



Nordic Journal
of Science
and Technology
Studies

2025 | Volume 13 | Issue 2



"people-social-game-team-teamwork" 2025, by Geralt

Volume 13, issue 2

Editorial

Care, collaboration and AI

by Shan Wang & Kristine Ask

3

Articles

Conducting caring collaborations in societally engaged research:
A literature review

by Anna Umantseva, Katia Dupret & Daniela Lazoroska

5

Script Tales from Participatory Energy Transitions: Critical Reflections
from Co-Designing Energy Citizenship in a Rural Community

by Lina Naoroz Bråten, Berit Therese Nilsen, Lucia Liste & Pasi Aalto

22

Editor in chief:

Kristine Ask

Shan Wang

Editorial board:

Kim-André Myhre Arntsen

Nora Kristiansson

Layout:

Camilla Trønnes

Contact:

Department of Interdisciplinary
Studies of Culture

Norwegian University of
Science and Technology

7491 NTNU, Trondheim, Norway

ISSN: 1894-4647

nordicsts.org



EDITORIAL

Care, collaboration and AI

By editors Shan Wang and Kristine Ask

The year 2025 seemed to unfold as if someone had pressed a fast-forward button, propelling us forward at an unprecedented pace. Artificial intelligence (AI) swept rapidly into nearly every aspect of daily life and across platforms and sectors, 'AI' became a feature eagerly integrated into various practices. In academia, AI has become deeply entangled with the routines of research and writing, offering efficiency and new possibilities for knowledge production, while also provoking intense and highly warranted debates over academic integrity, authorship, and the evolving norms of scholarly communication. These developments are collectively reshaping the rhythms and directions of academic work. In the editorial for the 2025 issue, inspired by Haraway's "think with trouble" (Haraway, 2016), we invite readers to think with the change: to linger with their tensions, to follow the questions they unsettle, and to explore how they reshape our practices and understandings toward the future of academia.

Among our editorial team, we are individually enthusiastic experimenters that enjoy exploring and reflecting on AI use. However, as editors we recognized the need to update our own and decide on how NJSTS respond to this new technology, and potentially new forms of output and reviews.

While seemingly simple on the surface, in drafting these guidelines we touch upon several foundational issues related to AI. For example, while we all agreed that the use of AI must be disclosed, it was less clear what such disclosure should entail. Unlike other technical tools with clearly delimited purposes, such as proofreading software or reference managers, AI is so ubiquitous and flexible that it can be employed at every stage of the process. Then, which forms of AI use should be disclosed – or not disclosed? If AI is employed for basic tasks such as voice-to-text transcription, minor language editing or as supplement to a literature search, does that too warrant disclosure?

Amidst uncertainties and undeveloped best practices, we have opted for a careful approach, asking authors to disclose "All use of AI". While we recognize that this implies disclosure of AI that is relatively minor and benign, such as using AI for spellchecking, it is also indirectly encouraging authors to be mindful and deliberate about their use of AI. Given persistent issues with resource consumption (Crawford, 2021), black boxed processes (von Eschenbach, 2021) and errors (aka hallucinations, Xu, Jain & Kankanalli, 2024), we believe we are obligated to develop our scholarly AI user practices with care.

The great issue with disclosing AI, is that – like many scientific processes – it is entirely based on trust. There are no tools that can reliably detect AI-generated text, nor are there any form of documentation that could be added to definitively prove AI use or non-use. While our guidelines emphasize transparency of use and placing responsibility of any and all text on the authors, we are also painfully aware of how such guidelines are ultimately dependent on trust; trust in the integrity of authors, trust in the judgments from reviewers, and trust in the shared commitment to produce knowledge for our community of the society.

The rise of AI does not replace such a foundation, rather, it makes the work more visible and demanding. To care for the scholarship is to continually negotiate this relationship between boundaries and trust, between uncertainty and responsibility. The trust that underpins the review process, where we trust the anonymous authors to be truthful about their process, data and results, are being placed under further pressure. This trust-based model was already struggling under the weight of "publish or perish"-culture that rewards salami publications, give fertile ground for predatory journals and speculative authors. Junior and precariously employed scholars have to play the game or risk their career prospects and employability. And it is perhaps exactly because this is the current culture in academia, that so many universities were quick to embrace this mythical knowledge-work machine with promises of even more production, despite foundational problems about transparency and accuracy – that are crucial in all disciplines – going unsolved (and is unlikely to ever be solved).

Following ICBO (It Could Have Been Otherwise) (Latour & Woolgar, 1986), we can imagine an academic culture of care where we value doing work slowly and deliberately and choosing quality over quantity. In such an academic culture the promise of a machine that takes of thinking and writing to increase speed and productivity would be entirely unwanted. The appeal of AI should thus not be understood as separate from the capitalist structures that shape scientific institutions toward increased production, nor from the new public management systems that values measurable outcomes from scientific work. In this sense, when or if we challenge the natural place given to AI in science, we should recognize, in classic STS style, that it is not just a question about the technology and its capabilities, it is also about culture and context. And while academia's ability to shape the flows of money and innovation in Silicon Valley is limited, we do have more

(albeit also limited) power to change our own culture and we need to rise to this challenge.

Given the associated pressures with the current AI hype, we are happy and encouraged by how authors and reviewers in NJSTS are resisting the temptation to delegate the important tasks of authoring and reviewing science to AI.

More than ever, we need to think through the lens of care when doing academic work; in collaborations, in our methodology – but also for ourselves. The curiosity that drives more or less structured explorations of literature, the burst of joy that comes from co-authors finally establishing categories that explains the data in desired ways, the pleasure of mastery that comes from honing of one's craft of structuring a solid and convincing argument. The pleasures and joys of science might seem a strange thing to care about, after all science is expected to be objective and serious. We often underestimate pleasure as a motivating force, both in life and in science. The social contract exists because science is useful and good for society, but for us as individual scholars, the pleasure of producing insights, to see patterns and explain them, in seeing your knowledge affect the world, are far from inconsequential. When we delegate this work to a machine, and automate the process of finding, we are denying ourselves the pleasures that comes with figuring things out. As the physicist Richard Feynman said "If you're not having fun, you're not learning. There's a pleasure in finding things out."

If we do not care for our own curiosity, joy and pleasures from science, we risk losing something important; something essential that drives us toward new ideas, methods and perspectives. Towards new horizons and ideas, instead of using a machina that looks back (on its dataset) to produce something that can be published.

If we are to attempt some kind of summary of our thinking around AI in academia, is that it in many ways highlights the subjective and the social dimensions of science. The subjective in that is shapes not only our cognitive but also emotional processes around writing and discovery. And social, in the sense

that it relies on, and places pressures, on the social institutions and relationships that underpins science. This means that now, more than ever, do we need to understand knowledge as social endeavor, and the ways in which science is changing together with new social constellations. For STS that means we need to keep investigating the social, technical and cultural dimensions of knowledge and knowledge production, and that ways they are intersecting with new and changing institutions and technologies. This issue includes two articles, both of which engage with the theme of collaboration in academia. In the article by Umantseva, Dupret, and Lazoroska (2025), a literature review was conducted on the care concept in research collaborations. Both external collaboration and internal dimensions of collaboration were identified and reflected upon the care ethics. Meanwhile, an empirical case on co-design approaches was presented by Bråten, Aalto, Liste, and Nilsen (2025), to showcase that how such external collaboration, rural communities with the municipalities, can bring in the care bridge the abstract policy concepts and the everyday rural practices. Both papers echo with the care concept in the academia: at this particular moment, we urgently need to think about the care ethics, what care concept means and how, as an academic community, we might reinterpret it and put into our practices, not only in our everyday work but also bring its values into the society.

The social dimensions of knowing remain highly relevant and important. Both as new technologies are socialized into everyday life and scientific practice, and as scientific institutions and constellations change and open for new forms of collaborations. To highlight this we have chosen a cover image that to us reflect this sense of a collective and messy endeavour. The artist Geralt has aptly named it "people-social-game-team-teamwork", an apt example of a title that is relatively uninspiring to a human audience, but is legible for a machine and thus easily searchable (and thus usable) in our datafied and algorithmically directed life.

Shan Wang & Kristine Ask

References

- Crawford, K. (2021). *The atlas of AI: Power, politics, and the planetary costs of artificial intelligence*. Yale University Press.
- Haraway, D. (2016) *Staying with the trouble making kin in the chthulucene*. Donna J. Haraway. Durham ; London: Duke University Press.
- von Eschenbach, W.J. (2021). *Transparency and the Black Box Problem: Why We Do Not Trust AI*. *Philosophy & Technology*, 34(4), 1607–1622. <https://doi.org/10.1007/s13347-021-00477-0>
- Xu, Z., Jain, S., & Kankanhalli, M. (2024). *Hallucination is inevitable: An innate limitation of large language models*. arXiv preprint arXiv:2401.11817.

CONDUCTING CARING COLLABORATIONS IN SOCIETALLY ENGAGED RESEARCH:

A literature review

by Anna Umantseva, Katia Dupret & Daniela Lazoroska

This article presents a conceptual literature review on the topic of care in research collaborations. The review covers 27 articles that complied with our focus. Based on the findings, we call for an increased acknowledgement of external collaborations (with external stakeholders) versus internal dimensions of collaboration (within research institutions). With regard to internal dimensions, we underline the role played by subjective motivation and working conditions, which impact the possibility of building impactful collaborations. In terms of external dimensions, we highlight the role of temporal constraints, which discourage the development of trust with societal actors, and the importance of power relations between researchers and participants. Finally, we identify dimensions which cut across the internal and external, such as affect, normative framings of research and measures of excellence. We conclude that the performance of caring collaborations is often constrained by measures of excellence, institutional constraints and policy regulations.

Keywords: Collaboration, social innovation, ethics of care, societal engagement, working conditions, democratic participation

Author: Anna Umantseva, Postdoctoral researcher
Department of People and Technology, Roskilde University, Roskilde, Denmark

Katia Dupret, Associate Professor
Department of People and Technology, Roskilde University, Roskilde, Denmark

Daniela Lazoroska, Lecturer
The International Institute for Industrial Environmental Economics, Lund University, Sweden

Licensing: All content in NJSTS is published under a [Creative Commons Attribution 4.0 license](#). This means that anyone is free to share (copy and redistribute the material in any medium or format) or adapt (remix, transform, and build upon the material) the material as they like, provided they give appropriate credit, provide a link to the license, and indicate if changes were made.

Introduction

The focus on societal engagement and collaboration in science stems from the general objective of improving the science–society relationship by increasing the public's participation in science, orienting research towards societal challenges, and reinforcing democratic governance of science, where society has rights and responsibilities (Michali & Eleftherakis, 2022). A number of scientific and policy frameworks have played a role in shaping cross-sectoral and transdisciplinary research collaborations; for example, participatory design (Bratteteig & Wagner, 2016) or triple and quadruple helix (Carayannis & Campbell, 2010). One such framework is responsible research and innovation (hereafter RRI), which has placed a renewed emphasis on societal engagement and collaboration (Bauer et al., 2021; Rip, 2014). RRI adds to the other frameworks in that it has a specific focus on how cross-sectoral science collaborations hold ethical methodological and output responsibilities that are specifically related to the stakeholders involved in all stages of the collaboration and research process. RRI has grown to become an important concept at policy level (European Commission, 2011) – for example, as part of the European Framework Programmes such as Horizon 2020 – and was first used in the 7th Framework Programme (Regulation (EU) No 1291/2013) that highlighted cooperation between research and society (Burget et al., 2017). RRI has also become a burgeoning field of academic research (Dupret et al., 2022), and we take it as our focal point into a theoretical and empirical field that takes collaboration seriously. We call for a renewed exploration of the

complex dimensions of collaboration, as it can provide us with insights about the dynamics and tensions of the relationships involved. We thus build on growing research that explores the value of the ethics of care for deepening the understanding of collaborations as embodied practices situated within institutional conditions (Dupret et al., 2024; Groot et al., 2019; Sheel et al., 2020).

We therefore address care in collaboration, as it can support the approach to collaboration that goes beyond a distribution of (scientific) knowledge, but frames science as having an obligation to engage in the development of society in a more just and inclusive manner. We engage with feminist ethics of care because it provides us with an opportunity to reimagine how research can be performed (Pellé, 2016) with an explicit self-reflective approach for researchers to engage with the dimensions on how and what to care about (Puig de la Bellacasa, 2017) and enriching the process of co-learning and co-becoming, challenging the productivity paradigm centred on publications and high research performance (Johansson et al., 2024). In relation to collaboration, being the central node in the analysis, we address tensions of private/public divisions widely addressed by feminist scholars, making them visible in the context of collaborations within and outside organisations. The following research question guides the investigation:

What are the implications of the care ethics literature for responsible scientific collaborations?

Theory: the different approaches to collaboration with external partners

This section outlines the different approaches to collaboration within research, with the academic and policy-based approaches to collaborations as commonly recurring in the literature. Collaboration is herein understood as the inclusive and collective pooling of resources, such as participants' time, ideas, knowledge, motivation and/or networks, towards a commonly defined goal (Dupret et al., 2024), while societal engagement in research refers to societally relevant research that cultivates collaboration and engagement among different social actors (Dupret et al., 2023).

Cross-sectoral collaboration in research

The negotiation of needs, concerns and priorities in research collaborations have different arenas of materialisation. Different kinds of actors and sectors of society are engaged, with different epistemological foci and aims (Dahlin-Ivanoff et al., 2024; Leydesdorff & Ivanova, 2021; Johansson et al., 2024). The so-called triple-helix model (or the collaboration between universities, government and business), spearheaded in the mid-90s (Leydesdorff & Etzkowitz, 1996), has long been highlighted as critically important for successful economic and social development (Miller et al., 2018) but did not include a focus on (civil) society. The follow-up analytical

and normative quadruple-helix model of innovation recognises four major actors in the innovation system: science, policy, industry, and society and the need for openness and co-creation of universities' knowledge and technology transfer with research and innovation users' engagement at various stages of collaboration (Carayannis & Campbell, 2009). The quadruple-helix model is more inclusive in its incorporation of the public via the concept of a 'media-based democracy'. It is done through a policy approach of the importance of the political system (government) and its influence in developing the economy through its innovation policy. The argument goes that the innovation policy must be communicated 'adequately' via the media in order to obtain public support for new strategies or policies. It approaches civil society as an actor that is to be informed about the policies rather than collaborated with.

Care ethics – in relation to collaboration and societal engagement

There is a growing academic interest in how feminist ethics of care and the broad concept of care can be used to foster and reimagine research collaborations (Carrigan & Wylie, 2023; Hakkim, 2023; Scheel et al., 2020; Bergmark et al., 2023; Groot et al., 2019).

Groot et al. (2019) suggest that viewing research collaborations through the ethics of care lens is useful for revealing the aspects of collaborative research which are rarely documented in literature, such as invisible labour and emotional work. Other works explore how applying ethics of care (by focusing on relational approaches and cultivating attention to different positionalities of individual researchers and research participants) to develop collaborative methodologies helps to enhance reflexivity about knowledge production, increase trust and challenge power relations in collaborative research (Scheel et al., 2020; Bergmark et al., 2023). Care has increasingly become an important point in science and technology studies (STS) (Friese, 2013), with researchers exploring temporal (Puig de la Bellacasa, 2015), relational (Harmann, 2024), and emotional (Dupret et al., 2024) aspects of care in STS, as well as reflecting the non-innocent, often invisible, and potentially harmful dimensions of care (Murphy, 2015; Dupret et al., 2024), or pointing to the often gendered or hierarchized aspects of care in STS (Pinel et al., 2020).

The ethics of care emerged in the early 1980s through the writings of feminist thinkers. The so-called first generation of ethics of care studies saw it as closely related to women and social care, while second-generation care studies interpreted care beyond the domains of gender and healthcare, simultaneously attempting to detach care from normative values such as kindness and generosity and, instead, frame care from a social-political perspective (Leget et al., 2019).

The ethics of care, however, has from its beginning not been a homogenous concept. Generally, several main framings of ethics of care are distinguished (Edwards, 2009). Firstly, the ethics of care approach that can be attributed to the works of Carol Gilligan (Gilligan & Attanucci, 1988), who identifies two distinct approaches to moral problems – ‘ethics of justice’ and ‘ethics of care’ from a social psychological perspective. In the former, moral questions are approached by developing rules and regulations, while in the latter the focus is more on contextual factors. (Edwards, 2009). Gilligan applied this theory to explore patterns in decision-making in boys and girls from a socio-psychological perspective and aimed to shed light on girls’ neglected perspectives on morality, which could inform an ethics that takes care into consideration. This strand of care ethics developed in a philosophical approach applied to various empirical fields, often detached from gender differences. For example, regarding research collaborations and research in general, Gilligan’s version of care ethics has been increasingly applied in conceptualising collaborations and relations between science and society (Ruggui, 2020).

Another prominent version of ethics of care can be attributed to the political scientist Joan Tronto (1993, 1998), who places the practice of care more centrally in human life, because care is a fundamental aspect of life that is often overlooked. Tronto develops an ethics of

care as a contribution to political philosophy, arguing that more focus on caring relationships can introduce a new, different set of social arrangements that challenges existing power relations (Edwards, 2009). Tronto argues that, firstly, care should be thought of as a fundamental state of individuals (receiving or giving care at different stages of life), and secondly, that care must be given more space and recognition as a part of ‘institutions, societies, even global levels of thinking’ (Tronto, 1995, p. 145).

Tronto’s framing of ethics of care plays an important role in more recent conceptualisations of care by María Puig de la Bellacasa (2012; 2017). Puig de la Bellacasa draws on Fisher and Tronto’s definition of care as ‘everything that we do to maintain, continue and repair “our world” so that we can live in it as well as possible. That world includes our bodies, ourselves and our environments, all of which we seek to interweave in a complex, life-sustaining web’ (Tronto, 1993, p. 103). Drawing on the relational aspect of this definition, Puig de la Bellacasa furthers the care ethics focus on the relations and interdependence between all human as well as non-human entities, hence in her reading care is ‘ontological requirement of relational worlds’ (2012, p. 199). With contributions by empirical philosopher Annemarie Mol and psychologist Jeanette Pols, she expands on the concepts of care in ways that emphasise its relational, ethical, and political dimensions. In particular, Puig de la Bellacasa adds a wider ethical and political dimension to her concept of care and care ethics in that other species and environments are to be considered. In addition, she introduces speculative thinking into the discussion of care, encouraging scholars to think beyond existing structures and practices. This speculative approach allows for the imagining of new forms of care that are not yet realised but are necessary for creating a more just and sustainable future. Puig de la Bellacasa’s speculative ethics challenges us to rethink our relationships with the world in ways that foster care for marginalised beings and ecosystems, opening up possibilities for new forms of solidarity and coexistence that go beyond the actual practices of care in our everyday collaborations. Puig de la Bellacasa offers a non-predefined, non-idealised version of care ethics that acknowledges that care has space for contradictions, tension, asymmetrical power relations and even non-innocent and brutal exploitation, and the question ‘how to care’ in the relational world adds important dimensions to previous contributions in that our responsibility reaches into the future, since it is speculative (and contextually and practically defined).

Care is also one of the main concepts in feminist political economy and work-life research, where care labour (often considered as gendered) is viewed as undervalued and exploited within the predominant understanding of the economy as rational action with the purpose of capital maximisation (Bauhardt, 2018).

Drawing on these strands, this literature review positions care as a

'doing', as 'ethico-affective everyday practical doings that engage with the inescapable troubles of interdependent existences' that raises the speculative question *how to care?* (Puig de la Bellacasa,

2012, p.199). We explore how academic publications approach care in research collaborations, addressing methodological, institutional, and emotional implications.

Methodology

We conducted a conceptual literature review with the aim of identifying and exploring relations between the key concepts which emerge when researchers approach responsible collaborative research from a care perspective (Kennedy, 2007; Snyder, 2019). To select the articles for this review, we searched three databases: Scopus, ProQuest and Web of Science. For the search we used three clusters of keywords. Firstly, we used 'responsible research' OR 'RRI'. The second cluster included terms related to the care ethics framework: 'care ethics' OR 'ethics of care' OR 'Tronto' OR 'Bellacasa'. The third cluster combined keywords related to the theme of societal engagement in research: 'collaborative research' OR 'collaboration' OR 'societal engagement' OR 'participatory' OR 'co-production' OR 'co-creation' OR 'civil society' OR 'triple helix' OR 'quadruple helix'. This third cluster of keywords was used to strengthen the focus on interaction between science and society in the search results. The article needed to engage with at least one term from one cluster to be included in the final selection with the aim of identifying literature that engages with collaborative research practices within the framework of RRI, from an ethics of care perspective.

The search returned 129 results. The next step was to manually exclude results which were irrelevant for the review. The main exclusion criteria we used were:

- 1) The article does not sufficiently engage with the ethics of care.

This category included literature that, for example, used the concept of care in a literal rather than theoretical/conceptual sense. By literal sense we mean, for example, healthcare (Ramvi et al., 2021) or robots as caregivers (Coghlan, 2021). Neither was the article selected if care ethics was only briefly touched upon; for example, in the reference list.

- 2) The article does not sufficiently engage with responsible research and innovation, collaborative/engaged research.

Articles were excluded when the collaborative/engaged research aspect of RRI was not in their scope; for example, articles focusing on technological innovation design without explicit user engagement in their methodological considerations. A total of 27 articles were selected for the final analysis.

The 27 selected articles comprise 11 empirical and 16 conceptual papers (see the overview in Table 1). The conceptual studies contribute to the conceptualisation of the diverse elements of responsible collaborative research from the perspective of care ethics. The methods used in the empirical studies are qualitative research, including ethnography of research practices, interviews with research teams, and auto-ethnography. The blend of conceptual and empirical works in this review allows for a comprehensive overview of what main themes, concepts and recommendations emerge if responsible research collaborations are approached from care ethics perspectives, and what conclusions unfold if research practices are empirically approached from care perspectives. In the conceptual articles, we analysed how the ethics of care shape theoretical frameworks and principles of collaborative responsible research, as well as critiques of existing practices. Empirical articles allow us to identify what conclusions are drawn when care ethics are used as a lens for analysis of collaborative research environments.

To summarise the findings, we used thematic analysis. The articles were carefully read, often several times, to identify different thematic categories, which were compiled in the thematic tables. Then the categories were refined, incorporated within existing categories or deleted, depending on the frequency of mentions. This exploratory analytical strategy allowed us to identify different aspects of research and academia which shape care in collaborations, such as methodological choices, relations within research groups, institutional and research evaluation structures, research paradigms, etc. This allowed us to map out the loci and levels of care in research.

This conceptual literature review was conducted to identify the core ideas and theoretical perspectives that shape collaborative research within a care ethics perspective². The process of literature analysis was informed by work on redefining responsibility in research and innovation (Dupret et al., 2022). Additionally, a reading group was formed among the members of the research team. On a weekly basis, articles were selected from the review, read and discussed by the members to validate the analytical themes.

¹ We were interested in exploring the literature that, to a greater or lesser extent, analyses responsible research collaborations from a theoretical perspective of care (which does not exclude practices of care). However, since care is a concept that can be used in many contexts, the initial search that used just 'care' as a key word returned most of the literature that focused on analysing care in a narrow sense – in terms of medical and nursery care. To avoid this skewing, we added 'key scholars of care ethics' to the key words.

² It was part of scientifically validating the collaborative research methodologies and best practices as part of a European scientific and educational alliance project (RE:ERUA). For more information on the project, please see Acknowledgements.

TABLE 1

Empirical		Conceptual	
	Dimensions of collaboration addressed		Dimensions of collaboration addressed
Pandey 2020	External	Jenkins et al. 2020	External
Endaltseva & Jerak-Zuiderent 2021	Mixed	Ruggiu 2020	External
Sylvestre et al. 2018	External	Agate et al. 2020	Internal, mixed
Loman 2015	External	Francis et al. 2021	External
Smolka et al. 2021	Internal	Codeiro-Cruz 2021	External
Sigl 2019	Internal	Reber 2018	External
Rivard et al. 2021	Mixed	Coenen 2016	External
Davies & Horst 2015	Internal, mixed	Randles et al. 2022	External
Brun 2009	Mixed	Albertson 2021	External
Latimer 2019	Internal, mixed	Timmermans & Job 2020	External, mixed
Herron & Skinner 2013	External	Beauchemin 2022	External
		Pellé 2016	External
		Tolbert et al. 2018	External
		Groves 2015	External
		Mejlgaard 2019	Mixed
		Latimer & López Gómez 2019	Internal, mixed

Table 1: Distribution of the selected articles according to their methodologies and analytical dimensions of collaboration

Analysis

In the analysis of the articles, we focused on mapping out what is understood by 'caring collaborative research', what is required for reinforcing this type of research, and what is at stake if conditions do not allow these practices to be carried out. We started the analysis by identifying the primary thematic patterns that addressed the directions in which caring collaborative research can take place.

We then grouped them into external or internal dimensions of collaborative responsible research, or a mix of both (see Table 1 for the overview). By external we mean collaborations with societal actors, end-users and research participants. By internal – collaborations within the teams of colleagues and management. Following Felt (2017), we recognise that researchers' responsibility to non-academic stakeholders and societal values, which is the core of RRI, can only be considered if researchers' emotional, social and institutional environments are taken into account and centered in RRI policies. Hence, we choose to differentiate between internal and

external dimensions of caring collaborative research in the analysis to highlight that care in research collaborations is required not only vis-à-vis societal stakeholders, but also, inseparably, towards, researchers themselves, and their immediate working environments.

The external and internal dimensions of caring collaborative research are inherently interconnected, and excluding one of the dimensions can become prescriptive and even exploitative, hence we argue for attention to both the external and the internal dynamics of caring collaborations. Research on cross-sectoral collaborations traditionally focuses on outputs, and responsibility dimensions such as anticipation, reflexivity, and inclusion are important to ensure that research does no harm and in fact serves the common good. However, the internal dimensions of collaboration cannot be detached from the outputs. The relations and methodologies that are applied, the way power relations and institutional practices are enacted internally, are interrelated and embedded with external

relations. We acknowledge the danger of dichotomising the public and the private, the society and the research when explicitly differentiating between external and internal dimensions as these dimensions in practice are inherently interwoven. However, by analytically visibilising the two dimensions, we are at the same time also showing the interdependence of caring relations with societal stakeholders and caring relations with more immediate environment. This can provide a heuristic device to reconsider the directions in which caring exchanges flow in their particular conditions, where they might be hindered, and the reason for this. Hence, in the following sections we approach external and internal dimensions as analytically distinct to explore how the care ethics approach frames these themes.

The first section discusses which elements constitute caring collaborative research with societal stakeholders, or so-called external collaborations (see Figure 1). This topic focuses on relations between researchers and participants, the importance of strengthening participatory methodologies, and the co-creation of knowledge, and explores the requirements for caring research

collaborations with external stakeholders.

The second section of the analysis delves into questions related to what we identified as the internal aspects of collaborative research – collaborations within research institutions, for example, in cross-disciplinary research teams. In this section we first look at how we understand our roles as researchers, the way we connect and know about the world (i.e., the subjective approach), and why that matters in collaborative research. This section maps out collaboration through the prism of researchers' lived experiences and perceptions of how they build collaboration in their daily tasks. We further distinguish the subject of researchers' working conditions and how researchers' well-being influences the possibility of building meaningful collaborations.

Finally, in the third section we identify the topics which cover both external and internal dimensions: the role of affective and embodied experiences in collaborations, as well as how normative framing of research and situatedness within measures of excellence frame possibilities for caring collaborations.

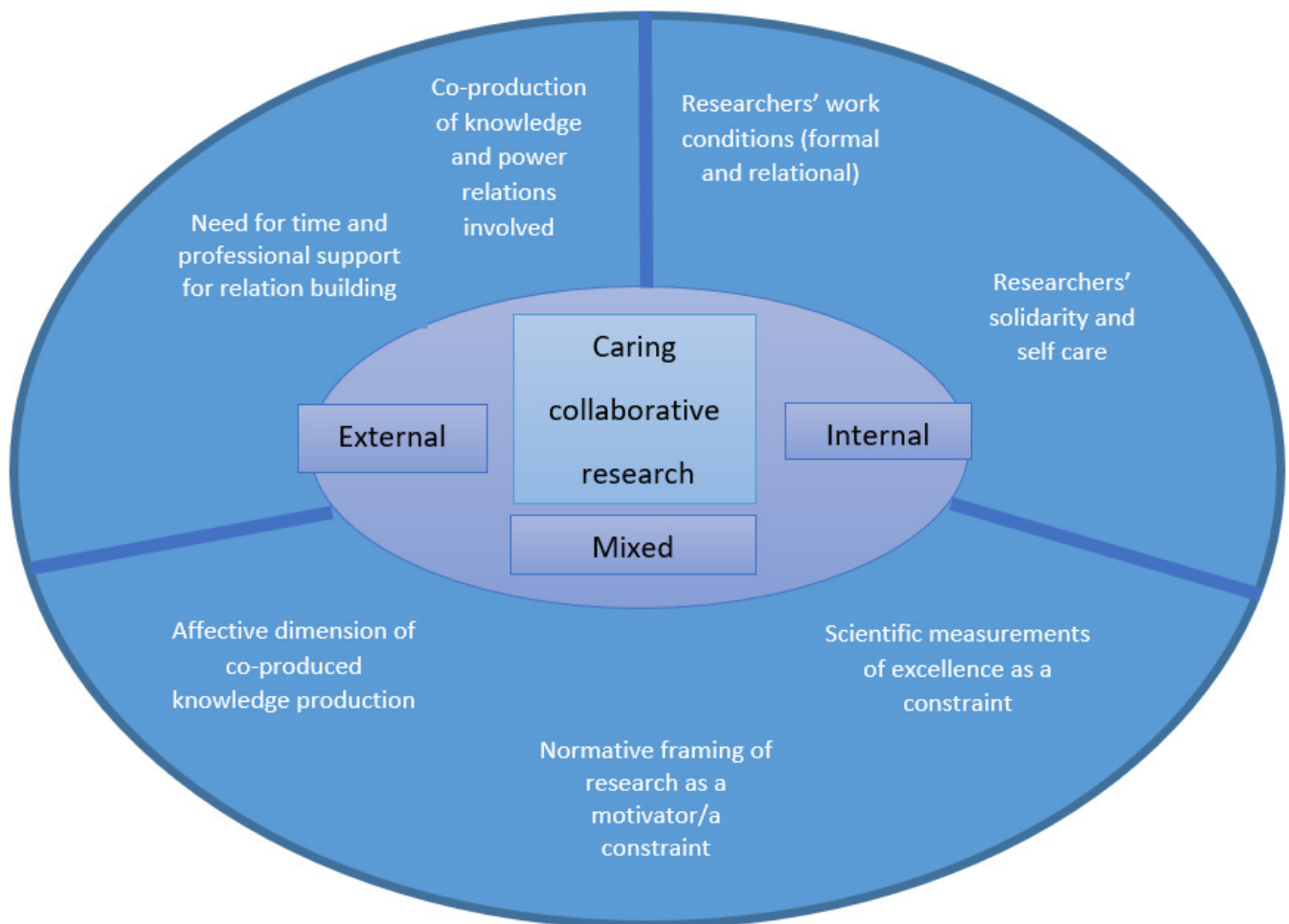


Figure 1. Analytical themes

Analysis part 1. Collaborations with external stakeholders: what constitutes caring collaborations between researchers and societal stakeholders

Co-production of knowledge and power relations between researchers and research participants

An array of articles (Tolbert et al., 2018; Pandey, 2020; Herron & Skinner, 2013; Sylvestre et al., 2018; Codeiro-Cruz, 2021; Francis et al., 2021) discuss how the ethics of care can be a way to change and challenge relations between researchers and research participants. The articles can be summarised as an attempt to rethink the objective of engaging participants in research, which, as suggested by these articles, is not primarily to produce knowledge or contribute to the research field, but to *care* about the research participants, their needs and well-being. However, a common thread that was identified in this literature is the lack of attention to constraints and the danger of exploitation that care can provoke, which we discuss further in this sub-section.

This topic focuses particularly on rethinking power relations in the production of knowledge to avoid 'objectification', in the sense of speaking for instead of speaking with participants in the research process (Tolbert et al., 2018). This approach explicitly posits research as a practice that can be caring. Some articles associate caring academic practices with the aims and processes of decolonising research (Codeiro-Cruz, 2021; Francis et al., 2021). For example, Codeiro-Cruz (2021) suggests the need for decolonising knowledge co-production between researchers and technology recipients, which involves researchers engaging in a dialogue of knowledge and reflecting on their positioning, values, and worldview. Following Codeiro-Cruz (2021), decolonisation of knowledge is the opposite of paternalism, of 'doing *for* or *in the place of* the colonized/oppressed/subaltern' (p. 1852), which means engaging in listening instead of merely delivering solutions, and not impinging on the other's views and decisions. It is suggested that these processes are inseparable from nurturing 'care as affective bonds' in the research field (p. 1858). Similarly, Sylvestre et al. (2018) suggest that giving 'the power to dictate the terms of care' (p. 763) is an important dimension of caring, even if this implies that participants refuse to take part in research, especially in contexts where 'responsibility' and care towards communities by settler-colonial states traditionally implied oppression and violence. These points raise a broader discussion about participative methodologies – questioning to what extent and how participants, especially vulnerable groups, can lead collaborations, including instances of refusing to collaborate if they consider that their voices are not sufficiently integrated. The authors suggest that responsible and caring methodology cannot be 'prefigured or researcher ascribed' (p. 763), and research participants' power to shape (or refuse) what is perceived as care from the part of the researchers should be inscribed in caring collaborations.

Pandey (2020), drawing on Puig de la Bellacasa's (2015) conceptualisation of care as cultivating attention to multiple relationalities between humans and non-humans, similarly argues for a transition in the technical sciences away from technological fixes of 'a singular, disconnected problem' (p. 251) to engage in understanding a complex nexus of interdependencies, relations and vulnerabilities

around the research problem. The authors illustrate this point with a research project related to farming practices where researchers engaged in participatory research instead of following their mandate to develop technical solutions. They engaged in dialogues with participants, aiming to create trusting spaces where multiple dimensions of concern could be shared, related to economy, institutional affiliation and peer pressure. This research process revealed an array of renegotiation of relations which shape the farmers' decision-making, including extractivist and exploitative production and market environments, decline of 'sociocultural institutions of community' (p. 252), and the loss of local knowledge.

Another point often raised within this topic is how the concept of care can be a guiding principle in reassessing what responsibility, relevance, and impact mean in collaborative research. Herron & Skinner (2013) and Tolbert et al. (2018) suggest that the relevance of research is too often approached from the viewpoint of contribution to an academic field, and there is a need for viewing its relevance in terms of responsiveness to participants and the transformative impact of academic work on participants' lives from their point of view. Democratising dissemination practices (sharing and verification of research results with the participants and with audiences outside academia) is proposed as one way to support this transition.

Brun (2009), Agate et al. (2020) and Sylvestre et al. (2018) discuss how collaborative responsible research requires time and resources – for prolonged fieldwork, for developing trusting relations with the participants. Agate et al. (2020, p. 4) argue that 'careful and caring scholarship' – one where the process matters as much as the output – needs time, reflexivity and attention, which are often in conflict with institutional cultures of quantifiable research evaluations and production metrics, such as publishing and quotations.

For all the above articles, care means changing the power relations between researcher and participants to make them more egalitarian and democratic, or giving research participants more power of voice, ownership of research, etc. This is done through methodological changes (e.g. Pandey, 2020), through reflexivity, and through changing what research relevance and impact means. This signifies a movement from contribution to the field to transformative effect on participants' lives (Tolbert et al., 2018; Herron & Skinner, 2013). These articles call for extending what ethics and responsibility mean in research beyond standardised ethical guidelines. We are called to pay attention to affective/emotional dimensions and socio-political dimensions (e.g. by including activism as a part of academic practice), as well as to avoid the essentialisation of vulnerability and vulnerable groups (Herron & Skinner, 2013).

At the same time, we suggest that articles within this topic (although positioning their stand as critical) often lack self-reflection about the nature and directionality of the care they propose. Making relations with participants more participatory and egalitarian – and therefore

more caring – can be criticised as a rather one-sided view of what ‘good’ and ‘caring’ methodologies and relations with participants are. Most of these articles view lengthy development of trust and reflexivity in relations with participants as a desirable path towards cultivating care for the well-being of research participants. As Puig de la Bellacasa (2012) points out, ‘care can be consuming both for the carer and the cared, care can devour their lives, (...) can asphyxiate other possible skills’ (Puig de la Bellacasa 2012, p. 209). We found that the challenges and constraints that care and its exercise can

pose in relation to socially innovative research collaborations were insufficiently addressed (with the exceptions, perhaps, of pointing out the time constraints and acknowledging that care in research can be oppressive because it can reproduce colonial violence). To conclude this section, analysing collaboration with external participants from the angle of care highlights the participatory dimension of collaborative experiences with the focus on researchers’ responsibility to societal actors, and the great need for sensitivity towards power relations inevitably framing the collaborations.

Analysis part 2. Internal dimensions of collaborations

Internal dimensions of research collaborations correspond to collaborative experiences which are related to interactions with other researchers within the research teams (often in cross-disciplinary settings), as well as with other actors in the research institutions. This section, therefore, reflects collaborators’ subjective experiences and perceptions of the collaboration and how these experiences are produced by institutional positionality and working conditions.

Caring about the researcher’s institutional positionality

The following articles relate to researchers’ care for the self and their own position and role in an institutional dynamic and to the infrastructural support to conduct societally engaged research that they might or might not have (Agate et al., 2020; Sigl, 2019). Sigl (2019) suggests that research cultures and academic knowledge are shaped by the interaction of the researcher’s agency and their research environment. The author records and analyses researchers’ experiences with the question of responsibility in research practice, showing that dimensions of responsibility in research are experienced along two lines: one, with responsibility perceived as a bureaucratic, strategic tool to get funding by including some ‘standard sentences’ into grant proposals; and the other, with researchers caring deeply about doing research to improve societal well-being, to engage societal stakeholders. In the latter type of cases, researchers tend to detach themselves from external expectations, framing them as bureaucratic procedures, but not from societal responsibilities and engagement with the public. In these articles the notions of responsibility and care are not limited to the outcomes of their research (Agate et al., 2020; Sigl, 2019). They care about people in their labs, their careers and well-being; they care about continuing to be curious in their research, about creating and maintaining a network of people with shared research interests. Sigl (2019, p. 132) concludes that policy tools in research ‘never work in direct ways but are mediated by how researchers interpret, evaluate, and act upon them’.

The articles in this section raise the important issue of lack of attention to subjectification and social relations as a methodological procedure for understanding how external requirements, such as focus on societal engagement, are perceived, interpreted and lived by researchers. This focus on subjectification, according to the authors, would contribute to understanding how researchers

co-produce the worlds of research, co-creating the external requirements through their lived experiences.

The importance of researchers’ working conditions for conducting caring collaborative research

Interestingly, although this review was prompted by interest in collaborative research, and societal engagement in science, the studies show that many themes revolve around the researchers themselves: the values and motivations of scholars (Davies & Horst, 2015), devalued labour, unrecognised by traditional metric measurements (Agate et al., 2020), as well as emotional and affective elements of knowledge production (Smolka et al., 2021; Latimer & Gómez, 2019). The articles reviewed address what needs to be in place so that researchers can care for societal engagement and impact, and point to the role of adequate research support and the importance of researchers’ professional well-being.

From the articles reviewed, we see that care in collaborations is approached not only as having ‘external’ engagement as a focus of one’s activities, but also as the internal and immediate work environment and team. The team and collaborators could act as the main locus of one’s action and agency. Like Sigl (2019), Davies and Horst (2015) base their article on conversations with researchers to explore how they understand responsibility in research. Through their fieldwork, however, it became apparent that although scientists are concerned about responsibility in their research to society at large, in the interviewed researchers’ narratives the focus of responsible research was situated on the research group itself, as responsibility for the well-being and good dynamics of the research group and of the researchers themselves. The authors noted that the site where responsibility is located and performed was the research group, rather than the broader and more abstract locus of society – which differs from the definition of RRI in policy. For the interviewed researchers, responsibility for broader societal issues was inseparable from creating a good working environment.

Several authors list institutional structures as a general barrier for caring research. For instance, following Brun (2009), for caring responsible research to be supported, the control of the research project must be ceded to a substantial degree, making way for

the co-construction of research. However, as the author notes, it is challenging, mainly due to the accountability of the researcher to the institutions, which rarely accept unpredictability as a valid element of research design.

From these articles we can see that in academic environments, particular distinctions are created between the private and the public. It can be described as a paradox when the societal needs of engaged and caring research create institutional procedures and cultures that are in fact counterproductive. This paradox leads to reflection on the relations of production and reproduction in academic work, in that it disregards the effect of working conditions on the academic's capacity for social engagement. These spheres in research, we argue, are intertwined, and the private constructs the public, and is therefore subject to constant negotiation and struggle – influencing, not least, how researchers can and will engage. Many of the themes raised by academics in the literature reviewed can be thought of as calls to acknowledge the crucial role of reproductive activities in generating the production of science. These reproductive activities include the relations with research participants, relations within the research group and academic institution, and relations between researchers and the scientific

paradigms they operate in. Hence, approaching responsibility in research from a care perspective suggests that responsibility and social impact often reside in the invisible dimensions of research processes, often rendered of secondary importance by institutional ethical procedures. Invisibility resonates with the non-innocence of care, in the sense that concerns regarding care ethics that are embedded in the internal relations of research are neglected and not acknowledged as important in performance indicators and institutional procedures. Yet another paradox is that thinking of these reproductive activities, following Puig de la Bellacasa (2011, p. 93), as productive labours of care and 'doings which support liveable relationalities' suggests that these dimensions of research (affects, relations) are fundamental for building responsible and caring research practices. Perhaps what is needed is not more requirements and measurements of social impact and societal engagement coming from policy framing of responsible research, but attention to how collaborative research is constructed through 'bodies, emotions, and the private realm' (Davies & Horst, 2015, p. 375). This of course raises important questions about how the power dynamics that influence 'how to care' in ways that also attend to the internal dynamics are negotiated, as well as on policy level, which resonates with Tronto's approach to care.

Analysis part 3. Crossing boundaries: conditions of caring collaborations which comprise both external and internal dimensions

While the former two analytical sections addressed the external and internal conditions that frame research-society collaborations, in this analytical section we address dimensions that transcend this divide and creep across groups, stakeholders and institutions. We begin by addressing affect and its role in creating alliances and communities. We then go on to address cultural norms and the ways their internalisation affects what is perceived as 'good scholarship'. Finally, we address the (constraining) effect that measures of excellence have on developing caring research-society collaborations.

How can caring research collaborations be conceptualised through affect and what does it offer to our understanding of societal engagement?

An emergent theme that applies to collaborations with external participants and to internal dimensions of collaboration is the importance of affect as different ways of doing research and producing knowledge.

The following articles can be summarised as exploring how research collaborations (with human and non-human research objects, with colleagues, with others present at academic institutions and research sites, with our own bodies) can be meaningful and joyful. Following Davies and Horst (2015, p. 375), care in responsible research gives attention to the invisible dimensions of scientific practice – 'the private, emotional, embodied, messy, and insoluble,

as opposed to the calculable and controllable'. Latimer and Gómez (2019), reflecting upon care, affect and intimacy in the construction of scientific knowledge, note that research is traditionally viewed as a 'protocolised activity' (p. 251) where intimacy – affective, emotional, bodily dimensions – are viewed as dangerous, unethical and a source of bias. The authors view affect as an emotional dimension of research activity, while intimacy refers to a broader dimension which combines the affective and the material (emotions and the body). Referring to feminist studies of technoscience which highlight the value of affect and embodiment in knowledge production, the authors suggest that bringing affect and intimacy into the methodologies of science and technology can challenge the erroneous neutrality of sciences:

Bringing to the fore the more-than-human intimacies that configure the current modes of doing science and technology, we believe, is also a way to politicise them and even to offer a mode of resistance to the entanglements that emplace and position them. (Latimer & Gómez, 2019, p. 254)

For Latimer and Gómez (2019), affect and intimacy transform the notions of collaboration and inclusion from instrumental tools for achieving socio-economic goals to 'possibilities of our being-in-common' (p. 280) and creating collective attachments around things researchers and participants care about. The notion of intimate entanglements – paying attention to the affective and material

practices that form scientific knowledge –, broadens the dimension of inclusion in scientific processes into collective thinking. This includes humans as well as non-humans, through acknowledging that our knowledge creation as scientists is never individual and is done alongside intimate entanglements with human and non-human participants, often rendered invisible in scientific practice. This, according to the authors, includes other scientists, support staff, soils, air pollution, lab animals, and other human and non-human actors which are often othered but participate in collective knowledge-production besides the figure of the individual scientist.

Smolka et al. (2021) talk about the affective dimension as a way to rethink interdisciplinary collaborations not as strategic alliances but as spaces of reflexivity, where affective elements – notably, disconcertment – could be approached, using the body as a source and sensor, to generate knowledge, to identify epistemological differences when engaging in transdisciplinary collaboration, and hence, to facilitate recognition of what has so far been taken for granted in different disciplines. Endaltseva and Jerak-Zuiderent (2021) emphasise the need to recognise and account for embodied and affective resources of caring collaborative research, as they are often invisible and taken for granted both by academic institutions and by stakeholders. The authors point out that with the increasing strategic requirements for responsible research and innovation, including the quest for collaborations in research proposals, it is important not to take for granted 'the energy and resources required for epistemic collaborations' (p. 51). The authors understand collaboration as an embodied experience from a 'bodies-in-movement' perspective. 'Bodies-in-movement' (p. 38) is argued to be important for collaborative responsible research because a diversity of resources is required for a caring collaboration, including 'listening emotively to stories, (...) choosing a right moment for a question, overcoming fatigue and pain during the interview' (p. 42). The authors suggest that caring collaborations require time, space and resources to move back and forth – physically (to go back to the sites of research), emotionally, and epistemically (p. 42). Thus, Endaltseva and Jerak-Zuiderent (2021) argue that embodied engagement grants access to the creation of scientific knowledge in ways that challenges more instrumentalised methodologies and that this is necessary in research that cares to tend to the differences among collaborators. Likewise, Sylvestre et al. (2018), talking about a responsible deeply collaborative research, highlight the need for physical presence, physical interactions, and the bodily and affective labour they entail:

...through bodies meeting, sometimes across great distance (both socially and physically), sitting at "kitchen tables", to listen and learn in places that decentre the academic in the messy world of imperfect interactions. (p. 762)

Creating collaborative practices with attention to affective and embodied experiences can open doors for meaningful and reflexive collaborative experiences, but it is also important to take certain concerns into account, such as having to confront scientific silo

thinking, time, space and resources for them to be successful.

Normative framing of research – how different visions of what is 'good' and valid research influence collaborative research

We identified that prominent constraints for conducting caring research were created by the structures and practices of research institutions (Agate et al., 2020; Pandey, 2020). Furthermore, we identified barriers which can be described as cognitive and cultural norms. These rigidly determine the aims and limits of 'good scholarship'. According to Davies and Horst (2015), one of the main challenges for integrating care into collaborative research is general exclusion of affective elements from what is considered high-level, legitimate scholarship. Brun (2009) argues that the element of unpredictability which is essential for crafting caring research (similar to how Davies and Horst (2015, p. 375) define caring research 'as a continuous process of creative experimentation') is not constrained solely by institutional structures but also by our own presumptions of what valid academic research is. Tolbert et al. (2018) argue that the impossibility of nurturing caring research largely comes from the depoliticisation of scholarship that, on the structural level, is supported by, for instance, discouraging activism as a part of research or publication in alternative journals. The authors, however, call for resistance against these cognitive and structural norms, to 'promote creativity (vs. standardisation), critique, and transformation of unjust educational conditions and opportunities' (p. 800).

The issue of research commercialisation is another common concern found in the literature, as it is seen to create obstacles for developing caring responsible research. Mejlgaard et al. (2019) draw attention to the predominant paradigm that requires universities to contribute to societies by focusing on 'strengthening commercialisation, industrial relevance, and technology transfer rather than the more complex issues related to democratisation of alignment with societal values' (p. 610).

In summary, the authors suggest that activities and methodologies which constitute caring collaborative research can often be located outside the boundaries of what is considered 'valid' research by institutions or the general public. Caring collaborative research can require blurring the boundaries between, for instance, research and activism, or including affective methodologies. Hence, there is a need for expanding the spectrum of what kind of research is considered responsible so that it includes a diversity of methodologies and approaches.

Caring collaborative research – is it compatible with scientific excellence?

This section comprises articles which generally criticise the institutional structures of academia which are unable to provide conditions for accommodating care in research practices. In this regard, the articles in this section can be positioned alongside Tronto's approach to care ethics – a critique of undervaluing care as a building-block of society and suggesting reforms of institutional

structures to accommodate care – as well as alongside care as viewed by feminist political economy.

The rigidity of measures of excellence (publications, citations, h-index) employed in universities to quantitatively measure and evaluate the output of researchers' work is a common concern. Firstly, according to Agate et al. (2020) these measures of excellence do not reflect and reward many of the activities researchers engage in (e.g. building trusting relations with research participants, public dissemination of research, work promoting diversity and inclusion, etc.) which are the basis of caring collaborations, and can generate a different kind of impact than, for instance, research publications. Secondly, the rigid evaluation metrics can limit researchers in acting upon the values which drive care for the world, instead succumbing to the logic of academic competition (Agate et al., 2020). Several of the articles argue for the change in how excellence in research is evaluated, stating that its nature/rigidity is destructive of caring responsible research and even counterproductive to societally engaged research. Mejlgaard et al. (2019) suggest that universities are change-averse institutions, and the mainstream interpretation of research excellence has not adapted to the shift towards responsibility in research and innovation, if responsibility is interpreted as giving care in researchers' daily tasks 'to public values, to the anticipated positive and negative consequences of their praxis' and including reflexivity in their work (p. 611). The authors suggest that the measures of excellence and impact favour more instrumental and technical aspects of research outputs such as counting citations in highly profiled journals where research is published, as well as patenting the research results (prevalent in the fields of natural science and engineering and computer sciences) – components which are often incompatible with the ideas of care in research collaborations, especially in social and human science, and particularly within fields that work with, for example, action research, interventions, social design, social change, systemic and social innovation that involve participatory and empowering methodologies.

Agate et al. (2020) share the view that the role of research and educational institutions must shift towards supporting and encouraging the values which drive caring and responsible research, instead of suppressing them by competition-driven institutional culture, largely reflected in rigid measures of excellence. The authors suggest that current excellence metrics and evaluation mechanisms sustain 'an impoverished definition of scholarship' (p. 6), restricted to a limited number of academic products 'counted as artefacts of scholarship in isolation from the broad array of processes and practices that contribute to their creation and enhance their quality' (p. 6). The authors therefore suggest reorienting measures of excellence towards attending with sensitivity to others' circumstances, cultivating trust, responding to needs, as well as aiming at the well-being of others and oneself. The authors thus propose setting an agenda to explore, firstly, the socio-professional values and motivations of researchers; secondly, how these values can be translated into the practices; and lastly, how universities and research policies acknowledge and reward academic work that is committed to these values.

The articles in part 3 of the analysis make mention of the theoretical terms 'affect', 'materiality' and 'disconcertment' and of the use of theory within the field of STS and embodiment. The result is also that theoretical conceptualisations about cross-sectoral collaboration show a counter-movement against more instrumental approaches to collaborative research – both as a critique and as making visible the work on care ethics that is in fact necessary and widely practised. Moreover, the result not only challenges instrumentalised methodologies or paradigmatic traditions within academia but may even be seen as questioning the privileged positioning of academia itself. If we are to be caringly attentive and acknowledge the expertise and needs of humans and non-humans in more sustainable/inclusive ways, it might be in ways we have not been accustomed to practising before.

Discussion: collaborating in responsible research through the ethics of care

The analysis demonstrates that there are two dominant approaches to collaborative research from the care perspective. On the one hand, care for research participants works towards changing power relations between different stakeholders, especially when working with external collaborators. The second main theme has been described as the internal dimension of collaboration. This focuses on the researcher (working conditions, importance of personal motivations, aspirations and satisfaction with the research process). We find that caring collaborative research requires attention to both external and internal dimensions of collaboration. Understanding caring collaborative research only as care for research participants without equal attention to what this care requires from the researcher side can easily become prescriptive and exploitative, falling into the trap pinpointed by most of the critics of the ethics of care.

Looking at research collaborations from the lens of care ethics demonstrates that, theoretically, the concept of care draws from multiple approaches to the ethics of care. We see that some have been inspired by Gilligan, contrasting ethics of care and ethics of justice in arguments that it is not enough to regulate relations between researchers and research participants through ethical regulations; rather, these relations need to strive towards challenging power relations and changing the practices of research ownership and control. This angle frames the participatory aspect of caring collaborative research – societal engagement and participation with a strong emphasis on the quality of relations and degree of empowerment/disempowerment that takes place. Furthermore, the emphasis on the importance of care and, simultaneously, the scarcity of care in research created by institutional constraints can be interpreted within Tronto's

approach to care as an undervalued aspect of life that needs to be recognised more within society, at both the institutional and the personal level, as well as care as understood in the tradition of feminist political economy as an exploited aspect of economic and work-life activity. Finally, the focus on care as a manifestation of interdependency and relationality emphasised in Puig de la Bellacasa's approach to care is evident in the focus of some of the articles on the emotional, affective and embodied dimensions of collaborative research practices.

The literature review demonstrates the multiplicity of levels where caring collaborative research is constructed, nurtured, or, on the contrary, suppressed. Based on the review, we propose the following definition of caring collaborative research, comprising external and internal collaborative dimensions: *A caring approach to collaboration in research necessitates building relations with research participants, while paying attention to power and to the value of the research for the participants. Simultaneously, there needs to be structural acknowledgement of the needs (professional, relational and emotional) and labour of the researchers, whose collaborations are embedded and shaped by institutional resources and conditions.*

The articles reviewed show that caring collaborative research is often situated within a certain approach to the methodological development of collaborations. This includes dedicating time and attention to creating trusting relations with research participants, reflecting about power relations and forms of knowledge production in research collaborations, co-identifying needs and co-creating research design, as well as making affective elements a part of knowledge production.

At the same time, the review highlights that these methodological considerations struggle to exist within the currently used research evaluation metrics. These rigid metrics do not have the capacity to reflect and reward caring methodological approaches, because the work that has been done to create such collaboration cannot be easily reflected in a publication or a patent. This can lead the researcher to avoid pursuing engagement with methodologies which require time and other embodied resources, resulting in exclusion of caring methodologies from collaborative research. Because of the strong hegemonic practices and discourses that praise instrumental approaches to scientific collaborations it is difficult in practice to make the relational dimensions and care ethics in collaborations not only visible but also actively attended to.

Besides evaluation measures, the normative framing of research as problem-solving through technological fixes is described as another obstacle to caring collaborative research (Pandey, 2020; Latimer, 2019a). The ethics of care suggests that care is valuable but pluralistic because needs are different. Therefore, the paradigm of research as activity that seeks to create solutions to societal problems can be contradictory to the ethics of care approach, because the concept of a solution creates a pre-defined, rather top-down approach, of how to fix societal ills.

Latimer (2019a) describes this tendency as turning collaborative research into strategic alliances instead of striving to be alongside each other.

The importance of care for the self for the capacity to care with – how collaborative research is shaped by researchers' working conditions

From the articles reviewed we can see that working conditions within academia consist of various aspects, such as the formal matters of loads of administrative responsibilities, work contracts and allocated resources, as well as relational conditions, which in turn largely underpin the ways researchers are able to conduct engaged research.

As emphasised in Davies and Horst (2015), the conditions for conducting research with social engagement do not allow one to observe or follow the output of researchers' efforts in their everyday work. Hence the effect of one's work becomes more accessible and tangible in the researchers' immediate environment, for example, in the team. Therefore, caring within the team can be experienced as a fertile ground for caring for ourselves and for society, because caring within the team is what we have access to on a daily basis.

The distinction between internal and external dimensions of collaboration that we arrived at reviewing the articles also reflects feminist theories' focus on forced separation between the public and the private, production and reproduction, rational and emotional, that is the basis for exploitation. We found that the focus on researchers' societal engagement in the RRI literature is disconnected from working conditions (formal and relational work) which need to be ensured for researchers to be able to create caring collaborations and be responsible to society. We find this finding to be both our contribution to the RRI research field and a call to action for policy makers to align expectations of the societal impact of research with adequate working conditions.

It is important at the same time to add a critical reflection about the feminist approach and how it also needs to be aware of its own power dynamics that can create inequalities. The authors' contributions in the reviewed literature also bring their own gaze into how to theorise what collaborative research is or should be on different levels, which brings in certain normativities and blind spots. Revealing the affective, reproductive and vulnerable dynamics, being aware of emotions and sharing one's vulnerabilities, demanding intimacy in collaborative dynamics (in methodological approaches with research participants or within the research groups) can also be hegemonic and marginalising, because it demands personal commitment in spaces which are often seen as professionalised and detached from affective engagements. When approaching care ethics as a pluralistic theory that calls for attending to a diversity of needs, it is important to consider how to make collaborations caring in ways which do not impose unwanted dynamics on participants.

Difference in paradigms: caring research vs policy regulations

One of the themes analysed in this review is the need for relational and embodied understanding of collaboration and societal engagement. How can it be integrated into ethical procedures, and should it be so? And why is it important to have a dialogue, an exercise in translation between a subjective approach to collaboration and policy measures?

As Hesjedal and Åm (2022) suggest, research policies often introduce concepts built on implicit assumptions not backed by analysis of different contexts or lived experiences. Along these lines, the understanding of collaborative research and societal engagement can be enriched by relational ontological foundations of ethics of care.

Relying on the lens of care, as a deeply relational ontology (Puig de la Bellacasa, 2017; Tronto, 1998), brings relational aspects to the front. Hence, from the care perspective, aspects such as societal engagement and social impact acquire a strong focus on the analysis of relations – between researchers and participants, of power and positionality, and between different knowledge

systems (Dupret et al., 2024). Attention to these relations needs to be more visible, recognised and valued in ethical procedures. Sigl (2019, p. 132) suggests that exploration of responsible research needs 'analytical focus on (the quality of) relations and relational work' to explore how subjective experiences of societal engagement and responsible research shape research cultures and societal impact.

Addressing these tensions adds to the feminist ethics of care literature, in a manner that points to the mutual correspondence between working conditions of academics and the kind of output in terms of social engagement that they can generate. Care ethics also grapples with particular (masculine) kinds of power structures and world views about what is legitimate knowledge (Plumwood, 1991; Cross, 2018). In particular, it addresses Kantian theories of morality and ethics that tend to create different types of segregated dualisms/dichotomies, for instance between knowledge and emotion/affectivity, or masculine and feminine, resulting in the marginalisation of particular kinds of knowledge (Plumwood, 1991; Puig de la Bellacasa, 2011, 2017).

Conclusion

Our analytical focus in this literature review has been structured around the implications of the literature on care ethics for responsible scientific collaborations. We found that a line of internal as well as external conditions need to be in place so that researchers can perform research that has the potential to be socially innovative in a way that takes the ethics of care as its guiding principle. We also found that there are conditions that are not as easily squared into the former categories, as they cut across groupings. We found that collaborations, and the nurturing of professional relationships with a plenitude of societal actors, can offer alternatives to professional practices as they are available in universities and defined by metrics systems. In spite of the increasing inclusiveness of models of collaboration suggested in policy frameworks such as RRI, they neither address the intersections between internal and external conditions of the stakeholders that are collaborating and their consequences (Dupret & Pultz, 2021), nor do they have an explicit focus on how needs, priorities, and concerns from a democratic participatory perspective may affect the outcome of the research collaboration. Collaborations, that have the privilege of developing over time and are infused with trust, can provide meaning and

value for the various parties involved. The articles reviewed further indicate that current working conditions are at odds with caring engagement. Adequate working conditions are a prerequisite. When this is not in place – if, for example, the work of relationship maintenance is not made visible and appreciated, or this labour is not calculated in the timelines of a researcher's projects and employment – such engagements are performed in a 'covert' manner. While all researchers have access to various resources, it seems universal that the time for care of the professional self and relationships is not institutionalised.

Thus, our analysis tallies well with recent calls for evaluating research assessments, wherein funding agencies, institutions and publishers re-examine the basis on which successful research is defined and make space for qualitative assessments of work that is focused on outreach, relationship building, teaching, etc. Nevertheless, as we pointed out, it is essential to keep in mind that while the work of caring can be giving, both for individuals, institutions and research subjects, this is not to be imposed but based on transparency, consensuality and mutual respect for boundaries.

Annex 1. Selected articles

- 1) Smolka, Marieke, Erik Fisher, and Alexandra Hausstein. 2021. 'From Affect to Action: Choices in Attending to Disconcertment in Interdisciplinary Collaborations.' *Science Technology and Human Values* 46 (5): 1076–1103. <https://doi.org/10.1177/0162243920974088>
- 2) Herron, Rachel V, and Mark W Skinner. 2013. 'Using Care Ethics to Enhance Qualitative Research on Rural Aging and Care.' *Qualitative Health Research* 23 (12): 1697–1707. [doi:10.1177/1049732313509893](https://doi.org/10.1177/1049732313509893)

- 3) Latimer, J. 2019. 'Science under Siege? Being alongside the Life Sciences, Giving Science Life.' *Sociological Review* 67 (2): 264–86. <https://doi.org/10.1177/0038026119829752>
- 4) Latimer, Joanna, and Daniel López Gómez. 2019. 'Intimate Entanglements : Affects , More-than-Human Intimacies and the Politics of Relations in Science and Technology.' *The Sociological Review Monographs* 67 (2): 247–63. <https://doi.org/10.1177/0038026119831623>
- 5) Brun, Cathrine. 2009. 'A Geographers' Imperative? Research and Action in the Aftermath of Disaster.' *The Geographical Journal* 175: 196–207. <https://doi.org/10.1111/j.1475-4959.2009.00329.x>
- 6) Mejlgard, Niels, Malene Vinther Christensen, Roger Strand, Ivan Buljan, Mar Carrió, Marta Cayetano i Giral, Erich Griessler, et al. 2019. 'Teaching Responsible Research and Innovation: A Phronetic Perspective.' *Science and Engineering Ethics* 25 (2): 597–615. [doi:https://doi.org/10.1007/s11948-018-0029-1](https://doi.org/10.1007/s11948-018-0029-1)
- 7) Groves, C. 2015. "Logic of Choice or Logic of Care? Uncertainty, Technological Mediation and Responsible Innovation." *NanoEthics* 9 (3): 321–33. <https://doi.org/10.1007/s11569-015-0238-x>
- 8) Tolbert, Sara, Alexa Schindel, and Alberto J Rodriguez. 2018. "Relevance and Relational Responsibility in Justice oriented Science Education Research." *Science Education* 102 (4): 796–819. <https://doi.org/10.1002/sce.21446>
- 9) Beauchemin, Élie, Louis Pierre Côté, Marie-Josée Drolet, and Bryn Williams-Jones. 2022. "Conceptualising Ethical Issues in the Conduct of Research: Results from a Critical and Systematic Literature Review." *Journal of Academic Ethics* 20 (3): 335–58. <https://doi.org/https://doi.org/10.1007/s10805-021-09411-7>
- 10) Pellé, S. 2016. "Process, Outcomes, Virtues: The Normative Strategies of Responsible Research and Innovation and the Challenge of Moral Pluralism." *Journal of Responsible Innovation* 3 (3): 233–54. <https://doi.org/10.1080/23299460.2016.1258945>
- 11) Agate, Nicky, Rebecca Kennison, Konkiel Stacy, Christopher P Long, Jason Rhody, Simone Sacchi, and Penelope Weber. 2020. 'The Transformative Power of Values-Enacted Scholarship.' *Humanities & Social Sciences Communications* 7 (165): 1–13. [doi:https://doi.org/10.1057/s41599-020-00647-z](https://doi.org/10.1057/s41599-020-00647-z)
- 12) Davies, Sarah R, and Maja Horst. 2015. 'Crafting the Group: Care in Research Management.' *Social Studies of Science* 45 (3): 371–93. <https://doi.org/10.1177/0306312715585820>
- 13) Timmermans, Job. 2020. 'Mapping the Five Contributions onto the Ontological and Axiological Dimensions of the Emerging Responsible Innovation Paradigm. An Introduction to the Special Issue on Responsible Innovation.' *Philosophy of Management* 19 (3): 229–36. [doi:https://doi.org/10.1007/s40926-020-00145-x](https://doi.org/10.1007/s40926-020-00145-x)
- 14) Randles, Sally, Elise Tancoigne, and Pierre-Benoit Joly. 2022. 'Two Tribes or More? The Historical Emergence of Discourse Coalitions of Responsible Research and Innovation (Rri) and Responsible Research and Innovation (RRI).' *Journal of Responsible Innovation*, 248–74. <https://doi.org/10.1080/23299460.2022.2061306>
- 15) Albertson, Kevin, Stevienna de Saille, Poonam Pandey, Effie Amanatidou, Keren Naa Abeka Arthur, Michiel Van Oudheusden, and Fabien Medvecky. 2021. "An RRI for the present moment: relational and 'well-up'innovation." *Journal of Responsible Innovation* 8 (2): 292–299. <https://doi.org/10.1080/23299460.2021.1961066>
- 16) Ruggiu, Daniele. 2020. 'Inescapable Frameworks: Ethics of Care, Ethics of Rights and the Responsible Research and Innovation Model.' *Philosophy of Management* 19 (3): 237–65. [doi:https://doi.org/10.1007/s40926-019-00119-8](https://doi.org/10.1007/s40926-019-00119-8)
- 17) Jenkins, Kirsten EH, Shannon Spruit, Christine Milchram, Johanna Höffken, and Behnam Taebi. 2020. "Synthesizing value sensitive design, responsible research and innovation, and energy justice: A conceptual review." *Energy Research & Social Science* 69. <https://doi.org/10.1016/j.erss.2020.101727>
- 18) Lomax, Helen. 2015. "Seen and Heard? Ethics and Agency in Participatory Visual Research with Children, Young People and Families." *Families, Relationships and Societies* 4 (3): 493–502. <https://doi.org/10.1332/204674315X14326324216211>
- 19) Sylvestre, Paul, Heather Castleden, Debbie Martin, and Mary McNally. 2018. "'Thank You Very Much... You Can Leave Our Community Now.': Geographies of Responsibility, Relational Ethics, Acts of Refusal, and the Conflicting Requirements of Academic Localities in Indigenous Research." *ACME: An International E-Journal for Critical Geographies* 17 (3): 750–79. <https://doi.org/10.14288/acme.v17i3.1327>
- 20) Francis, Hilary, Inge Boudewijn, Antonia Carcelen-Estrada, Juana Francis Bone, Katy Jenkins, and Sofia Zaragocin. 2021. 'Decolonising Oral History: A Conversation.' *History* 106 (370): 265–81. <https://doi.org/10.1111/1468-229X.13141>
- 21) Endaltseva, Alexandra, and Sonja Jerak-Zuiderent. 2021. 'Embodiment Work in Ethnographic Collaborations: Composition, Movement, and Pausing within the Multiple Sclerosis Society in Russia.' *Science & Technology Studies* 34 (3): 38–54. [doi:https://doi.org/10.23987/sts.96101](https://doi.org/10.23987/sts.96101)
- 22) Pandey, Poonam. 2020. 'RRI's Commitment to Care and Vulnerability of Agrarian Systems: The 'Problem' of Rice Straw Burning in India.' *Science, Technology and Society* 25 (2): 240–55. <https://doi.org/10.1177/0971721820902965>
- 23) Codeiro-Cruz, Cristiano. 2021. 'Decolonizing Philosophy of Technology: Learning from Bottom-Up and Top-Down Approaches to Decolonial Technical Design.' *Philosophy & Technology* 34 (4): 1847–81. [doi:https://doi.org/10.1007/s13347-021-00489-w](https://doi.org/10.1007/s13347-021-00489-w)
- 24) Reber, Bernard. "RRI as the inheritor of deliberative democracy and the precautionary principle. 2018." *Journal of Responsible Innovation* 5 (1): 38–64. <https://doi.org/10.1080/23299460.2017.1331097>
- 25) Coenen, Christopher. 2016. "Broadening discourse on responsible research and innovation (RRI)." *NanoEthics* 10 (1): 1–4. <https://doi.org/10.1007/s11569-016-0255-4>
- 26) Rivard, Lysanne, Pascale Lehoux, and Nicola Hagemester. 2021. "Articulating care and responsibility in design: A study on the reasoning processes guiding health innovators'care-making'practices." *Design studies* 72. <https://doi.org/10.1016/j.destud.2020.100986>

Acknowledgements

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101035808.

The authors report that there are no competing interests to declare.

Author description

Anna Umantseva is a postdoctoral researcher in Social Innovation at Roskilde University, Denmark. Her interdisciplinary research focuses on social innovation, sustainability, and eco-social transitions. As an anthropologist, she has conducted ethnographic research in Mexico, Portugal, and Denmark.

Katia Dupret is Head of Research and Associate Professor of Social Psychology in Working Life at Roskilde University, Denmark. Her interdisciplinary research focuses on human resources and leadership in value-driven organisations. In addition, she engages in co-creation of social innovation initiatives with external stakeholders through participatory design and serious gaming. She has conducted research in Denmark, France, Germany, Greece, Bulgaria and Chile.

Daniela Lazoroska, lecturer, researching gender and diversity in the energy sector, Lund University. She is an anthropologist with a research background in body culture and eating, sustainable urban development and collaborative dialogues, energy communities and gender, and research collaborations for social innovation. She has conducted ethnographic research in Brazil, Sweden, Japan and Denmark.

References

- Agate, N., Kennison, R., Konkiel, S., Long, C. L., Rhody, J., Sacchi, S., & Weber, P. (2020). The transformative power of values-enacted scholarship. *Humanities & Social Sciences Communications*, 7(165): 1–13. <https://doi.org/10.1057/s41599-020-00647-z>
- Bauer, A., Bogner, A., & Fuchs, D. (2021). Rethinking societal engagement under the heading of responsible research and innovation: (Novel) requirements and challenges. *Journal of Responsible Innovation*, 8(3), 342–363. <https://doi.org/10.1080/23299460.2021.1909812>
- Bauhardt, C. (2018). Nature, care and gender: Feminist dilemmas. In C. Bauhardt & W. Harcourt (Eds.), *Feminist political ecology and the economics of care* (pp.16–35). Routledge. <https://doi.org/10.4324/9781315648743>
- Beauchemin, É., Côté, L. P., Drolet, M. J., & Williams-Jones, B. (2022). Conceptualising ethical issues in the conduct of research: Results from a critical and systematic literature review. *Journal of Academic Ethics*, 20(3), 335–358. <https://doi.org/10.1007/s10805-021-09411-7>
- Bergmark, U., Dahlbäck, A., Hagström, A., & Viklund, S. (2023). Leading with care: Four mentor metaphors in collaboration between teachers and researchers in action research. *Educational Action Research*, 1–18. <https://doi.org/10.1080/09650792.2023.2229870>
- Brun, C. (2009). A geographers' imperative? Research and action in the aftermath of disaster. *Geographical Journal*, 175(3), 196–207. <https://doi.org/10.1111/j.1475-4959.2009.00329.x>
- Burget, M., Bardone, E., & Pedaste, M. (2017). Definitions and conceptual dimensions of responsible research and innovation: A literature review. *Science and Engineering Ethics*, 23, 1–19. <https://doi.org/10.1007/s11948-016-9782-1>
- Carayannis, E. G., & Campbell, D. F. (2009). 'Mode 3' and 'Quadruple Helix': Toward a 21st century fractal innovation ecosystem. *International Journal of Technology Management*, 46(3–4), 201–234. <https://doi.org/10.1504/IJTM.2009.023374>
- Carrigan, C., & Wylie, C. D. (2023). Introduction: Caring for equitable relations in interdisciplinary collaborations. *Catalyst: Feminism, Theory, Technoscience*, 9(2). <https://doi.org/10.28968/cftt.v9i2.41070>
- Codeiro-Cruz, C. C. (2021). Decolonizing philosophy of technology: Learning from bottom-up and top-down approaches to decolonial technical design. *Philosophy & Technology*, 34(4), 1847–1881. <https://doi.org/10.1007/s13347-021-00489-w>
- Coghlan, S. (2022). Robots and the possibility of humanistic care. *International Journal of Social Robotics*, 14(10), 2095–2108. <https://doi.org/10.1007/s12369-021-00804-7>
- Cross, C. L. (2018). Ecofeminism and an ethic of care: Developing an eco-jurisprudence. *Acta Academica: Critical views on society, culture and politics*, 50(1), 28–40. <https://doi.org/10.18820/24150479/aa50i1.2>
- Dahlin-Ivanoff, S., Berge, I., Barenfeld, E., Haak, M., & Lood Q. (2024). Research collaboration with older people as a matter of scientific quality and ethics: A focus group study with researchers in ageing and health. *Research Involvement and Engagement*, 10(1), 6. <https://doi.org/10.1186/s40900-024-00540-y>
- Davies, S. R., & Horst, M. (2015). Crafting the group: Care in research management. *Social Studies of Science*, 45(3), 371–393. <https://doi.org/10.1177/0306312715585820>

- Dupret, K., Eschweiler, J., Umantseva, A., & Hyldkrog, R. (2022). Mapping innovation and societal engagement: Responsible research from a care ethics perspective. <https://doi.org/10.13140/RG.2.2.31722.59845>
- Dupret, K., & Pultz, S. (2021). Hard/heart worker: Work intensification in purpose-driven organizations. *Qualitative Research in Organizations and Management: An International Journal*, 16(3/4), 488–508. <https://doi.org/10.1108/QROM-07-2020-1989>
- Dupret, K., Umantseva, A., & Lazoroska, D. (2024). Lessons from the 'dark' side: Emotional labour and positioning in cross-sectoral collaborations. *Science & Technology Studies*. <https://doi.org/10.23987/sts.130957>
- Dupret, K., Umantseva, A., Lazoroska, D., & Eschweiler, J. (2023). *Research collaboration for societal engagement and social innovation: Guidelines and reflections for best practices*. Roskilde Universitet.
- Edwards, S. D. (2009). Three versions of an ethics of care. *Nursing Philosophy*, 10(4), 231–240. <https://doi.org/10.1111/j.1466-769X.2009.00415.x>
- Endaltseva, A., & Sonja, J. Z. (2021). Embodiment work in ethnographic collaborations: Composition, movement, and pausing within the Multiple Sclerosis Society in Russia. *Science & Technology Studies*, 34(3). <https://doi.org/10.23987/sts.96101>
- European Commission: Directorate-General for Research and Innovation & Schomberg, R. (2011). Towards responsible research and innovation in the information and communication technologies and security technologies fields. (R. Schomberg, editor) Publications Office. <https://doi.org/10.2139/ssrn.2436399>
- Felt, U. (2017). "Response-able practices" or "new bureaucracies of virtue": The challenges of making RRI work in academic environments. In R. Von Schomberg & J. Hankins (Eds.), *The handbook of responsible innovation: A global resource* (pp. 49–66). Edward Elgar Publishing. https://doi.org/10.1007/978-3-319-64834-7_4
- Francis, H., Boudewijn, I., Carcelén-Estrada, A., Francis Bone, J., Jenkins, K., & Zaragocin, S. (2021). Decolonising oral history: A conversation. *History*, 106(370), 265–281. <https://doi.org/10.1111/1468-229X.13141>
- Friese, C. (2013). Realizing potential in translational medicine: The uncanny emergence of care as science. *Current Anthropology*, 54(S7), S129–S138. <https://doi.org/10.1086/670805>
- Gilligan, C., & Attanucci, J. (1988). Two moral orientations: Gender differences and similarities. *Merrill-Palmer Quarterly* (1982–), 223–237.
- Groot, B. C., Vink, M., Haveman, A., Huberts, M., Schout, G., & Abma, T. A. (2019). Ethics of care in participatory health research: Mutual responsibility in collaboration with co-researchers. *Educational Action Research*, 27(2), 286–302. <https://doi.org/10.1080/09650792.2018.1450771>
- Hakim, A. (2023). Community members as fieldwork guides in disaster settings: Ethics of care through a relational methodology of empathy and trust. *Qualitative Inquiry*, 29(6), 737–750. <https://doi.org/10.1177/10778004221126704>
- Herron, R. V., & Skinner, M. W. (2013). Using care ethics to enhance qualitative research on rural aging and care. *Qualitative Health Research*, 23(12), 1697–1707. <https://doi.org/10.1177/1049732313509893>
- Hesjedal, M. B., & Åm, H. (2023). Making sense of transdisciplinarity: Interpreting science policy in a biotechnology centre. *Science and Public Policy*, 50(2), 219–229. <https://doi.org/10.1093/scipol/scaco55>
- Johansson, J., Gao, G., Sölvell, I., & Wigren-Kristoferson, C. (2024). Exploring caring collaborations in academia through feminist reflexive dialogues. *Gender, Work, and Organization*, 31(5), 2241–2263. <https://doi.org/10.1111/gwao.13115>
- Kennedy, M. M. (2007). Defining a literature review. *Educational Researcher*, 36(3), 139–147. <https://doi.org/10.3102/0013189X0729919>
- Latimer, J. (2019). Science under siege? Being alongside the life sciences, giving science life. *The Sociological Review*, 67(2), 264–286. <https://doi.org/10.1177/0038026119829752>
- Latimer, J., & López Gómez, D. (2019). Intimate entanglements: Affects, more-than-human intimacies and the politics of relations in science and technology. *The Sociological Review*, 67(2), 247–263. <https://doi.org/10.1177/0038026119831623>
- Leget, C., van Nistelrooij, I., & Visse, M. (2019). Beyond demarcation: Care ethics as an interdisciplinary field of inquiry. *Nursing Ethics*, 26(1), 17–25. <https://doi.org/10.1177/0969733017070008>
- Leydesdorff, L., & Etzkowitz, H. (1996). Emergence of a Triple Helix of university-industry-government relations. *Science and Public Policy*, 23(5), 279–286. <https://doi.org/10.1093/spp/23.5.279>
- Leydesdorff, L., & Ivanova, I. (2021). The measurement of 'interdisciplinarity' and 'synergy' in scientific and extra-scientific collaborations. *Journal of the Association for Information Science and Technology*, 72(4), 387–402. <https://doi.org/10.1002/asi.24416>
- Mejlgaard, N., Christensen, M. V., Strand, R., Buljan, I., Carrió, M., Cayetano i Giralt, M., Griessler, E., Lang, A., Marusic, A., Revuelta, G., Rodríguez, G., Saladié, N., & Wuketich, M. (2019). Teaching responsible research and innovation: A phronetic perspective. *Science and Engineering Ethics*, 25, 597–615. <https://doi.org/10.1007/s11948-018-0029-1>
- Michali, M., & Eleftherakis, G. (2022). Public engagement practices in EC-funded RRI projects: Fostering socio-scientific collaborations. *Administrative Sciences*, 12(3). <https://doi.org/10.3390/admsci12030104>
- Miller, K., McAdam, R., & McAdam, M. (2018). A systematic literature review of university technology transfer from a quadruple helix perspective: Toward a research agenda. *R&D Management*, 48(1), 7–24. <https://doi.org/10.1111/radm.12228>
- Owen, R., Macnaghten, P., & Stilgoe, J. (2012). Responsible research and innovation: From science in society to science for society, with society. *Science and Public Policy*, 39(6), 751–760. <https://doi.org/10.1093/scipol/scso93>
- Owen, R., Stilgoe, J., Macnaghten, P., Gorman, M., Fisher, E., & Guston, D. (2013). A framework for responsible innovation. In R. R. Owen, J. R. Bessant, & M. Heintz (Eds.), *Responsible innovation: Managing the responsible emergence of science and innovation in society* (pp. 27–50). John Wiley & Sons Inc. <https://doi.org/10.1002/9781118551424.ch2>

- Pandey, P. (2020). RRI's commitment to care and vulnerability of agrarian systems: The 'problem' of rice straw burning in India. *Science, Technology and Society*, 25(2), 240–255.
<https://doi.org/10.1177/0971721820902965>
- Pellé, S. (2016). Process, outcomes, virtues: The normative strategies of responsible research and innovation and the challenge of moral pluralism. *Journal of Responsible Innovation*, 3(3), 233–254.
<https://doi.org/10.1080/23299460.2016.1258945>
- Pinel, C., Prainsack, B., & McKeivitt, C. (2020). Caring for data: Value creation in a data-intensive research laboratory. *Social Studies of Science*, 50(2), 175–197.
<https://doi.org/10.1177/0306312720906567>
- Plumwood, V. (1991). Nature, self, and gender: Feminism, environmental philosophy, and the critique of rationalism. *Hypatia*, 6(1), 3–27.
<https://www.jstor.org/stable/3810030>
- Puig de la Bellacasa, M. (2011). Matters of care in technoscience: Assembling neglected things. *Social Studies of Science*, 41(1), 85–106.
<https://doi.org/10.1177/0306312710380301>
- Puig de la Bellacasa, M. (2015). 'Nothing comes without its world': Thinking with care. *The Sociological Review*, 60(2), 197–216.
<https://doi.org/10.1111/j.1467-954X.2012.02070.x>
- Puig de la Bellacasa, M. (2017). Making time for soil: Technoscientific futurity and the pace of care. *Social Studies of Science*, 45(5), 691–716.
<https://doi.org/10.1177/0306312715599851>
- Puig de la Bellacasa, M. (2017). *Matters of Care: Speculative Ethics in More than Human Worlds*. University of Minnesota Press.
<https://doi.org/10.1080/14636778.2019.1586527>
- Ramvi, E., Gripsrud, B. H., Hellstrand, I., Gjerstad, B., & Vagli, Å. E. (2021). Caring futures: A study protocol for transdisciplinary qualitative research on technology-mediated care practices and theory development for ethics of care. *BMJ Open*, 11(9).
<https://doi.org/10.1080/23299460.2022.2061306>
- Randles, S., Tancoigne, E., & Joly, P. B. (2022). Two tribes or more? The historical emergence of discourse coalitions of responsible research and innovation (rri) and Responsible Research and Innovation (RRI). *Journal of Responsible Innovation*, 9(2), 248–274.
<https://doi.org/10.1080/23299460.2022.2061306>
- Rip, A. (2018). The past and future of RRI. *Futures of Science and Technology in Society*, 115–133.
<https://doi.org/10.1186/s40504-014-0017-4>
- Ruggiu, D. (2020). Inescapable frameworks: Ethics of care, ethics of rights and the responsible research and innovation model. *Philosophy of Management*, 19(3), 237–265.
<https://doi.org/10.1007/s40926-019-00119-8>
- Scheel, S., Grommé, F., Ruppert, E., Ustek-Spilda, F., Cakici, B., & Takala, V. (2020). Doing a transversal method: Developing an ethics of care in a collaborative research project. *Global Networks*, 20(3), 522–543.
<https://doi.org/10.1111/glob.12263>
- Sigl, L. (2019). Subjectivity, governance, and changing conditions of knowledge production in the life sciences. *Subjectivity*, 12, 117–136.
<https://doi.org/10.1057/s41286-019-00069-6>
- Smolka, M., Fisher, E., & Hausstein, A. (2021). From affect to action: Choices in attending to discontentment in interdisciplinary collaborations. *Science, Technology, & Human Values*, 46(5), 1076–1103.
<https://doi.org/10.1177/0162243920974088>
- Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, 104, 333–339.
<https://doi.org/10.1016/j.jbusres.2019.07.039>
- Sylvestre, P., Castleden, H., Martin, D., & McNally, M. (2018). 'Thank you very much... you can leave our community now.': Geographies of responsibility, relational ethics, acts of refusal, and the conflicting requirements of academic localities in indigenous research. *ACME: An International Journal for Critical Geographies*, 17(3), 750–779.
<https://acme-journal.org/index.php/acme/article/view/1327>
- Timmermans, J. (2020). Mapping the five contributions onto the ontological and axiological dimensions of the emerging responsible innovation paradigm: An introduction to the special issue on responsible innovation. *Philosophy of Management*, 19(3), 229–236.
<https://doi.org/10.1007/s40926-020-00145-x>
- Tolbert, S., Schindel, A., & Rodriguez, A. J. (2018). Relevance and relational responsibility in justice-oriented science education research. *Science Education*, 102(4), 796–819.
<https://doi.org/10.1002/sce.21446>
- Tronto, J. C. (1993). *Moral boundaries: A political argument for an ethic of care*. Psychology Press.
<https://doi.org/10.4324/9781003070672>
- Tronto, J. C. (1998). An ethic of care. *Generations: Journal of the American Society on Aging*, 22(3), 15–20.
<https://www.jstor.org/stable/44875693>
- Tronto, J. C., & Fisher, B. (1990). Toward a feminist theory of caring. In E. K. Abel & M. K. Nelson (Eds.), *Circles of care: Work and identity in women's lives* (pp. 36–54). Suny Press.

SCRIPT TALES FROM PARTICIPATORY ENERGY TRANSITIONS

Critical Reflections from Co-Designing Energy Citizenship in a Rural Community

by Lina Naoroz Bråten, Berit Therese Nilsen, Lucia Liste & Pasi Aalto

*This paper explores how context-sensitive co-design approaches shape energy transitions, drawing on empirical insights from the municipality of Overhalla, Norway. Using Citizen Action Labs (CALs) as a participatory co-design tool, the article offers a retrospective methodological reflection addressing the question: **How are expectations of a more participatory energy transition enacted in a rural community?** Through the lens of script tales, we examine how energy citizenship is negotiated via subscription, de-inscription, and the emergence of new user scripts. Our findings underscore the importance of aligning participatory expectations and methods with local practices, values, and socio-spatial dynamics to foster meaningful engagement and identify viable, sustainable options. Recent EU calls emphasise energy citizenship as a tool for public engagement, yet the discourse remains relatively urban-centric. Rural contexts are often viewed as vulnerable, but they are also rich sources of inspiration and learning that can inform more inclusive co-creation approaches in energy transitions, thereby challenging urban biases in current policy frameworks. The study contributes to debates on energy citizenship by showing how co-designed processes can bridge abstract policy concepts and everyday rural practices. It expands our understanding of how rural communities can actively participate in sustainable energy transitions, emphasizing the need for tailored approaches in co-designing energy citizenship.*

Keywords: Co-design; energy citizenship; rural energy transitions; joint critical reflection; script

Author: Lina Naoroz Bråten, Assistant professor & PhD candidate,
Department of Architecture and Planning, Norwegian University of Science and Technology

Berit Therese Nilsen, Senior researcher,
NTNU Samfunnsforskning AS

Lucia Liste, Senior researcher,
NTNU Samfunnsforskning AS

Pasi Aalto, Centre Director of NTNU Wood,
Department of Architecture and Technology, Norwegian University of Science and Technology

Licensing: All content in NJSTS is published under a [Creative Commons Attribution 4.0 license](#). This means that anyone is free to share (copy and redistribute the material in any medium or format) or adapt (remix, transform, and build upon the material) the material as they like, provided they give appropriate credit, provide a link to the license, and indicate if changes were made.

Introduction and background

There is a growing trend and demand involving citizens and other actors in facilitating sustainable and democratic development (Schreiber et al., 2023). This focus involves employing innovative, multidisciplinary, and experimental approaches to tackle diverse spatial and social challenges in local communities in various contexts (e.g., Zavrtnik et al., 2019; Smith et al., 2017). Such a participatory approach fits with the notions of co-creation, co-design and participatory design (terms often used synonymously), and facilitates working together with citizens to reflect on and accomplish shared goals through collective creativity (Sanders and Stappers, 2008). Participatory design processes are characterised by mutual learning, where the design outcome and the learning process are legitimate end-goals for the process (Bødker et al., 2022, p. 20). In addition to being a tool for citizen-practitioner collaborations, these collaborative methods have also gained traction in what we can term public engagement with science (Irwin, 2015), citizens science (e.g., Vohland et al., 2021; Hetland, 2020) or participatory research through co-design processes, where researchers, citizens and other stakeholders are equally involved to co-create future solutions and integrate research into practice more actively (Benz et al., 2024).

Energy citizenship has emerged as a central concept in discussions about sustainable energy transitions, highlighting the role of individuals and communities as active participants rather than passive consumers. It is commonly understood as citizens' engagement in energy-related practices, decision-making, and awareness, aimed at fostering more democratic and sustainable energy systems (Ryghaug et al., 2018; Silvast & Valkenburg, 2023). Energy citizenship may be expressed through a wide range of practices, such as dialogue with energy planners, co-production, material participation through technological artefacts, smart energy monitoring, or participation in energy platform technologies (Boekelo & Kloppenburg, 2023). In our use of the concept, citizen participation includes both individual and collective forms of engagement—ranging from everyday energy practices and household-level decisions to involvement in community energy initiatives, local governance processes, and broader political or civic action.

In European policy contexts, however, energy citizenship has been adopted primarily as a tool to support ongoing energy transition goals. Initiatives such as the Citizens' Energy Forum and policy frameworks such as the Clean Energy for All Europeans Package and the European Green Deal frame citizens primarily as consumers or prosumers, whose participation contributes to market efficiency, system flexibility, and renewable integration (European Commission, 2019). While these documents acknowledge the importance of citizen involvement, they deploy the concept in an instrumental way, without engaging with its theoretical or democratic dimensions. Citizen participation is thus often reduced to a mechanism for achieving predefined techno-economic objectives,

rather than a transformative form of civic or political agency. These divergent interpretations—instrumental and consumer-oriented in policy contexts, but theoretically diverse and at times contradictory in academic research—highlight the conceptual fragmentation that currently characterises energy citizenship.

Academic research initially mirrored some of these limitations. Although widely used, the concept remains underspecified and lacks a consistent theoretical framework (Silvast & Valkenburg, 2023; Biresselioglu et al., 2024). Early studies tended to operationalise energy citizenship through behavioural indicators, such as energy-saving actions, willingness to adopt renewable technologies, or participation in community energy projects (Wahlund & Palm, 2022). This focus produced normative assumptions and conceptual ambiguity, alongside a limited understanding of the structural, social, and institutional factors shaping civic energy participation (Lennon et al., 2020). More recently, scholarship has increasingly adopted critical, political, and justice-oriented perspectives. These approaches highlight the collective, socio-material, and institutional dimensions of energy agency, linking energy citizenship to energy democracy and emphasising power relations, governance structures, inequalities, and the socio-material organisation of energy systems (Wahlund & Palm, 2022; Dunphy et al., 2025). This shift moves beyond behavioural framings toward a more transformative and democratic understanding of how citizens engage with energy systems.

In this paper, we build on this emerging critical tradition. While we acknowledge Devine-Wright's (2007) foundational framing of energy citizenship as democratic engagement in energy transitions, we adopt Biresselioglu et al.'s (2024:1904) definition of energy citizenship "as the extent to which and how the goals of a sustainable energy transition are incorporated into the everyday practices of individuals." In this article, we define energy citizenship as the ways in which individuals and collectives integrate the goals of a just and sustainable energy transition into their everyday practices and forms of participation. This definition allows us to focus on how citizens incorporate sustainability goals into daily life while recognising the political, structural, and justice-related conditions that shape such engagement. Our approach places particular emphasis on citizens' willingness and capacity to participate in a just and sustainable energy transition, moving beyond consumerist roles toward a more situated and context-sensitive understanding of energy citizenship.

In addition, energy transition research (including research on energy citizenship) has predominantly focused on urban areas, which has resulted in the notion of 'urban energy transitions' (see for instance, Droege et al., 2018). Rural energy citizenship has been largely overlooked in the energy citizenship literature (see, e.g., Debourdeau et al., 2024), and rural energy transitions remain

relatively underexplored (Salonen et al., 2022). Therefore, more research is needed to understand transitions unfolding in rural settings (Naumann and Rudolph, 2020). This paper contributes to both fields by addressing the rural gap and demonstrating how participatory expectations are enacted in practice.

Rural communities face challenges that differ from those in urban settings affecting energy transitions on several areas, for instance, housing (Funch et al., 2020). Construction costs in general are the same in rural or urban settings, but since the sale price is significantly lower in rural areas, investing in a house is riskier (Quist Eliassen et al. 2020). Rural bindings also often lack energy-saving designs (Abouaiana and Battisti, 2023), but upgrading is challenging due to the beforementioned discrepancy between investment costs and selling price. Transport also represents different challenges in rural settings (Sovacool et al., 2018), with less developed infrastructure, fewer transportation options in addition to longer travel distances and car dependency (Leiren and Skollerud, 2015). Demographically, rural areas typically have an older and more male dominated population (Heleniak and Sánchez Gassen 2020), with less education than the urban average, and poorer health (Bremberg 2020; NOU 2020). This in turn influences the view on

transition issues, as younger people, and those holding a university degree are more positive towards energy efficiency measures (KC et al., 2023). A lack of educational opportunities, a less diverse job market, fewer recreational activities, and a greater degree of social conformity are some of the reasons behind the out migration of young people (Rauhut et al., 2008), predominantly women (Faber et al., 2015). However, in recent years, immigration populations have started to arrive in rural destinations (Rye and Slettebak, 2020), potentially moderating the speed of rural depopulation (Heleniak and Sánchez Gassen 2020). Effectively navigating these demographic changes and tackling the energy transition requires the use of participatory tools and methodologies that recognise unique context-specific dynamics. Yet, participatory expectations, tools and methods do not differentiate between rural and urban contexts (e.g. Dell'Era and Landoni, 2014), nor do we have a set of solutions tailored to the specific needs and conditions of rural areas in the context of energy transitions. Moreover, dominant policy narratives, particularly within EU documentation, frequently frame rural areas as sites of deficiency, while positioning urban regions as sources of innovation. This framing risks reinforcing inequalities and undermining the potential of rural communities to lead their own energy transitions.

Purpose and research question

We address the gap in rural energy citizenship research by critically reflecting on a participatory process addressing sustainable living in rural energy transitions in Norway. Existing research often overlooks the specificities of rural energy transitions, with rural studies tending to focus on preserving traditional ways of life. In contrast, energy transition literature frequently applies urban-centric frameworks to rural contexts. This paper aims to address this gap by conceptualising rural energy transition as a distinct domain—one that foregrounds place-based approaches and recognises the unique resources, capacities, and lived experiences of rural communities. We ask: *How are expectations of a more participatory energy transition enacted in a rural community?*

Our collective reflections come from our participation in a Horizon 2020 funded project, called DIALOGUES (2021–2024). A core aim of the DIALOGUES project is to enable citizens to take a central role in the energy transition, and the practical objective is to allow deep, inclusive energy citizenship to emerge. The project explored what

energy citizenship means to diverse actors in different European contexts through a participatory and interdisciplinary co-design method named Citizen Action Labs (CALs). A series of CALs were conducted in different countries. In Norway, the CAL was conducted in a small, rural community and aimed to gain insights into how the built environment (e.g. residential housing and social meeting places) may shape rural energy citizenship practices.

Through the theoretical lens of script theory (Akrich, 1992), this paper illustrates how urban-focused ideals may be misaligned with rural lifestyles and realities, as evidenced by varying responses to energy citizenship frameworks. Our key findings reveal that participatory energy transitions must be tailored to distinct social, spatial and economic geographies. Specifically, we argue that flexible, context-sensitive approaches are essential for enabling meaningful engagement in energy transitions. This paper contributes to a more nuanced understanding of how rural communities can actively shape energy citizenship through locally grounded participatory processes.

Theory: Scripting participatory energy transitions in rural contexts

To gain insights into what characterises the relationship between the CAL, us as researchers, the local community, and the context where it takes place, we draw on the script concept. CALs offer a way to materialise participatory energy transition processes. We understand a CAL as a socio-material artefact in which several actors (EU, researchers, policymakers, and practitioners) have

ascribed meanings, projections, and expectations to specific action programs. The concept of scripts, originated by Madeleine Akrich, illustrates how artefacts encode intended usage and meaning (Akrich and Latour, 1992). To understand the CAL as a process of scripting can help us articulate participants different voices and timelines (Huybrechts et al., 2017), and like 'instruction manuals',

these scripts convey designers' visions but may be contested, rejected, or reinterpreted by users, creating new scripts.

As described by Akrich (1992: 208), *inscription* is the process where designers (or in this case, researchers) embed their intended usage and societal assumptions into artefacts, defining users' roles and expectations. However, users may deviate from these prescribed roles, leading to misinterpretation or rejection of the intended usage. *Description* involves how people interpret these embedded instructions. *Subscription* occurs when users accept and enact the prescribed roles, aligning with the designer's vision. Conversely, *de-inscription* consists of rejecting the artefact or creating alternatives to challenge the prescribed roles, enabling users to construct new scripts. Later, the notion of *user scripts* was introduced to

accommodate reactions that generate new usage patterns (Gjøen and Hård, 2002).

This framework facilitates understanding how local actors, funding institutions (such as the EU), and researchers negotiate and construct a sphere of action and meaning through collaborative efforts. The interactions among participants within the CAL—as a collaborative effort—are characterized by continuous negotiations and renegotiations of diverse scripts (Pineda, 2008). Moreover, both resistance to and adherence to these negotiated scripts are not solely performed by human actors (e.g., CAL participants) but also by non-human actors (Pineda, 2008), including the physical design of the town centre, the transport system, the layout of residential housing, and the geography and climate of the studied area.

Rural Norway as the point of departure

The Norwegian CAL was conducted in the rural municipality of Overhalla in the northern part of Trøndelag county (Figure 1), where the population density is low, even by Norwegian standards. Around 50% of the land in the municipality is covered by forest, and the area is well-suited for agriculture, which explains the foundation for forestry, grain cultivation, and cattle farming. In addition, the local economy includes a wood-processing industry as well as the production of mineral and chemical products. Public services (especially the service industry and health sector), agriculture, and tourism (particularly salmon fishing) are main sources of income.

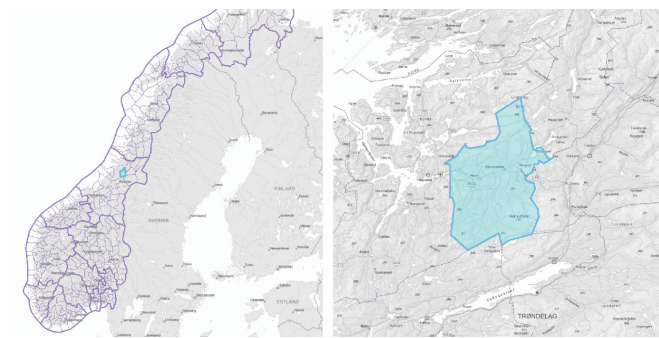


Figure 1. Overhalla, Trøndelag county, Norway (Map generated through NVE Atlas)

Overhalla exhibits a relatively balanced age distribution, which is both uncommon and advantageous for a rural municipality in Norway. While many rural areas are projected to experience population decline, forecasts from Statistics Norway (SSB) indicate a modest population increase in Overhalla by 2030 and 2050, primarily driven by anticipated immigration, which together with welfare state interventions represent key factors in mitigating the depopulation of rural parts of Norway (Aasbrenn and Sørli, 2016).

However, the gender distribution remains skewed, with men comprising the majority in most age groups up to 65–69 years. This gender imbalance is characteristic of rural communities, particularly those with economies rooted in agriculture and other primary industries.

As part of the Trøndelag commuter region, Overhalla forms a commuter sub-region together with several other rural municipalities. Data from 2018 indicate that 46.9% of the municipality's workforce commutes to work outside the municipality (Trøndelagfylke.no).

Joint critical reflections as method

Inspired by approaches found in collaborative autoethnography (Adams et al., 2021; Chang et al., 2016; Duncan, 2004), and drawing on reflexivity (e.g., Olmos-Vega et al., 2022), we developed a novel methodological approach that combines collaborative autoethnography with reflexive practices to conduct joint critical reflections as a core method. Autoethnography is defined as "a research method that uses personal experience [of the researcher] ('auto') to describe and interpret ('graphy') cultural texts, experiences, beliefs, and practices ('ethno')" (Adams et al., 2017, 2). In this

approach, the researcher assumes a dual role as both investigator and participant, critically examining their own perspectives while leading the research (Chang et al., 2016: 22). While our study does not adopt an orthodox autoethnographic approach, we do embrace certain elements of self-inquiry and critical reflection.

This integration allows us to critically reflect on our research approach, the ongoing adjustments throughout the process, and how these adaptations influenced the co-design process. By merging

collaborative autoethnography and reflexivity, we bridge personal narratives with collective analysis, creating a methodological space that is both introspective and dialogical. This approach fosters a deeper understanding of how our positions, experiences, and interactions with stakeholder's shape and inform the research process. In doing so, we not only engage in self-inquiry but also systematically interrogate the research dynamics within the collaborative space, allowing for more nuanced interpretations of the co-design process.

Our co-design process, that forms the basis of our critical reflections, consisted of a three-year qualitative study (2021-2023) conducted through a Citizen Action Lab (CAL). The CAL responded to one of the main objectives of DIALOGUES: to "engage citizens in co-creating the way towards deeper, inclusive energy citizenship" (Schibel et al., 2022). It functioned as an open innovation space for citizens, researchers and stakeholders working collaboratively on creating environments that will help to understand how to foster deep, inclusive energy citizenship in rural contexts.

The DIALOGUES project designed a common protocol for all partners to guide the design and implementation of local CALs. This protocol highlighted the focus on diversity, encouraging the involvement groups that are not the most represented in energy transitions and including various socio-demographic characteristics, such as gender, age, socio-cultural-economic status and ethnicity (Clément et al., 2022).

As a place-based co-design process, the CAL focused on actively involving "people with lived experiences" (McKercher, 2020 in Örnekoğlu-Selçuk et al. 2023) and the overarching intention was empowerment of people in decision-making processes through a mutual learning experience (Örnekoğlu-Selçuk et al., 2023) in a local context. The CAL-methodology shares similarities with co-design approaches such as Living laboratories (Bulkeley et al., 2019), Future Workshops (Jungk and Müllert, 1987), and Real-World Labs. However, we opted to conceptualize our efforts as an "action lab" to maintain methodological flexibility and avoid rigid definitions (Sahakian et al., 2025: 13; Schibel et al., 2022).

The Norwegian CAL aimed to explore rural energy citizenship through collaboration with local stakeholders. We chose the municipality of Overhalla as the location for the CAL due to its representativeness of Norwegian rural areas in three key aspects: First, its remoteness (Norwegian centrality index 6 out of 6) necessitates that they have to address all services locally. Second, the municipality has a strong focus on demographics, actively working to attract younger generations to ensure the continuity of the community. Third, the presence of local industry creates a demand for skilled labour, requiring recruitment from outside the municipality.

A diverse range of representatives was involved including citizens, municipal employees, representatives from local industry and members of local organisations, all with vested interest in future decision-making and local development. Rather than approaching

these participants as research subjects, we regarded them as "experts of their experience" (Sahakian et al., 2025: 18). In line with a phenomenological perspective, we emphasized capturing both the expressed and interactional experiences of participants, while critically reflecting on the dialogues throughout the co-design process (Tjora 2021, p. 30-31).

Particular to the Norwegian CAL was the examination of the interplay between place, architecture, and energy use, aiming to enhance understanding of how rurality, energy, and societal transformation intersect. The project also explored visions of well-being in relation to the green transition, with a particular focus on place development and the built environment. The action lab concentrated on co-designing housing and social spaces to attract young, early-career professionals, particularly those completing vocational apprenticeships or recently graduated.

The focus on attracting young early-career professionals emerged through early dialogue with local representatives, who framed it as a shared priority across industry, public administration, and the broader community. This group was identified as essential to ensuring the continuity of the community, particularly in light of an ageing population and the growing need for new skills and knowledge in various local initiatives. To reach young professionals who had already migrated to the area—whether temporarily through vocational apprenticeships or more permanently via employment—local industry companies played a key role in recruiting participants. This recruitment strategy was used solely to leverage local networks to reach the young professionals, as their participation in the workforce was a key defining criterion. However, the participants joined as individuals, and neither industry representatives nor other company personnel (e.g., CEOs, owners, superintendents) were present during the workshops to ensure a safe space to voice opinions.

The goal was to explore how energy citizenship materializes among young professionals within the local context across home, work, and leisure spaces and to identify viable, sustainable options (Zhan & Sahakian, 2023). By integrating local knowledge, practical solutions, construction expertise and academic insights, the CAL aimed to co-create innovative housing and social meeting places that support low-emission lifestyles in rural contexts. Ultimately, the CAL sought to produce both policy-relevant knowledge for decision-making and empowerment knowledge for citizens, allowing them to take active roles in co-creating the social, economic, aesthetic, and environmental dimensions of the energy transition (Schibel, et al., 2022).

The gender imbalance characteristic of rural Norway, including our project site, was reflected in the composition of our CAL, where only two women participated in the CAL. It raised important questions about whose perspectives shape visions of future housing and community life in Overhalla. While our recruitment strategy—focused on young

professionals in response to local concerns about demographic continuity—enabled strong engagement with a key stakeholder group, it also limited broader inclusiveness. Further, it highlights how structural gendered dynamics, such as migration patterns, shape who is present in rural participatory spaces and, consequently, the possibilities for inclusive energy citizenship (Epp et al., 2025).

Thus, although our research study was not initially conceived as an autoethnographic endeavour, particularly given the practical and collaborative nature of our CAL, our critical reflection, which forms the analysis presented in this paper, represents a retrospective narration that challenges established norms in research practice (Adams et al., 2021: 4).

Co-design phases as processes of constant adjustments

In the following we present our research approach through the different phases of the process (see figure 2), our continuous adjustments throughout this process and our critical reflections on how this affected the CAL-process and its participants.

Phases
1. Using the joint protocol as guiding script and mission
2. Translating the script into a rural Norwegian context
3. Using the script as approach to discuss energy citizenship with young professionals
4. Adapting activities to context specific lifestyles, challenges and expectations
5. Exploring future imaginaries and scenarios for low-emission rural lifestyles
6. Critical reflections on the need for context-specific co-design methods

Figure 2. Phases of the local CAL process

Phase 1: Using the joint protocol as a guiding script and mission

The DIALOGUES project emphasises inclusivity and diversity, aiming to foster equitable participation in developing sustainable energy practices. A vital component of this process was the creation of the common protocol—which worked as a guiding script for partners to design their CALs. The protocol sought to ensure that the co-design process would be accessible and representative of diverse perspectives. In this context, diversity also encompassed various socio-demographic factors, including gender, age, socio-economic status, race, ethnicity, and intersections between these characteristics. Moreover, it recognised the different levels of knowledge, experience, and access to resources, such as energy consumption and living conditions, which shape individuals' participation in energy transition efforts. These socio-demographic considerations, along with the aim to represent diverse perspectives, led partners in different countries to adopt context-specific notions of inclusivity—engaging various underrepresented, marginalized, or hard-to-reach groups in their CALs based on local challenges.

In the Norwegian context, the common protocol navigated us to explore the lived experiences of young professionals in rural municipalities like Overhalla—settings where mobility and temporary residence patterns pose distinct challenges for young residents. For many young professionals employed in the municipality, particularly those without local roots, residence in

Overhalla was regarded as temporary. Their stay often lasts only a few years, typically serving as a stepping stone at the beginning of their careers before relocating to other places. This recurring pattern raises important questions about the social, economic, and cultural factors that may influence whether such individuals choose to establish long-term residence in Overhalla.

Phase 2: Translating the script to a Norwegian context: Engaging with local partners

The initial phase of translating the common protocol to a Norwegian context involved reaching out to local industry representatives and municipal actors in Overhalla. Members of the research team had prior experience collaborating with stakeholders in the municipality, which facilitated the initiation of discussions about energy citizenship and co-design activities. These initial conversations were guided by the principles of inclusiveness, equality, and representation outlined in the DIALOGUES CAL Guidelines. Practical considerations also played a role in this phase, as we sought to identify actors with the capacity to connect with diverse local groups. The response to these outreach efforts was overwhelmingly positive, with actors from the municipality, local industry, and community members expressing enthusiasm about the initiative's potential to foster local knowledge-building and engagement.

The choice of the research focus was informed by broader challenges faced by several rural communities in Norway and site-specific conditions identified in collaboration with the local industry park. As a core actor in the municipality's energy transition and sustainability efforts, the industry park provided valuable insights into pressing local issues and potential avenues for engagement.

Through this collaborative process with the industry park, we identified young professionals as a key target group for the initiative. This decision was based on demographic patterns prevalent in many Norwegian rural municipalities, including an aging population and high rates of out-commuting for work. Consequently, a central question emerged: *How can the municipality create conditions for young professionals to settle, thrive, and actively contribute to the local green transition?*

By framing the research around this demographic group, we aimed to explore potential pathways for strengthening the local labour force while fostering energy citizenship in the context of rural sustainable development efforts.

Phase 3: Using the script as approach to discuss energy citizenship with young professionals

To better understand the perspectives of young professionals, we organised a three-hour workshop session with seven participants—two women and five young men. The session focused on their current living situations, working life in the municipality, social activities, and future aspirations. The workshop took the form of an open, facilitated group discussion, where researchers asked questions and provided reflections to stimulate dialogue among the participants and with the researchers. An audio recording of the session was transcribed and coded to identify key themes, which were subsequently woven into a coherent narrative capturing the participants' perspectives on life in Overhalla. This narrative was shared with the participants for review, ensuring it accurately reflected their collective experiences and insights.

As background and to inform the workshop design, we conducted interviews with key local actors who have insight into the lives of young people in Overhalla: a municipal employee working in mental health among youth and young adults, a teacher at a lower secondary school, and a central figure in the municipality's volunteer sector. We also carried out a detailed mapping of leisure activities in the area. In addition, we participated in a local event organised by industrial actors, where upper secondary school students participated to learn about career opportunities in local industrial companies.

Prior to the workshop, we anticipated that participants would highlight a lack of social gathering places, cultural offerings such as cafés, bars, and outdoor public spaces, and limited public transportation options as central factors having negative impact on their daily life. However, the workshop revealed that the participants' lifestyles, social habits, and perceptions of the municipality differed significantly from our initial assumptions, shaped by our experiences in urban contexts. These insights underscored the importance of grounding our participatory process in the lived realities of our target group rather than preconceived assumptions based on external perspectives on lifestyle among young adults.

Phase 4: Adapting activities to context specific lifestyles, challenges and expectations

We discovered that our CAL approach needed significant adjustments to the specific context in which it took place and that our former experience in participatory approaches centred around urban issues and places. In our case, initial assumptions centred on creating social gathering places to retain young professionals in the municipality. One proposal involved co-creating a temporary pop-up meeting place using modular wooden structures to test the viability of such spaces. Workshop discussions revealed distinct challenges faced by young adults, including car dependency, a lack of evening social venues, and difficulties in finding suitable housing.

While most participants maintained social networks through work or childhood connections, they did not express a strong need for social lives centred around places like a café or a bar, even if they highlighted the absence of such places. Instead, their social activities focused on fishing, hunting, video gaming, home gatherings, and hiking, all of which were readily accessible in the area. This feedback indicated that our initial idea of a pop-up meeting place did not align well with the more evident needs and preferences of the young professionals.

A pressing challenge affecting the young adults' ability to live and work in the municipality was the housing situation. Purchasing a home often required several years due to limited availability. Many available houses were in poor condition, and refurbishing them was rarely profitable, particularly for those considering future resale. The financial burden of purchasing, renovating, and reselling these large properties was a significant concern for them.

The young adults expressed a preference for detached homes with garages and ample space for outdoor projects. Although 150 square meters was considered a reasonable home size, many noted that much of this space often remained unused. Participants also emphasized the importance of having generous space around their homes and maintaining distance from neighbours.

In response to these findings, we explored more adaptable, modular housing designs that could better accommodate changing life stages and needs. Additionally, we engaged participants in discussions about the potential benefits of denser residential patterns, smaller gardens, and closer proximity to neighbours to reduce energy consumption and environmental impact. Further, we challenged them to reconsider their need for space and to explore the potential for denser, environmentally friendly, low emission living situations through engagement with and awareness of measures for energy efficiency in housing.

Phase 5: Exploring future imaginaries and scenarios for low-emission rural lifestyles

Building on insights from the previous phases, we carried out home design workshop to gain insights from young professionals' housing preferences and the potential for compact, energy-efficient dwellings. Seven participants (two female and five male), all of whom had attended earlier workshops, took part in this workshop.

The workshop began with one-on-one interviews, each lasting one to two hours, during which participants reflected on their current housing situations. Discussions centred on how their home environments influenced social interactions, hobbies, daily routines, economic considerations, and overall well-being. The conversation then shifted to future scenarios, where participants were invited to imagine their lives in smaller, more flexible housing options.

To facilitate this process, we introduced 1:100 scale models of a microhouse developed within the DIALOGUES project, along with

three prototype designs created by the CAL team based on findings from earlier phases. Participants were encouraged to critique these

models, suggesting changes and sharing reflections on how these spaces might accommodate their day-to-day needs and aspirations.

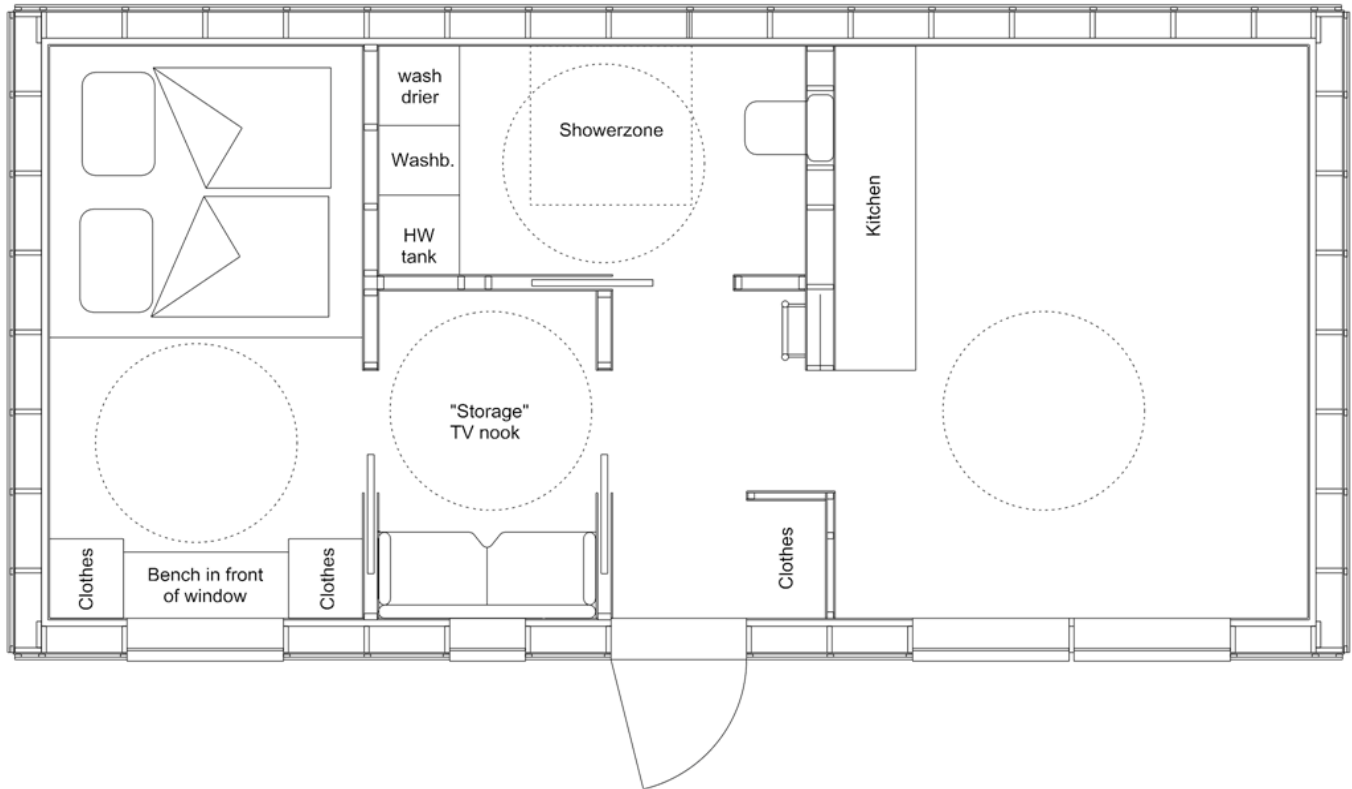


Figure 3. An example of a plan drawing for a 40sqm dwelling co-developed with local young professionals.

As part of this co-design process, we engaged local industry representatives to assess the feasibility of the proposed housing concepts. The ongoing dialogue with industry actors was essential in translating participants' ideas into practical, scalable housing solutions.

The co-design process ultimately led to the design of a 40-square-meter modular house (see figure 3) to be ready to fabricate for the element-based house production line available locally, specifically tailored to young professionals' needs, desires, and economic situations.

The layout of the modular house was surprising, as it deviated significantly from conventional layouts in current home construction in Norway. Notably, only one facade has windows; the living room is omitted and replaced with a small TV/gaming nook, and the kitchen becomes the main social space when having visitors. In addition, the omission of familiar comforts, such as floor heating, was accepted as long as it could be seen as a cost-saving measure in construction. The participants directly expressed their interest in the design, as they considered it much better adapted to their needs than what is available locally: either a large house connected to a farm or a generic apartment that poorly supports their lifestyle.

Phase 6: Critical reflections on the need for context-specific co-design methods

Our initial assumptions, shaped by research experiences from urban settings, did not align with the lived realities of the young professionals involved in the process. In this context, the young adult's social lives were centred around nature-based activities and home gatherings rather than public spaces, and their housing preferences were influenced by factors such as household size and availability.

The iterative and adaptive nature of the co-design process proved essential in identifying these context-specific dynamics. By continuously adjusting our methods based on participants' feedback, we could co-create housing concepts that better align with their needs and aspirations, while at the same time challenging them to consider future energy consumption and their willingness to participate in a sustainable and just energy transition in line with the energy citizenship concept. Furthermore, collaborating with local industry actors demonstrated the potential of participatory design to bridge knowledge gaps and promote locally grounded solutions for sustainable development.

Our experiences made us critically reflect on the assumptions embedded in co-design approaches and tailor methods to the

specific characteristics of the context and community we engaged with. In the context of rural energy citizenship, this entailed

acknowledging and leveraging the existing social practices, spatial configurations, and economic realities that shape everyday life.

Discussion: Script tales from a rural co-design process

The following discussion is structured around challenges that emerged through our phases of joint critical reflections on the CAL in rural Norway. These challenges are explored through three co-existing script tales, each highlighting different dynamics within the CAL-process. In doing so, we address our research question: *How are expectations for a more participatory energy transition enacted in a rural community?* The chapter contributes to broader discussions on the need for energy citizenship to be adapted to diverse contexts and the role of participatory research in sustainable and just rural energy transitions.

Subscription: Embracing the Energy Citizenship Script

The CAL-process revealed instances of subscription, where local industry and municipal actors actively adopted the energy citizenship script, seeing it as a promising framework for community engagement and local energy transition efforts. The pathway to subscription was iterative. Firstly, the actors closest to the activity wished to showcase to a broader public within the local community, inviting the research team to present their preliminary findings at an industry seminar. Secondly, multiple actors approached the research team with their own stories during and after the seminar. They found that the script had helped them connect the dots on some of the observations they had made in their own organisations. From here, the research team was invited to participate in various meetings, primarily online, to discuss not only their findings, but also how different organisations might operationalise and engage in energy citizenship.

Local industry actors from the industry park therefore demonstrated a willingness to align with the energy citizenship concept as envisioned by the CAL protocol and the researchers. Their engagement was evident in both formal interviews and informal conversations, where they expressed enthusiasm for initiatives connecting young professionals to the municipality's sustainability goals. This subscription illustrates how external policy narratives, like energy citizenship, can be locally translated and adopted when actors perceive them as aligned with their own objectives.

Additionally, this aligns with the broader theoretical understanding of scripts (Akrich, 1992), where artefacts and associated meanings are more readily adopted when they resonate with local social practices, capacities and economic conditions. The active engagement of industry stakeholders highlights how policy concepts like energy citizenship can be translated into action through collaborative, context-sensitive design practices.

From our experiences, participatory methods have the potential to act as mediators between abstract policy goals and practical,

local applications, especially when participants see clear benefits for their local community. The industry's subscription suggests that rural contexts, despite their unique characteristics, can contribute significantly to energy transitions when participatory and collaborative processes are adapted to local conditions. This demonstrates the potential for communities to engage meaningfully in energy transitions when methods are adjusted for context-specific conditions.

De-Inscription: Challenging Urban-Centric Assumptions

In contrast, some of the young professionals did not recognise or identify with the proposed ideas [the subscription], leading to processes of de-inscription. This lack of recognition often stemmed from the perception that the CAL's proposed interventions did not account for the realities and capacities of rural life.

In line with Funch and colleagues (2020) workshops revealed challenges regarding rural housing, and scepticism toward compact living in dense residential settings. Participants highlighted the importance of indoor space for hobbies and home-based social gatherings and storage for equipment for activities such as sports, hiking, hunting and fishing. The researcher's initial emphasis on social gathering places was not the most evident challenge, as participants explained that their social networks primarily functioned through private and nature-based gatherings. These reactions illustrate how predefined scripts for energy citizenship often fail to resonate locally when they overlook the unique cultural practices and spatial dynamics of diverse contexts.

This resistance can be understood through Akrich's concept of de-inscription (1992), where artefacts (in this case, the CAL's proposed interventions) are rejected or reinterpreted. The scepticism towards the compact living proposals reflects participants' concerns about lifestyle compromises and a broader cultural attachment to space and privacy.

As Pineda (2008) explains, resistance to the script may also be performed by non-human actors. In this case, the scepticism toward new, more small-scale and energy-efficient housing models may relate to the existing layout and design of the residential housing. None of the existing housing - and what participants might see at the reference point - supports the proposed CAL script.

The observed de-inscription emphasises the need for us as researchers to critically reflect on the transferability of participatory energy transition methods from urban to rural contexts. It shows how assumptions about residential and social lifestyles risk undermining engagement and trust in co-design processes of energy transition when they are not problematized.

User Scripts: Co-Creating New Narratives

Throughout the CAL process, researchers and participants engaged in co-design processes, resulting in new user scripts. The workshop design, combined with reflections on initial misconceptions, led to adaptations of the CAL's original direction.

Recognizing the disconnect between the researchers' assumptions and participants lived experiences prompted adjustments. The focus shifted from promoting urban-style social gathering places to exploring housing models better suited to local lifestyles. As Abouaiana and Battisti (2023) explain, rural housing often lacks energy savings design. Therefore, our CAL could contribute to more knowledge on energy-saving design for private housing that aligns with local needs, by co-designing modular, small-scale homes designed to match local housing preferences while promoting energy efficiency.

The introduction of these new user scripts – accommodating other usage patterns (Gjøen and Hård, 2002) than expected, demonstrates how participatory energy transition processes can lead to the redefinition of design goals when participants' feedback is actively incorporated. The emergence of context-specific housing concepts shows the potential for CALs to facilitate place-based innovation by responding to local knowledge and practices.

In the absence of rural-specific models, our CAL drew on general knowledge of common rural challenges—such as demographic shifts, youth outmigration, housing development, and the loss of skilled labour. While Overhalla shares many of these traits, what stood out was the richness of local resources, knowledge, and collaborative practices. These elements, often overlooked in mainstream research, suggest a local mindset oriented toward inclusion, problem-solving, and resilience.

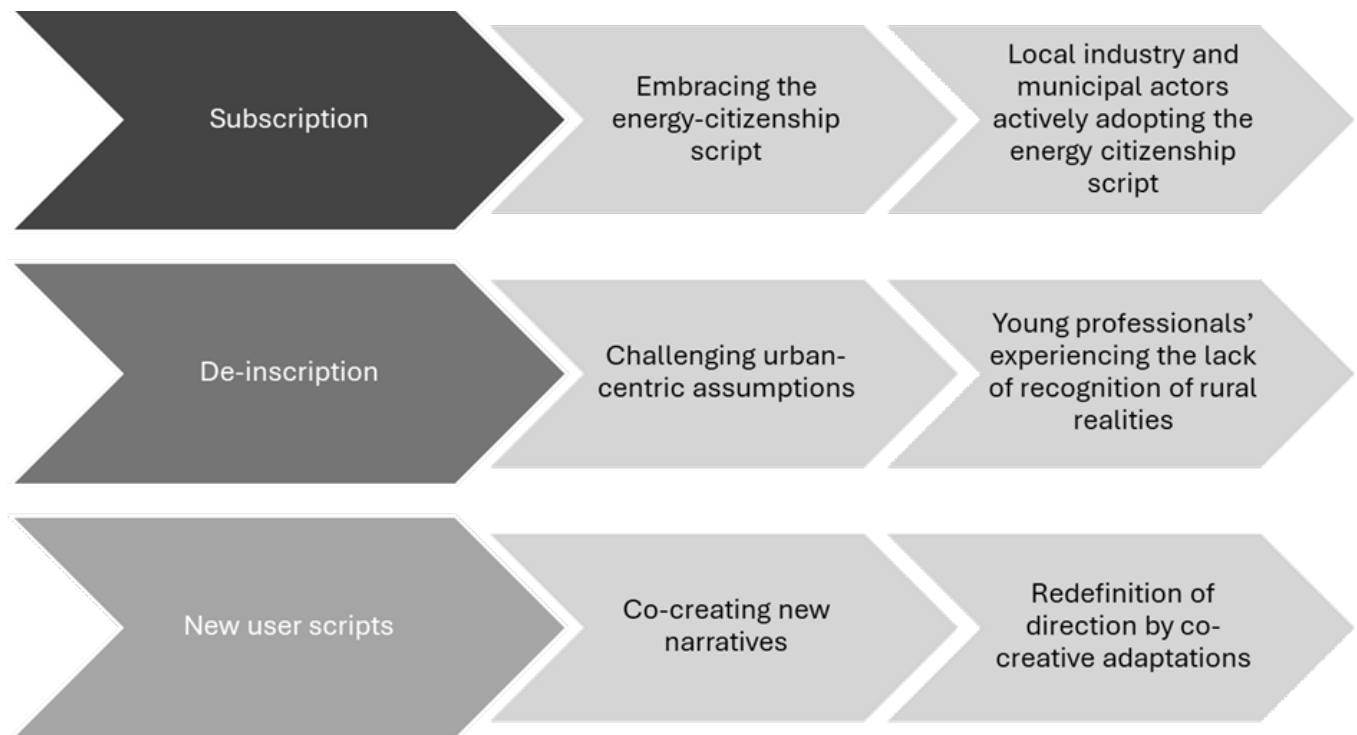


Figure 4. Processes of subscription, de-inscription and new user scripts

Concluding remarks

In summary, this paper addresses three key gaps in current scholarship: the limited attention to rural energy citizenship within energy citizenship literature, the underexplored nature of participation in rural energy transitions, and the overlooked insights rural contexts offer for advancing broader energy transition research.

Our analysis of script tales highlights the value of context-sensitive participatory energy transitions, conceptualising rural energy transition as a distinct domain—one that foregrounds place-based

approaches and recognises the unique resources, capacities, and lived experiences of rural communities. In Overhalla, energy citizenship – and the focus on how to incorporate sustainable energy transitions into the everyday practices of individuals and collectives and their willingness to participate in a just and sustainable energy transition– was shaped through subscription, de-inscription, and the emergence of new user scripts. These experiences show that participatory methods, when aligned with local conditions, practices and values, can foster meaningful

engagement in rural energy transitions and help identify viable, sustainable options.

We also gained broader methodological insights: participatory energy transition methods developed for urban settings require significant adaptation in rural areas. Factors like dispersed housing, nature-based social practices, and distinct interaction patterns demand tailored methods.

Policymakers should account for the socio-spatial dynamics and diversity of rural communities when designing energy transition strategies. Recognising local practices, spatial layouts, and economic and political conditions enables more inclusive engagement. Co-design processes must remain flexible to reflect local perspectives and foster relevant outcomes. Future research should explore how

participatory energy transitions can be adapted across contexts and assess their long-term impact on energy citizenship.

Our CAL process demonstrates that adapting methods to local lifestyles is essential for inclusive, grounded energy transitions. This discussion ties back to our theoretical framing, emphasising the need to tailor participatory methods to rural contexts and contribute to debates on energy citizenship in sustainable transitions. The emergence of new user scripts shows how context-sensitive participation can connect abstract policy concepts with everyday place-based practices. Ultimately, continued research should examine how co-design fosters locally relevant engagement in energy transitions, helping drive sustainable and just place development that is both locally grounded and globally significant.

Acknowledgements

This work was part of the DIALOGUES project funded by the European Union's Horizon 2020 Research and Innovation Programme under [grant number 101022585].

Author description

Lina Naoroz Bråten is an assistant professor and PhD candidate at the Department of Architecture and Planning, Norwegian University of Science and Technology (NTNU). Her research investigates how participatory and experimental planning practices influence the design of social, inclusive and democratic cities and places. Orcid ID: 0000-0001-6921-7484

Dr. Berit Therese Nilsen is a senior researcher at NTNU Samfunnsforskning AS. She works at the intersection of energy, sustainable transitions, and spatial development. Her research examines how local challenges, place-based strategies, and the built environment, including digital infrastructure, shape pathways to sustainability and sufficiency.

Dr. Lucia Liste is a senior researcher at NTNU Samfunnsforskning AS. She works at the intersection of public participation, democratic resilience, and sustainability transitions. Her research examines how social change unfolds in times of crisis, with particular attention to arenas of resistance and the governance of complex societal challenges. Orcid ID: 0000-0003-4104-8273

Pasi Aalto is the Centre Director of NTNU Wood at the Department of Architecture and Technology, Norwegian University of Science and Technology (NTNU). His work focuses on minimising the resource use of the current building stock by better utilisation of existing buildings and the better design of alterations and transformations in line with local needs. Orcid ID: 0000-0001-7739-1888

References

- Aasbrenn, K., & Sørli, K. (2016). Uttynningssamfunnet – 25 år etter. In M. Villa & M. S. Haugen (Eds.), *Lokalsamfunn* (pp. 152–176). Oslo: Cappelen Damm Akademisk.
- Abouaiana, A., & Battisti, A. (2023). Insights and Evidence on Energy Retrofitting Practices in Rural Areas: Systematic Literature Review (2012–2023). *Buildings*, 13(7), 1586.
<https://doi.org/10.3390/BUILDINGS13071586/S1>
- Adams, T.E., Holman Jones, S., & Ellis, C. (Eds.). (2021). *Handbook of Autoethnography* (2nd ed.). Routledge.
<https://doi.org/10.4324/9780429431760>
- Adams, T. E., Ellis, C., & Jones, S. H. (2017). *Autoethnography*. In J. Matthes, C. S. Davis, & R. F. Potter (Eds.), *The International Encyclopedia of Communication Research Methods*.
<https://doi.org/10.1002/9781118901731.iecrm0011>
- Akrich, M. (1992). The de-scription of technical objects. In W. E. Bijker & J. Law (Eds.), *Shaping Technology/Building Society: Studies in Sociotechnical Change* (pp. 205–224). Cambridge: MIT Press.
- Akrich, M., & Latour, B. (1992). A summary of a convenient vocabulary for the semiotics of human and nonhuman assemblies. In W. E. Bijker & J. Law (Eds.), *Shaping Technology/Building Society: Studies in*

- Sociotechnical Change* (pp. 259–264). Cambridge: MIT Press.
- Benz, C., Scott-Jeffs, W., McKercher, K.A. et al. Community-based participatory-research through co-design: supporting collaboration from all sides of disability. *Research Involvement and Engagement* 10, 47 (2024).
<https://doi.org/10.1186/s40900-024-00573-3>
- Biresselioglu, M. E., Demir, M. H., Solak, B., Savas, Z. F., Kollmann, A., Kirchler, B., & Ozcureci, B. (2024). Empowering energy citizenship: Exploring dimensions and drivers in citizen engagement during the energy transition. *Energy Reports*, 11, 1894–1909.
<https://doi.org/10.1016/j.egyr.2024.01.040>
- Boekelo, M., & Kloppenburg, S. (2023). Energy platforms and the future of energy citizenship. *Energy Research & Social Science*, 102, 103165.
<https://doi.org/10.1016/j.erss.2023.103165>
- Bremberg, S. (2020). Rural-urban mortality inequalities in four Nordic welfare states. *Scandinavian Journal of Public Health*, 48(8), 791–793.
- Bulkeley, H., et al. (2019). Urban living laboratories: Conducting the experimental city? *European Urban and Regional Studies*, 26(4), 317–335.
<https://doi.org/10.1177/0969776418787222>
- Bødker, S., Dindler, C., Iversen, O. S., & Smith, R. C. (2022). What is participatory design? In *Participatory Design. Synthesis Lectures on Human-Centered Informatics*. Springer, Cham.
https://doi.org/10.1007/978-3-031-02235-7_2
- Chang, H., Ngunjiri, F. W., & Hernandez, K. A. C. (2016). *Collaborative Autoethnography* (1st ed.). New York: Routledge.
- Clément, G., Guerrieri, M., Sahakian, M., Schibel, K. L., & Zhan, M. X. (2022). Guidebook for designing and implementing Citizen Action Labs and Recruitment to the Citizen Action Labs, DIALOGUES Project D5.3/D6.1.
- Debourdeau, A., Schäfer, M., Pel, B., Kemp, R., & Vadovics, E. (2024). A conceptual typology of energy citizenship. *Energy Research & Social Science*, 117, 103720.
<https://doi.org/10.1016/j.erss.2024.103720>
- Dell'Era, C., & Landoni, P. (2014). Living lab: A methodology between user-centred design and participatory design. *Creativity and Innovation Management*, 23(2), 137–154.
<https://doi.org/10.1111/CAIM.12061;WGROUP:STRING:PUBLICATION>
- Devine-Wright, P. (2007). *Energy citizenship: Psychological aspects of evolution in sustainable energy technologies*. In J. Murphy (eds.), *Framing the present, Shaping the future: Contemporary Governance of Sustainable Technologies*.
- Duncan, M. (2004). Autoethnography: Critical appreciation of an emerging art. *International Journal of Qualitative Methods*, 3(4), 28–39.
<https://doi.org/10.1177/160940690400300403>
- Dunphy, N. P., Lennon, B., Revez, A., & Pearce, B. B. J. (2025). *Energy Citizenship: Envisioning Citizens' Participation in the Energy System* (1st ed.). Palgrave Macmillan Cham.
- Droege, P. (Ed.). (2018). *Urban energy transition: Renewable strategies for cities and regions*. Elsevier.
- Epp, J., Demir, M. H., Liste, L., Nilsen, B. T., Sahakian, M., Zhan, M., ... Biresselioglu, M. E. (2025). Scaling the impact of the energy transition through inclusivity and diversity across living labs. *Sustainability: Science, Practice and Policy*, 21(1).
<https://doi.org/10.1080/15487733.2025.2527474>
- European Commission. (n.d.). Citizens' Energy Forums. European Commission. Retrieved [05.02.2025], from
https://energy.ec.europa.eu/topics/markets-and-consumers/energy-consumers-and-prosumers/citizens-energy-forums_en
- Faber, S. T., Nielsen, H. P., & Bennike, K. B. (2015). *Place, (in)equality and gender*. Nordic Council of Ministers.
- Funch, M., Eliassen, S. Q., Vestergård, L. O., Penje, O., Rut Sigurjónsdóttir, H., & Turunen, E. (2020). Breaking the downward spiral: Improving rural housing markets in the Nordic Region. *Nordregio Policy Brief* Vol. 2020 No. 4.
<https://doi.org/10.6027/PB2020:4.2001-3876>
- Gjøen, H., & Hård, M. (2002). Cultural politics in action: Developing user scripts in relation to the electric vehicle. *Science, Technology, & Human Values*, 27(2), 262–281.
<https://doi.org/10.1177/01622439020700204>
- Heleniak, T., & Sánchez Gassen, N. (2020). The demise of the rural Nordic region? Analysis of regional population trends in the Nordic countries, 1990 to 2040. *Nordisk välfärdsforskning | Nordic Welfare Research*, 5(1), 40–57.
<https://doi.org/10.18261/issn.2464-4161-2020-01-05>
- Hetland, P. (2020). Citizen science: Co-constructing access, interaction, and participation. *Nordic Journal of Science and Technology Studies*, 8(2), 5–17.
<https://doi.org/10.5324/NJSTS.V8I2.3547>
- Huybrechts, L., Hendriks, N., & Martens, S. (2017). Counterfactual scripting: Challenging the temporality of participation. *CoDesign*, 13(2), 96–109.
<https://doi.org/10.1080/15710882.2017.1309438>
- Irwin, A. (2015). On the local constitution of global futures. *Science and democratic engagement in a decentred world. Nordic Journal of Science and Technology Studies*, 3(2), 24–33.
<https://doi.org/10.5324/NJSTS.V3I2.2163>
- Jungk, R., & Müllert, N. (1987). *Future workshops: How to create desirable futures*. London: Institute for Social Inventions.
- KC, R., Föhr, J., & Ranta, T. Public Perception on the Sustainable Energy Transition in Rural Finland: A Multi-criteria Approach. *Circular Economy and Sustainability*, 3, 735–755 (2023).
<https://doi.org/10.1007/s43615-022-00206-5>
- Leiren, M. D., & Skollerud, K. (2015). Public transport provision in rural and sparsely populated areas in Norway. *International Transport Forum Discussion Paper*.
- Lennon, B., Dunphy, N., Gaffney, C., Revez, A., Mullally, G., & O'Connor, P. (2020). Citizen or consumer? Reconsidering energy citizenship. *Journal of Environmental Policy & Planning*, 22(2), 184–197.
<https://doi.org/10.1080/1523908X.2019.1680277>
- McKercher, K. A. (2020). *Beyond sticky notes. Doing co-design for real: Mindsets, methods, and movements*. Sydney, NSW: Beyond Sticky Notes.
- Naumann, M., & Rudolph, D. (2020). Conceptualizing rural energy transitions: Energizing rural studies, ruralizing energy research. *Journal of Rural Studies*, 73, 97–104.
<https://doi.org/10.1016/j.jrurstud.2019.12.011>
- NOU (Norges offentlige utredninger). (2020). NOU 2020: 15 – Det handler om Norge: Bærekraft i hele landet. Kommunal- og moderniseringsdepartementet.
- Olmos-Vega, F. M., Stalmeijer, R. E., Varpio, L., & Kahlke, R. (2022). A

- practical guide to reflexivity in qualitative research: AMEE Guide No. 149. *Medical Teacher*, 45(3), 241–251.
<https://doi.org/10.1080/0142159X.2022.2057287>
- Örnekoğlu-Selçuk, M., Emmanouil, M., Hasirci, D., Grizioti, M., & Van Langenhove, L. (2023). A systematic literature review on co-design education and preparing future designers for their role in co-design. *CoDesign*, 20(2), 351–366.
<https://doi.org/10.1080/15710882.2023.2242840>
- Pineda, A. F. V. (2008). Scripts and distribution of agency in urban transport projects. In J. Glynn, F. Hackney, & V. Minton (Eds.), *Networks of Design: Proceedings of the 2008 Annual International Conference of the Design History Society (UK)* (pp. 265–270). Falmouth: Universal Publisher.
- Quist Eliassen, S., Ormstrup Vestergård, L., Sigurjonsdottir, H. R., Turunen, E., & Penje, O. (2020). Rural housing challenges in the Nordic region.
<https://doi.org/10.6027/R2020:7.1403-2503>
- Rauhut, D., Rasmussen, R. O., Roto, J., Francke, P., & Östberg, S. (2008). *The demographic challenge to the Nordic countries*. Nordregio.
- Rye, J. F., & Slettebak, M. H. (2020). The new geography of labour migration: EU11 migrants in rural Norway. *Journal of Rural studies*, 75, 125–131.
<https://doi.org/10.1016/j.jrurstud.2020.01.014>
- Ryghaug, M., Skjølsvold, T. M., & Heidenreich, S. (2018). Creating energy citizenship through material participation. *Social Studies of Science*, 48(2), 283–303.
<https://doi.org/10.1177/0306312718770286>
- Sahakian, M., Zhan, M., Epp, J., Liste, L., Nilsen, B. T., Schibel, K.-L., Reusswig, F., Aalto, P., Haider, J., Kirchler, B., & Kollmann, A. (2025). From dispersed practices to radical socio-technical imaginaries: the role of action labs for supporting collective energy citizenship. *Consumption and Society*, 4(1), 11–32.
<https://doi.org/10.1332/27528499Y2024D000000041>
- Salonen, H., Guðmundsdóttir, H., & Åberg, H. E. (2022). Discussion Paper: A "Just Green Transition" for Rural Areas in the Nordic Region: key concepts and implications.
- Sanders, E. B. N., & Stappers, P. J. (2008). Co-creation and the new landscapes of design. *CoDesign*, 4(1), 5–18.
<https://doi.org/10.1080/15710880701875068>
- Schibel, K.-L., Guerrieri, M., & Trenti, C. (2022). D6.2 First progress report of the Citizens Action Labs. Citta di Castello. Available at: <https://www.dialoguesproject.eu/wp-content/uploads/2023/03/DIALOGUES-D62-First-progress-report-of-the-Citizens.pdf>
- Schreiber, F., Fokdal, J., & Ley, A. (2023). A Catalyst for Innovation? A Conceptual Framework for Analyzing the Potential of Urban Experiments to Transform Urban Planning Practices. *Planning Theory & Practice*, 24(2), 224–241.
<https://doi.org/10.1080/14649357.2023.2199460>
- Silvast, A., & Valkenburg, G. (2023). Energy citizenship: A critical perspective. *Energy Research & Social Science*, 98, 102995.
<https://doi.org/10.1016/j.ERSS.2023.102995>
- Smith, R. C., Bossen, C., & Kanstrup, A. M. (2017). Participatory design in an era of participation. *CoDesign*, 13(2), 65–69.
<https://doi.org/10.1080/15710882.2017.1310466>
- Sovacool, B. K., Noel, L., Kester, J., & Zarazua de Rubens, G. (2018). Reviewing Nordic transport challenges and climate policy priorities: Expert perceptions of decarbonisation in Denmark, Finland, Iceland, Norway, Sweden. *Energy*, 165, 532–542.
<https://doi.org/10.1016/j.ENERGY.2018.09.110>
- Tjora, A. (2021). *Kvalitative forskningsmetoder i praksis* (4th ed.). Trondheim: Gyldendal.
- (Trøndelagfylke.no). Faktafredag: Mer enn 59 000 pendlere i Trøndelag - Trøndelag fylkeskommune.
- Vohland, K., Land-Zandstra, A., Ceccaroni, L., Lemmens, R., Perello, J., Ponti, M., Samson, R., & Wagenknecht, K. (2021). The Science of Citizen Science. In K. Vohland et al. (Eds.), *The Science of Citizen Science*. Springer Nature Switzerland AG.
<https://doi.org/10.1007/978-3-030-58278-4>
- Wahlund, M., & Palm, J. (2022). The role of energy democracy and energy citizenship for participatory energy transitions: A comprehensive review. *Energy Research & Social Science*, 87, 102482.
<https://doi.org/10.1016/j.ERSS.2021.102482>
- Zavratnik, V., Superina, A., & Duh, E. S. (2019). Living Labs for Rural Areas: Contextualization of Living Lab Frameworks, Concepts and Practices. *Sustainability*, 11(14), 3797.
<https://doi.org/10.3390/SU11143797>