intentions; to create, navigate, and signpost 'preferable sustainable futures', built around *Ecological Citizenship* (EC). EC embodies sustainable responsibility beyond personal needs and motivation(s). The *Ecological Citizen(s)* team asserts that 'design interventions' should align with applications, avoiding the pitfall of 'techno-solutionism', and ensuring suitability to situations, contexts, and audiences, whether site-specific or embedded within surroundings (Samantha, 2021). For example, a pencil is a technology that is appropriate, cost-effective, contextual, and divergent from conventional norms of 'tech'. Often, high-level technologies find themselves misapplied. Despite ongoing technological developments, the pursuit of climate futures remains a universal objective.

Within this design futures discourse, we pinpoint a research gap marked by missing methods that facilitate communities in co-creating shared solutions or pathways. Authors within the EC team align Design Futures (DF) approaches with the creation of resilient societies that aim to achieve more sustainable climate futures. DFs can be used as tools to speculate 'preferable futures' in designerly ways. Alternative "futures give us new perspectives on the wicked problems of the present" leading us to "see blind spots, provide abilities to identify and develop the [propositions] within existing system(s) and avoid treating symptoms rather than grappling with underlying causes" (DDC, 2023). We perceive a future of sustainable resilient societies responding to local and national challenges.

Within preferable futures we centralise social design "practices towards collective and social ends, rather than predominantly commercial or consumer-oriented objectives" (Armstrong, et al., 2014, p.6). We scaffold off Hopkins (2019), designing provocations with informed, grounded questions, rather than accepting established norms. Exploring "what we must do to revive and replenish our collective imagination. If we can rekindle that precious creative spark, whole societies and cultures can change – rapidly, dramatically, and unexpectedly – for the better. There really is no end to accomplishments" (Hopkins, R. 2019, p.18). Preferable futures should be transformative, tangible, community embedded, providing all with better choices.

## 1.2 *Ecological Citizenship*

We see *Ecological Citizenship* playing a pivotal role in shaping the discourse beyond the conventional boundaries of environmental and ecological studies. Foundational texts, such as "Fundamentals of Ecology" (Odum & Barrett, 1971) and "A Sand County Almanac," (Leopold, 1970) lay the groundwork for understanding the intricate relationships within

natural systems, fostering a sense of ecological awareness and responsibility. Coupling these texts with contributions detailing ecological design, (Braungart & McDonough, 2009; Pawlyn, 2019) authors advocate for sustainable practices by emulating nature's efficiency, aligning with the principles of EC that emphasise positive, ecological behaviours and sustainable practices. What is more, the works on regenerative design and ecopsychology (Cohen, 2003; Mang & Reed, 2020) underscore the importance of restoring balance with natural systems, aligning with the ethos of EC in establishing sustainable practices and addressing ecological inequalities.

The discourse on climate futures and policy highlights the interconnectedness of ecological issues with broader societal and policy considerations, reinforcing the role of citizens in environmental stewardship. Within the domain of design futures and speculative design, this paper navigates, sheds light on imaginative and forward-thinking practices, fostering a collective vision for sustainable futures, a key tenet of *Ecological Citizenship*. Specifically, work on EC and ethical considerations emphasises the responsibilities and duties of citizens toward the environment, promoting the core principles of EC.

*Ecological Citizenship* also serves as a key entry point for Transition Design, expanding the conventional citizenship concept to encompass environmental responsibilities (Irwin, 2015). Aligned with Transition Design's holistic approach to address environmental sustainability challenges, EC promotes active participation in stewardship and systemic changes. It resonates with Transition Design's call for proactive involvement in shaping and transforming systems, emphasising cultural and behavioural shifts, individual responsibility, and societal norms (Irwin *et al.*, 2022). The focus on long-term perspectives and values prioritising ecological well-being in EC aligns with Transition Design's commitment to envisioning sustainable futures. The term *Ecological Citizenship* will mean different things to different people, it is a new approach for sustainable practice unbound by discipline. We see it as a 'catalyst' between wicked problems, building on g-off transdisciplinary knowledge, creating 'Climate Futures'.

*Ecological Citizenship* is defined for this research as "accessible activities and skills which establish sustainable practice(s) and/or address ecological inequalities". We "are (all) citizens of the world, with the natural environment sustaining all life on earth. Our human existence is intertwined with our environment; we live in and are 'citizens' of our environment. EC fosters positive, ecological behaviours involving and benefiting communities through individual and collective action(s)" (Phillips *et al.*, 2022, p.265). Unsustainable practices (and consequences) are not constrained to individual countries, single industries, or discrete societies. Our life-supporting ecosystems (for example, oceans we eat from and the air we breathe) are impacted by "contemporary resource exploitation, pollution, material misuse and inadequate protection" (Phillips *et al.*, 2022, p.265). Environmental citizenship consists of an understanding of ecological issues (Gabrielson & Cawley, 2010), the rights, responsibilities of citizens (Clarke & Agyeman, 2011), and action promoting positive and sustainable interactions for environment(s) (Berkowitz *et al.*, 2005;

Häyrynen, *et al.*, 2021). Design (as a process) relies on the contextualisation of technologies, grounding audiences, and breaking-down ambiguities.

It is probable and preferable that environmental impact(s) data is accessible and transparent (Probable Futures, 2023). Territorial complexities include public perception of rewilding (Weston, 2023), and digital exclusion (Anthony, 2023); and contextual green prescribing could “result in gross annual cost savings of 635.6 million GBP” (Ricardo, 2023). Authors see the EC approach as providing practical, tangible starting points in intangible situations. Article conclusions signpost: barriers to entry, opportunities, and pitfalls of integrating *Ecological Citizenship* into our lives. An emerging space that must question its barriers to entry, whilst celebrating its opportunities, not just single territories. EC caters for ‘overlap in between disciplines’... i.e., you can be a good *Ecological Citizen* by linking touchpoints together. Our work aims to co-create with communities specifying digital tools that would enable community groups to address environmental sustainability in a holistic way. This project has commenced its work as a ‘network’ by convening a roundtable of people from different communities to undertake a visioning exercise.

Authors included appropriate organisations (developed through our successful funding application) in the work, to catalyse new concepts. We defined technological interventions for *Ecological Citizenship* as ‘EC touchpoints’, embodying: product(s), service(s), system(s), or a suite of all working in chorus. We referred to ideas as ‘design proposals’ “embody[ing] values apart from those traditionally associated with functionality and usefulness, they are examples of research through design, balancing concreteness with openness to spur imagination, allowing the emergence of a new design space” (Gaver & Martin, 2000, p.210). Meadows highlights “places within a complex system (a corporation, an economy, a living body, a city, an ecosystem) where shifts in one thing can produce changes in everything” (Meadows, 1999, p.1), i.e., knowing where to intervene with appropriate touchpoints. To comprehend ‘leverage points’ co-design enables interested parties’ “behaviour and perceptions”, making them central to design processes (Suri, 2003, p.39). Co-design helps parties gather “information about the contexts of people’s interactions” so interested parties can contextualise and frame opportunities (Vaajakallio, & Mattelmäki, 2007, p.224).

Transition Design argues that entire societies (as well as our organisations, institutions and communities) must intentionally transition toward more sustainable, equitable and desirable long-term futures (Gaziulusoy & Öztekin, 2018). These co-created visions (created by interested parties themselves) must inform solutions in the present. Within contemporary practice(s), we must question from diverse perspectives, including knowledge bases, to unpick concepts, critique and provide affirmation. Scaffolding on Rob (Hopkins’) *From What is: to What If?* We build imaginative climate futures, representing action considering possible, and desirable, preferable futures. Preferable future narratives are credible and useful, “follow conditions of; pertinence, coherency, likelihood, importance, and transparency” (Durance, & Godet, 2010, p.1491). Proposals are not finite, they are contextual, optional, and come from an informed perspective.

Design “is a practice-led field which has an uneasy relationship with theorising”, therefore contextual signposts and narratives were translated into tangible illustrations to inform wider exploration (Selin, *et al.*, 2015, p.2). Chen (*et al.*) highlights the importance of tangible and ‘ethereal creative material’, furthering creative practices in others “as a result, the interactions between objects and humans unlock the object agency”, enabling others to imagine more intangible, or preferable futures (Chen, *et al.*, 2020, p.483). That process opened conceptual spaces, whilst remaining tangible and understandable. Our narratives (Figure 1–7) identified touchpoints for further exploration rather than detailed ‘things’, or fully resolved propositions. Narratives unlock diversity in seeing parallel things, e.g., a ‘camera’, can encompass: accessible DIY tech, 35mm analogue, CCTV, 3D scanning, automated machine learning from imagery, pinhole, or a digital single lens reflex (DSLR)... but all share the same word. The authors are aware of our biases as a design team (Arnott, 2006), and are also aware of the organisationally led approach of interested parties we led. It did result in certain outputs, based on everyone’s background.

## 2. Method

We created an online workshop to explore *Ecological Citizenship* and climate futures, with a group of participants, each representing distinct organisations with specialised expertise and perspectives. Among the attendees were representatives from *Brighton University*, *Forestry England*, *The Wildlife Trusts*, *Local Works Studio*, *Fosters + Partners*, and the *Open Data Institute*. The selection of these organisations was based on an understanding of various critical aspects, such as materials, resources, contextual ramifications, ecosystems, and propositional scaling knowledge. The inclusion criteria for these organisations were stringent, focusing on their depth of contextual understanding and their capacity to contribute valuable insights to the discussions. This incorporated representatives from academia, environmental management, design, and data science, the workshop sought to enrich the dialogue with a broad spectrum of expertise.

The decision not to include ‘end citizens’ in this particular workshop was intentional, and part of a larger strategy. The authors were specifically scoping a space for review from both design-led and community-led perspectives. While recognising the importance of the lived experience of individuals in shaping narratives, the focus of this workshop was on harnessing the collective expertise of organisations deeply engaged in the ecological and environmental domain (Reid, 2005). The workshop provided a platform for these organisations to collaborate and co-create narratives that would serve as touchpoints for *Ecological Citizenship*, as a provocation to explore. The scenarios developed during the workshop were informed by the participants’ diverse backgrounds and perspectives, ensuring a nuanced and inclusive exploration of preferable climate futures. Our intention was defining narrative(s) where (preferable futures) crossover with digital or physical intervention points, scoping touchpoints for *Ecological Citizenship*.

Following invitations, participants were sent materials for context. These included a thorough definition of *Ecological Citizenship*, *Phillips et al.*, and information regarding the

*Ecological Citizen(s) Network*<sup>+</sup> funded project. We split participants into complementary groups of interest and expertise. These included *Sustainable Urban Environments* (H&F Council, Foster + Partners), *Place Based Opportunities* (Local Works Studio, Brighton Uni, Forestry England) and *Citizen Permissioning* (Wildlife Trusts, H&F Council, ODI), all working towards a digital sustainable society. Within groups, facilitators discussed a 'day in the life' of an *Ecological Citizen*, the actions / systems / infrastructures they might inhabit. These themes and 'time as a tool' shaped expansive possibilities that EC manifests. We considered not only what an *Ecological Citizenship* might represent, but also infrastructures that might be affected / leveraged and contextual barriers-to-entry. Narratives were created, discussed, and critiqued as 'preferable futures' to quantify tangible proposals and touchpoints within the *Ecological Citizen(s)* framework.

The results of the session were examined and transformed by the team into narratives that employ scenarios to envision potential climate futures, establish a shared understanding, providing a tangible framework for intangible qualities inherent in the discussions. Drawing inspiration from Ishii's concept (2008), the narratives were intentionally crafted to convey propositions without delving into excessive detail, fostering an environment of thought-provoking and desirable future scenarios. The amalgamation of responses and insights led to the identification of overarching themes. These thematic explorations served as lenses through which to delve into the multifaceted realm of *Ecological Citizenship*. Importantly, it is crucial to note that these climate future explorations are not presented as one-size-fits-all solutions but rather as nuanced and interconnected components within the broader context of environmental stewardship. The work was unpicked, built on and communicated by our illustrator *Amber Anderson*.

By encapsulating these themes within the narratives, we aimed to spark meaningful conversations and reflections on the potential trajectories of our collective environmental journey. Each theme represents a facet of ecological responsibility, and together, they contribute to a more comprehensive exploration of sustainable practices and pathways. The emphasis on provocative preferable futures encourages a forward-thinking mindset, urging parties with vested interests to actively engage with, and contribute to, the ongoing discourse surrounding the environmental challenges we face.

By presenting themes as signposts for opportunities, these results avoid the pitfalls of overreaching and overpromising, by grounding our assertions in a clear analysis of the current state of affairs as presented by session participants. As such, rather than making grandiose promises, this research advocates for diverse approaches across various fields, acknowledging the complexity of the challenges at hand, demonstrating a genuine effort to avoid overgeneralisation by pinpointing specific environmental issues, such as water pollution, landfill problems, ocean detritus, and declining biodiversity.

### 3. Results & Discussion

Seven themes were developed (see Figures 1 to 7), ranging from digital economies to citizen empowerment. Each are described in detail below.

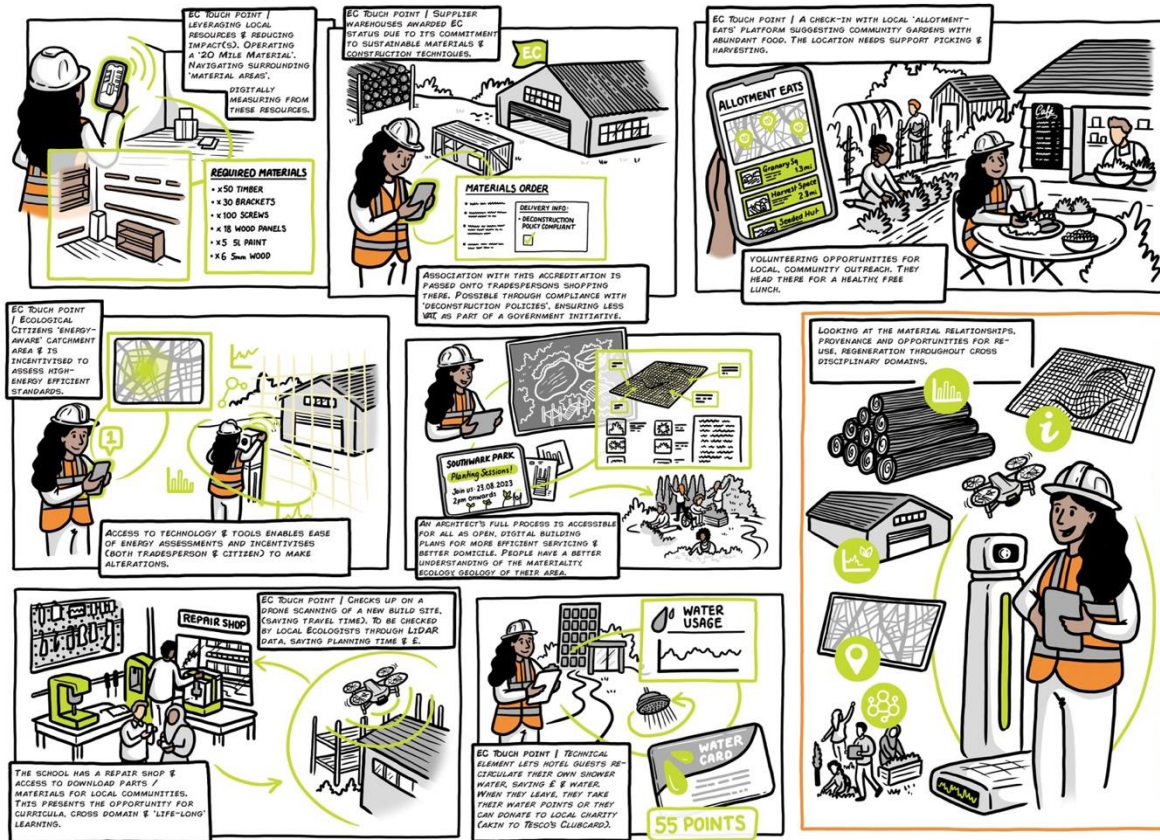


Figure 1. Climate future of Ecological Citizen accreditation.

#### EC Accreditation

This theme covers a range of top-down mechanisms deployable by organisations, retailers, suppliers, and communities, akin to BSI or CE standards (see CE marking, 2023).

Accreditation (Figure 1) is “the action or process of officially recognizing someone as having a particular status or being qualified” to perform an activity (Dictionary.com, 2021). This can be an organisation or individual, benefiting each, and vice versa, both top-down and bottom-up. An example of where accreditation could be used is around repair work. Currently many artefacts remain ‘closed’ (Svensson, *et al.*, 2018), with limited options to repair them outside expert labs (Hernandez, *et al.*, 2020). Key considerations include: accessibility to what you own, i.e., “if you cannot open it then you don't own it”, from the Maker Movement (Torrone, 2016, p.1), and the opportunity to design to (with transparencies), an exemplar of this being *Open Structures* (2023). Open Structures (OS) generates widely interchangeable parts, objects that allow infinite adaptation and repair, and a more sustainably built environment. OS enables repair, and community resources that can work within existing infrastructures, i.e., schools, town halls etc. (van der Velden, 2021). There are countless opportunities for ‘digital interactions’ to advise on deconstruction, analysis and more. Akin

to BMW's 'professional repair' using augmented reality, for visual troubleshooting (Pichikala, 2009). Group expertise was informed by *Hammersmith Local Council* and *Fosters & Partners* (researchers). The greatest barrier is 'new standards and protocols', protecting warranties of elements too complex for consumer repair or taken to accredited parties (Saidani, *et al.*, 2023).

### *Material Passport(s)*

Opportunities lie in provenance, accreditation, and traceability. Materiality is interlinked with our world of health and safety (HSE, 2023), fire regulations (HSE, 2023) and built environments. The built environment requires routine regulatory maintenance and offers best practices for construction. A *Material Passport* is a "tool providing information on material handling [throughout its life] and how to benefit from end-of-life stages through recovery opportunities" (Atta, *et al.*, 2021). Insights were informed by *Local Works Studio* expertise. Accreditation could review building orientation, potential for green roofing, and optional 'biodiversity corridors' (West, *et al.*, 2016), and how species can be mapped through various means, and inform relationships. *Kathmandu* fashion brand is exercising material passports for clothing, "customers scan their jacket's code, view item-specific information including manufacturing process, factory origin, repair information, traceability and resell recommendations" (Anon, 2023). Opportunities for repair and material passports are interrelated, demonstrating an EC opportunity (Figure 2), used not only for standards, shipping, and construction, but also deconstruction and repair. For example, a car's vehicle service history is akin to the process of a materials passport. Referencing whole-life carbon may be valuable here, focusing on building component passports and building for repair and deconstruction e.g. (Roberts, *et al.*, 2020). Other opportunities are in resources, for example 'water usage', and how that 'usage' may be carried with you, encouraging better water health-cataloguing, rewarding positive behaviour.

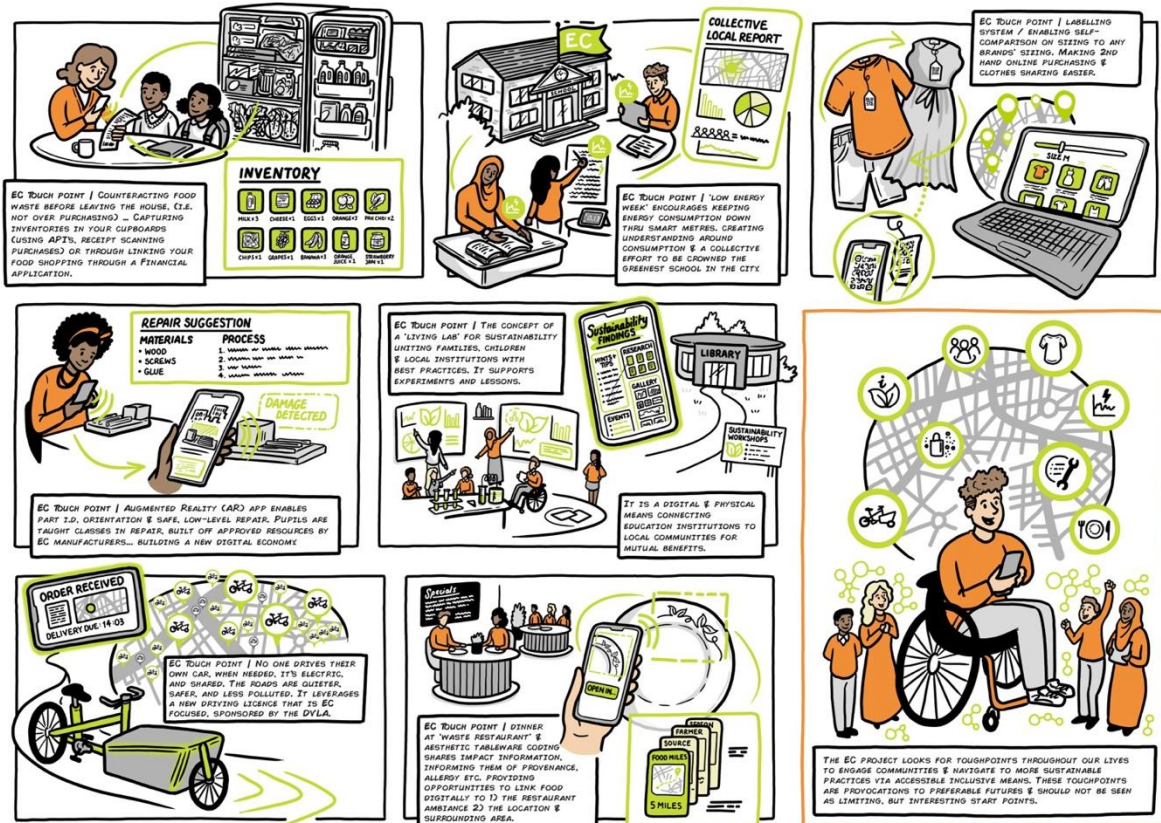


Figure 2 Climate future of material passports.

## Digital Economies

The digital economy's core is "the 'digital sector' producing foundational digital goods and services" (Bukht, *et al.*, 2017, p.1). It opens new relationships informing sustainable practices, where means are ethically shared, working across platforms. Some of the authors are also versed in data capture and storage footprints. Insights were informed by *The Open Data Institute* (ODI). A contextual example given was clothing sizing: "In a fashion e-commerce website, clothes cannot be touched, nor worn prior to purchase/delivery; this engenders issues of fit and thus, fashion companies turn to size recommendation and virtual fit platforms" (Ornati, *et al.*, 2022, p.199). The extra shipping of ill-fitting garments or simply their disposal presents vast waste. Labelling and ergonomic fit differ within fashion houses as, "there are no standard sizes in industry, for good reason, the human body does not come in a standard size" (UKFT, 2023). Another digital economy concerns food waste: inventories, storage, and labelling represent impacts upon energy resourcing. This is a huge issue as around 320,000 tonnes of fruit and vegetables are wasted in the UK every year, over half of which is because it does not get eaten in time (WRAP, 2023). Our experts commented that often people didn't know home food stocks, providing digital opportunities for creating remote access food inventories. These narratives seek to reduce food miles and establish provenance, providing access to reliable information, even in restaurants and commercial kitchens (Figure 3). Food information can be centred around its 'life', provenance, and

efficacy, offering a new range of interactions. We are also aware that traceability can increase costs.

## Empowered Citizens

Citizenship implies the status of freedom (in certain locations) with accompanying responsibilities, although we use the term to emphasise that everyone has certain rights, duties, and responsibilities. These can leverage a process to enable 'public-interest technologies', i.e., outputs that benefit each other and wider society (McGuinness, *et al.*, 2021). Insights were informed by *Hammersmith City Council*. We foresee a link between organisation(s) to inform best practices, by linking relevant communities. This approach is parallel to *Permissioning the City*, asking "What if we could foster reciprocal, stewardship-based agreements and perceive space as a foundational 'civic' asset capable of generating positive outcomes for the entire city?" (Matter, 2023). We foresee preferable futures where people can improve the environment around them symbiotically improving their personal health, mutually benefiting parties. For example, advocating for air quality, water quality, or biodiversity within the area.

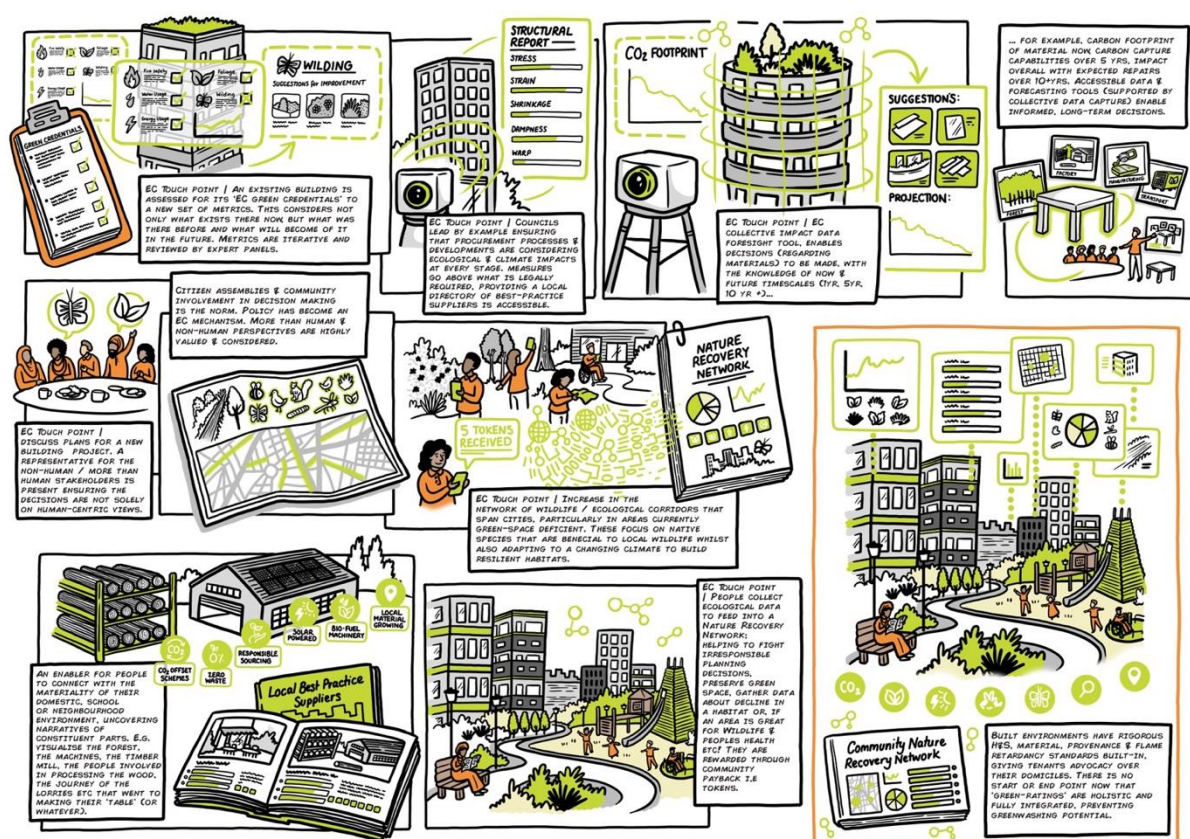


Figure 3 Climate future of digital economies.

## Resource Transparency

Transparency initiatives have emerged to combat corruption, and increase public benefits and understanding. The Extractive Industries Transparency Initiative (EITI) is one such

initiative, through which 49 resource-rich countries have disclosed a cumulative 282 fiscal years of government revenues amounting to US\$1.9 trillion, since 2003 (Boldbaatar, *et al.*, 2019, p.1908). The process shows how and where financial information goes, making it traceable and available on hand to public(s) motivated to view it. The challenge is the cost to entry for small- to medium-sized businesses, as data availability (to maintain transparency) requires investment. The workshop discussed the documentation of our existing housing stock and provision of visual information to leverage change. It was discussed that an *Ecological Citizen touchpoint* would be a digital means for citizens to scan their building's checking compliance and several other issues, including reporting faults accurately for repair.

This could be an opportunity for layers of information provided to different parties, one being the lifecycle, but supported by its compliance to contemporary and regulatory requirements. For example, health & safety documentation, fire regulations, thermal efficiencies and/or material composition(s). The authors foresaw this enhancing best practices for councils in regulating their housing stock, a challenging task as it requires step change, and often experiences a lack of finances (Figure 4). It would help others to advocate for their local community, providing evidence and also sharing conditions with other parallel organisations.

### *Made from Here*

Urban mining utilises the concept that "materials hidden in [surrounding environments] are attractive alternatives to raw ones" (Koutamanis, *et al.*, 2018, p.32). It is a subset of recycling that focuses on the recovery of valuable metals and minerals from urban waste streams, especially electronic waste (e-waste) such as smartphones and computers. The term emphasises the idea that cities can be considered as potential sources of valuable resources, akin to traditional mining sites, rather than sending it to landfill, incinerating it, or turning it into lower value products. Resources can be highly abundant: In Europe in 2020, 850 million tons of construction demolition materials were generated (Holcim, 2023). Urban mining is achieved by means of landscape and materials audits that "reuse waste and bio-renewable construction materials sourced [locally with] the intention to take a circular approach to procurement and construction, i.e., re-imagining the built environment as an extension of the wider ecosystem" (Local Works Studio, 2022).

Insights were informed by *Local Works studio* and *Forestry England*. To authors' the classification of food provenance is a different process. Interactive maps could be generated to support designers to make better material choices (see for example, SPACE10, 2023). EC touchpoints could; indicate foods' seasonality, harvest locations, contextual and appropriate materials, avoid over-harvesting and inform better options. A historical example of this is a coracle, a small, keelless boat used for fishing and transportation, and more recently, for recreation. The traditional construction of the coracle is a basketwork frame made from locally foraged wood, for a specific location, water course and individual's ergonomic requirements.

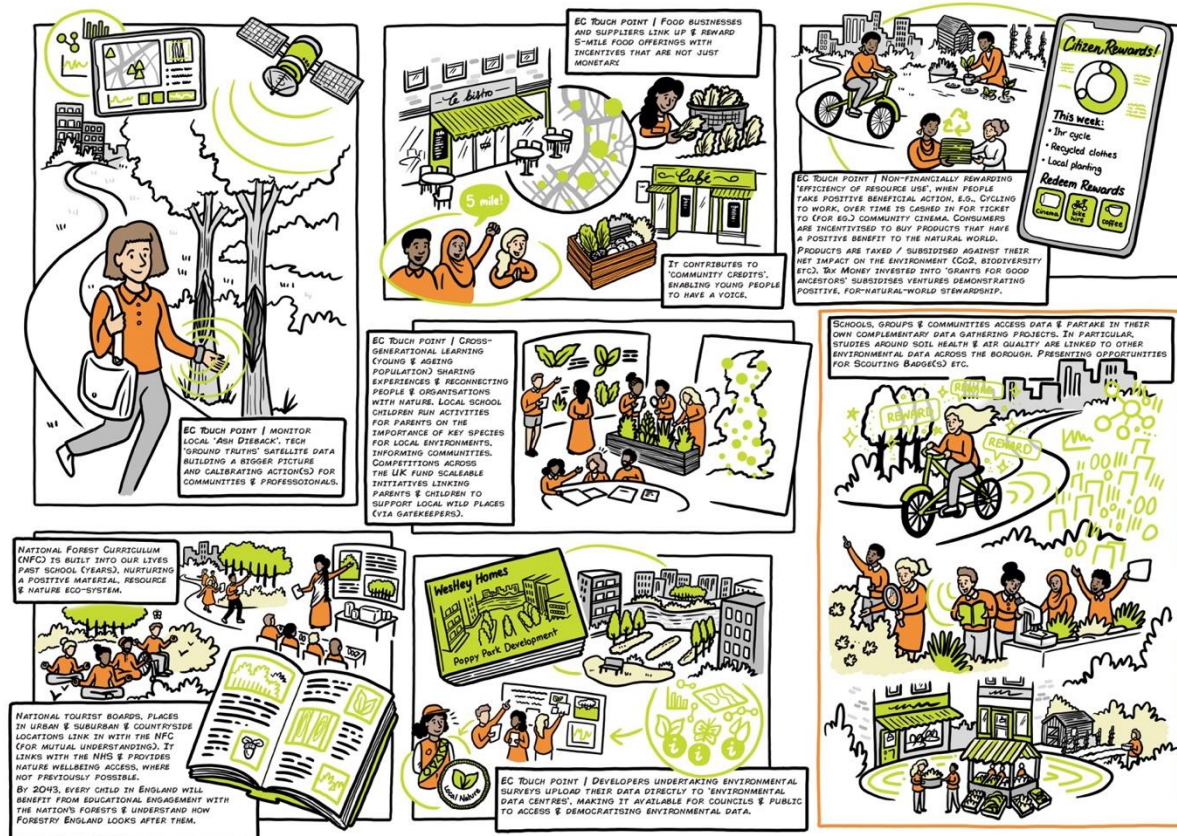


Figure 4 Climate future of resource transparency.

## Community Empowerment

This theme is about engaging communities to actively engage with conservation by collecting data about their environment and acting as stewards. Such engagement can enable a mass shift towards positive, deep-held responsibility for our surroundings and environments. Examples could include ground truthing satellite data about ash-dieback disease in forests, to inform management stakeholders ([theashproject.org.uk](http://theashproject.org.uk)). Experiencing greenspace within communities from an early age, such as through Forest Schools (Forest School Association, 2023), enables a generation of conscientious stewards to develop knowledge, skills, and sensitivity towards spaces. This benefits biodiversity and conservation efforts, but also positively impacts the physical and mental wellbeing of the community that uses these spaces. Curriculum offerings such as a natural history / ecological literacy GCSE) and extracurricular activities (such as Scouts and Guides badges) can support this, similar to the Future Generations Wales policy documentation (2024).

Through environmental education, cross-generational learning can take place as children exposed to nature share their knowledge with their families and wider communities. Motivation for engagement in the 'community-empowered future', could be encouraged by rewarding positive ecological behaviour with credits, rewards or acknowledgements exchanged for appropriate rewards, e.g., discounts on approved/certified products or services to be spent or exchanged in the local area, benefiting, local economies and supports

businesses employing ecological practises, much like a 'local currency'. As a community engages holistically with their environment, town planners, developers and authorities recognise the value of sharing and inviting citizens to engage in decisions by publishing future plans and democratising environmental data (for example, see *smartcitizen.me*).

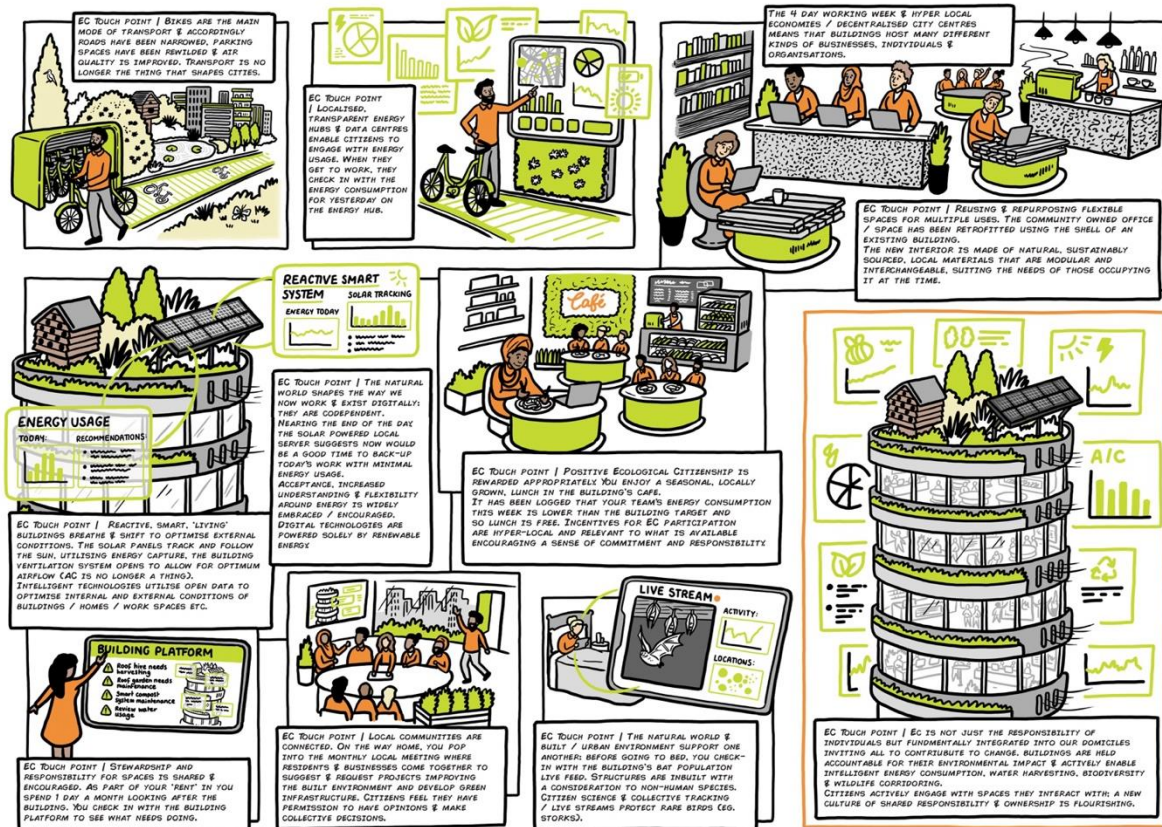


Figure 5 Climate future of De-Centred Human(s).

## De-Centred Humans

Traditionally we exploit the natural world for resources and value, rather than forming our lives around it. We live within the natural world, but are also custodians of it, as our lives are co-dependent and interlinked. We need to change our approaches to *Environment Centred Design* (Sznal, 2021) as we are experiencing two interlinked crises: climate and biodiversity. Climate change is driving nature's decline, and the loss of wild spaces is leaving us ill-equipped to reduce carbon emissions and adapt to climate change. Meanwhile, degraded habitats are actively emitting carbon instead of storing it. The UK is one of the most nature-depleted countries on the planet, with damage to habitats and species having led to the loss of half its biodiversity. Insights were informed by representatives of *The Wildlife Trusts and Hammersmith City Council*, reviewing how we can achieve 'one health' within our communities (Figure 5). The discussion yielded the understanding that humans need to take a decentralised approach and e.g., take account of seasonality impacts according to nature's needs, especially in the urban environment. Within the urban space, how architecture dictates biodiversity corridors and vice versa, is an area for further investigation. Finally,

end-to-end opportunities for planning application transparency, within the area, and its impacts toward biodiversity, were called for by participants.

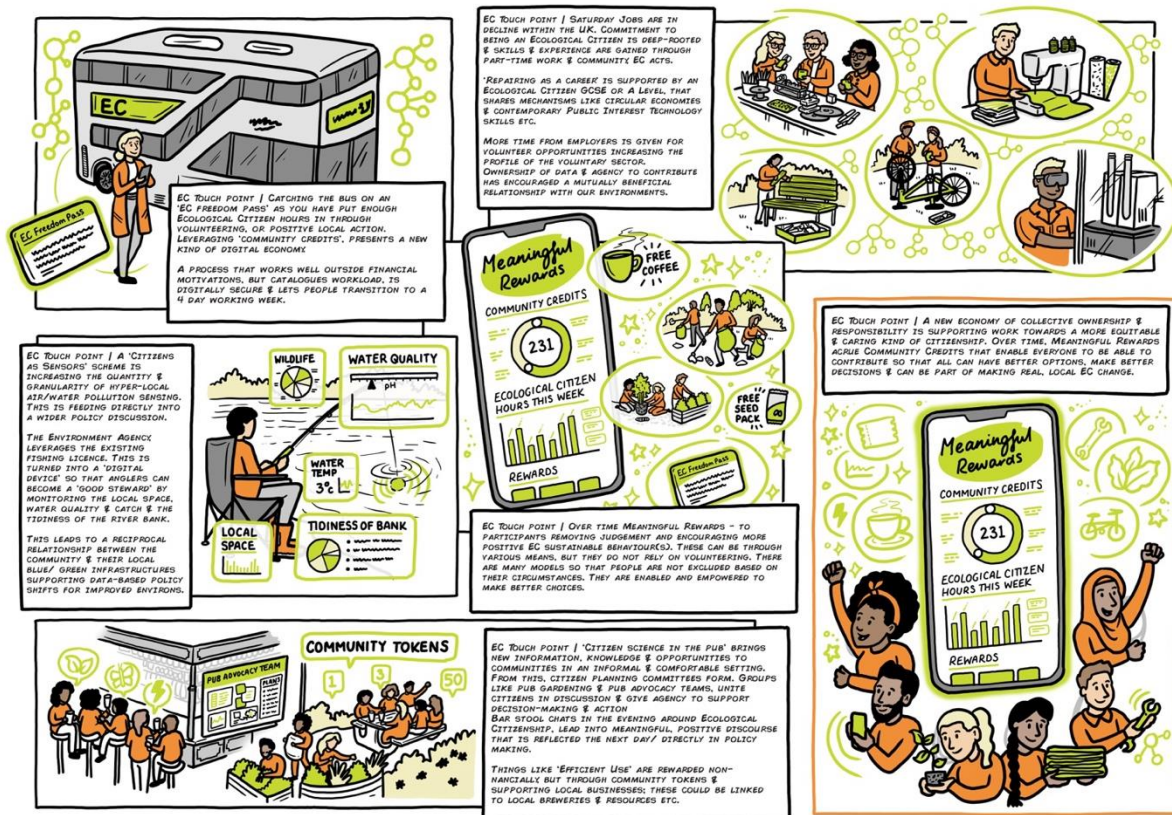


Figure 6 Climate future of Environmental 'Custodians'.

## Environmental 'Custodian'

The 'Natural Health Service' has a long connection with benefits to humans' physical and mental health (Hardman, 2020). The COVID-19 "pandemic highlighted the importance of being outdoors to people's mental and physical health, as well as the inequality of access to green space, now taking form in green social prescribing" (NHS England, 2023). Nature connection "is about our relationship with nature – how we think about, feel about, and experience nature. When we feel close to nature, we recognise ourselves as part of the natural world, and value our relationship with it" (Pritchard, *et al.*, 2020, p.1161). Being connected with the natural world stimulates improved mental wellbeing, more pro-environmental behaviours, greater vitality and happiness, but there has been a steady decrease in nature-based recreation over the past 35 years (Wolf, *et al.*, 2017). A negative consequence of "decreased interest in nature is that those with little knowledge or negative attitudes about the natural environment are unlikely to value protection of biodiversity" (Aruguete, *et al.*, 2020, p.364). Insights were informed by representatives from *The Wildlife Trusts* and *Fosters & Partners architects*. One overarching theme was supporting positive behaviour through meaningful rewards, rather than chastising people (Figure 6) (see also Figure 4). It requires consideration as to how those behaviours can be made accessible, and

not reliant on people's spare time, as this is a large barrier to entry. The concept of a 'freedom pass', builds on the model of initiatives such as 'Casserole Club' where volunteers share extra portions of home-cooked food with people in their area who aren't able to cook for themselves, and a link with Transport for London enabled reduced rate public transport ([casseroleclub.com](http://casseroleclub.com)). The workshop explored forming steward-led interventions where mutual motivations align. For example, angling (fishing): keeps you fit, increases your vitamin D levels, improves concentration, reduces stress, and provides connection with the natural world (Canal & River Trust, 2023). We saw a link (Figure 7) between the fishing licence and stewardship of rivers, preserving and recording water quality being motivationally aligned. It forms touchpoints where people can advocate for their environment, through existing motivations.

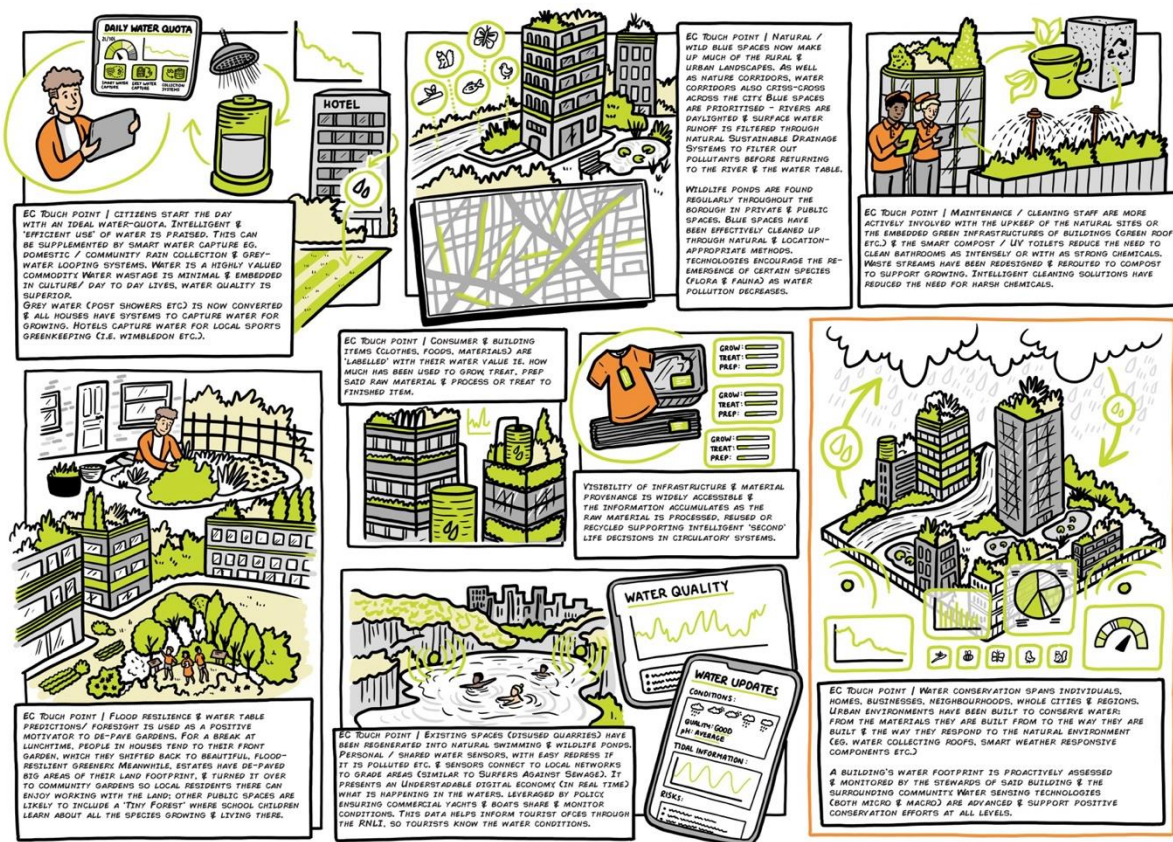


Figure 7 Climate future of Environmental 'Custodians'.

## Overarching

The summary issues have been replicated in Figure 8 as tables, for clarity and familiarity. The elements are overarching challenges for more discrete pieces of work within 'Climate Futures' and need to be contextualised within locations and cultures.

| Accreditation (for Ecological Citizenship)         |                                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                  |                                                                                                                                                                                                                                                   |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pitfalls                                           | Each EC touchpoint needs careful consideration of cost implications.                                                                                                                         | Validation and compliance are paramount, instilling a process of inclusion and agency... not led by negative compliance or being punished.                                              | Remove the cultural and media pressure for EC to be translated into 'greenwashing' for unjust causes.                                                                            | Being top-down limits routes for further community / citizen interaction / development. Ownership needs to be democratised with appropriate means for all agents, and not static.                                                                 |
| Opportunities                                      | EC can connect organisations through transparency and resources.                                                                                                                             | Costs, in all their senses (financial, motivational, CO <sub>2</sub> , impact etc) have a 'footprint' attached to them.                                                                 | EC accreditation would bring transparency and retailers would know what they were selling. Also, materials would be more 'reclaimable'.                                          | EC could be a grounded means to creating true standards for sustainable practices. This could also enable a community of compliant incubators of excellence, i.e., creating new businesses fitting around communities that are climate compliant. |
| Benefits                                           | EC could lead to many new classifications of things, i.e., buildings and deconstruction.                                                                                                     | EC could lead to acceleration of change, as it is more devolved.                                                                                                                        | EC holds opportunities for crossover like ISO 9001, that safeguards practices so SMEs can work with corporations.                                                                |                                                                                                                                                                                                                                                   |
| Data Economies (for Ecological Citizenship)        |                                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                  |                                                                                                                                                                                                                                                   |
| Pitfalls                                           | Efficacy of citizens gathered data based on either equipment cost, training, or skills; also the challenge of false positives in data sets.                                                  | Designing within a wicked interconnected space. Especially when relying on our motivation(s). It raises the question: why we should care? About others and how do we make it intrinsic? | Are there means in current structures, 'National Service' or something similar, as it cannot rely on the public's 'spare time', as that is not always accessible.                | If EC touchpoints are entirely digital, then where is the inclusion for non-digitals?                                                                                                                                                             |
| Opportunities                                      | A new means for digital economy, perhaps akin to traditional Saturday jobs or other appropriate age groups / abilities, improving mental health of participants.                             |                                                                                                                                                                                         |                                                                                                                                                                                  |                                                                                                                                                                                                                                                   |
| Benefits                                           | Legacy data (over time) could be exceptionally supportive, for example seeing how different (similar) climates can share lessons on growing conditions, water consumption, temperatures etc. |                                                                                                                                                                                         |                                                                                                                                                                                  |                                                                                                                                                                                                                                                   |
| Resource Transparency (for Ecological Citizenship) |                                                                                                                                                                                              |                                                                                                                                                                                         |                                                                                                                                                                                  |                                                                                                                                                                                                                                                   |
| Pitfalls                                           | Working out the true cost of a resource, in all its means, could push prices up.                                                                                                             | The onboarding of new materials suppliers, to a new system.                                                                                                                             |                                                                                                                                                                                  |                                                                                                                                                                                                                                                   |
| Opportunities                                      | Local economy 'currency,' quantification of non-monetary benefits that work in favour of all involved.                                                                                       |                                                                                                                                                                                         |                                                                                                                                                                                  |                                                                                                                                                                                                                                                   |
| Benefits                                           | Discussion around decentralised energy, community energy, energy citizenship, lobbying for change (step away from Big 5 centralised discourse)                                               |                                                                                                                                                                                         | Highlight the additionality that positive EC action can have – linkages to circular economy. Promoting / highlighting a step change away from traditional investment structures. |                                                                                                                                                                                                                                                   |

| Community Empowerment (for Ecological Citizenship) |                                                                                                                                    |  |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|--|
| Pitfalls                                           | The common perception is that EC is reliant on time, and how is that possible for all. Other means and metrics need to be created. |  |
| Opportunities                                      | EC citizens / organisations being able to advocate for conditions on the ground.                                                   |  |
| Benefits                                           | EC reaching the ambivalent / the excluded / those without capacity for involvement (time / energy / mobility / health / finance).  |  |

| De-Centred Humans (for Ecological Citizenship) |                                                                                                  |                                                                                                                                                                 |
|------------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pitfalls                                       | Designing EC and its elements so it is not exclusive                                             | The negativity of how people receive it, behaviours we must change, seasonality of things. I.e., its co-development, co-reflection and co-delivery is critical. |
| Opportunities                                  | EC opportunities for non-humans.                                                                 |                                                                                                                                                                 |
| Benefits                                       | Community inclusion, and a community group builder, combating loneliness / mental health issues. |                                                                                                                                                                 |

| Environmental ‘Custodian’ (for Ecological Citizenship) |                                                                                                                |                                                                        |                                                                                             |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Pitfalls                                               | The EC custodian relies on trust and accuracy of what is captured, i.e., it is open to abuse.                  |                                                                        |                                                                                             |
| Opportunities                                          | EC can encourage new behaviour / touch points across society, means for comprehension, leveraging new systems. |                                                                        |                                                                                             |
| Benefits                                               | Transparency of elements over time... if it works.                                                             | EC locations lobbying for our environment's health as it impacts us... | Thoughts on rewarding positive behaviours, rather than leading with a ‘metaphorical’ stick. |

Figure 8. Summary of overarching issues for Ecological Citizenship in table format.

The results emergent from the method highlight the value of co-creating visions, and play a pivotal role in shaping contemporary solutions and navigating the balance between concreteness and openness, facilitating the emergence of a novel design space.

We acknowledge that although the round table format explores participants' perspectives before, during, and after crafting narratives, a more exhaustive exploration of these perspectives could yield richer insights into the evolving viewpoints of the participants. The backgrounds of facilitators and those attending determines the course of the narratives, and we did not conduct analysis of this, which would be useful for future workshops. Furthermore, we see the next steps from this round-table stage to be the incorporation of a discussion on the infrastructure necessary to actualise envisioned futures, potential sacrifices, and communication processes.

## 4. Conclusion

The narrative scenarios developed here serve as critical signposts of what a preferred future could look like, illuminating promising opportunities within the space of *Ecological*

*Citizenship*. The overarching theme that emerged involves the complex task of aligning motivations, moving beyond the reliance on 'people's kindness', voluntary efforts, or sporadic contributions of spare time. While financial input is not the sole focus, the establishment of robust infrastructure becomes pivotal for sustained impact and transformative change. This infrastructure-centric approach necessitates in-depth contextual and extensive research efforts, acknowledging that motivations are intricately woven into the fabric of various cultures, geographic locations, demographics, and individual abilities.

In the pursuit of leveraging preferable futures, there lies an inherent capacity to take meaningful strides towards what is objectively 'better'. However, a fundamental truth surfaces, in that, as humans, we may harbour a reluctance to embrace transformative endeavours. Acknowledging this human inclination to 'carry on as normal' becomes crucial in designing strategies that foster genuine commitment and engagement. The introduction of the typology of citizenship emerges as a pragmatic and strategic framework, offering a structured approach for businesses, industries, and individuals alike to actively contribute to and support the ongoing transition toward more sustainable climate futures. This typology not only provides a conceptual roadmap but also offers tangible means for collective action, encouraging a comprehensive and collaborative response to the challenges of our evolving environmental landscape.

## 5. Future Work

The *Ecological Citizenship* landscape is complex. The bigger RQ; What are the tools and infrastructures required to offer autonomy and EC? and how should they be created, so there is a cohesive and equitable power relationship?

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