

Metadata of the chapter that will be visualized in SpringerLink

Book Title	HCI International 2025 Posters	
Series Title		
Chapter Title	HCI Opportunities: The Ecological Citizen(s) Preferable Futures Deck	
Copyright Year	2025	
Copyright HolderName	The Author(s), under exclusive license to Springer Nature Switzerland AG	
Corresponding Author	Family Name	Phillips
	Particle	
	Given Name	Robert
	Prefix	
	Suffix	
	Role	
	Division	
	Organization	Royal College of Art
	Address	Rausing Building, Riverside, 1 Hester Rd, London, SW11 4AY, UK
	Email	robert.phillips@rca.ac.uk
Abstract	<p>The triple planetary crisis [1] highlights interlinked issues that humanity and multi-species currently face: climate change, pollution and biodiversity loss. For viable planetary futures, issues need unpacking in accessible and collaborative means. In contemporary times, it is critical to transition to less impactful distributed practices, external to governmental structures, based on contextual placed-based challenges. This article reports on the design of the <i>Ecological Citizen(s) Preferable Futures Deck</i>, focusing on 'EC what if question creation' for positive planetary futures and Human-Computer Interaction (HCI) interventions. Its goal is to produce inclusive, accessible outcomes with design/non-design audiences' intent on bringing agency/autonomy to their communities based on co-created What if? questions.</p> <p>It shares insights on cross-disciplinary development of the Deck, grounded with partners and leading peers. The HCI opportunity for <i>Ecological Citizen(s)</i> is expansive, but it follows the transition in designers' roles outlined by the UK's <i>Design Council: Systems Thinker and Connector/Convener</i> [2]. The EC project seeks to work collaboratively for planetary futures building on; lived, place-based and trained experience(s). The in-progress workshop sessions collated feedback from leading design experts and community voices, presenting applicable reciprocal HCI lessons for to cultivate a digital sustainable society, toward positive planetary design.</p> <p>Our Research Objective: Unpacking the development/trials of the <i>Ecological Citizen(s) Preferable Futures Deck</i>. Authors unpack insights to signpost planetary futures, pertinent to: HCI, philanthropic, social innovation and societal audiences.</p>	
Keywords (separated by '-')	Human Computer Interaction - Ecological Citizens - Design-led	



HCI Opportunities: The Ecological Citizen(s) Preferable Futures Deck

Robert Phillips^(✉)

Royal College of Art, Rausing Building, Riverside, 1 Hester Rd, London SW11 4AY, UK
robert.phillips@rca.ac.uk

[AQ1]

Abstract. The triple planetary crisis [1] highlights interlinked issues that humanity and multi-species currently face: climate change, pollution and biodiversity loss. For viable planetary futures, issues need unpacking in accessible and collaborative means. In contemporary times, it is critical to transition to less impactful distributed practices, external to governmental structures, based on contextual placed-based challenges. This article reports on the design of the *Ecological Citizen(s) Preferable Futures Deck*, focusing on ‘EC what if question creation’ for positive planetary futures and Human-Computer Interaction (HCI) interventions. Its goal is to produce inclusive, accessible outcomes with design/non-design audiences’ intent on bringing agency/autonomy to their communities based on co-created What if? questions.

It shares insights on cross-disciplinary development of the Deck, grounded with partners and leading peers. The HCI opportunity for *Ecological Citizen(s)* is expansive, but it follows the transition in designers’ roles outlined by the UK’s *Design Council: Systems Thinker and Connector/Convener* [2]. The EC project seeks to work collaboratively for planetary futures building on; lived, place-based and trained experience(s). The in-progress workshop sessions collated feedback from leading design experts and community voices, presenting applicable reciprocal HCI lessons for to cultivate a digital sustainable society, toward positive planetary design.

Our Research Objective: Unpacking the development/trials of the *Ecological Citizen(s) Preferable Futures Deck*. Authors unpack insights to signpost planetary futures, pertinent to: HCI, philanthropic, social innovation and societal audiences.

Keywords: Human Computer Interaction · Ecological Citizens · Design-led

1 Introduction

The work combines: Human-Computer Interaction (HCI) principles, Ecological Citizenship (EC) and design tools introducing new forms of sustainable practices. Authors see “citizenship as a practice” providing a force over mechanisms impacting us, to navigate and contribute towards wider planetary benefits. Human-Computer Interaction [3] embodies our interaction with technologies, but also the wider contextual ramifications of their existence, use, ethics and application. With technological advances, occurring

at an exponential rate, we need to unpack design future(s) opportunities to evolve HCI interactions and protect all parties, including the planet. For example, connecting communities under ethical (opt-in) conditions, sharing material and resource provenance, material passports and much more. Accompanying this are the burgeoning mental-health challenges centred around screen time, and a reticence around replacing natural interactions with potentially more screen time. Authors do not just focus on personal experiences but the opportunities for Public-Interest Technologies (PITs) [4].

Ecological Citizenship, builds on this, and is intended to create mechanisms for sustainable intent, driven “with” communities, designers, and interested parties to provide autonomy. As a research domain, EC explores touchpoints in-between disciplines and systems, beyond sustainable design, within post-participatory and distributed approaches. It is a contextual, complex, domain and requires unpicking within democratic and accessible discussions. Traditionally “hierarchies” are dictated by e.g., designers, colonialism or parties of power, so we must look to preferable futures and unpack strategic steps. This approach seeks to cultivate what UK Research & Innovation (UKRI) call a “digital sustainable society” as “it is recognised that social and economic sustainability are interconnected with environmental sustainability, therefore exploration of these aspects of sustainability” [5]. Design Futures is not a crystal ball, but a means of unpacking preferable scenarios, transitioning us by bypassing current bureaucracy and restricted view(s). The four visions of future proposed by Henchey [6] are conceptualised in “classes – ‘possible’ (any future), ‘plausible’ (future that makes sense), ‘probable’ (highly likely to happen), and ‘preferable’ (the best that could happen)” [7]. We need to design with, and for, as we need to unpack the pitfalls, benefits and opportunities. HCI will rapidly transform, under forthcoming government legislation regarding sustainability that will evolve all of our interactions and responsibilities.

PITs are “technology used to serve the public good” [8]. Emerging examples of this work include: (1) *Re: Permissioning The City* [9], seeking to leverage built assets during their downtime; (2) *Provenance* [10], empowering customers to cut through the green-wash and make informed choices, to accelerate the sustainability transition; and (3) *8:80 Cities* [11] incorporating all stages of life into cities. HCI has a means to not only leverage new tech but unpack its future direction and build territories (like the three examples) that build preferable futures. The article aligns to the *theoretical category: dealing with models, concepts, and structures* track for audiences including strategic designers and HCI professionals. The article reports on an approach to building What If? questions for Ecological Citizenship, leveraging HCI opportunities. The type of interactions we foresee public augmented reality, personal sustainability experiences, material passports through digital provenance chains, nature connectedness opportunities and more.

We see the practice of design as; appropriately, contextually and inclusively leveraging contemporary materials [12]. Contextually, our contemporary materials build on Manzini’s ‘designing the conditions for change’ and ways of living that mitigate against detrimental impact(s), devolving negative unsustainable consequences and transitioning our responses to more sustainable practices and choices [13]. Design (as a practice) is rapidly evolving with; distributed design tools [14], accessible tech, crowdfunding, artificial intelligence and more, changing the dynamics, providing autonomy and agency to new audiences. Conditions can be catalysed through Public-Interest Technologies

[4]. We are in complex period of polycrisis [15], biodiversity loss, nature disconnection and mistreatment of the abundance of our planet. Defining Ecological Citizenship as accessible activities and skills which establish sustainable practice(s) and/or address ecological inequalities, the position is “post sustainability,” exploring practices mitigating consequences and “desiloing” expertise [16]. EC is intent on navigating more inclusive and possible sustainable choices, outside legislative and mandatory norms. It is “optional,” proposed as a non-mandatory, “better for all” situation. Ideally EC initiatives review strategic leverage points “places within a complex system (a corporation, an economy, a living body, a city, an ecosystem) where a small shift in one thing can produce big changes in everything” [8]. Consequently design (as a practice) undertakes a catalysing role “combining thinking and feeling, facts and values; both doing and reflecting, divergence and convergence”, communicating potentiality [17].

1.1 Background/Context

Within our contemporary times, we design for planetary futures, where we unpick living beyond our resources. Our intention supports climate-positive post-participatory design, with citizens, providing a repeatable internationally applicable framework, for place-based application contexts. The Ecological Citizen(s) Network + is UKRI funded and mandated to prioritise the UK. Authors are against imposing colonialist activities; hence the work’s focus is UK-centric in practice, whilst unpacking a scalable international concept. Other parties can build insights, as place-based contextual nuances and cultural understanding is paramount. We see the opportunities to leverage HCI approaches to embed EC interventions within our everyday practices, yielding planetary futures.

1.2 Our Ecological Citizenship Frame

Ecological Citizenship is “an activity or a skill that anyone can do, which helps establish sustainable practice(s) and address ecological inequalities. This includes community-led sustainability approaches leading to scalable, transferable ‘design values’ for wider application(s)” [18]. Our EC position is intent on enabling autonomy in citizens as cross-disciplinary creatives through Public-Interest Technologies. PITs are “technologies used to serve the public good” [19]. We believe PITs should be appropriate to their application, with different lenses, not solely conventional or traditional views of ‘high technologies’ [20]. For example; (1) *Indigenous technologies* demonstrated in naturally drying Cod (to preserve it) in the Lofoten Islands, Norway [21]. Since the air temperature is cool the fish does not spoil, requiring: local knowledge, skill, and environmental expertise. (2) *Contextual technology* site-specific and place-based an example being an *Ice Stupa* an “artificial glacier, designed to refreeze glacier meltwater and facilitate water storage, a techno-scientific intervention” [22]. (3) *Appropriate technology*, the “wheel nut indicator” a cost effective, visual, low-tech example providing a quick and easy way to detect loose wheel nuts for HGV and commercial vehicles [23]. (4) *Participatory Technology*, e.g., Park(ing) day a global, public, participatory project where people internationally “temporarily repurpose” curbside parking spaces, converting them into public parks and social spaces advocating for safer, greener, and more equitable streets for citizens [24]. We frame EC touchpoints as proposals rather than solving problems. Within this article

our lens of PITs is pluralistic and centres around EC, but our frame of PITs is appropriate to their contexts.

2 Toolkit(s) and Decks

The designer's/creative's role is exponentially transforming, no longer being deployed at the start, middle or end of projects, but sought to catalyse what is possible and 'designing the conditions for change'. Authors believe 'research in the wild' takes practice(s), into the field "mak[ing] a strong contribution to the formulation of problems and questions that become intelligible for confined researchers" building beyond researchers' comprehension [25]. Co-design gets people personally, emotionally engaged so they can reflect on processes with practices using tools that create a fluency. For contextual insights, processes can comprehend behaviours and perceptions centrally placing them in the design process. The commonality in these approaches is 'empathy', that "cannot be achieved without engagement, and inspiration goes hand in hand with cross-disciplinary collaborations involving tangible materials from which to be inspired" [26]. The design profession's major strengths [are] the ability to create tangible expressions of ideas and to invent and exploit new tools, i.e., translating insights into tangible design outputs, from research. Design research "is not concerned with what exists but with what ought to" exist as it "continually challenges, provokes and disrupts the status quo" [27]. Designing tools can "influence the way we think" including participants without formal design training, however users can also be warped validating implausible concepts [27]. The process of design is complex, with factors including careful attention to manufacturing, design aesthetics and functionality, user interpretation and more. Design toolkits and decks are interface[s] that enable trial-and-error experimentation and allow the customer to take an active part in product development, deconstructing challenges that users without design experience can engage with.

2.1 Archetypes for Preferable Futures

Archetypes are an essential part of design processes and marking beginnings, helping interested parties define objectives and parameters of projects, toward generating appropriate propositions. Briefs are descriptions of the proposal to conceive something. These documents can include various considerations, such as a list of requirements. Authors see them as a creative way to conceptualise proposals; open concepts, navigate the potential for audiences to explore and bring clarity. The work explores Preferable Futures as a demonstrator to support what is possible. Authors are aware of natural tensions: design/climate and tools to deliver or cultivate EC. Both collaboratively between partners/authors and remote (without the authors). These frames combine, creating a design tool to inform new ways of being an Ecological Citizen within contemporary times. Our design approach is built on the need to leverage "creative intent" to liberate participants' imaginations as part of the design process. Archetypes were created as aspirations for participants to identify with: Nurturing Caretaker, Responsible Materialist, System Connector, Community Economist, Lifelong Learner, Restorative Naturalist and Creative Activist (Fig. 1). Rather than creating job roles or design terms, the work concerned inspiring wonder and freedom of thought.



Fig. 1. Illustrated archetypes unpacking different aspirational roles that Ecological Citizen(s) could be. Illustrations: Amber Anderson, Photography: Kate Green Photography.

3 Conclusions

The In-Progress work gives participants aspirations, rather than defining them by their job roles, to transition to more sustainable interactions. This was best received in live workshops, rather than in classifying people by their perceived personas or demographics. We need to give parties better choices, rather than dictate terms, people are citizen(s), not consumers.

Acknowledgements. Dan Price and Emily Boxall for their Support. Rights Retention Statement: This work was funded by a UKRI grant (EP/W020610/1). For the purpose of open access, the author has applied a Creative Commons Attribution (CC BY) licence to any Author Accepted Manuscript version arising. Ecological Citizen(s) is a cross-RCA research network led by Dr. Rob Phillips, with Professor Sharon Baurley, and Tom Simmonds, in partnership with Professor Sarah West of the Stockholm Environment Institute (SEI) at the University of York, and Professor Alec Shepley of the Faculty of Arts, Science and Technology at Wrexham University, and partners from industry, third sector, NGO.

References

1. United Nations University. Beyond opportunism: the UN development system's response to the triple planetary crisis. UNU Collections (2021). <http://collections.unu.edu/view/UNU:8210>


2. Design Council. Systemic Design Framework - Design Council (2022). <https://www.designcouncil.org.uk/our-resources/systemic-design-framework/>
3. Sinha, G., Shahi, R., Shankar, M.: Human computer interaction. In: 2010 3rd International Conference on Emerging Trends in Engineering and Technology, pp. 1–4. IEEE (2010)
4. McGuinness, T.D., Schank, H.: Power to the Public: The Promise of Public Interest Technology. Princeton University Press (2021)
5. Digital Economy: Sustainable Digital society (2020). <https://www.ukri.org/opportunity/digital-economy-sustainable-digital-society/>
6. Henchey, N.: Making sense of future studies. *Alter.: Perspect. Soc. Technol. Environ.* **7**(2), 24–27 (1978)
7. Architettura, & Architettura, A. M. 0.-. I. C. E. Possible and Preferable Scenarios of a Sustainable Future: Towards 2030 and Beyond (2021). <https://iris.unipa.it/handle/10447/624865>
8. Ford Foundation. Public Interest Technology - Ford Foundation (2024). <https://www.fordfoundation.org/news-and-stories/big-ideas/public-interest-technology/>
9. Matter, D.: Re: Permissioning the City — Unlocking cities’ growing underutilised spatial assets for an emergent civic economy. *Medium* (2024). <https://provocations.darkmatterlabs.org/re-permissioning-the-city-unlocking-cities-growing-underutilised-spatial-assets-for-an-emergent-1550997714a4>
10. Provenance. Creating positive change (2015). <https://www.provenance.org/about>
11. 8:80 Cities. 8:80 Cities | Creating cities for all (2024). <https://www.880cities.org/>
12. Olivetti, E.A., Cullen, J.M.: Toward a sustainable materials system. *Science* **360**(6396), 1396–1398 (2018)
13. Manzini, E.: Making things happen: social innovation and design. *Des. Issues* **30**(1), 57–66 (2014)
14. Tooze, J., Baurley, S., Phillips, R., Smith, P., Foote, E., Silve, S.: Open design: contributions, solutions, processes and projects. *Design J.* **17**(4), 538–559 (2014)
15. Meadows, D.: Leverage points. *Places Intervene Syst.* **19**, 28 (1999)
16. Phillips, R., et al.: Defining ecological citizenship; Case-studies, projects & perspectives; analysed through a design-led lens, positioning ‘preferable future (s)’ (2022)
17. Hooton, C.: Defining tech: an examination of how the ‘technology’ economy is measured. *Nordic Baltic J. Inf. Commun. Technol.* **1**, 101–120 (2018)
18. Hung, S.: Shung photography. Natural drying of cod fish in Lofoten, Norway. *Stephen Hung Photography* (2023). <https://shungphotography.com/2023/06/15/natural-drying-of-cod-fish-in-lofoten-norway/>
19. Kleinman Center for Energy Policy. Engineering ICE Stupas - Kleinman Center for Energy Policy (2023). <https://kleinmanenergy.upenn.edu/research/publications/engineering-ice-stupas/>
20. Checkpoint. Wheel Nut Indicators | HGV Wheel Nut Covers | CHECKPOINT. CHECKPOINT (2024). <https://checkpoint-safety.com/products/indicators.aspx>
21. Heuristics and Decision-Making in Design for Behaviour Change (2012)
22. Park(ing) Day. (2024). Park(Ing) Day. <https://www.myparkingday.org/>
23. Callon, M., Rabeharisoa, V.: Research “in the wild” and the shaping of new social identities. *Technol. Soc.* **25**(2), 193–204 (2003)
24. Mattelmäki, T., Eva, B., Kirsiikka, V.: On designing open-ended interpretations for collaborative design exploration. *CoDesign* **7**(2), 79–93 (2011)
25. Milton, A., Rodgers, P.: Research methods for product design. Hachette UK (2023)
26. Franke, N., Von Hippel, E., Schreier, M.: Finding commercially attractive user innovations: a test of lead-user theory. *J. Prod. Innov. Manag.* **23**(4), 301–315 (2006)
27. Jones, W.M., Haugen Askland, H.: Design briefs: is there a standard? In: DS 74: Proceedings of the 14th International Conference on Engineering & Product Design Education (E&PDE12) Design Education for Future Wellbeing, Antwerp, Belgium, pp. 115–120 (2012)

Author Queries

Chapter 38

Query Refs.	Details Required	Author's response
AQ1	As per Springer style country name is mandatory for affiliations. Please confirm if the inserted country name is correct. Amend if necessary.	
AQ2	As References [4, 15] and [8, 18] are same, we have deleted the duplicate reference and renumbered accordingly. Please check and confirm.	

Alternative Texts for Your Images, Please Check and Correct them if Required

Page no	Fig/Photo	Thumbnail	Alt-text Description
5	Fig1	 A photograph showing a person's hands holding several playing cards. The cards are white with colorful illustrations of various insects and animals, along with text. The cards are spread out, showing different designs and numbers. In the background, there are papers and a notebook on a table, suggesting a game or activity involving the cards.	<p>A person holding a set of playing cards, each featuring colorful illustrations and text. The cards are spread out, showing different designs and numbers. In the background, there are papers and a notebook on a table. The scene suggests a game or activity involving the cards.</p>