

Welcome to the 26th Futures Conference
SUSTAINABILITY, TEMPORALITIES AND FUTURES
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BOOK OF ABSTRACTS

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FUTURES CONFERENCE 2026

VENUE: MEDISIINA D

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CONFERENCE SCIENTIFIC PROGRAMME

TUESDAY 9 JUNE 2026

- 09.00 Registration to the Conference & coffee
- 10.00 Conference Opening and Introduction to Conference Themes
Senior University Lecturer, Dr. *Katriina Siivonen*, Finland Futures Research Centre, University of Turku, Finland
- 10.30 Keynote Speech: “The Future of Extractivism: Navigating Planetary Boundaries, Wicked Problems and Geopolitical Turmoil”; Professor, Dr. *Per Högselius*, KTH Royal Institute of Technology, Sweden
- 11.30 Lunch
- 12.30 Session 1 (parallel tracks)
- 14.00 Coffee break
- 14.30 Session 2 (parallel tracks)
- 16.00 Short break
- 16.15 Keynote Speech: “More than North Futures, More than South Possibilities”; Associate Professor, Dr. *Geci Karuri-Sebina*, Wits School of Governance, University of the Witwatersrand, Johannesburg, South Africa
- 17.15 Closing of the first conference day
- 19.00 Conference dinner

WEDNESDAY 10 JUNE 2026

- 09.00 Coffee
- 09.30 Keynote Speech: “Imagining Sustainable Futures: Narratives of Place in Heritage-Making”; Professor, Dr. *Inger Birkeland*, University of South-Eastern Norway, Norway
- 10.30 Short break
- 10.45 Session 3 (parallel tracks)
- 12.15 Lunch
- 13.00 Session 4 (parallel tracks)
- 14.30 Coffee break
- 15.00 Session 5 (parallel tracks)
- 16.30 Short break
- 16.45 Session 6 (parallel tracks)
- 18.15 Final Thoughts: Committing to Fair Future for All, Forever? Professor, Dr. *Arto O. Salonen*, University of Eastern Finland, Finland
- 18.40 Closing the Conference; Professor, Dr. *Toni Ahlqvist*, Head of Finland Futures Research Centre, University of Turku, Finland
- 18.45 Networking

SESSION PROGRAMME

TUESDAY 9 JUNE 2026

**SESSION 1
12.30-14.00**

**SESSION 2
14.30-16.00**

Track 1	Track 2	Track 3	Track 4	Track 5	Track 6	Track 7	Track 8
Alhopuro	Laurén 2	Säätiö	Blokki 1	Skooppi 1 & 2	Laurén 1	Aistikattila	Blokki 2 & 3
Sustainability Transformations in the Forest Sector	Imagining Transformative Futures: Methods and Visual Approaches	Cultural Sustainability Transformation Across People, Places, and Practice	Temporalities Across Politics, Idleness, and Foresight	Special Session: Assessing Energy Futures: Trends and Interlinkages Between Futures-Orientated Methodologies and Sociotechnical Transitions Research	Workshop: Dancing Uncomfortable Futures	Workshop: Temporal Ecospheres: Rewilding Our Sense of Time	Workshop: Exploring Resilience and Social Sustainability in a Post-Crisis World Through a Talkoo Futures Roleplaying Workshop
Transitions Towards Sustainable Circular Economies	Navigating Transformative Futures Across Time	Anticipatory Governance for Sustainable Futures	Governing Uncertain Futures: Institutions, Methods, and Sustainability Competencies	Special Session: Bridging Foresight and Democratic Innovation for a Just Sustainability Transformation	Special Session: Future in Our Hands: Young Europeans' Voices on Democracy and Futures	Workshop: Narrative Futures: Backcasting Sustainable Worlds through Literary Worldbuilding	Workshop: The Experience of Planetary Belonging – A Constellation Method for Sustainability Transformations

WEDNESDAY 10 JUNE 2026

	Track 1	Track 2	Track 3	Track 4	Track 5	Track 6	Track 7	Track 8
	Alhopuro	Laurén 2	Säätiö	Blokki 1	Skooppi 1 & 2	Laurén 1	Aistikattila	Blokki 2 & 3
SESSION 3 10.45–12.15	Climate Futures: Risk, Adaptation, and Mitigation	Futures for and by whom? participation, agency, and sustainability transformation	Futures Thinking in Practice	Sensing the Future: Arts-Based Practices for Sustainability Transformation	Special Session: Governing Sustainable Futures in Uncertain Times	Special Session: Foresight as Social Infrastructure	Workshop: Long-Term Futures Need Long-Term People	Workshop: Balancing Procedural and Skills-Centred Approach to Institutionalised Foresight in Governments
SESSION 4 13.00–14.30	Emerging Futures in Sustainability and Urban Transformation	Learning Into the Future: Education, Youth, and Wellbeing	Futures Literacy for Sustainable Transformation	Rethinking What We Wear: Textile Sustainability Transformation	More-Than-Human Futures: Energy, Leadership, and Multi-species Ethics for Sustainability	Special Session: Our World of Futures Studies as a Mosaic, Part 2	Workshop: Designing Delphi Prompts for Sustainable Well-Being: Co-Creation Lab for Planetary Futures	Workshop: Designing Fair Futures through Strategic Fun
SESSION 5 15.00–16.30	Youth Narratives for Future Worlds	Foresight Methods for Policy, Education, and Entrepreneurship	Governance, Welfare, and Digital Infrastructures in Sustainability Transitions		Sustainable Pathways in Space and Advanced Communications	Workshop: Rehumanizing Profit: An Interactive Workshop on Regenerative Business and the Healing Economy	Workshop: Drawing Time: Artifact-Based Explorations of Temporal Organization in Future Societies	Workshop: Purpose Scanning: Horizon Scanning for Just and Inclusive Futures
SESSION 6 16.45–18.15	Sustainable Food Production and Consumption Futures	Designing Futures: Scenarios, Strategy, and Sustainability Transformation	Sustainability Transformations: Bridging the Gap between Adhering to Present-Day Standards and Longer-Term Desired Outcomes		Digital Infrastructures, AI Foresight, and the Governance of Sustainable Futures			

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KEYNOTE SPEAKERS

Tuesday 9 June at 10.30

The Future of Extractivism: Navigating Planetary Boundaries, Wicked Problems and Geopolitical Turmoil

Professor, Dr. Per Högselius

History of Science, Technology and Environment, KTH Royal Institute of Technology, Sweden

Almost everything we do depends on something being extracted from nature. Natural resources – whether in the form of crude oil, mineral ores, water, wood, or other useful substances – are everywhere in our lives and we use them almost constantly. Humanity’s ability to extract natural resources is astonishing. Every year, around 100 billion tons of raw materials are consumed worldwide, corresponding to 12 tons per capita, and the volumes are increasing from year to year.

Can this development continue in the future? And do we want it to continue? We live in an age of cognitive dissonance when it comes to resource extraction: on the one hand, there is a feeling that a continued “great acceleration” would be disastrous, not least in view of what are now understood as “planetary boundaries”. On the other hand, our modern lives depend entirely on the continuation and intensification of extractivism. This dilemma hints at the wicked problems that are part and parcel of today’s and tomorrow’s challenges in the extractivist realm.

Building on these uncomfortable observations, this talk will elaborate on the future of extractivism against the backdrop of its historical antecedents. The analysis will be divided into three parts. The first part gives a brief overview of “how we got here”, identifying the key technological and societal forces that have enabled the scaling up of resource extraction to its current unprecedented levels. The second part discusses the most important current trends in extractive industries from a global perspective, considering a set of closely linked technological, environmental, and geopolitical developments. The third part elaborates more specifically on a number of possible extractivist futures. These range from ecomodernist utopias of harmony between technology, environment and society and socialist dreams of “just extractivism”, to apocalyptic visions of societal and environmental collapse caused by war and turmoil, social and political polarization, and moral deterioration.

Tuesday 9 June at 16.15

More than North Futures, More than South Possibilities

Associate Professor, Dr. Geci Karuri-Sebina

Wits School of Governance, University of the Witwatersrand, Johannesburg, South Africa

Contemporary futures discourse often assumes a particular relationship to time: it tends to be linear, accelerated, measurable, and governable. Whether in sustainability transitions, urban transformation, technological innovation, or anticipatory governance, the future is frequently approached as something to be managed through planning, optimisation, prediction, and control. Yet many of the crises we face (ecological, social, political, existential) may also reflect a deeper temporal dissonance: a narrowing of the ways in which we sense, inhabit, and relate to time itself.

How might alternative experiences and imaginaries of temporality invite different orientations to futures practice? Drawing lightly from experiences in African urbanism, informal life-worlds, ecological thinking, and more relational philosophies, this talk considers what becomes possible when we loosen the assumption that continuity, growth, and preservation are always synonymous with sustainability.

Rather than positioning “the South” as a source of solutions for “the North,” the talk reflects on encounters with alterity as invitations toward humility, plurality, and self-reflection. Building on an ongoing body of practice and reflection, the speaker asks whether engaging different temporalities – cyclical, entangled, ancestral, ecological, emergent – might create space for other ways of imagining change, collective life, and notions of transitions.

The talk will move between story, reflection, urban practice, and futures thinking to consider questions such as: What happens when sustainability requires not only sustaining, but also ending? How might we distinguish resilience from delay? What forms of planning, development, or governance become possible when emergence is treated not as disorder to be controlled, but as a condition to be worked with carefully?

Participants are invited into a shared inquiry about the relationship between time, transformation, and the futures we are currently making possible (or impossible) – and those we may still be unable to imagine.

Sources:

Bazile, S., and G. Karuri-Sebina. 2025. ‘The Wilds beyond 2x2 Futures: An Enquiry into Decolonising Foresight’. In *Improving and Enhancing Scenario Planning*. Edward Elgar Publishing. <https://www.elgaronline.com/edcollchap/book/9781035310586/chapter6.xml>.

Karuri-Sebina, G. (unpublished). ‘Saving Time from Conservation, and Conservation from Time’. Unearthodox, March 2025.

Terry, N., Azucena C., B. Chibwe, G. Karuri-Sebina, C. Savu, and L. Pereira. 2024. ‘Inviting a Decolonial Praxis for Future Imaginaries of Nature: Introducing the Entangled Time Tree’. *Environmental Science & Policy* 151 (January): 103615. <https://doi.org/10.1016/j.envsci.2023.103615>.

Wednesday 10 June 2026 at 9.30

Imagining Sustainable Futures: Narratives of Place in Heritage-Making

Professor, Dr. Inger Birkeland

University of South-Eastern Norway, Norway

Cultural heritage is often understood as heritage-making, as uses of the past for present-day purposes. Time and temporality, and especially the relationship between the past and the present, has always been central in heritage-making. Recently, we have seen a new interest in the ways heritage-making is used to imagine sustainable futures.

The lecture will focus on the imaginary construction of the future relating to the heritage of industrial society. The lecture takes its outset from place narratives constructed around the development from industrialization to de-industrialisation at Rjukan and Notodden in Norway, whose technical-industrial heritage was inscribed on UNESCO's World Heritage List in 2015. This region has a special place in Norwegian modern history and identity as the cradle of Norway's industrial adventure.

Place narratives are important; They are maps of meaning telling stories that provide orientation and aspiration for the future of a place and its inhabitants, if the narrative grants a sustainable future to the place. We can ask: What can we learn from the case of Rjukan and Notodden about the role of the imagination for creating sustainable futures, at a time when global climate change represents a new context for valuing our industrial past?

TUESDAY 9 JUNE 2026

Session 1:

Tuesday 9 June at 12.30–14.00

1. Sustainability Transformations in the Forest Sector

Time: Tuesday 9 June at 12.30–14.00

Room: Alhopuro

Chair: Arto O. Salonen

Walking in Finnish Forests: Experiential Pathways to Restoration and Regenerative Futures

Heikkilä, Miia^a – Hautamäki, Ranja^a – Pasanen, Tytti, P.^b – Verma, Ira^a

^a Aalto University, Finland; ^b Finnish Institute for Health and Welfare, Finland

Understanding sustainability transformation requires attention not only to systems and policies, but also to the lived, embodied, and relational ways in which humans connect with more-than-human environments. This presentation draws on an ongoing phenomenological study exploring how people experience restoration while walking in Finnish forests.

Rather than focusing on forests solely as restorative environments, the study approaches forests as sites where human and more-than-human relationships, meaning-making, and emerging orientations toward care and responsibility emerge and evolve. Through go-along interviews, the research identifies visible experiential qualities, such as sensory perception, movement, and spatial structure, and invisible dimensions, including values, memories, emotions, and symbolic meanings. These dimensions interact dynamically, shaping how forests are experienced as places of restoration, care, and responsibility.

The presentation explores a relational and circular understanding of restoration that views restoration not as an isolated outcome, but as a relational and circular process that can support regenerative orientations and actions. By highlighting the interplay between inner experiential worlds and external environments, the study contributes to discussions on cultural sustainability transformation, everyday practices, and experiential foundations of planetary well-being.

The findings invite future-oriented reflection on how experiential relationships with forests may influence long-term sustainability transformations, intergenerational thinking, and the cultivation of regenerative human–nature relations.

Keywords: Restorative experience, Forest, Human-nature interactions, Restorative environments, Nature experience, Phenomenology

Beyond forest time: How getting rid of time can make our relationship with forests more sustainable

Kortekangas, Otso

Åbo Akademi University, Finland & University of Helsinki, Finland

Addressing the conference key topic “Individual and collective understandings of time and temporalities in sustainability transformation”, this presentation challenges the notion of forest time (related to such notions as deep time or geological time) as separate from human temporalities.

The paper applies a critical conceptual analysis of narratives of time and temporality in recent works on environmental philosophy and environmental history. It also presents an empirical focus on Swedish and Finnish Biology school textbooks. In both cases, the paper discusses the distinction between human time and forest time.

Forests obviously exceed and outlive human time in multiple ways. However, the paper argues that in the era of the Anthropocene, no temporality or time on a planetary scale can meaningfully be understood as existing outside human time: humans influence everything from the deep-sea floor to the proportion of protective gases surrounding our planet. In many cases, time itself, with its urge to measure, control, and report, impedes a truly sustainable relationship with forests.

The paper offers constructive criticism of the idea of “natural time” independent of humans, while also suggesting possible solutions. Indeed, the paper suggests that liberating ourselves from time as a concept means that other notions beyond time and temporality (e.g., ethics or care) can guide how humans should relate to forests. These notions refer to a fundamentally sustainable approach and practice toward the ecological logics according to which forests exist and will continue to exist even after the end of human-kind.

Keywords: forest time, deep time, temporality, biology textbooks, education

Making sense of time and temporality in natural resources governance

Soini, Katriina – Varho, Vilja – Ramcilovik-Suominen, Sabaheta – Pellikka, Jani – Mishra, Himansu – Eerikäinen, Nelli – Salo, Matti

Natural Resources Institute Finland, Finland

Currently, decisions on natural resources are made in rapidly changing and uncertain environmental, political and economic situations. Changes in some variables may take place rapidly, while in some others more slowly. Natural resource governance decisions often fail because they do not account for non-linearity of time or, conflicting rhythms between ecological processes and policy cycles. Moreover, perceptions of change are deeply rooted in different socio-cultural temporalities, i.e. stakeholders’ and citizens’ subjective perceptions of the speed of ecological change, the urgency of climate action, the longevity of economic cycles, or expectations for biodiversity recovery.

The premise of this research is that there is no single time, but rather many, co-existing times and plurality of temporalities. We argue that this plurality in temporalities is an underlying factor for many conflicts in natural resources and understanding these divergencies is a key in reducing polarization and advancing just transition and transformation. Moreover, awareness of temporal diversity and an understanding of associated path dependencies may enable better preparedness for disturbances and risks.

This paper presents results of ongoing research on how different temporal dimensions - ecological, institutional and lived - as well as mismatches between or within them are recognized and understood in research relevant for natural resource governance research. Secondly, it discusses the preliminary implications of the findings for the natural resource governance.

The results are based on an interdisciplinary integrative literature review that is co-designed and co-produced by a research team composed of researchers with diverse disciplinary backgrounds, ecology, political science, geography, regional studies, landscape architecture, and future studies and different contexts of natural resources (e.g. energy, forestry, game management, nature-based solutions) and includes literature among western and indigenous communities.

The overall aim of this review is to provide a framework for further studies in sector and policy specific questions in the field of natural resources governance (such as forest governance, nature restoration) and to advance research in this field with more holistic and explicit recognition of various temporal dimensions.

Keywords: temporal mismatches, natural resources governance, interdisciplinary literature review

Defining sustainable enough: Assessing the EU forest sector against planetary boundaries

Suuronen, Juulia – Yang, Jing – Hurmekoski, Elias

University of Helsinki, Finland

Imagining sustainable futures requires defining the status quo and sustainable enough. The sustainability of activities is commonly measured with life cycle assessment (LCA), but it only reveals the relative environmental impacts in comparison to other alternatives. Therefore, Absolute Environmental Sustainability Assessment (AESAs), a recent development in LCA, combines it with the Planetary Boundary framework with the objective of comparing LCA results against environmental thresholds to determine if an activity is sustainable enough given the environmental crises. This study uses AESA to evaluate the sustainability of the EU forest sector that provides feedstock for bioeconomy to replace fossil products while forests play an important role as carbon sinks sequestering carbon from the atmosphere.

This study takes the LCIA-based carrying capacity AESA method, in which the environmental impact is calculated and the carrying capacity set for the sixteen impact categories of the Environmental Footprint LCA method. Two sharing principles are used to allocate carrying capacity for the EU forest sector to perform a sensitivity assessment of the carrying capacity allocation. Additionally, this study incorporates biogenic carbon into the climate impact LCA with different approaches, as considering only fossil emissions can lead to underestimated climate impacts for wood-based products in some time horizons.

The results indicate that the EU forest sector is not currently operating within its assigned carrying capacity in multiple environmental impact categories, such as climate change, freshwater ecotoxicity and eutrophication, particulate matter, land use, and fossil resource use. When biogenic carbon is incorporated in the model, the results with dynamic methods suggest that over short time horizons the climate impacts are likely to increase and over long time horizons decrease. With static methods, the inclusion of biogenic carbon gives net zero impacts and, thus, has minimal influence on the results.

This study highlights the need to define sustainability relative to the environmental thresholds and to account for biogenic carbon in AESAs of wood-based products to generate more accurate information to support current and future decision-making in the EU forest sector.

Keywords: Absolute Environmental Sustainability Assessment, Life Cycle Assessment, Planetary Boundaries, Forest sector, Biogenic carbon

2. Imagining Transformative Futures: Methods and Visual Approaches

Time: Tuesday 9 June at 12.30–14.00

Room: Laurén 2

Chair: Laura Pouru-Mikkola

Imag(in)ing the Future: The Power of imagination as a driver to sustainable futures

Karaïskou Vicky

Open University of Cyprus, Cyprus

This presentation explores collective perspectives and perceptions for and of the future in relation to collective imag(in)ing and imagination. The central question it poses is “What are the images and the emotions that feed our memory for the future? On what soil do we build our futures?”. In other words, what keeps us from imagining our ideal futures?

It stresses the need to consider two crucial parameters, indispensable for curing the poverty of imagination we experience individually and collectively: The images and the emotions that are intertwined to our ability to imagine. Our prospection mechanism – how we think about the future – activates the very same areas our hippocampus uses when we recall memories. We need to reflect on what are the mental and emotional landscapes we involve while contemplating the possible, doable, impossible, or utopian in the future and ask what shapes the limits of our imagination. Imagination has no limits under the condition that we stubbornly cultivate our capacity to generate alternative futures and new realities beyond the reactive thinking anchored in fearful narratives that dominate our public spaces.

This presentation sustains that the exploration of our viscosity is essential to support us, individually and collectively, to build antibodies to toxic, delimiting narratives that awash our daily lives. The tools applied during the “Imag(in)ing” visual literacy workshops focus on redesigning our mental stages and explore how and why we have grown an ingrained habit of stating what we do not want, what we want to eliminate and cure, instead of the vision of what we want to experience. Tools such as the “Stage”, the ‘Sensing instead of making Sense’, the ‘Identity triangle’ or the ‘Five Mirrors’ challenge familiar scenarios with empowering, fulfilling, worth-living alternatives.

“What if” questions instead of “what is” affirmations; intentional unearthing of our limiting assumptions, biases and stereotypical perceptions; brave pursue of visualizing our possible selves; and, mostly, upgrading of imagination from a ‘flight from reality’ propensity to a valuable asset in constructing just and sustainable futures, can transform our present and future beyond the limitations that currently constrain our sustainable aspirations.

Keywords: viscosity; visual literacy; imagination; images; emotion

Future images of organizational culture transformation and voluntary employee turnover in Chinese accounting firms

Zhu, Jieni – Heino, Hanna –Tapio, Petri

Finland Futures Research Centre, University of Turku, Finland

High voluntary employee turnover negatively influences the long-term economic and social sustainability of firms, a challenge particularly serious in Chinese accounting firms. To explore how the organizational culture transformation could improve employee retention in Chinese accounting firms, this study introduced a novel Organizational Culture–Employee Turnover framework. Based on this theoretical framework, we conducted a two-round Disaggregative Delphi study with 21 experts in the first round and 25 in the second. Experts assessed the probability and desirability of organizational culture transformation in Chinese accounting firms by 2040. The analysis identified four alternative images of the future: 1) highly systematic and process-oriented firms, 2) people-oriented innovation firms, 3) traditional firms undergoing gradual reform, and 4) mission-oriented and rigidly structured firms. Results indicated a marked gap between experts' desirable and probable views of organizational culture transformation in Chinese accounting firms. While improvements in organizational-oriented cultural dimensions, such as systems thinking, transparency, and learning, were perceived as both desirable and likely, transformations in people-oriented cultural dimensions, including well-being, work–life balance, and equality, were considered highly desirable yet unlikely to be realized, highlighting structural and institutional barriers to achieving these organizational culture transformations. These findings contribute to futures studies by highlighting organizational cultural transformation strategies to Chinese accounting firms that may improve employee retention by 2040. The outcomes of this study also provide valuable insight for sustainable business from both economic and social perspectives. Furthermore, the project promotes interdisciplinary dialogue across futures studies, sustainable development, organizational culture, human resource management, and the accounting profession.

Keywords: Organizational culture; Voluntary employee turnover; sustainable business; Future image; Delphi method; Mixed-method research

Imageries of sustainability transformations - a scoping review on positive futures (or their absence)

Neuvonen, Aleks – Lähteenoja, Satu

Demos Helsinki, Finland

The role of future visions, imagination, and the factors limiting them is increasingly significant in sustainability science. This is because current beliefs about the future shape our present behaviours and choices (Miller 2018). Images of the future are essential for justifying present-day political, economic, and innovation decisions (Beckert 2013).

Despite this, there is a common assertion that contemporary societies lack positive, long-term visions, contributing to a sense of social malaise. To explore the scope and characteristics of positive or aspirational sustainability futures, we conducted a scoping review across both academic and non-academic literature. This review synthesizes various sources of future visions for a society undergoing a sustainability transformation, classifying their presented themes, solutions, and perspectives. The final database consists of 158 identified sources, including academic articles, non-fiction books, policy reports, websites, and works of fiction.

A significant gap observed in the literature on sustainability futures is a reliance on currently known technological solutions—such as renewable energy, the circular economy, and sustainable urban design. Crucially, the institutional or fundamental economic structural changes required to implement these are rarely addressed. This focus creates a one-sided depiction of everyday life, where citizens are primarily seen as users of new technologies or as performing tasks directly related to their implementation. In contrast, the role of civic action in driving the sustainability revolution is seldom featured in these futures. Overall, despite the large volume of sources reviewed, our analysis revealed that:

1. Future scenarios are predominantly technical in nature.
2. They describe processes of change in a somewhat schematic or non-systemic manner.
3. The range of actors identified as agents of change is narrow.

These findings highlight a need to expand the practice of creating positive futures—depicting worlds and societies that extend beyond the initial sustainability transformation. Imagining the future is not merely a cognitive-emotional process; it is also socio-political, influenced by the existing phenomena, imaginaries, and discourses available in the social environment (Milkoreit 2017). The current deficit of aspirational futures in public discourse risks narrowing people's imagination and leading to timidity toward truly transformative solutions.

Keywords: Positive futures, imaginaries, scoping review, sustainability transformations, visions

Making Sense of Sustainability Transformations

Ketonen-Oksi, Sanna^a – Vigren, Minna^b

^a Laurea UAS, Finland; ^b LUT-University, Finland

In recent years, sustainability transformations has become a rallying term across conferences, special issues, and policy forums. Yet the conversation remains markedly misaligned. While some strands emphasise structural political–economic change, others foreground systemic relational shifts or emphasise enabling local experimentation—often speaking past one another about whose futures count, what qualifies as transformation, and how methods should be meaningfully combined in practice.

This presentation examines this growing fragmentation by mapping key fractures, tensions, and conceptual divergences across the transformations field. Rather than treating these inconsistencies as a weakness, the preliminary analysis of this work-in-progress aims to demonstrate, how they surface fundamentally different assumptions about agency, temporality, knowledge, and justice. Building on these insights, the presentation proposes the first draft of a pragmatic synthesis aimed at moving beyond rhetorical convergence toward situated, present day change. This includes clarifying the kinds of methodological commitments, participatory practices, and power related approaches that could support more grounded and accountable sustainability transformations – ones that recognise plurality, expose the politics of anticipation, and strengthen collective capacity to act within the constraints and possibilities of the present moment.

Methodologically, the presentation contributes two elements. First, it introduces an alignment matrix that helps clarify and compare divergent strands within sustainability transformations work by making sense of (a) the type of transformation claim being advanced (structural, systemic, or enabling), (b) the underlying normative stance (e.g., justice, planetary wellbeing), (c) the locus of change being targeted (practice, policy, or governance), and (d) the specific function that different futures methods are intended to serve (such as generativity, legitimacy building, or conflict navigation). The matrix draws on insights from the recent review *Methods to imagine transformative futures in Futures*, using it as a backbone for making

visible how techniques differ in purpose, effect, and suitability—and how misalignments in the field may arise.

Second, the presentation proposes a set of co-research scaffolds, including role configurations, consent to uncertainty protocols, reflexive prompts, and distributed authorship practices. By embedding pluralistic knowledge and participation directly into the architecture of transformative spaces—rather than treating them as add-ons—these scaffolds strengthen methodological integrity. They foreground power over futures, enable shared sense making, and align co-created inquiry with situated sustainability challenges. Together, the matrix and scaffolds offer a pragmatic way to navigate conceptual fractures in the transformations discourse while supporting grounded, present-day transformative action.

Keywords: futures methods; transformative futures; alignment matrix; conceptual divergences

3. Cultural Sustainability Transformation across People, Places, and Practice

Time: Tuesday 9 June at 12.30–14.00

Room: Säätiö

Chair: Marianna Birmoser Ferreira-Aulu

Museums as facilitators of cultural sustainability transformation in Finland

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The transformation towards life within planetary boundaries implies a fundamental shift from the current way of living, altering values and practices in relation to over-consumption. Evidence is solid about the fact that we will have serious consequences of climate change and biodiversity loss without sustainability transformation.

Museums are often seen as places where only past is present. We turn this idea upside-down and take the notion that museums have a key role in anticipating futures and sustainability transformation in society as our starting point. We argue that people's actions in time are parallelly informed by individual and collective memories, images of futures and imaginations of futures. To understand people's actions, we also need to scrutinize their past- and futures-oriented affects and emotions. These are intertwined with each other in people's temporal understanding and anticipatory actions.

In our presentation, we ask how museums may support imaginations of sustainable futures and cultural sustainability transformation. We draw on qualitative research data produced in three in-person Heritage Futures Workshops organized in different museums in Finland. These workshops have been developed to support cultural sustainability transformation including emotional skills and planetary thinking. Our results indicate that achieving cultural sustainability requires understanding of how people navigate the past, present, and future. Museums can be seen as affective agents in society. On the one hand, museums can support and enable individuals to act in the cultural sustainability transformation, but on the other hand, they act on behalf of the sustainability transformation as part of societal structures.

Our research is part of Sufficiency solutions for a resilient, green, and just Finland (SISU) project, funded by the Strategic Research Council of Finland.

Keywords: cultural sustainability transformation, affects, anticipation, memories, heritage futures

Neurocomb25 Model of Cultural Sustainability Transformation: The Process of Change, The People of Change, The Content of Change

Halchenko, Aleksandra

Neurocomb25 Lab, United Kingdom

The Neurocomb25 Model presents a neuroscience-informed metaphorical framework for cultural sustainability transformation, grounded in George Lakoff and Mark Johnson's theory of conceptual metaphor. Central to this framework is the proposition that the beehive functions not as a decorative analogy but as a Lakoffian container metaphor — a cognitively coherent structure whose architecture actively organises how transformation is understood, communicated, and enacted across complex systems.

Three pioneering metaphors form the model's interconnected core. The hexagon, representing the Process of Change, embodies a geometry that is structured yet flexible and interlocking, thereby translating neuroscience-informed principles — grounded in Bonsai Thinking's 3D Approach™ of Learning, Unlearning, and Relearning — into a coherent methodology for organisational transformation.

Building upon this structural foundation, the bees embody the People of Change: an ecology of distributed specialists organised across two distinct but interdependent streams. The Creative Stream comprises Poets-in-Residence, who use PostScriptum Poetry™ and conceptual metaphor to surface what organisations cannot yet say; Artists-in-Residence, who train aesthetic intelligence and the capacity for fresh perception; Designers-in-Residence, who engineer environments that make learning, unlearning, and relearning structurally possible; and Musicians-in-Residence, whose practice of large-group improvisation and rhythmic ensemble work generates neural entrainment and collective intelligence across teams. The Scientific Stream comprises Educational Engineers, who translate cognitive neuroscience into evidence-based learning systems; Happiness Pundits-in-Residence, who apply affective neuroscience and the hedonia–eudaimonia distinction to create the psychological conditions for deep unlearning; and Futurists-in-Residence, who draw on conative neuroscience and futures literacy to develop organisational capacity for intentional, long-horizon action over habitual response. Together, this ecology of seven specialist roles generates outcomes — cognitive, affective, and conative — that no individual actor could produce alone.

The accumulated product of both structure and agency is captured in the honey pot, embodying the Content of Change: layered wisdom drawn from cognitive, affective, and conative neuroscience, converting raw organisational experience into actionable knowledge across seven specialist domains — from the language of poetry and the spatial logic of design to the embodied intelligence of music and the anticipatory frameworks of futures studies.

Threaded through all three metaphors are the model's defining arms — temporality, resilience, and sustainability — which function not as abstract policy concepts but as embodied principles giving the framework its practical and ethical orientation. Methodologically, the model draws on a transdisciplinary synthesis of futures studies, implementation science, neuroaesthetics, large-group improvisation research, and embodied cognition theory, positioned within an ecosystem builder framework that foregrounds distributed agency, long-horizon thinking, and regenerative practice.

Underpinning the entire framework, the "25" signals a foundational commitment to a 25-year transformation horizon — the minimum timeframe futures studies identifies as necessary for embedding cultural change across generations, systems, and collective consciousness — offering governments and organisations a scientifically rigorous yet imaginatively compelling pathway for sustainable transformation.

Keywords: cultural sustainability transformation, conceptual metaphor, neuroscience-informed frameworks, futures studies, ecosystem building, temporality, resilience, regeneration

Taking the time, making the effort: Consciously moving towards cultural sustainability transformation

Halme, Amanda – Jokela, Janna

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Contemporary Western culture places a high value on speed, convenience, efficiency, and material abundance. These cultural traits have fueled the ecological crises confronting Earth, as anthropogenic activities increasingly disrupt the fundamental natural processes of the planet. However, as an ever-changing process of interaction, culture has an inherent capacity for transformation. It carries meanings that change through time, and the seemingly small changes brought about by individual people carry the potential to multiply and become a force that steers culture in new, desired directions. In order for the deterioration of nature to stop and healing to begin, a cultural sustainability transformation is needed.

Cultural sustainability transformation cannot be dictated from the outside. It emerges through interaction among individual people and communities. One venue where this interaction can take place are heritage futures workshops. In our presentation, we draw together data from several such workshops organised in Finland in recent years. These workshops bring individual people together to discuss what their desired futures could look like and to co-create heritage futures. Heritage futures are shared new skills, values, worldviews, and actions that build ecologically sustainable futures. As dynamic, intangible cultural heritage, heritage futures prompts us to consider what we can and want to do in this moment for a more sustainable lifestyle. At the same time, it challenges us to consider the long-term effects of our choices and the legacy we leave for future generations.

While the perspective of heritage futures is on the personal, individual level, in these workshops, individuals' thoughts often prove to be shared, unconventional ways of thinking. One such shared way of thinking that emerges from our workshop data is the idea of making an effort. This is highlighted as a desirable aspect by the participants, mentioned for example, through using muscle power for moving around and repairing things instead of buying new ones. In this presentation, we have examined the data especially with the idea of conscious effort in mind. We suggest that redefining the meaning of effort can have a vital role in achieving the cultural sustainability transformation needed. By doing so, we could move away from the current culture governed by short-term thinking and quick and easy solutions. This could help us move toward a culture where long-term impacts are considered, and the pace of life is more aligned with the natural rhythms of the planet.

Keywords: heritage futures; cultural sustainability transformation; participatory methods; cultural heritage

Moral Cognition in Relation to Perceived Responsibility Regarding Personal Sustainability Practices

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^a 784m, Honduras; ^b 784m, Germany; ^c Freie Universität, Germany; ^e 784m, Uruguay

Our research explores the nexus between moral cognition, emerging perceived personal responsibility regarding sustainability practices, and late-twentieth-century cultural-historical construction of narratives that inform it by privileging private consumer action over collective or institutional responses as the primary site of environmental intervention. This paper argues that moral cognition, constituted by distributed neural processes that integrate and compute reward, valuation, and social understanding (Moll et al., 2005; Yoder & Decety, 2018), serves as a critical yet underexamined factor in how agents perceive their agency in relation to sustainable futures and their sense of responsibility within sustainability transformation.

Understanding how moral cognition emerges from the interplay between neurological processes and social contexts is essential for comprehending how agents navigate responsibility regarding sustainability, whether accepting disproportionate accountability, abdicating agency, or falling somewhere between these two poles. These patterns reveal the psychological and social mechanisms shaping collective capacity to imagine and enact sustainable futures.

The study examines the historical construction and cultural evolution of personal responsibility narratives in sustainability discourse. Through media-cultural analysis, we trace how responsibility frameworks have developed since the 1970s, including corporate-funded campaigns that introduced concepts like personal carbon footprints (BP, 2004; Rees & Wackernagel, 1996) and consumer choice as primary sites of environmental action. This investigation reveals how responsibility has been framed, circulated, and internalized across scales (personal, corporate, systemic) and the resulting dynamics where agents often bear disproportionate perceived responsibility for planetary-scale challenges (Supran & Oreskes, 2021).

Our methodology integrates futures studies, sociology, and cultural media theory to construct a comprehensive understanding of contemporary sustainability consciousness and responsibility attribution. We employ network node analysis software, utilizing agent-based modeling approaches (de Marchi & Page, 2014; Schulze et al., 2017), to map how agents perceive their agency, responsibility, and futures in relation to sustainability challenges. Through empirical surveys and sociological analysis, we examine how awareness of historical responsibility frameworks affects anticipatory capacities (Miller, 2017), emotional responses, and engagement with sustainability transformation.

By revealing patterns embedded within individual moral cognition and tracing their networked manifestations across populations, this study offers insights into potential futures where responsibility is more equitably distributed across individual, corporate, and systemic levels. Understanding reactions when the historical construction of responsibility frameworks becomes visible is crucial for developing more just and effective pathways toward sustainability transformation.

Keywords: Moral Cognition, Sustainability Practices, Perceived Responsibility

Altered experiences of time with an idler way of life

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^c University of Helsinki, Finland

Introduction: Deeply rooted ideas of productivism is integral to the development of capitalism and modern industrial and post-industrial society. Yet, an appreciation for the freedom, ease, and political potential that being unproductive entails has never really disappeared. Idleness as resistance to excessive work and unsustainable lifestyles can even be considered a growing movement – even if under the radar of public discourse where it is usually shouted down by the high-performing proponents of efficiency, productivity and growth.

Idleness has the potential to enhance life satisfaction and health through allowing more freedom and time autonomy and through reducing stress, thus providing time for exploring existential questions of purpose and meaning. It can also be drawn on as a political strategy of refusal of work and non-compliance with dominant societal norms and expectations of productivity. Maybe most important in the current historical moment is its ecological potential: doing less implies less immediate resource and energy use and allows for more sustainable time-use and consumption patterns. In this way, idleness can be understood as sufficiency of activity: not simply meaning less activity but a qualitatively different, often much richer experience of time and being in the world, relating to basic sufficiency themes such as how much is enough, what is too much, and what is needed for a fulfilled life within ecological limits.

In this paper, we explore perceptions and understandings of time and temporality in individuals who diverge from standard full-time working norms. Drawing on Fine’s five dimensions of time (periodicity, tempo, timing, duration, and sequence), we ask how an idler way of living, as a form of sustainability transformation, affects the use and experience of time in everyday contexts.

Methods: As part of an ongoing research project we conduct empirical research on the experience and effects of idleness among five groups of people who diverge from standard full-time working norms and therefore have the ability to do less: “reprievers” (young people taking post-school gap years), “respiters” (people taking career breaks and sabbaticals), “retreaters” (those opting for early retirement), “reducers” (participants in working time reduction schemes), and “refusers” (people deliberately staying out of the labour market). Fieldwork takes place in Sweden, Finland and the Netherlands, and involves in-depth qualitative interviews as well as time-use diaries to investigate how purposefully doing less may reshape everyday practices, understandings of time and anticipated futures, and perceptions of a fulfilled life.

Keywords: idleness, sustainability, time, temporalities, change

4. Temporalities Across Politics, Idleness, and Foresight

Time: Tuesday 9 June at 12.30–14.00

Room: Blokki 1

Chair: Hanna Heino

Zooming in on the Time Perspective of Just Sustainability Transformations

Hujala, Teppo – Mauno, Tuomas

University of Eastern Finland, Finland

Time perspective – one of the five dimensions of Futures Consciousness (FC) identified by Ahvenharju et al. (2018) – emphasizes the ability to think about the future and to understand the long term consequences of present actions. In sustainability transformations, or in any normative process of systemic change, the time perspective interacts with the other FC dimensions in ways that future makers and change facilitators must actively consider. Time related aspects often become even more critical when addressing justice concerns within governance systems that must simultaneously consider multiple temporal dynamics.

Futures studies have introduced several time related concepts that can help refine how time perspective is understood and operationalized in sustainability work. This presentation proposes and justifies four time perspective considerations that are particularly valuable for governing just sustainability transformations:

1. Recognizing varying time horizons of consequences – from short term impacts to long term effects.
2. Understanding differing paces of systemic change – ranging from slow, incremental developments to rapid, abrupt shifts.
3. Appreciating the value of analysing how different change processes co-evolve and how their interacting consequences shape outcomes – especially when combined with comprehensive justice assessments.
4. Anticipating the high likelihood of changing framework conditions over time, including shifts in the “rules of the game” that may create new winners and losers and launch a need to reconsider earlier governance mechanisms.

Together, these considerations suggest that actors involved in sustainability transformations need systematic and systemic analyses that employ a refined understanding of the time perspective. Such attention to temporal dynamics can strengthen governance capacities for fostering just and future-proof sustainability transitions.

Keywords: abrupt change, futures consciousness, resilient governance, systemic interactions, time horizon, transformation governance

The conflict of temporalities: its effects on social movements and politics

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In the past, except for specific traumatic moments such as wars, revolutions, agricultural or economic crises, and natural disasters, the temporalities in which we human beings live – subjective time, social

time, political time, and historical time—were nested within one another like a kind of Russian doll: subjective time conformed to the social time that dominated our public life, political/institutional time defined the rhythms of life in our societies, and historical time was barely perceptible on a distant horizon or not at all. Currently, the acceleration of different temporalities external to our subjectivity has resulted in a disarray of the temporal order (social, political, economic, historical, geological), so that, instead of marking horizons of possibility for our existence, time is lived as a threat.

This becomes even clearer when we consider climate change, the threat of an environmental catastrophe that could impact future generations or even our own, which has introduced a temporality that was absent to previous generations: geological time. We are now living in a new epoch, the Anthropocene, a geological era generated by human action, which is now present in our daily lives not only as an abstract concept, but materially as heat waves, storms, fires, and epidemics; it has become an everyday topic that appears daily in newspapers, on television, on the internet, and in conversations. This Earth time places an even greater challenge on our shoulders, especially on young people who consider (rightly) that not enough is being done to prevent environmental destruction.

My main hypothesis is that the dislocation of different temporalities has become the primary issue for today's left social movements, pointing to the possibility of a different future. On the other hand, it has been instrumentalized by radical right-wing movements to instil uncertainty and fear among populations, pointing to an imaginary past.

I will first analyse the most significant works that address the modifications of social (Rosa, Hartog, Tomba), economic (Boyer), historical (Koselleck, Hartog, Bouton), and geological time (Dupuy) in the present. I will then support my conclusions from interviews (both my own and those I find online) on how left- and right-wing militants and leaders refer to time.

I will first explain the distinction between time and temporality, and define the various temporalities that shape human existence. I will then analyse how the different times that our subjective time faces have become threats and obstacles, rather than horizons for our action.

I will end with a discussion of how the radical right has used the uncertainty felt by many individuals to try to impose its conservative project on society. And, more optimistically, how new social movements are striving for a new society in which awareness of our relationship to nature is central.

Keywords: Time, temporalities, conflict, social movements

Temporal Dimensions in Corporate Foresight: Gaps, Approaches, and Future Directions

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Future-oriented management in organizations requires sustained engagement with uncertainty and long-term change. Corporate foresight has increasingly been recognized as an important means through which firms explore possible futures and inform strategic action. While the corporate foresight literature extensively discusses methods, organizational integration, and outcomes, less attention has been given to how temporal dimensions are operationalized within foresight practices.

This paper reviews the academic literature on corporate foresight and examines how temporal dimensions are represented in studies of foresight practice, including planning horizons, the timing and frequency of foresight activities, temporal dynamics, and context-specific factors influencing when foresight is initiated and updated. The review also considers how different understandings and organizational approaches to corporate foresight shape these temporal functions.

The findings reveal fragmented and uneven attention to temporal dimensions across the literature. By bringing together dispersed discussions of temporal dimensions, the study clarifies how time-related functions are embedded in corporate foresight practices and identifies areas requiring further conceptual and empirical investigation.

Keywords: corporate foresight, temporal dimensions, time, future horizons

The Temporal Foresight Expertise within R&D and Innovation Ecosystems

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The Finnish Society for Futures Studies, Finland

Sustainability transformations in high-tech R&D and innovation falter due to unresolved temporal conflicts in governance, such a fundamental timescape misalignment (Adam).

Grounded in foresight methodology and the anthropology of time this paper argues for developing the concept of "Temporal Foresight Expertise for R&D&I" (TFE).

Key theses of the anthropology of time - From Singular to Multiple Temporalities - involve such key concepts: temporal multiplicity and hybridity, allochronism and coevalness (Fabian), deep and intergenerational time, and critiques of linear contemporaneity (Osborne), rhythmanalysis (Lefebvre), etc.

TFE is the practiced ability to navigate and strategically align the multiple, conflicting temporalities inherent to innovation. It shifts governance from a linear view of time to acknowledging temporal multiplicity—concepts like coevalness (simultaneous temporalities) and rhythmanalysis (intersecting social-natural rhythms).

Crucially, TFE is reconceptualized not as episodic consulting but as an essential, internalized core competence for leadership and organizational governance.

Key temporal tensions across the R&D&I cycle illustrate the need of TFE:

- Research (R): Discovery Time vs. Institutional Discipline Time. TFE mediates between open-ended scientific inquiry and the rigid time of grant cycles, publication metrics, and career tracks.
- Development (D): Engineering Time vs. Ecological Time vs. Market Time. Desynchronization here creates latent sustainability and safety risks. Governance must synchronize engineering schedules, regulatory processes, and slow biological-ecological rhythms.
- Innovation (I): Adoption Time vs. Social Time vs. Generational Time. Leadership must reconcile the pace of market rollout with the slower time of building social trust, adapting cultural norms, and the intergenerational timeframes of planetary thresholds.

To scale TFE, the paper proposes repurposing High-Tech Conferences into arenas of temporal governance via "Open Foresight Laboratories" (OFLabs). The high-tech scientific conferences could become scalable infrastructures for mainstreaming "temporal foresight expertise."

Using foresight methods (temporal mapping, project stress-testing, etc.) OF Labs mainstream TFE by integrating three types of intelligence:

1. Personal Intelligence (PI): Cultivating individual temporal reflexivity among leaders and researchers.
2. Collective Intelligence (CI): Structuring dialogue to harmonize stakeholders' conflicting temporal perspectives.
3. Artificial Intelligence (AI): Serving as a "temporal sense-making" partner. AI tools model long-term cascading effects, identify weak signals of emerging conflicts, and visualize complex tempo-interactions to augment human deliberation.

Drawing on examples like the International Conference on Nanobiomaterials and Biomedical Engineering (ICNBNE, Moldova), the paper examines how foresight as a temporal practice can be embedded in conference program alongside classical disciplinary tracks (through temporal mapping sessions, temporal stress-testing of projects, and structured multi-stakeholder foresight forums, etc.)

Based on TFE, traditionally oriented toward retrospective knowledge exchange, conferences can evolve into arenas of temporal governance where heterogeneous temporal perspectives are made explicit, negotiated, and aligned.

These transformation from retrospective exchanges the conference into spaces for proactive, practice-based foresight.

By grounding foresight in time theory and scaling it through this socio-technical practice, TFE becomes a shared governance competence. It enables leadership for sustainability by making strategic, intergenerational decision-making systematically attentive to the heterogeneous temporalities that shape innovation's ultimate impact.

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Keywords: temporalities, R&D&I, ecosystem, foresight methodology, anthropology of time, AI

5. SPECIAL SESSION: Assessing Energy Futures: Trends and Interlinkages between Futures-Orientated Methodologies and Sociotechnical Transitions Research

Time: Tuesday 9 June at 12.30–14.00

Room: Skooppi 1 & 2

Chair: Vilja Varho and discussant: Sakari Höysniemi, Natural Resources Institute Finland (Luke), Finland

The sustainability transformation of energy systems and the underpinning societal shift is one of the key contemporary trends. Previous research has noted there are clear linkages between futures research and sociotechnical transitions such as the popular framework of multi-level perspective (Ahlqvist, 2022) and the related strategic foresight framework of ‘x-curve’ (Hebinck et al., 2022), yet the full potential of futures-orientated methods could be explored further. In a recent review concerning acceleration of low-carbon transition Sovacool et al. (2025) made a similar suggestion to the sociotechnical transitions community for adopting wider range of futures methods to study ongoing and future transitions instead of the more common and well-established focus on historical analysis. For instance, typology of pathways has focused on technology-driven innovations may require reconsideration and here for instance the literature on scenario typologies that covers much broader set of possible futures could add relevant insights. While for instance the use of scenarios found in the literature with the terms of ‘sociotechnical scenarios’ or ‘sociotechnical pathways’ has enabled to increase also the scope of foresight of energy modelling community, the engagement between SSH and STEM communities is still worth exploring.

Another research community inside SSH that could be potentially contribute to this debate is geopolitics and security. As geopolitical drivers and increasing concerns of security are similarly driving energy transformation forward such as the EU consideration for strategic autonomy, we therefore consider geography and international relations research as well as intelligence studies could provide fruitful insights. To our knowledge, particularly intelligence studies has contributed very little to this debate, while their futures-driven, yet more short-term focus could add relevant contribution.

In this session we seek contributions that have sought to integrate futures thinking (as well as foresight and intelligence studies) to the study of sociotechnical transitions in the context of energy system transformation in a multitude of scales. Also, studies that have combined e.g. energy-food-water nexus or e.g. interlinkages between energy and mobility transitions are welcome. Method-wise participatory action research or citizen science perspective, ethnographic research, or research seeking to broader actor-perspective such as analysis of corporate strategy are welcome. In addition to the qualitative research, also multi- and transdisciplinary research combining qualitative research (such as storylines) with quantitative analysis of energy system or energy market (such as various modelling methods) in the construction of scenarios or pathways is welcome.

Keywords: energy transition, foresight, roadmaps, scenarios, sociotechnical transitions

Attaining strategic energy visions with roadmapping: the case of REPower project

Höysniemi, Sakari – Mikkola, Olli-Matti – Eerikäinen, Nelli – Kautto, Niina

Natural Resources Institute Finland (Luke), Finland

Roadmapping has transformed in the last few decades from a method or toolkit primarily used in the realms of business and management particularly in technology-driven spheres to a more systemic scope to cover strategic sectoral and national level foresight and planning. One of such examples are in the

Finnish national context industry low-carbon roadmaps as initiated by the Finnish government to assess the needs for policy interventions for decarbonisation. While roadmaps are popular in policy and practice, there is only a small number of research on their use and description of theoretical and methodological background in sociotechnical transitions or the broader sustainability literatures. This presentation gives insights on how a roadmapping process was implemented in constructing a renewable energy roadmap for Finland up to 2055 in the REPower project.

All the while roadmaps are fairly generic and context-driven in their structure. However, as has been noted elsewhere, particularly when roadmaps lean towards strategic foresight use they start to have increasing similarities with the commonly used multi-level perspective of sociotechnical transition (Ahlqvist, 2022), where also the x-curve framework (Hebinck et al., 2022) stems from. We used particularly the strategic roadmapping tradition that develops short, mid-term and long-term strategic pathways consisting of core development options to attain a generated vision.

The knowledgebase in roadmaps is commonly based on scenario or Delphi process and in the case of REPower we generated four base scenarios of which we selected two (a 'transition' and 'transformation' pathway) that we proceeded in the pathway construction phase. The base scenarios were qualitative in nature, whereas in the pathway construction phase we combined quantitative data on energy system development from KEITO project (also funded by the REPower project). In order to focus on key development options we distilled three strategic areas that we named as 1) land use, sustainability, and economic aspects, 2) regional agency and justice in energy transition 3) geopolitical actorness in energy transition. We generated separate visions for these areas and then assessed their development in our pathways with the framework of X-curve in background.

Our results highlight the relevance of combining roadmapping with x-curve framework as it enabled to name the processes of both high-carbon (fossil fuel practices that need to be destabilised) and low-carbon (practices that need to be scaled up) transitions and to identify key policy measures for attaining the vision of the renewable energy roadmap.

Keywords: energy transition, roadmapping, scenarios, x-curve, sociotechnical transitions

Regionally envisioned scenarios of wind and solar power led energy transitions up to 2055 – A Delphi study of four case regions in Finland

Eerikäinen, Nelli – Rikkonen, Pasi

Natural Resources Institute Finland (Luke), Finland

The same energy policy leads to different outcomes in different regions. This article provides results of a systematic regional study of socio-technical scenarios for Finland's renewable energy transition up to 2055. The low-carbon energy transition is guided not only by national and EU energy and climate policy but also by the regions undergoing the transition, and therefore, by the actual local decisions. Regional capabilities, expectations and socioeconomic and system-level structures shape the energy transition outcomes which may vary vastly between different regions. In addition, the regional perspective improves understanding of how to coordinate the diverse interests of local actors, objectives, and social and environmental aspects in the development of the energy transition.

Solar and wind power have seen a rapid development over the past decade and growth is expected to continue. At the same time, the whole energy transition is taking shape in different regions. However, little is known about how regional actors envision the long-term transition and how these imaginaries diverge across different spatial contexts. Therefore, this study examines regional energy transition scenarios and the socioeconomic aspects of the transition in four different case regions in Finland. The data is collected through a two round Delphi process, first round through expert interviews (2025) and second round

through a Delphi-survey (at the beginning of 2026). Expert panel consisted of different regional experts involved in the transition in the case regions.

Following dimensions of the transition are studied through the Delphi data: the pace of renewable energy deployment, the distribution of socioeconomic benefits and the level of local acceptance and environmental consideration. Also, the aim is to consider more disruptive alternatives that may be less likely but may have a significant impact on the outcomes of the transition. The goal is to focus on our analysis on 1) the gap between expectations through comparing the probable and the desired regional pathways for the energy transition between the case regions and 2) to examine what kinds of scenarios do regional experts envision. The data analysis is based on the divergence of future views that are clustered to construct alternative scenarios.

The empirical approach of the study aims to provide further insight about multidimensional and multi-voiced regional perspectives and their significance in understanding the just and inclusive energy transition. The energy transition progress is largely affected by regional policy and its' local socioeconomic impacts, together with various concerns and interests, should be taken into account.

Keywords: energy transition, Delphi, alternative scenarios, spatial imaginaries

Experts' insights on the regional opportunities and challenges of hydrogen transition in Finland until 2035

Anttila, Aino – Varho, Vilja – Rikkinen, Pasi

Natural Resources Institute Finland (Luke), Finland

Hydrogen is seen as an important enabler for decarbonising energy and industry systems. The hydrogen economy requires input from multiple disciplines and intersects with numerous sectors in society. It encompasses renewable energy and nuclear power, land-use planning, security and resilience considerations, industrial systems, the bioeconomy and climate change mitigation, transportation, and beyond. Grasping the interdependencies within the progress of hydrogen economy, and conducting robust analyses of them, requires an integrated understanding of a broad and inherently complex landscape. Finland has important prerequisites for hydrogen economy, such as stable energy infrastructure, available water, and the potential for large-scale renewable energy production. However, the benefits and risks of the emerging hydrogen economy are unlikely to be distributed evenly across Finland.

We have interviewed ca 20 actors in four regions in Finland regarding opportunities, plans, risks, and future images for hydrogen economy. Although most investment plans are concentrated in Western and Southern Finland, preliminary findings indicate that there are activity and plans in all regions, as they attempt to use their own strengths in energy system transition. Hydrogen is seen to have different uses in different locations, and it ties closely to the plans to capture CO₂ emissions from bioenergy use. Local people are invited to the discussions mainly regarding siting and zoning. As hydrogen economy is a relatively new concept, few people have (critical or favouring) opinions about it at present. The largest environmental impacts may be caused by the electricity production. Stable policy environment and ambitious climate goals are a requirement for the growth of hydrogen economy. Early insights showcase some tensions between different regions in Finland. The closeness of the Russian border in the East coupled with limited transmission lines restrict renewable energy development. The potential for hydrogen production and industrial demand do not always occur in the same regions, resulting in unpredictability about where value might ultimately materialise in the future. The contrast between market driven and regionally balanced developments raises questions about regional justice. Simultaneously, questions concerning local identities, nature values, land use and workforce availability may become more notable with rapid industrial development. These tensions highlight the usefulness of a multidisciplinary and future-oriented approach to the transition.

Keywords: Hydrogen economy, regional development, future development, expert interviews

Designing Feasible Pathways for Sustainability Transformation through Futures Research

De Matos, Murilo – Zullo, Gustavo – Silva, Daniele – Carraca, Daniele – Noronha, Thiago – Nascimento, Renato – Junior, Marcello

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Sustainability transformation in industrial systems requires futures research methods capable of integrating long-term perspectives, structural characteristics of technological systems, and evidence-based strategic decision-making. Traditional foresight approaches often struggle to operationalise sustainability transitions in contexts marked by uncertainty, path dependence, and uneven technological capabilities. This paper presents an applied futures methodology designed to support sustainability-oriented transformation by systematically identifying feasible and transformative technological pathways aligned with existing industrial structures. The study applies a mixed-methods futures research framework combining patent-based analytics with the Smart Specialisation (S3) approach. The methodology integrates indicators of Revealed Technological Advantage, technological proximity networks, proximity density, and technological complexity to map global technological trajectories and identify strategic opportunities for diversification. Temporal dynamics are explicitly incorporated through longitudinal patent citation analysis, enabling the assessment of technological maturity, diffusion patterns, and innovation cycles across short-, medium-, and long-term horizons. The framework is empirically applied to the biotechnology domain, analysing areas of technological convergence across major international economies and the Brazilian industrial context. The results show that the combined use of proximity-based network analysis, complexity indicators, and temporal impact metrics enables the identification of sustainability-relevant technological pathways that balance feasibility and transformative potential. The methodology reveals clusters of emerging and underdeveloped technologies with distinct temporal profiles, highlighting opportunities for incremental development in the short term and more complex, high-impact transformations in the long term. By making temporal trade-offs explicit, the approach supports anticipatory decision-making and reduces the risks of short-term lock-ins and misaligned long-term investments. This paper contributes to futures research methodology by operationalising a structured, data-informed approach to sustainability transformation grounded in futures thinking. The proposed framework enhances the capacity of organisations and policymakers to manage multiple temporalities, align innovation strategies with sustainability goals, and design coherent transformation pathways within planetary and institutional constraints. By linking futures research methods with Smart Specialisation and patent analytics, the approach offers a replicable model for applied foresight in sustainability-driven industrial transformation.

Keywords: Corporate Foresight; Smart specialisation; Technological pathways

6. WORKSHOP: Dancing Uncomfortable Futures

Time: Tuesday 9 June at 12.30–14.00

Room: Laurén 1

Dufva, Mikko

Aalto University & Finnish Innovation Fund Sitra, Finland

We are living amidst a polycrisis in postnormal times. In order to create a sustainability transformation in a just and resilient way, it is more important than ever to think about unthought or even unthinkable futures. But reaching and facing these futures is hard. The challenge is twofold. First, we must identify and challenge our current deeply held assumptions. Second, we must be able to handle the torrent of anxiety and other emotions that many current trends and developments evoke.

In this workshop we explore futures thinking through movement. We focus on the ways futures feel in our bodies, how we can become more comfortable in thinking about uncomfortable developments and how can we translate this embodied knowledge into something actionable. We also explore temporality and how pasts and futures are present in the body and movement. No prior knowledge of movement practices or futures thinking is required.

The workshop builds on anticipation studies and embodied futuring, and previous workshops and sessions I have held on futures thinking through movement. I guide the participants through non-verbal movement and breathing exercises with music and suggestions. Together we create a free-flowing dance with uncomfortable futures. The workshop ends with articulation and reflection, where key insights are put into words and what needs to be shared is shared.

Keywords: Embodied futuring, movement practice, other ways of knowing, anticipations studies

7. WORKSHOP: Temporal Ecospheres: Rewilding Our Sense of Time

Time: Tuesday 9 June at 12.30–14.00

Room: Aistikattila

Engelhardt, Simone^a – Menke, Birthe^b

^a Adaptive Wonderland, Germany; ^b 4strat GmbH, Germany

What if we conceived of time not as a scarce resource, but as a living ecosystem that we inhabit, shape, and cherish? Temporal Ecospheres is a workshop format and gentle invitation to reimagine our relationship with time through the lens of speculative design, drawing inspiration from the wild intelligence of other living species and the innate rhythms of nature – which we sometimes forget we are still part of.

Equipped with the tools of futures research, the workshop utilizes insights into wildlife behaviour to focus on our experience of human time and bring into question how contemporary society constructs and values time. We embark on an imaginative journey that challenges entrenched beliefs such as “time is money” or “wasting time” and explores radical new perspectives on the experience of everyday time in contemporary Western societies.

Participants will collaborate to transform collective imagination into new narratives and speculative prototypes for the future. Using wildlife facts, world-building cards, and futures wheels, participants craft visionary scenarios and tangible artefacts that explore regenerative ways of spending human time to gain new perspectives on societal systems, the rhythms of work, our own force of nature, and collective well-being in today’s and future worlds. The workshop journey follows four phases:

1. **Immersion in a Wildlife Rhythm:** Participants delve into a “wildlife fact” that illuminates the lifecycle or seasonal behaviour of a particular animal. This reconnects participants with the existence of natural rhythms, inviting participants to sense the pulse of nature and consider how such patterns might inspire alternative models for human time.
2. **Mapping Possibilities with the Futures Wheel:** Guided by the chosen wildlife rhythm, participants employ a Futures Wheel to explore the implications of introducing this natural cadence into human society. Together, they map out consequences, uncovering new opportunities and transformative potentials for the use of human time.
3. **Crafting Narratives from Possible Futures:** Building on these insights, participants weave short, evocative narratives that bring their imagined reality to life. These stories serve as portals into a world where human time flows in harmony with nature.
4. **Creating Speculative Artefacts:** Finally, participants translate their collective imagination into tangible form. Participants design and create physical artefacts—objects, ritual elements, or other—that embody the rhythms and values of their envisioned future. These artefacts serve as both conversation pieces and catalysts, inviting ongoing dialogue about how we might rewild our sense of time for a more regenerative society.

Keywords: Speculative Design; Future Artefact; Time Ecology; Social Rewilding; Multispecies Futures; Regenerative Time

8. WORKSHOP: Exploring Resilience and Social Sustainability in a Post-Crisis World through a Talkoo Futures Roleplaying Workshop

Time: Tuesday 9 June at 12.30–14.00

Room: Blokki 2 & 3

Salminen, Hazel – Näsi, Riina

The Finnish Society for Futures Studies, Finland

Background and purpose: The purpose of the workshop is to explore how community, resilience, and sustainability relate to one another in a futures context. Through their work, the facilitators', Riina Näsi and Hazel Salminen, have found that experiential and embodied futures methods provide a richness and tangible quality to futures work. Thus, they now seek to offer the participants an experience of something more concrete, creative, and collaborative, in the midst of an intensive conference.

The workshop is grounded in a framework in which culture intersects with the layers of imagining the future. The workshop approaches culture as part of the guiding Agenda 2030 sustainability action plan, under the umbrella of social sustainability.

Making the most of the international perspectives brought by the participants, we will explore social sustainability through the potentially shared phenomenon of collaborative community work. In Finnish, this kind of collective, voluntary work is called 'talkoot'. As part of the Finnish cultural heritage, this centuries-old tradition is not only a form of structuring labour, but also of relating to another in communities. To have talkoot means helping the community, or individuals in the community, without salary or formal recognition. In this workshop, we will start off from this Finnish cultural concept and go beyond it through conversations and roleplay.

Workshop: The 90-minute Talkoo Futures workshop offers an introduction to exploring community building through roleplay in a future scenario of the city of Turku in 2046. The process will be interactive and collaborative, and we will also physically move outside of the workshop room for a part of the session.

The workshop will contain a short introduction and overview of the topics, a futures adventure in smaller groups, and a common discussion with take-aways.

Conclusions: The workshop is based on a framework of collaborative futures thinking, aiming to provide the participants with new insights into the topics of sustainability, community, and resilience through a context of collaborative action in an imagined post-crisis future scenario.

The discussions and materials created during the workshop will be documented and processed into a written report by the workshop facilitators after the conference.

The workshop facilitators:

Riina Näsi is an art educator and an expert in foresight and development. She has specialised in creative foresight methods and in culture as part of the sustainability transition.

Hazel Salminen, has a MSc in Human Geography and extensive experience in futures studies and improvisational theatre. Combining the viewpoints of these holistic fields, she promotes the exploration of more sustainable futures through play.

Keywords: experiential methods, community, social sustainability, collaborative methods, futures workshop, resilience

Session 2:

Tuesday 9 June 2026 at 14.30–16.00

1. Transitions Towards Sustainable Circular Economies

Time: Tuesday 9 June at 14.30–16.00

Room: Alhopuro

Chair: Sari Puustinen

Sustainable circular economy: Stakeholder collaboration and alternative future images as drivers of a circular economy transition

Marjamaa, Maili

Tampere University, Finland

The transition from a linear economy to a sustainable circular economy (CE) requires organizing CE practices sustainably, fostering multi-level and cross-border stakeholder collaboration, and cultivating an orientation toward possible—and particularly desirable—futures. The window of opportunity to influence the climate and other planetary systems before irreversible changes occur is rapidly narrowing. At the same time, the shift of production and consumption systems towards a CE is widely recognized across academia and the public and private sectors as a key pathway to addressing sustainability challenges.

Although CE research spans multiple disciplines, scholarship has primarily focused on environmental and techno-economic dimensions, leaving limited room for holistic sustainability perspectives and socio-cultural interpretations. Moreover, collective stakeholder efforts to jointly address CE-related challenges across diverse network contexts, as well as long-term temporal aspects of CE, remain underexplored. Consequently, theoretical understanding of CE is limited, and practical CE advancement is fragmented, unilateral, and too slow in light of escalating sustainability pressures.

The objective of my interdisciplinary, article-based doctoral dissertation is to advance understanding of sustainability issues in the CE, the role of stakeholder collaboration in the transition, and CE's long-term development. The research draws on CE, sustainability, stakeholder, and futures studies literatures. Empirically, it is based on 85 thematic interviews with experts from pioneering CE organizations—such as companies, cities, and development organizations—representing diverse sectors of Finnish society.

The dissertation's key findings include a conceptual definition of a sustainable CE and an outline of its economic, environmental, social, and cultural dimensions and their core elements. The research also identifies the foundations of effective issue-focussed stakeholder collaboration, including shared interests, collaborative relationships, mutual problem solving, and value creation. These dynamics generate four types of value for stakeholders while they jointly address CE challenges. Furthermore, the dissertation presents eight alternative CE futures for 2050, ranging from the optimistic "Circular Success Story" to the dystopian "Circle of Disaster," as well as four sustainability utopias, each highlighting a different sustainability dimension.

Overall, the research contributes to CE scholarship, issue-focussed stakeholder theory, and futures research by showing that although CE development is progressing, it remains complex, partly conflictual,

and advances through steps that are too small relative to the urgency of sustainability challenges. Nonetheless, by 2050 the CE has still the potential to evolve into a comprehensively sustainable economic model that generates wealth and well-being within the planetary boundaries through the smart use of resources, regenerative environmental practices, and the extensive utilization of collective wisdom generated by stakeholder collaboration and mutual problem-solving.

Keywords: sustainable circular economy, sustainability, circular economy transition, issue-focussed stakeholder collaboration, alternative futures, image of the future

Visioning for sustainability transitions: Anticipatory agency of intermediaries

Uverov, Nikita

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Market-shaping activities are guided by representational practices, i.e., picturing current and envisioning future markets. Representations continually inform strategic action, readjusting in response to processes unfolding in time; they serve as a basis of intentionality to reduce fundamental, Knightian uncertainty, a condition under which all market actors operate. For an envisioned future to materialize, a critical mass of market actors and their stakeholders is required to act in alignment with its principles, which is more probable if a vision builds on a common benefit, as a joint belief in the fictional future image may, in a performative fashion, enact that future. In this regard, research on intermediary actors offers a promising view into how diverse values, interests, and strategies are negotiated and aligned to manifest in roadmaps and action plans as performative market devices influencing decisions and shaping mutual expectations. Although the development of visions has been considered among the functions of intermediaries in innovation and sustainability transitions, prior research has merely catalogued possible foresight instruments such as Delphi, scenarios, backcasting, or strategic workshops, rather than offering detailed accounts of how visions are constructed in practice.

This research adopts a multiple-case study design focusing on research centres involved in the circular economy transition in Finland and specializing in collaborative foresight. Research data includes semi-structured interviews of researchers identified as responsible persons or partners in publicly available descriptions of collaborative foresight projects. Interviews are supplemented by archival data such as publications (articles, thematic reports, guidelines, and toolkits) drawn from the websites of organizations in focus. The data analysis procedure, guided by the intention to contribute to theory development in an emerging field of research, will follow the principles of abductive theorizing in iterating between theory and data. The research will employ thematic analysis to examine transcribed interview texts and archival documents.

The research seeks to reconstruct collaborative foresight project timelines and develop a composite process narrative that depicts the course of such projects and their immediate impact on sustainable value creation and market exchange.

Keywords: intermediaries, market shaping, visions, collaborative foresight

Managing circular economy tensions in Finnish construction and housing

Kanninen, Vesa – Toppinen, Anne

University of Helsinki, Finland

Institutional transformations toward sustainability involve not only technical innovation but also reconfiguration of governance practices, organisational remits, and interactor trust. In sectors characterised by complex liability, procurement, and regulatory environments, actors face contradictory demands that shape how they manage sustainability transitions – and related tensions - in practice.

The analysis is based on 15 semi-structured interviews from 2025 with key actors involved in housing, construction, governance, and intermediary organisations in Finland. Interviews were coded inductively and analysed abductively to identify recurring circularity themes and tensions, and to identify the ways in which actors respond to them in practice.

We identify three intertwined paradoxes: from piloting-to-mainstream, ambition-affordability, and innovation-liability. Each illustrates how institutional governance, remits and perceived institutional roles influence responses to advancing circularity. Actors support ambitious circular objectives at a national policy level while enacting defensive strategies that preserve accountability in their primary roles. Spatial and organisational separation keeps circular experimentation in pilots and “special projects”. Here normal rules can be bent and responsibility remains limited, while mainstream construction and housing work is expected to proceed “as usual”. Temporal separation defers more far-reaching change by framing circular solutions as something that will become viable later, once prices come down, standardisation improves, or someone else “figures out the model”. This allows present decisions to remain governed by cost and risk considerations. Displacing responsibility shifts liability for uncertain outcomes across organisational boundaries. Actors stress that reuse and new solutions are desirable but ultimately “not for us to decide”, pointing to clients, insurers, regulators, or missing standards as the appropriate locus of responsibility. These dynamics tend to persist because actors operate under different remits tied to governance, economic outcomes, legal issues, and strict performance measurement. The fragmentations reproduce institutional inertia and shapes who can legitimately act and in what capacity. This leads to persistent tensions rather than creating opportunities for integrative governance outcomes.

The persistence of paradoxical tensions in circular transitions emphasizes the importance of understanding and acting upon institutional governance and remits, in order to develop increased trust, better governance, and viable sustainability outcomes. This has implications for public administration and business management alike, suggesting pathways for institutional change that centres on shared circular economy mandates.

Keywords: circular economy, organisational separation, temporal separation, responsibility displacement, paradox, governance

Institutional Logics and Change Dynamics in Linking Biodiversity Management and Circular Economy in the Mining Industry

Lappalainen, Inka

Tampere University, Finland

Despite increasing biodiversity awareness, current research on businesses addressing biodiversity is scarce, particularly in the mining industry. Therefore, complex interdependences between biodiversity management and the circular economy (CE) are also still poorly understood. Even though natural resource extraction is necessary in nature-resource dependent industries (such as mining, forestry, fishing, and agriculture), transformative change is needed in corporate strategizing and value creation models to align economic growth with planetary boundaries, including biodiversity protection and recovery.

Sustainability, specifically biodiversity and CE issues, has indeed challenged the institutionalized dominant logic(s) and related system paradigms and forced businesses and their different stakeholders to rethink shift towards more integrated social-ecological systems. This study applies an institutional logics perspective and builds a bridge between biodiversity management and CE domains. The aim is to deepen understanding of the change dynamics generated by competing institutional logics as manifestations of ongoing sustainability transitions. The empirical multi-case study is targeted at the topical and controversial mining industry and consists of two cases from Finland. The primary empirical data covers altogether 50 in-depth thematic interviews of two mining companies and their multiple stakeholders, which were conducted during 2023-2025.

The research findings demonstrate empirically how the institutional logics lens helps to build an in-depth understanding of competing institutional logics and related change dynamics from a multi-stakeholder perspective in interlinked biodiversity management and CE in the mining industry. Thus, the findings bring valuable new empirical and conceptual insights to both biodiversity management and CE domains by helping to understand the complex change dynamics at different temporal and spatial scales as manifestations of ongoing sustainability transitions.

As a practical contribution the findings inform companies and their multiple stakeholders, such as authorities and policymakers, in their crucial roles in the highly topical and controversial mining industry. This particularly concerns multi-voiced views and more comprehensive understanding of the interlinkages between business and biodiversity management, as well as CE principles in terms of transformative challenges and opportunities.

Keywords: Institutional logics, transformative change, biodiversity management, circular economy, mining

2. Navigating Transformative Futures Across Time

Time: Tuesday 9 June at 14.30–16.00

Room: Laurén 2

Chair: Juha Kaskinen

Integrating Hindsight, Insight, and Foresight: A Temporal Methodology for Systemic Innovation

Şahan, Uğur

CoreXas Consulting Group, Turkey

Organizations seeking future-readiness invest in and develop innovation initiatives that rely on traditional approaches; however, these efforts frequently fail to produce tangible results because they treat learning from past experiences (hindsight), understanding the present (insight), and anticipating future possibilities (foresight) as separate, independent processes. Rather than functioning as an integrated temporal intelligence system, these three dimensions are typically addressed through disconnected tools and fragmented methodologies, limiting the organization's capacity to generate innovation that is both contextually grounded and future-oriented. Existing frameworks in strategic foresight and innovation management address temporal dimensions with considerable depth, yet they remain mapping and analysis tools that stop short of specifying a structured pathway from temporal integration to innovation concept design and validation. The hindsight–insight–foresight concepts exist in the literature as conceptual orientations, but not as an operationalized innovation architecture.

This study proposes a five-stage temporal methodology that integrates these three dynamic dimensions through an adaptive temporal intelligence system. Rather than imposing a fixed sequence, this Hindsight-Insight-Foresight methodology operates through four context-dependent systemic activation patterns: hindsight-first for incremental innovation, foresight-first for radical or disruptive innovation, insight-first for adaptive crisis response, and systemic activation for compound innovation outcomes that span the full typology. The Hindsight stage maps organizational memory and failure patterns. The Foresight stage identifies emerging forces and alternative futures through weak signal analysis, horizon scanning, and scenario planning. The Insight stage researches and synthesizes these outputs through problem identification, needs mapping, and systems thinking to produce innovation-ready opportunity briefs. The Innovation stage transforms these briefs through ideation, design, and validation across radical, disruptive, incremental, architectural, and sustainable types, and across product, process, and business model domains. Finally, the Iteration stage establishes a temporal diagnostic loop, routing feedback to the appropriate lens based on the mismatch's source.

This methodology, based on the Hindsight-Insight-Foresight cycle, provides a practical approach that helps organizations to learn from the past, understand the present, and foresee the future, and offers an integrated temporal framework for innovation. By operationalizing established temporal theories into an implementable architecture, this Hindsight-Insight-Foresight Methodology offers futurists, strategists, and innovation leaders a systematic roadmap for systemic innovation that spans the radical, disruptive, incremental, architectural, and sustainable typologies suitable for empirical testing at both the corporate and ecosystem levels. The study contributes to future studies and innovation management literature by providing a temporal integration mechanism that bridges the gap between hindsight, insight, and foresight practices and innovation execution.

Keywords: Hindsight-Insight-Foresight, Futures Methodology, Innovation Methodology, Futures Studies, Temporal Methodology, Strategic Foresight, Systemic Innovation, Innovation Typology

From Neglecting to Embracing Futures in Sustainability Education

Pajula, Liisi

University of Tartu, Estonia

The presentation explores the role of Futures Literacy (FL) in fostering a sustainability mindset within the context of sustainability education (SE). FL is a theoretically integral but, so far, practically rather neglected feature of SE – an educational approach distinguished by its future orientation. This is especially relevant in the context where “sustainability” itself is understood as a conversation around different visions of desirable futures.

I draw on existing literature in both SE and futures studies to bridge the gap between the two interrelated fields. The results underscore FL’s potential in SE to empower learners to envision alternative futures and engage in present actions that support sustainable outcomes, while highlighting the need to engage with futures purposefully. Therefore, careful attention to how we (re)produce futures, in terms of framing and negotiation, is required. I further draw attention to critically engaging with the concept of “desirability” of futures that much of sustainability discourse depends on.

While still emerging, early empirical research provides evidence that futures-oriented pedagogies support the development of action-oriented mindsets capable of addressing complex sustainability challenges. The proposed approach underscores FL as essential for such a future-focused education as SE, offering a novel theoretical clarification and highlighting the specific considerations of applying FL methods in the context of SE. It further offers practical value for sustainability educators, who can draw on the approach introduced for application in their work to deepen their engagement with futures.

Keywords: futures literacy, futures thinking, sustainability education, education for sustainable development, sustainability mindset

2001: A Time Odyssey – Futures Beyond Spacetime

Virmajoki, Veli^a – Laakkonen, Mika-Petri^b – Hannes, Rajeeka^c

^a FFRC, Finland; ^b OAMK, Finland; ^c University of Oulu, Finland

Futures research recognizes that different actors possess distinct time-needs – varying requirements for measuring, representing, coordinating, and controlling temporal information (Virmajoki & Laakkonen, 2024). Time-need captures how temporality is not merely a background but actively produced through human and nonhuman practices, with different systems operating across incompatible temporal modes. The notion reveals how power dynamics operate through temporal control, and how collisions between different time-needs create discoordination in human activities and future-making. Building on this framework, we propose a speculative extension: such temporal plurality may reflect something fundamental, with time, space, and mass emerging from underlying informational structures rather than existing as primitives.

Our framework centres on hypothetical entity with unusual properties: no measurable rest mass, extreme material transparency, and null electromagnetic response. Judged within conventional spacetime kinematics, this entity appears superluminal (Einstein, 1905). However, rather than violating the relativity, we confine Lorentz-invariant speed limits to processes embedded within spacetime. The entity is interpreted as projection from a timeless or differently-timed informational manifold where such limits do not apply.

Because "time" is not an observable for this entity, the standard time–energy uncertainty relation proves inapt. We propose instead generalized uncertainty function operating over informational and topological variables (Heisenberg, 1927). The entity is modelled as quantum-informational mode within extended Hilbert space where mass, locality, and velocity are non-primitive. Quantum teleportation provides an operational analogue: information is re-indexed across auxiliary temporal degree of freedom – a "new time dimension" – without superluminal signalling (Bennett et al., 1993).

At the interface between this timeless sector and ordinary spacetime, we hypothesize trans-temporal decoherence: a process selecting over internal temporal indices and stochastically re-indexing states while preserving relativistic causality (Zurek, 2003).

This framework reinterprets time-need's core insight – that actors measure, represent, and coordinate time differently – as reflecting couplings between distinct temporal indices rather than mere social construction (Sorokin & Merton, 1937; Adam, 1998). For futures studies, this suggests that scenario methods and foresight practices operate not just within alternative futures but across fundamentally different temporal structures. Consequently, communication, governance, and strategic coordination require redesign for the multiplexed systems spanning conventional spacetime and additional temporal dimensions (Geels, 2002). Futures literacy would need expanding beyond anticipating what might happen toward navigating how different temporalities interact and transform.

Keywords: time-need; temporal plurality; futures research; quantum information, trans-temporal decoherence; temporality

Exploring the joint terrains of futures studies and cartography

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From early cave paintings through to modern times, mapping and, more formally, the practice of cartography have provided a means to understand our place in the world, and to inform decision-making. Maps have thus been utilised as tools for exploring the unknown, for imagining what could be behind the horizon, for communicating new findings, and for planning strategic uses for territories already – or yet to be – conquered. Moreover, modern cartography has far extended our understanding of maps, and their uses, usage, and users. Via the lens of critical cartography, maps have been analysed as social constructs, as instruments of geopolitical power, and currently increasingly as digital worlds of cybercartography.

In this paper, we explore the potential joint intellectual terrains between futures studies and cartography. These two fields of inquiry share a quite significant amount of joint terrain, especially when thinking about the use of cartographical metaphors in futures studies, such as roadmapping, horizon scanning and future pathways. Furthermore, we argue that there is even more joint terrain to be discovered by exploring the uses of other spatiotemporally attuned concepts and methods of futures studies, such as scenarios and visions.

Our research finds several epistemic and conceptual relations between cartography and futures studies. We propose that theorisation of futures, that is, advancing the theoretical baseline of futures studies, could benefit from the scrutiny of intellectual topographies of cartography. In the paper, we outline two points of conjunction between these fields:

1. Firstly, we argue that the explorative orientation of futures studies shares plenty of common ground between cartographic reasoning, especially in the age of exploration when maps were utilised as tools for

organising the known and the unknown. The maps were the means to demarcate the known societal cosmos to separate it from the uncertain and unknown chaos.

2. Secondly, maps as artifacts are built on specific visual language and symbolisation. Futures studies also leans on visual language – just think about the practices of visioning, scanning or roadmapping. However, while practices of cartography lean on standardised cartographic symbols, the field of futures studies lacks such jointly developed standards and features.

Thus, the visibility of both fields of inquiry open intriguing avenues for exploration. While we realise that it may not be feasible or even sensible to strive for such a symbolic uniformity in futures studies, the exploration of cartographic symbolisation in futures thinking would be beneficial to advance a sort of cartographic reasoning with futures studies and thus advance, for example, shared principles and patterns for constructing and communicating futures knowledge.

Keywords: futures studies, cartography, cartographical metaphors, spatiotemporal concepts and methods, cartographic reasoning, symbolisation

3. Anticipatory Governance for Sustainable Futures

Time: Tuesday 9 June at 14.30–16.00

Room: Säätiö

Chair: Toni Ahlqvist

Amazonia 2040: Futures for Governance of Commons in the Mosaic of Protected Areas of the Lower Rio Negro

Birmoser Ferreira-Aulu, Marianna^a – Zuquim, Gabriela^b – Ahlqvist, Toni^a

^a Finland Futures Research Centre, University of Turku, Finland; ^b CSC – IT Center for Science, Finland

This study explores futures imagined by people working for protected areas in the Lower Rio Negro, Brazilian Amazonia. Our findings suggest that these futures imaginaries express emerging forms of governance and leadership for sustainable use of resources and resilient forest peoples.

For this study, a novel approach for participatory anticipatory action research was developed and applied: Spatially Explicit Future Scenarios (SEFS). This approach integrates spatial knowledge and futures thinking, to produce map-based scenarios, roadmaps, and action plans which are based on local knowledge and participation. Eight workshops were held in two fieldworks in 2023 and 2025.

SEFS proved to be a flexible and effective method that promotes both futures literacy and leadership empowerment.

Our findings reveal that participants share aspirations for governance that legitimizes local leaders as guardians of the forest and embeds decision making within community structures. Governance of commons is perceived as a solution for sustainable and legitimate leadership in Amazonia. Participants also envision versatile local economies, locally rooted and with fair division of revenue, reducing dependence on external markets and political fluctuations. They also call for new models of education and professional training more suitable for the Amazonian socio-environmental reality as well as investments in renewable energy, sanitation, communication, and leisure-activities infrastructures that support quality of life while protecting the forest.

These futures portray an Amazonia that is community-led, ecologically balanced, and capable of maintaining conservation commitments even amid political crisis. This study also illustrates how participatory scenario planning can strengthen decision-making processes, facilitate social cohesion, and collective capacity to navigate uncertainty, fostering collaborative governance towards more just and sustainable futures.

Keywords: Participatory Action Research (PAR); Critical Futures Studies; Governance of Commons; Brazil; Amazonia

Rhythm-aware Leadership: Navigating Temporal Tensions in Sustainability Transformation

Rastas Jansson, Laura

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Corporate organizations are increasingly challenged by complex systemic changes — e.g. environmental, geopolitical, and (geo)economic — which expose the limitations of traditional linear planning approaches. Such developments may intensify temporal tensions within organizations, exposing mismatches between short-term operational demands and long-term pathways required for meaningful sustainability transformation. Conventional governance tends to synchronize diverse organizational temporalities into rigid timelines, inadvertently restricting resilience, creativity, and strategic renewal. Leadership must find ways to navigate these temporal tensions, balancing immediate operational pressures with the need for enduring sustainability transformation extending across decades.

This ongoing study adopts a conceptual and design-oriented approach to develop a framework for leadership and anticipatory governance in the face of temporal complexity. Starting with a literature review on the concepts of transformation, disruption, and complex systemic changes, the study regards organizations as polyrhythmic systems operating across multiple, sometimes conflicting, temporalities. Applications of Estuarine Mapping and Cynefin Model are considered as a potential lens for sensemaking in polyrhythmic organizational systems. Key elements of the design proposition will include temporal orientation levels and vector-oriented objectives, prioritizing directional progress towards sustainability transformation, instead of fixed endpoints. The proposed design aims to guide leaders in identifying and harmonizing temporal rhythms within and between organizational units, using cadence awareness and temporal compacts, without enforcing rigid synchronization of transformative process.

Early observations suggest that embracing temporal plurality may enable smoother translation of macro sustainability strategies into coherent micro-level actions. Distributed decision-making and local response cycles could enhance resilience, while vector-oriented objectives might shift focus from static targets to sustained progress. Disruptions occurring during long-term transformation are likely to be framed as both catalysts for innovation and risks if not translated into enduring practices. When harnessed, disruptions may trigger adaptive responses, but risk causing fragmentation or decline if temporal misalignments persist. These working hypotheses remain provisional and will be refined through further data collection and analysis.

Leading sustainability transformation in complex environments may require moving beyond linear governance toward rhythm-aware, anticipatory practices. By making temporal tensions explicit, leaders could facilitate polyrhythmic alignment and reduce potential frictions between time horizons. The ongoing study aims to equip leaders with actionable principles for sustaining momentum and coherence amid systemic change.

While the framework is still evolving, it could offer a foundation for organizations to convert challenges into opportunities for long-term competitiveness and resilience, strengthening sustainability

transformation in unpredictable environments. The preliminary findings are to be validated in subsequent phases of the research.

Keywords: anticipatory governance; transformation; polyrhythmic organization; leadership in complexity; Cynefin Model.

Empathy-Based Strategy for Sustainable Futures: Bridging the Sustainability Intention–Action Gap

Rudzinska, Caroline

Berlin School of Economics and Law, Germany

This paper examines whether the deliberate integration of empathy into strategy development can strengthen commitment to the implementation of sustainability-oriented futures. It explicitly addresses the well-documented sustainability intention–action gap, that is, the persistent discrepancy between articulated sustainability goals and their effective realization in practice. While sustainability intentions are widely shared at organizational and societal levels, they frequently fail to translate into sustained action, thereby limiting the active shaping of desirable futures.

Against this backdrop, the paper asks how sustainability intentions can be successfully turned into sustainability actions capable of influencing future development pathways. It builds on the assumption that conventional, analytically driven strategy processes are insufficient to navigate the complexity, uncertainty, and long-term orientation inherent in sustainability transformations, and that alternative, process-oriented and anticipatory approaches are required. In this context, participatory formats, such as real-world laboratories or stakeholder engagement platforms, have gained prominence. Research shows that such formats foster technological and social innovation, new governance models, and collective learning, while emphasizing co-creation, shared responsibility, and enabling conditions rather than linear implementation pathways. Their effectiveness, however, remains strongly context-dependent and shaped by stakeholder interests and power relations, which in turn influence how future options are opened or constrained.

Building on this discourse, the paper conceptualizes empathy as a central but underexplored dimension in strategy processes concerned with shaping futures, and examines its potential to help close the sustainability intention–action gap. Empathy is understood not merely as an individual emotional experience, but as a social and relational capacity that enables mutual understanding and recognition across actors with differing future imaginaries. Hereby, empathy is defined as the ability to perceive the emotional states of others and to respond appropriately. Within participatory and transformative settings, empathic engagement is assumed to foster deeper identification with collective goals, strengthen individual responsibility for future consequences, and enhance commitment to implementation.

Within the exploratory research project EQ-Strategie (IFAF EXPLORATIV), an extended sustainability strategy process integrating empathic elements was developed and empirically tested. The aim was to initiate new forms of reflection and action, support anticipatory thinking, and enhance the binding force of sustainability-related decisions oriented toward long-term futures.

The study addresses the following research questions:

- In what ways does empathy influence the implementation of strategic sustainability objectives?
- How can goal-oriented empathy be intentionally designed within strategy processes to bridge the gap between decision-making and implementation in the context of sustainability-oriented futures?

Keywords: Intention–Action Gap, Empathy-Based Strategy, Anticipatory Decision-Making, Shared Responsibility

Reflexivity in Visions on Sustainability Transitions at the Science-Policy Interface

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PBL (Dutch Environment Assessment Agency), Netherlands

In this paper, we enquire about what role futures literacy and reflexivity can play in the Science-Policy Interface. We do this by critically examining the different visioning studies developed by the Dutch Environmental Assessment Agency, a governmental but independent research institute. The studies we examine engage with futures of sustainability transitions, ranging from visions on the futures of spatial planning, agriculture and nature, circular economy, heat transition, mobility to futures of the industry. Regarding their goal, these visions have in common that they inform politicians about “possible”, “desirable” or “feasible” futures and the implications of choosing for one or the other route. However, they differ widely in e.g. (quantitative and qualitative) methods and the understanding of plurality in developing them (ranging from consultation to participatory processes).

In this paper, we use this empirical basis to draw lessons on futures literacy and reflexivity to critically understand the underlying assumptions, methods, values, power relations and policy impact of visioning studies for policy makers. How do the different studies engage with Reflexivity: Reflexivity in terms of what is asked on the Policy side, and the response from Science to produce relevant policy advice. How do the studies engage with pluralism: in terms of plurality of possible “thinkable” futures that we produce and of pluriform stakeholder engagement (who sits at the table, whose futures are being represented). Reflexivity in terms of reflection on the assumptions and values on dominant images of the future we use and produce with our work. We use literature review and semi-structured interviews to gain insight in the futures literacy and reflexivity of these studies. The lessons from our analysis can inform Futures-projects at the Science-Policy Interface.

Keywords: Reflexivity, Futures Literacy, Transformative Vision forming, Pluralism, Anticipatory Governance, Policy

4. Governing Uncertain Futures: Institutions, Methods, and Sustainability Competencies

Time: Tuesday 9 June at 14.30–16.00

Room: Blokki 1

Chair: Tarian Jenkins

Participatory Futures Insights into the Complex Dynamics of Sustainable Peace in Tromsø, Norway

Timári, Bálint

UiT The Arctic University of Norway, Norway

Background: In an increasingly volatile and conflict-prone world peace is an important intermediary goal of governance. Without peace it is difficult to imagine genuine sustainability transformation, prosperity and wellbeing. Yet peace is often an overlooked variable in discussions of sustainability, being one of the least researched UN Sustainable Development Goals. What aspects of local everyday realities and policies can lead to the emergence of societal and international peace? What can we learn from societies which are more peaceful than others? How can this peace be sustained for future generations? This master's thesis project examines these questions in the context of Tromsø, the European Youth Capital of 2026 in Norway, a self-proclaimed 'peace nation'.

Methods: This paper builds on novel approaches to peace studies rooted in transdisciplinary complexity science. Local qualitative data was collected during participative futures workshops with Tromsø residents, where they identified everyday aspects of city life which contribute to or pose challenges to societal peace. They were also asked to imagine a desirable future for the city in 2050, focusing on these factors and challenges of peace. This qualitative data is interpreted using the complexity models made by the Sustainable Peace Project and the Halo Project of the Institute for Economics and Peace.

Results: Data collection and analysis are still ongoing, however preliminary results indicate that societal peace in Tromsø is precarious and multifaceted. Tromsø is a growing Arctic city, which is becoming a hub for tourism and a growing international population, meanwhile still grappling with a colonial legacy relating to its indigenous Sámi population. These changes alongside increasing militarization and the proximity of Russia are challenges to societal peace in the city. Meanwhile, a high standard of living, local youth- and university culture, the natural environment, and norms of trust and collective responsibility are local sources of resilience.

Conclusion: So far, the research seems to point to the importance of informal networks of solidarity, governance and peaceful societal norms for resilience. Although peace in Tromsø, like in many parts of the world, seems fragile - underscoring the urgent need for further research into how complex social systems can adapt peacefully to external pressures.

Keywords: *peace, complexity, transdisciplinary, participative, Norway, everyday*

Sustainability Competencies in the Workplaces: A Systematic Review

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In past decades, a growing body of research has identified sustainability competencies as a pivotal element in the process of sustainability transition. However, the topic is mainly discussed in the educational field, and few studies have investigated it in the workplaces. The aim of this study is to identify sustainability competencies required in the workplaces and propose a conceptual model applicable across diverse work contexts. Based on PRISMA guidelines, this study synthesises findings from 23 articles between 2011 and 2025, using the following databases: ERIC, Scopus, Web of Science, and EBSCOhost. The findings show that key competencies in higher education, such as systems thinking, values thinking, anticipatory thinking, strategic thinking, and interpersonal competency, are still prevalent in the workplaces. Basic academic competency, although not regarded as a key sustainability competency, is highly recognised among professionals in practice. Intrapersonal and implementation competence assumes a secondary role. Furthermore, this study identifies four additional competencies: leadership competency, political competency, entrepreneurial competency, and connection-to-nature competency. In the end, a conceptual model integrating all the identified competencies is proposed. This integrated framework presents a more advanced theoretical lens for developing sustainability competency in the workplaces. It will direct the design of training programs targeted at employees' sustainability competencies, whilst also guiding policymakers to respond effectively to dynamic organisational challenges.

Keywords: sustainability competencies, sustainability transition, workplaces, professionals

Navigating Deep Uncertainty and Competing Temporalities: Using Delphi to Stress-Test Governance in the Geopolitical/Environmental Polycrisis

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^a Demos Helsinki, Finland; ^b Aalto University, Finland; ^c Metodix, Finland

This abstract addresses the critical challenge of implementing sustainability transformation in contexts defined by radical geopolitical and environmental instability, focusing on the highly sensitive Gulf of Finland (GoF) region. The war in Ukraine has transformed the GoF from a space of regional cooperation into a zone characterised by data gaps and emerging hazards, necessitating the revision of existing mental models and acceptable futures. This domain is compelling because it involves four interacting, overlapping complex adaptive systems: geopolitics, marine environment, knowledge systems, and planning/decision-making systems.

For mapping the deep uncertainty in this context, the project, collaboration between Demos Helsinki and Metodix with external experts, applies an Argument/Policy Delphi approach. Unlike consensus-seeking Delphi variants, this approach uses expert-rated future claims as entry points into systemic uncertainty and structural tensions, rather than merely evaluating scenarios. The claims address urgent potential threats, such as the rise of intentional ecosystem damage (ecocide operations) as a grey-zone activity, major spills caused by Russia's aging oil transport, known as shadow fleet, and the loss of critical environmental monitoring data due to GPS interference or cyber disruption.

The emerging core argument is that the current focus on immediate security concerns, such as substantial increases in Finnish and Estonian defence expenditures, creates a creeping crisis by diminishing resources allocated to long-term environmental preparedness and adaptation efforts. This dilemma directly engages

the conference theme of temporality, highlighting how short-term military and security demands undermine the long-term governance required for genuine sustainability transformation.

The Delphi results provide a futures map that supports decision-making under deep uncertainty by defining uncertainty spaces, identifying critical decision points, and developing 'if...then' future pathways to test the robustness of existing strategies. The preliminary findings underscore the need for new governance models that transform complexity awareness into anticipatory capacity and resilience. The central challenge remains integrating this reflective, exploratory expert information into democratic processes to adequately address compound threats, such as the polycrisis where cascading effects generate continuous new areas of conflict.

Keywords: Geopolitical instability; Argument/Policy Delphi; Anticipatory governance; deep uncertainty simulation

Institutional landscape and practices of futures studies and foresight in Ukraine

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Ukraine faces profound uncertainty. Ongoing war, geopolitical instability, and the imperative of post-war reconstruction have created conditions that demand more than reactive policymaking. In this complex environment, characterised by what some futures scholars call 'postnormalcy' (Sardar & Sweeney, 2016; Sukhorolskyi, 2022a), the ability to anticipate, identify emerging challenges and opportunities and strategically prepare for multiple possible future trajectories has become essential.

Future-oriented planning in a context of ongoing war and an uncertain timeline for its resolution remains inherently constrained, as the conflict has reshaped both collective and individual temporal horizons. This, in turn, elevates the importance of rigorous scenario work. While such scenarios do not offer prescriptive pathways from war to peace, they provide analytically grounded insights into plausible trajectories, while highlighting potential obstacles and structural risks that may delay recovery or undermine the prospects for sustainable peace (Sushyi, 2026).

Against this backdrop, foresight is increasingly recognised across policy, academic, and civil society domains as a tool not only for strategic planning and policy development, but also for supporting societal resilience and post-war recovery.

This paper presents the actors, approaches and practices of futures studies and foresight in Ukraine, and examines how Ukrainian actors withstand current challenges, maintain resilience, and prepare for a post-war recovery to build a secure and prosperous future. It synthesises findings from a review of academic research, reports and publications, complemented by perceptions and insights gathered from decision-makers, researchers, practitioners and educators in Ukraine through an interview and an expert survey. We used three main sources of information. First, a structured search of the Web of Science for publications between 1972 and 2025 across five queries: authors with Ukrainian affiliation in four selected journals (Futures, Foresight, Journal of Futures Studies, and Technological Forecasting and Social Change), keyword "Ukraine" in the same journals, keywords "futures studies", "foresight", "social forecasting" and "Ukraine". Second, over a hundred reports and articles were identified through organisational websites, professional referrals, and social and professional networks, compiled as a catalogue (Gerasymenko, 2026). Third, the review of secondary sources was supplemented by 15 responses to an online survey from academics, experts and practitioners, alongside an interview with policymakers. The paradox of futures thinking in wartime is explored through the lens of a Futures Triangle (Inayatullah, 2023), examining

barriers and legacy (weights), current tendencies and change drivers (pushes), and visions and aspirations for the future (pulls).

This paper is a part of a publication "Our World of futures Studies as a Mosaic, Part 2"

Keywords: foresight, futures studies, forecasting, resilience, post-war recovery, Ukraine

5. SPECIAL SESSION: Bridging Foresight and Democratic Innovation for a Just Sustainability Transformation

Time: Tuesday 9 June at 14.30–16.00

Room: Skooppi 1 & 2

Chair: Onni Pekonen, Johan Hammarlund & Sanna Rekola

Bridging Foresight and Democratic Innovation for a Just Sustainability Transformation

Pekonen, Onni^a – Hammarlund, Johan^b – Rekola, Sanna^a

^a Finnish Innovation Fund Sitra, Finland; ^b Kairos Future, Sweden

Foresight and democratic innovations have traditionally evolved as separate fields, each contributing distinct approaches and methods to shaping futures and strengthening citizen voice in democratic governance. This paper track seeks to bridge this divide. It presents cases combining foresight and citizen participation to address the challenges of a sustainability transition that is not only environmentally sound but also socially just, well-informed and democratically legitimate.

Research and practical experience indicate that democratic innovations – such as citizens' panels and new types of digital platforms—along with broad, multi-voiced deliberation can help build shared visions for the future, anchor decision making in those visions, and enhance fairness and legitimacy of resulting actions. Foresight and futures thinking complement this by helping anticipate emerging changes, explore alternative pathways, and increase the coherence and resilience of long-term decisions. Together, anticipatory and participatory approaches can support sustainable policymaking while strengthening citizen commitment to change and its implementation.

The paper track explores cases where foresight and democratic participation intersect, drawing on examples from a variety of countries in Europe and beyond. Participants are invited to present work that integrates anticipatory governance with participatory practices, highlighting lessons learned and emerging opportunities. By presenting existing initiatives and experiments, we aim to identify patterns, gaps, and promising directions for future collaboration.

Keywords: democratic innovation, participatory foresight, deliberative democracy, sustainability transformation

Deliberative Play for Democratic Climate Adaptation

Lucas, Chloe

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Rapid climate change is leading to urgent needs for changes to infrastructure, systems and technology at all scales, in order for societies to adapt to new climate realities. However, accelerating change tends to lead to top-down decision-making, often in response to disaster events. This has created a democratic deficit in climate adaptation planning.

Four public communication challenges contribute to what has been called the climate democracy crisis. Polarised climate discourse has eroded public trust in democratic institutions and decision-making. Technocratic planning and disaster response frameworks disenfranchise many groups of citizens from formal decision-making. Top-down adaptation priorities do not incorporate different communities' diverse and uneven needs, including the needs of those most vulnerable to climate risks. And finally, citizens are often unaware of, or unable to fulfil, their government-mandated responsibilities for mitigating climate risks.

Legitimate and fair climate adaptation planning requires high levels of public participation in decision-making. This research project responds to a call from the Intergovernmental Panel on Climate Change (IPCC) and others for action-oriented research to explore new, appealing, and accessible ways to engage citizens in transformative climate adaptation. One emerging technique is deliberative play – practices that harness fun as a way of motivating and enabling deliberation and collaborative decision-making.

This presentation reports on a project in development that explores the affordances of play-based methods to facilitate democratic dialogue and collective decision-making on climate adaptation (a) between citizens, and (b) between citizens and governments, to influence policy and planning, and build democratic capacity. I will describe examples of games and playful engagements that have been designed to enable publics and decision-makers to map adaptation pathways toward desirable, even thriving futures. The opportunity afforded by deliberative play is to create spaces of respect and equality of participation, in which structural power imbalances are, at least temporarily, removed. Within these spaces, participants can explore new ideas and alternative futures. Importantly, they can also use these imaginative spaces to reflect on challenges facing their communities, and to play with different perspectives and actions without being bound by them in the 'real world'. Such playful deliberation can enable empathy-building, knowledge-sharing and relationship-building, all of which are vital to democratic participation in futures decision-making.

Keywords: democracy, decision-making, climate adaptation, deliberative play, communication, participation

Assessing the Impact of Participatory Foresight: Empirical Insights from Lithuania 2050

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We examine how participatory foresight can drive transformation-oriented governance, drawing on empirical evidence from Lithuania's "Lithuania 2050" national visioning process. Participatory foresight convenes diverse stakeholders to co-create long-term strategies, yielding not only tangible outputs (plans and policy proposals) but also critical intangible benefits such as greater trust, shared ownership, and democratic engagement. However, these qualitative societal impacts have often been underexplored, thereby limiting the perceived transformative potential of foresight. We address this gap by proposing a

multidimensional impact assessment framework and validating it using survey data from participants in the Lithuania 2050 foresight process. Using exploratory factor analysis (EFA), we empirically identified key impact constructs, confirming that participatory foresight yields significant immediate and intermediate outcomes in governance processes. Moreover, we employed impact constructs by conducting quantitative analyses, including descriptive statistics, one-way ANOVA, and nonparametric tests, to examine how perceived impact varies across participant characteristics, roles, and levels of engagement.

Our results reveal distinct patterns of impact across the cognitive, relational, and institutional domains. Cognitively, participants reported increased future awareness and learning; relationally, they experienced stronger cross-sector collaboration and trust; institutionally, they demonstrated a deeper shared long-term commitment to sustainability goals in governance. These findings indicate that the Lithuania 2050 initiative cultivated essential capacities for transformative leadership – enhancing inclusivity, resilience, and open governance in policymaking. The results indicate consistently high perceived impacts, particularly in terms of futures awareness, empowerment, and inclusiveness, as well as strong intermediate outcomes such as shared implementation commitment and future engagement intent. No statistically significant differences were found across demographic, professional, or experiential groups, suggesting that the foresight process generated broadly shared and equitable outcomes. Ultimately, our study demonstrates that participatory foresight processes can serve as catalysts for more inclusive and anticipatory governance, thereby strengthening institutions' ability to navigate short-term pressures while steering society toward long-term transformations. By quantitatively validating these often intangible effects, we offer a novel evidence-based approach to evaluating and leveraging participatory foresight, providing one of the first empirical demonstrations of how such engagement builds capacity for long-term transformations. This project has received funding from the Research Council of Lithuania (LMTLT), agreement No. S-MIP-25-64.

Keywords: Participatory foresight; impact assessment; governance; immediate impact; intermediate impact

Sustainable legal knowledge generation beyond interdisciplinarity: The role of political concepts

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Legal knowledge can help advance sustainable futures, an essential pillar of which is democratic decision making. However, unlike with knowledge generated in many other disciplines, legal knowledge has come to sit uneasily with the notions of science. The 20th century saw increased alienation between law and science. On the one hand, doctrinal approaches separate 'legal science' from other domains of knowledge but struggle to be accepted as scientific by the broader scientific community. On the other hand, calls for infusing perspectives and methods from other disciplines into law raises questions on whether anything distinct remains in such interdisciplinary legal scholarship as opposed to its merging with other academic disciplines. How can legal knowledge be more integrated into scientific work to advance sustainable—democratic—futures?

The genealogical method is employed to trace the dominant ways of legal knowledge generation as the process of creating authoritative research results that sustain and enhance the legitimacy of law as a discipline. This method also helps uncover the potential and limits of various ways of connecting law to other disciplines, focusing on data from spaces that are globally most visible and influential, such as US law journals and European continental doctrinal thought. Genealogy is combined with conceptual analysis

when scrutinizing the various variants of ‘-disciplinarity’ and the distinctions between them (notably multi-, inter-, trans-, a-disciplinarity).

Continued alienation between law and science can be identified amidst growing emphasis on ‘interdisciplinary’ scholarship. The limits of ‘interdisciplinary logics’ and the often shallow references to such endeavours necessitate an alternative logic beyond disciplines that begins with key overarching political concepts instead of disciplines, more than merely interdisciplinary engagement. Legal knowledge is particularly suitable to be welcoming towards such a shift due to its particular interest in concepts and linkages to legal practice that underscore its practical relevance. The study of concepts allows for a less dominating—hence more democratic—engagement beyond disciplines, because it does not require rigid disciplinary identities.

Although the focus on concepts cannot altogether replace working within disciplines, the findings point to the potential of more diverse academic spaces, often found in the ‘Global South’, to contribute to democratizing legal knowledge generation thanks to the relatively weaker straightjacket of disciplinary separation in general and alienation between law and science in particular in these spaces. Doing so not only helps generate new legal knowledge, but also increase its role in sustainable—democratic—futures.

Keywords: alienation, concepts, democracy, disciplinarity, genealogy, legal knowledge

6. SPECIAL SESSION: Future in Our Hands: Young Europeans' Voices on Democracy and Future

Time: Tuesday 9 June at 14.30–16.00

Room: Laurén 1

Kaljunen, Raija – Hario, Pasi

Laurea University of Applied Sciences, Finland

Across Europe, young adults face social, environmental and democratic uncertainties that influence their sense of agency and belonging. The Futures For You (FUTU4U, 2024–2026) project funded by the European Union responds by developing a two-part participatory workshop model focused on democratic understanding and preferred futures. The workshops were implemented mainly in libraries and municipal spaces offering low-threshold environments accessible to diverse young participants (age 18–30). The project is coordinated by Laurea University of Applied Sciences (Finland) with partners from the City of Vantaa (Finland), Monaghan County Council (Ireland), Ormož Library (Slovenia) and the Municipality of Fano (Italy). FUTU4U aims to strengthen young adults' societal inclusion, democratic competencies and capacity to envision and pursue sustainable futures.

Across nearly 80 workshops, approximately 1500 participants took part in My Voice (democracy-themed dialogues) and My Future, Our Future (co-creation workshops using participatory futures methods) workshops. While this total includes both young adults and professionals who participated in the training workshops, the insights presented here focus specifically on the voices and outputs of the young participants. The workshops produced practitioner-generated insights into how young people understand democracy, perceive influence and envision desirable futures for themselves and their communities. Insights discussed in the session are derived from national reports and cross-country synthesis rather than formal research data, grounding the contribution in applied practice.

The session combines a panel discussion with hands-on method demonstrations. The panel brings together trainers, youth experts and decision makers alongside representatives from the FUTU4U project to discuss and reflect on selected key findings emerging from the workshops. Following the panel, participants will engage in small group reflections and experience short method tasters drawn from the FUTU4U workshop models.

The session invites conference attendees to explore how practitioner-led, real-world youth engagement can reveal young people's perspectives on democracy and the future. Participants will hear an engaging panel discussion on selected key findings from the workshops and gain a personal, hands-on experience of the democracy and futures methods used with young adults.

Keywords: futures thinking, democracy, youth engagement, participatory methods

7. WORKSHOP: Narrative Futures: Backcasting Sustainable Worlds through Literary Worldbuilding

Time: Tuesday 9 June at 14.30–16.00

Room: Aistikattila

Bolek, Aleksandra

University of Wroclaw, Poland

Sustainability transformation requires linking long-term futures thinking with everyday decision-making practices. This workshop proposes literary futures – using narrative structures and character-driven worldbuilding – as an accessible methodology for cultivating temporal awareness and collective agency in sustainability contexts. Drawing on futures studies (e.g. backcasting, multiple futures) and narrative theory (e.g. principle of minimal departure), the session addresses how stories shape our capacity to imagine, critique and navigate sustainable temporalities.

Participants engage a structured Literary Futures process adapted from participatory foresight:

1. Character development: create literary characters as experiential lenses for futures.
2. Verge Framework worldbuilding: collaboratively map character interactions across six domains (Define, Relate, Connect, Create, Consume, Destroy) to construct sustainable future scenarios.
3. Narrative backcasting: from preferred worlds, work backwards to identify present-day actions bridging long-term visions with short-term practices.

The 90-minute workshop uses excerpts from contemporary fiction to model temporal play – unreliable memory, perspective shifts, alternative trajectories – as everyday anticipatory techniques.

Participants gain hands-on experience with narrative methods that:

- Reveal hidden temporal biases constraining sustainable imagination.
- Enable relational, embodied futures thinking beyond data-driven scenarios.
- Produce concrete backcasting paths applicable to education, community work and organisational sustainability strategies.

Literary futures offer a cultural driver of sustainability transformation, making temporal complexity tangible and actionable. By treating fiction as an anticipatory laboratory, the workshop equips practitioners to foster just temporalities – where diverse voices co-shape sustainable presents from plural futures. Ideal for educators, designers and policymakers seeking participatory tools bridging foresight with everyday life.

Keywords: literary futures, backcasting, narrative temporalities, sustainability literacy, participatory foresight

8. WORKSHOP: The Experience of Planetary Belonging – a Constellation Method for Sustainability Transformations

Time: Tuesday 9 June at 14.30–16.00

Room: Blokki 2 & 3

Holma, Silja^a – Roman, Jani^b – Hakio, Kirsi^c – Armanto, Riikka^d

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Sustainability transformation is fundamentally embedded in eco-social systems. This workshop introduces planetary constellation for the embodied, affective, and tangible exploration of where participants will explore their understanding, belonging, and agency within planetary systems.

The workshop follows research ethics guidelines, including principles of psychological safety. The process will be documented through audio recording and by two designated note-takers. Participation in the workshop is interpreted as informed consent to participate in the research. Participants will have the opportunity to reflect on the experiences in a facilitated session afterwards.

The planetary constellation builds on a systemic constellation, inviting participants to investigate their human–non-human relationships, moral dimensions, and temporal horizons. It is a collective, movement-based exercise navigating the space while the constellation facilitator supports the unfolding process. Systemic constellations have long been used in therapeutic and organizational contexts to surface hidden dynamics and relational patterns.

By entering a shared field of representation, participants can encounter and reflect their existence within planetary boundaries. The framework of planetary social pedagogy is applied to explore how coexistence, morality, and temporality are experienced, enacted, and negotiated.

The planetary constellation blends embodied role-representation, facilitated reflection, and integrative dialogue. This creates conditions for participants to discover systemic interdependencies and perspectives. The process aims to deepen a felt sense of belonging to a larger whole and strengthen the resolve to act within planetary boundaries.

The constellation is facilitated by a responsible leader with over 20 years of expertise, supported by two experienced facilitators who assist in guiding and documenting the process.

We examine how participants map human–non-human coexistence, moral dimensions, and timescales. We consider these as leverage points that typically remain implicit, including beliefs and loyalties that may either enable or hinder belonging, participation, and change. We hypothesize that the resonance emerging from experiencing coexistence within planetary boundaries can catalyse transformative processes, supporting shifts in values, intentions, and practices. This workshop focuses specifically on participants' lived experiences that we together generate understanding for.

A deepened understanding of the dimensions of sustainability transformations; insights into hidden relational constraints and resources within socio-ecological systems; and the potential for actionable shifts that could be translated into personal and collective fields.

By bridging futures studies, social sciences, humanities, arts-based inquiry, and sustainability practice, this workshop advances an interdisciplinary, intersectoral approach to sustainability transformations grounded in collective experience. Ethical approval for this research has been sought from the relevant ethics review board.

Keywords: planetary constellation; planetary belonging; socio-ecological system; planetary social pedagogy; planetary boundaries; coexistence

WEDNESDAY 10 JUNE 2026

Session 3:

Wednesday 10 June at 10.45–12.15

1. Climate Futures: Risk, Adaptation, and Mitigation

Time: Wednesday 10 June at 10.45–12.15

Room: Alhopuro

Chair: Leonardo Peña Pupo

Exploring foresight methods to inform climate risk assessment for Europe

Lorenz, Ullrich^a – Kimpeler, Simone^b – Kononenko, Vadim^c – Carter, Timothy R.^d – Přech, Jiří^e

^a 4strat, Germany; ^b Fraunhofer ISI, Germany; ^c European Environment Agency, Denmark; ^d Syke, Finland;

^e CENIA, Czech Republic

This paper presents research on how foresight methods can strengthen climate risk assessments for Europe, with a particular focus on the European Climate Risk Assessments. Against the backdrop of a widening EU preparedness agenda, we address the need to move beyond narrowly quantitative, hazard-focused assessments towards approaches that integrate systemic interdependencies and uncertainties.

First, we conducted a structured stocktaking and analysis of good practices in the application of foresight methods to climate risk assessments at the international, European, national, and sectoral levels. The review maps how various methods, such as horizon scanning, scenario development, participatory approaches, stress-testing, and qualitative systems mapping, are implemented to anticipate and better govern uncertainties, cascading risks, tipping points, and lock-ins across sectors such as water, energy, food, health, and also systems like finance.

Building on this synthesis, the second step proposes a set of foresight-based approaches tailored to the further development of climate risk assessments. We outline qualitative approaches that complement existing quantitative risk metrics, with e.g. (i) system mapping of functions and critical dependencies; (ii) exploratory and normative scenario sets that connect long-term futures with near-term decision windows; and (iii) participatory processes that bring together experts, policymakers, practitioners, and affected communities. These elements are organised as a modular “foresight for risk” toolbox that can be deployed across different climate risk assessment phases, from scoping and prioritisation to option development and governance design.

The contribution lies in translating dispersed good practice into actionable methodological guidance for integrating foresight into European climate risk assessments. This work is part of an ongoing collaborative task that will culminate in methodological guidelines and a handbook to support future climate risk assessments.

Keywords: Risk analysis, foresight for risk, climate, adaptation

Thermal Resilience and Decarbonization: How High-Mass Heritage Envelopes Mitigate Climate Change and Enhance Life Quality in Hot-Humid Climates

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In the current era of accelerated global warming, tropical and hot-humid regions face an escalating systemic crisis. The surge in energy demand for artificial cooling has created a feedback loop of high carbon emissions, severe economic strain on low-to middle-income households, and adverse respiratory health effects due to poor indoor air quality. This research posits that traditional heritage architecture, often dismissed as obsolete by modern industry, holds the empirical keys to sustainable urban resilience and passive decarbonization.

The core of this study focuses on characterizing and comparing the thermal behaviour of two distinct building envelopes located on the same geographical site, ensuring identical microclimatic conditions. The first is a century-old masonry section featuring 45 cm thick solid walls and high-volume ceilings; the second is a contemporary section constructed with standard concrete blocks and conventional lightweight roofing. A rigorous hybrid methodology was employed to bridge the gap between historical wisdom and modern science. This involved long-term on-site monitoring using high-precision calibrated data loggers (measuring air temperature and relative humidity at 15-minute intervals) synchronized with advanced dynamic thermal simulations. This dual approach enabled a precise evaluation of heat transfer dynamics, the influence of radiant temperature, and energy consumption patterns under peak summer conditions.

The findings provide conclusive evidence that the high-mass heritage envelope significantly outperforms modern construction standards. The traditional section maintained superior thermal stability, drastically increasing the "thermal lag" by several hours. This phenomenon kept indoor temperatures within the ASHRAE-defined comfort zone for significantly longer periods without mechanical intervention. Furthermore, the high ceilings facilitated natural convective cooling, a factor often ignored in modern vertical developments.

The study demonstrates that the "thermal inertia" inherent in heritage masonry acts as a natural carbon-free battery. Integrating these high-thermal-mass principles into contemporary building codes and social housing policies is a powerful strategy for climate change mitigation. By drastically reducing the operational dependency on HVAC systems, these envelopes not only lower the national carbon footprint but also improve the economic stability and life expectancy of inhabitants. This research offers a verified, scalable pathway toward sustainable development in tropical latitudes, proving that the future of resilient architecture may well be rooted in the intelligent reinterpretation of our architectural past.

Keywords: Passive Cooling Strategies, High Thermal Mass, Climate Change Mitigation, Building Physics, Decarbonization

Operationalising climate scenarios for organisational resilience: A cross-functional participatory foresight approach

Wahlberg, Satu

Framtid Consulting Oy, Finland

Climate change is reshaping risk landscape, market dynamics, and operational environments for organisations. Yet many companies continue to treat it as a bounded sustainability or compliance task. Emerging regulatory requirements, such as the Corporate Sustainability Reporting Directive (CSRD) demand systematic, forward-looking analysis of climate risks and resilience integrated into core decision-making of corporates.

This study, drawing from three climate scenario projects conducted for companies in technology and food sectors, explores how scientifically grounded climate scenarios can be translated into actionable, cross-departmental insights to make alternative climate futures tangible and actionable for non-futurists. The central research question addresses how long-term climate futures can be embedded into everyday organisational practices beyond compliance, engaging diverse functions and temporal horizons to increase collaborative understanding of the alternative futures.

The methodology followed TCFD (Taskforce on Climate-related financial Disclosures) guidelines for climate scenario analysis. The science-based scenarios employed were IPCC SSP1-2.6 (low warming scenario) and SSP3-7.0 (high warming scenario) selected as policy- and impact-relevant pathways.

The participatory, multi-step process included:

1. Translating scenarios into industry-specific assumptions through the lenses of physical climate risks and transition risks.
2. Cross-functional workshops with participants representing business development, technology, marketing, finance, procurement, human resources, and sustainability to explore scenario implications for business and operations.
3. Structured resilience analysis to assess risks' likelihood, magnitude, and financial relevance.
4. Co-development of prioritised adaptation, mitigation, and contingency measures.

Results revealed that climate risks and opportunities affect all organisational functions, not just sustainability or risk management. Finance and business development highlighted transition risks (e.g., regulation, carbon pricing), while technology and operations focused on physical risks (e.g., supply chain disruptions). Marketing and HR emphasised reputational and workforce challenges. Cross-functional engagement fostered a shared understanding of risk severity and timing under both scenarios, enabling concrete financial impact estimates and response strategies. This work demonstrates that scientifically anchored, participatory climate scenario processes can transform climate change from a reporting obligation into a core strategic concern. By engaging multiple departments through a structured and facilitated foresight process, organisations developed a common understanding for risk and resilience, supporting coherent decision-making.

This study illustrates how long-term climate futures can be operationalised within near-term practices, offering a pathway for organisations to strategically navigate and shape climate-constrained business futures. It also highlights the practical side of futures thinking and foresight in actionable future business creation.

Keywords: Climate scenarios, sustainability, strategic foresight, operationalisation, climate change, TCFD

Climate-Induced Disasters in Rural Vietnam: An Agent-Based Policy Simulation of Path-Dependent Futures of Housing Resilience

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^a Freie Universität, Germany; ^b 784m, Germany; ^c 784m, Honduras

Under the destruction of natural disasters, how do present household reconstruction decisions and policy interventions generate path-dependent trajectories of resilience? In rural Vietnam, where livelihoods remain precarious amid increasing typhoon frequency under climate change, the New Rural Development Program (NRDP) constitutes a central policy response aimed at strengthening rural housing. Ethnographic observations show that locally built houses, made from naturally available resources such as wood and clay, retain warmth in winter and stay cool in summer, while the NRDP standard house, promoted as a viable model of modernization, presupposes resources that rural households do not always have; a gap which, combined with the aspiration to participate in a modernizing agenda, produces a dynamic in which households manipulate data or substitute cheaper materials in order to comply with NRDP standards. The paper uses agent-based modelling (ABM) to examine how such micro-level decisions accumulate into macro-level patterns of resilience over time, aiming to make qualitative dynamics visible rather than to produce quantitative predictions. Households are modelled as independent agents with heuristic resilience parameters reflecting ethnographically observed differences: NRDP-compliant houses can reach up to 100% but fall to 10% where strategic adaptation under resource constraints compromises structural integrity, while locally built houses are capped at 80% yet never fall below 40%, reflecting a contextualized creativity in adapting to material and climatic conditions. Simulations across twenty years with changing parameters of household distribution, income, typhoon hazard, and monetary post-disaster state support, examine system stability operationalized through housing loss rates, mean income, and income distribution over time.

The findings indicate that initial construction alone does not account for system stability; rather, income, reconstruction decisions, and post-disaster support shape it jointly. Specifically, (1) reconstruction toward locally adapted housing yields more stable resilience trajectories than NRDP-compliant rebuilding; (2) income dynamics act as a hidden lever on resilience, rebuilding quality, and destruction probability, though absolute income levels matter less than initially expected; (3) post-disaster monetary support functions as a buffer rather than a solution; (4) above a certain crisis intensity, all scenarios converge into instability regardless of construction method. There is value in simplifying a policy's understanding of the agents it serves, translated into a model that focuses on behavioural dependencies at the micro level which produce outcomes at the macro level that would not have been visible through aggregate statistical methods. With that in mind, ABM's results are, like any futures exploration, a supporting tool to attempt a comprehension of a plausible coherent construction of future trajectories. It calls for a mixed method to contextualize the model's numerical simplification with the insights of the very agents whose behaviour has been abstracted in the first place, a deliberate analytical reduction that must not come at the cost of overlooking sensitive information which can only be grasped through human perception and is of utmost importance to understand the policy's actual effects. These findings raise questions about how policy categories and locally embedded knowledge interact in shaping resilience outcomes, questions that the model alone cannot resolve.

Keywords: Future Studies, Agent-Based Modelling, Housing Resilience, Natural Disasters, Rural Vietnam, Policy Simulation

2. Futures for and by Whom? Participation, Agency, and Sustainability Transformation

Time: Wednesday 10 June at 10.45–12.15

Room: Laurén 2

Chair: Petri Tapio

Whose future counts? Epistemic justice in participatory futures methods

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Sustainability transformation requires inclusive approaches to collective futures shaping. Participatory futures methods like Robert Jungk's Future Workshops (Zukunftswerkstatt), developed in the late 1970s, were widely adopted for their democratic potential. However, participation does not automatically lead to democratisation. While enabling presence, these methods often reproduce epistemic hierarchies that systematically privilege certain forms of knowledge, temporalities, and bodily capacities while marginalising others.

Current research documents who is excluded from participatory futures processes but not how methodological design produces these exclusions. Existing critiques focus on representation (who participates) rather than epistemology (whose knowledge counts). If methods structure what can be known and whose knowledge gains legitimacy, methodological design itself becomes a site of epistemic justice or injustice. Thus, the paper asks: Does the Future Workshop's methodological structure generate epistemic exclusions, and if so, how?

Drawing on epistemic injustice theory – particularly hermeneutical injustice – and critical disability epistemology, this research uses disability studies as an epistemological lens to reveal normative assumptions about bodies, temporalities, and legitimate knowledge embedded in Future Workshop methodology. Through critical reconstruction of the classic methodology, selected for its prototypical status among participatory futures formats, this theoretical-analytical study examines how the method's three-phase structure encodes exclusionary norms.

Initial results indicate how Future Workshop's structure might generate epistemic injustice across multiple dimensions: (1) temporal normativity (linear phase transitions disadvantage), (2) communicative hierarchies (privileging verbal-textual over embodied knowledge), (3) epistemological assumptions (delegitimising non-normative cognitive styles), and (4) somatic presuppositions (assuming unimpaired bodies). These results suggest that exclusions operate through methodological design treating certain epistemologies as universal, showing a tension between democratic claims and systematically privileged forms of participation. This can be conceptualized as methodological-hermeneutic injustice: when methods themselves do not offer interpretative resources for diverse types of knowledge about the future.

For sustainability transformation to be truly just, futures methods must examine their own power structures. This work provides conceptual foundations for redesigning participatory approaches that genuinely honor epistemological diversity. This contribution addresses methods and methodology of futures research (topic 9), justice in institutional transformations (topic 6), and individual and collective understandings of time and temporalities (topic 4).

Keywords: epistemic justice, participatory futures research, Zukunftswerkstatt, critical disability studies, methodology

Exploring multiple futures for sustainability transitions: a rules-based participatory foresight approach

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Background: Sustainability transitions research and futures studies share a common challenge of understanding socio-technical change well enough to support action under uncertainty. While MLP provides strong explanatory power for socio-technical change, it remains underutilised in forward-looking analysis, whereas foresight methods often lack systematic grounding in transition dynamics. Although, recent scholarship has begun bridging these gaps, no consolidated, replicable method exists that is structured enough to compare pathways across cases while remaining open enough to surface barriers, game changers, and competing visions of the future.

Methods: This paper introduces a rules-based card method for participatory foresight grounded in the MLP and the Deep Transitions framework. Rules – recurring principles that describe how socio-technical systems operate – are organised across four dimensions (science and technology; markets and business models; governance; consumers, culture, and values) and translated into a card-based format. The method follows a four-phase design: (1) horizon scanning using the STEEPLE+V framework to identify macro-level trends and key uncertainties; (2) rule formulation drawing on four archetypical transition pathways (green efficiency, high-tech transition, low-tech transition, and new modes of organising); (3) structured participatory workshops in which participants construct both probable and preferred future configurations by selecting and combining rule cards; (4) systematic analysis of structured outputs and discursive data. The method was piloted and applied across three socio-technical systems in Estonia: mobility, food, and the built environment.

Results: Across all three systems, a consistent pattern emerged: visions of the preferred future were dominated by rules associated with low-tech transition and new modes of organising, while the probable future was constructed primarily from green efficiency and high-tech transition rules. Participants converged more in their assessments of what is likely than in what is desirable, indicating that expectations are more shared than aspirations. Dimension-level analysis revealed system-specific governance deficits and cross-cutting barriers to sustainability transitions. The dual-round workshop design successfully surfaced structured, comparable data on where aspirations and expectations diverge and why.

Conclusion: The rules-based participatory foresight method provides a replicable tool for combining analytical rigour with inclusive participation in sustainability transitions research. By working with multiple pathways rather than a single normative vision, it makes visible the gap between probable and preferred futures and identifies the intervention points that would be needed to close it.

Keywords: Multi-level perspective; deep transitions; participatory foresight; sustainability transitions pathways; multiple futures.

Where are we coming from, where do we stand, where do we go from here? A bibliometric look at our community

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Critical self-examination should be part of any scientific practice, and thus, of course, also of futures studies. It is interesting to see where we as a community stand, to check whether it is in line with our self-

understanding, and to imagine where we could go from there. We use bibliometric techniques to give an overview over the evolution and the current state of futures studies with regard to certain key characteristics.

Bibliometrics is the quantitative analysis of publication data and has the advantage of creating meaningful results in a transparent and replicable way. It is an established method in futures studies, but has only rarely been applied *to* futures studies so far.

In the existing literature on the application of bibliometric methods to futures studies complex machinery for evaluation is often contrasted by rather simple database queries and emphasis on only specific aspects of futures studies. The focus of our work is on the construction of an elaborate query to describe the field of institutionalised academic futures studies, as well as on an array of easy-to-understand analyses that capture the status quo as well as the temporal development of this field as a whole.

We found, inter alia, that futures studies is growing at a faster rate than science in general, albeit with a more volatile year-on-year growth. Futures studies as a field is not as closely connected as e.g. fullerene research, but it is far less fragmented than, for example, the bioethical consideration of transhumanism. The proportion of collaboratively authored publications is growing strongly in futures studies, also with regard to cooperation across national borders – the proportion of international publications in futures studies has been greater than that in the two comparative disciplines mentioned above over the last 5 years. An increasingly broad distribution of publications across journals can be observed. On the one hand, relatively clear methodological preferences can be identified, while on the other hand, method mixes appear to be gaining popularity.

In conclusion, futures studies shows the signs of a rapidly growing, decentralised, but quite well-connected field. The question of whether the trends that can be observed in the data will continue should be – and is – discussed critically.

Keywords: Bibliometrics, Methods, Self-Reflection, Critical Self-Examination, Development of Futures Studies, Futures of Futures Studies

Activating Agency in the Interregnum: Prosocial Futures as Practice for Sustainability Transformation

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For sustainable futures transformation to manifest, the thick present state of profound uncertainty must shed its pathology and revive as a healthy ecosystem. Antonio Gramsci called his pathological present in early 20th-century Italy an interregnum, a time between systems of power in which the old was dying, the new was not yet born, yielding many morbid phenomena. Our present interregnum is characterized by a liquid perpetuity surfacing the morbid phenomena of shifting climate conditions, power struggles, and stark social and economic inequities that demand either an acquiescence to the emerging monsters, or a concerted activated effort at restoring the ecosystem.

The presence and orientation of human agency are crucial for ecosystem recovery. Agency oriented toward competition and individual survival produces different conditions than agency oriented toward cooperation and collective flourishing. Sustainability transformation demands systems that allow mutual flourishing for humans and the worlds they inhabit; to imagine and realize these systems, we need practices that activate prosocial agency, the capacity to act toward futures where we thrive together.

Prosocial futures is a practice-based approach that systematically surfaces cooperative behaviors and orients practitioners toward futures of equity and human flourishing. Grounded in cross-cultural cooperation

research demonstrating human capacity for mutual aid under stress, the framework operates through three elements: authenticity (aligning personal values with professional practice), hope (evidence-based trust in human cooperative capacity), and agency (identifying one's unique contribution to better futures). In application, the practice functions as a framework overlay applied to work internal and external to an individual practitioner and internal and external to the field. The framework privileges a prosocial orientation that guides the use of existing foresight tools. From framing to scanning to surfacing drivers to immersive futures design, a prosocial orientation and the intentional and guided identification of a self-shaped hole in any given future provide the navigational capacity to effectively inspire the type of agency needed to manifest sustainable transformation.

Practiced consistently, the approach shifts both outputs and practitioner orientation. What begins as professional method becomes personal practice like meditation or yoga, and like those practices, allows for an alignment of integrity with action. The interregnum transforms from an ominous and dangerous liminal space into a reclaimed and healthy ecosystem tended in a perpetual act of co-creation.

Keywords: prosocial futures, agency, sustainability transformation, foresight methodology, cooperation

Futures of Regenerative Agriculture: a case study with the Small Farmers Movement in Brazil

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"Regeneration" is a biological term, which refers to the capacity of organisms and entire systems to self-reform. It has also been widely used to express desirable scenarios, often related to images once attributed to sustainability and/or sustainable development. We understand that, given what some call polycrisis, degraded ecosystems, and social inequalities - as well as other examples of the alienation of modern humans; we, as a planetary system, need regeneration. Here, regeneration (in association with anticipation) can be interpreted as practices which aim to restore a state of planetary wellbeing ("the opportunity for both humans and nonhumans to have their needs satisfied now and in the future"). Moreover, in order to restore (or create) such a state, new images of possible futures must be generated. However, society struggles to envision futures that challenge current trends, sometimes mining our collective capacity to imagine. A useful tool in harnessing human agency and imagination for desirable futures is the use of Futures Literacy (FL).

This paper aims to explore images of the future generated and discussed during a Futures Literacy Lab (FLL) conducted with members of the Small Farmers Movement (MPA) in Brazil, focusing on "The Futures of Agriculture." MPA is a national peasant movement that advocates for agroecology and food sovereignty, and also seeks to build a popular project based on justice and fraternity. Despite their foundational vision and already regenerative practices, MPA, like many organizations dedicated to systemic change, faces deeply ingrained anticipatory assumptions that often limit their imagination due to present-day constraints.

The FLL methodology enabled participants to envision diverse futures and heightened their awareness of emergent concepts, even within a topic as fundamental to their daily existence as agriculture. The resulting scenarios encompassed the effects of climate change, the intensive application of technology, novel systems for seed distribution, alternative organizations of societal labour, investments aimed at retaining young people in rural areas, among other possibilities. Nevertheless, according to the group, the enduring impact of the workshop on them was the recovery of their collective capacity to dream and articulate a genuinely desired future. This case study demonstrates the critical role of Futures Literacy in

operationalizing regenerative practices, proving that even a highly visionary organization like MPA can benefit significantly from exercises designed to expand their capacity for future imagination, helping them shape a future based on healing inequalities and achieving profound systemic transformation.

Keywords: Futures Literacy, Regeneration, Regenerative Agriculture, Small Farmers Movement, Imaginary, Anticipatory Assumptions

3. Futures Thinking in Practice

Time: Wednesday 10 June at 10.45 – 12.15

Room: Säätiö

Chair: Hanna-Kaisa Aalto

Skills for Futures Thinking and Sustainable Futures

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Finland Futures Research Centre, University of Turku, Finland

Thinking about the future requires not only ontological, theoretical and methodological knowledge but also a set of skills.

A set of eight futures skills has been defined at the Finland Futures Research Centre of the University of Turku during 2019-2020. The theoretical background of futures skills lays on futures studies methodology, with a link to the concepts of futures consciousness and futures literacy.

Futures skills consist of the following cognitive, emotional and functional capacities:

1. Recognizing time perspectives and expanding the own time perspective
2. Imagining different alternative futures
3. Self-reflection and reflection about ethical and sustainable values
4. Systemic thinking and understanding complexity
5. Creative thinking
6. Critical thinking
7. Accepting and tolerating uncertainty
8. Acting proactively in a responsible manner

These skills support each other and work together towards building desirable and sustainable futures. The principle is that futures skills are something that can be taught, and that one can develop.

This Futures Conference presentation describes pragmatic experiences gathered from a teacher training module for secondary level teachers and tutors, implemented in Finland during 2022–2025.

The futures skills training module is built around the eight futures skills and the basics of futures studies in the context of sustainable development. The training module includes a detailed explanation of each skill, experiential exercises, as well as techniques for developing and assessing the futures skills. We additionally provide ideas for further enhancing and assessment of these futures skills.

To maximize impact, the presentation can be accompanied by a separate interactive workshop, where Futures Conference participants can test some practical exercises.

Keywords: Futures thinking skills; building sustainable futures

Making Futures Thinking Applicable: An International Training Model for Youth Workshop Facilitators

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Public libraries and municipal spaces across Europe have become important low threshold environments where young adults can explore democratic participation, belonging and their aspirations for the future. Within this context, the Futures For You (FUTU4U, 2024–2026) project funded by the European Union, coordinated by Laurea University of Applied Sciences with partners in Finland, Ireland, Italy and Slovenia, developed a participatory futures workshop concept for young adults. This paper focuses specifically on the Train-the-Trainers programme through which professionals learned to facilitate the My Future, Our Future workshop model, rather than on the content or delivery of the youth workshops themselves. The model was implemented in 37 workshops involving approximately 700 young adults in local library and municipal settings, aiming to support young adults in practicing futures thinking with simple participatory foresight methods.

The training workshops for library personnel and other professionals working with young adults introduced basic participatory foresight concepts, presented the accessible participatory tools designed around these concepts, and guided professionals in adapting the workshop concept to their cultural and organisational contexts. The programme aimed to make both applying futures thinking and facilitation understandable, relevant and actionable. Training sessions also covered foundational principles of facilitation and participatory methods to equip practitioners with the confidence and skills needed for workshop delivery.

This paper describes how applying futures thinking was made accessible in a non-academic, practice oriented context, and outlines the pedagogical principles used to translate the core concepts of futures studies into concrete tools. It also discusses how the training model was structured to support practitioner learning from basic principles of foresight and futures thinking, facilitation and participatory methods to hands-on experimentation and localized adaptation. Reflecting experiences from the four partner countries, it summarises key considerations for facilitating youth-focused futures workshops, including the importance of psychological safety, clear and accessible language and the use of versatile, creative methods. The training model emphasized practical application of participatory foresight methodology in real-life settings with young people. Across all countries, experiences suggest that accessible methods promoting futures thinking can be integrated into everyday public sector work with young people when suitable training, tools and support structures are provided. The paper contributes a transferable training model for non-academic public sector settings seeking to integrate participatory foresight into practice.

Keywords: participatory foresight, futures thinking, facilitation, training workshop

Sustainable Futures Images and Educational Practices of Non-governmental Organisations

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In my PhD I'm examining the nonformal sustainability education of non-governmental organisations (NGOs). The research focuses on the sustainable future images of different European NGOs and factors that either promote and enable or hinder and prevent their work in promoting those sustainable futures.

Understanding the enabling and constraining practices are essential not only for the agency of the NGOs but also for the wider sustainability and planetary well-being.

Nonformal education is intentional learning outside formal school settings, and it is considered more flexible, non-standardised and participatory than formal learning. The versatility of the action, networks, ideologies and educational approaches makes NGOs interesting and potentially powerful sustainability actors.

Different NGOs have diverse understanding of sustainable futures and what it looks like from their organisation's perspective. Futures can be seen as individual or collective images that reflect national, regional or cultural characteristics. Future images are composed of concepts, beliefs and desires that affect decision making and action in present time.

NGOs create and are affected by different kinds of practices. Prefiguring arrangements of practices are seen as the 'practice architectures' which are shaped by interconnected and site-specific cultural-discursive, material-economic, and social-political conditions. These preconditions do not determine practices but prefigure them, opening possibilities for action while limiting others.

The participating NGOs are part of an international CREA+BIRD -project and are from Finland, Italy, Romania and Slovenia. One semi-structured online focus group interview was conducted with each of the NGOs in their native language and then translated. The data is analysed using qualitative inductive content analysis and an article will be written in collaboration with local researchers to reduce cultural misinterpretation.

Expected outcomes of the research provide information of the future images and practice landscapes of European NGOs. According to preliminary analysis the data provides versatile perceptions of sustainability, images of futures on both individual and collective level and includes statements of constraints and enablers of sustainability work and education. Some of the prefiguring conditions of practices are unique to that specific NGO and some are common to all.

Further analysis will provide more information futures images and practices but they seem to be strongly linked to NGOs' ideology that includes deep understanding of sustainability and communality. The practices in and around the European NGOs seem to lead to dynamic, creative and participatory educational actions for sustainability but are hindered by lack of resources and validation.

Keywords: Sustainability education, nonformal, futures images, practices, non-governmental organisations

Youth Writing Futures of Hope and Crisis – Hungarian Secondary Students’ Collaboratively Imagined Tomorrow

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^a Corvinus University of Budapest, Hungary; ^b Pázmány Péter Catholic University, Hungary; ^c MTA-ELTE Collaborative Research Group, Hungary; ^d Eötvös Loránd University, Hungary; ^e Károli Gáspár University of the Reformed Church, Hungary; ^f (Anonymized) High School, Hungary

Sustainability transformation requires not only systemic change but also shifts in how individuals and communities understand time, agency, and their capacity to shape futures. Young people, positioned at the intersection of inherited crises and emerging possibilities, play a crucial role in these transformations. This presentation examines how Hungarian secondary school students from diverse socio-cultural backgrounds collaboratively imagine their futures and negotiate temporalities through collective authorship, contributing to discussions of youth agency and future-oriented learning.

The study draws on a 12-week collaborative writing program developed by the MTA–ELTE Collaborative Writing Research Group, involving students aged 15–16. Participants co-authored a speculative narrative titled *In 10 Years*, projecting themselves into early adulthood while engaging in discussion. The narratives were analysed through a collaborative coding process, following a participatory approach that positions teachers not only as facilitators of the writing process but also as co-researchers in the analysis. The dataset consists of 47 collaboratively written texts produced by nearly 100 secondary school students, reflecting multiple layers of collective authorship and negotiation. Teachers who worked directly with the student groups participated in the qualitative coding process, bringing pedagogical insight and contextual knowledge into the interpretation of the narratives.

The narratives reveal a diverse and often contradictory constellation of future imaginaries. Students envision unsustainable living conditions due to war and the depletion of natural resources, while utopian futures characterized by technological abundance and social harmony also emerge. Several narratives extrapolate current social realities, such as the normalization of remote work and its implications for social relationships and community cohesion. Across these scenarios, sustainability emerges less as a fixed goal than as a contested horizon, negotiated through fears, hopes, and moral positioning.

Crucially, the collaborative nature of the writing process foregrounds how collective temporalities are constructed. Competing visions of progress, decline, and survival intersect and are transformed through dialogue, revealing how sociocultural backgrounds, shared media references, and present-day uncertainties shape collective meaning-making. Students position themselves variably as passive subjects of global forces or as active agents capable of adaptation, resistance, and care.

By focusing on collaborative authorship as a temporal practice, this study highlights how learning environments can function as spaces for experimenting with future narratives and sustainability imaginaries. The findings contribute to futures studies, sustainability education, and youth research by demonstrating how collective writing can foster reflexivity, agency, and plural understandings of time—key capacities for navigating and shaping sustainability transformations.

Keywords: youth future narratives, collaborative writing, sustainability, agency, participatory research

4. Sensing the Future: Arts-Based Practices for Sustainability Transformation

Time: Wednesday 10 June at 10.45–12.15

Room: Blokki 1

Chair: Janna Jokela

Eco-Cultural Animation Through Plant Dyeing with Invasive Species

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University of Lapland, Finland

This presentation examines ecocultural animation as a culturally grounded method for enabling sustainability transformations. Ecocultural animation is based on sociocultural animation but with a focus on eco-culture. I present long-term action research oriented towards sustainable transformation through art- and craft-based community work. The case that I present focuses on an artistic practice in which lupine flowers, which are a harmful invasive species in the Nordic region, are used.

I collected lupin from roadsides in Pajala, northern Sweden, and used to dye local Finnsheep wool. Through this material process, the project brought together ecological activism, traditional textile practices, and contemporary craft-based art. The artistic work included embroidery that both renewed traditional blanket-embroidery aesthetics and communicated the ecological impacts of lupines, such as the loss of dry meadow habitats and the decline of local biodiversity. The initiative expanded into community art through embroidery circles in the Ounasjoki River villages of Tepasto and Könkäs, where participants shared memories of the river and discussed ecological change and local environmental protection. The aim was to cultivate locally rooted cultural practices—such as harvesting lupines for dyeing—that strengthen eco-cultural awareness and support the continuity of plant-dye traditions. While such grassroots actions alone cannot halt the spread of invasive species or address all drivers of biodiversity loss, they foster ecological literacy, community agency, and experiences of meaningful and sustainable living.

The project is part of the work of the Embroidered Stances collective, a group of artists, craft practitioners, and activists who develop exhibitions and promote wool-craft traditions. It also engages with more-than-human relations, as plant and fungal dyes and sheep's wool become part of stories of interspecies entanglement.

This case demonstrates how art functions as a catalyst for sustainability transformation by enabling embodied, place-based, and intergenerational knowledge practices. At the same time, a vibrant eco-culture supports cultural sustainability transformation, which is essential for achieving just sustainability transitions. Such practices create shared spaces for dialogue, nurture local cultural resilience, and offer materially and emotionally grounded alternatives to consumption-driven lifestyles. Through these intertwined knowledge systems—cultural, ecological, experiential, and craft-based—the project illustrates how cultural sustainability can enable community-rooted transformations toward more sustainable ways of living.

Keywords: art education, action research, craft, sustainable culture, cultural sustainability

Onstage and Backstage Transformations: Theatre in the Context of Ecoscenography

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As culture becomes the fourth pillar of sustainability – alongside the environment, society, and the economy – the question of sustainable practices also enters the performing arts. The emergence of circular economy principles in the performing arts, alongside the vision of the European Green Deal and the New European Bauhaus, has brought environmental sustainability into theatre. These affect not only theatres as organisations, but also the approach to performance production in terms of both form and content.

As a space for collective imagination addressing the relationship between humans and the more-than-human, ecotheatre has the potential to promote ecological awareness and encourage behavioural change. Focusing on ecomaterialism and circular thinking, researcher and scenographer Tanja Beer emphasises the need for an ecologically neutral theatre – there is no such thing as waste in nature, and therefore an ecologically viable theatre should focus not only on ecological issues in its content, but also on ensuring that theatre-makers work in a sustainable and socially responsible manner [Beer 2021]. As sustainability aspects become present in theatre, practitioners are changing their attitudes towards the life cycle of performances.

This paper aims to analyse contemporary ecoscenographic strategies through an examination of the concept of ecotheatre and the tools employed to foster sustainability in the performing arts. These strategies are contextualised through practical case studies that exemplify approaches such as zero-waste performance production, minimalist aesthetics, recycling and upcycling practices, the use of natural materials, and sustainable touring. Ecoscenographic strategies thus articulate and delineate diverse modes of integrating circular economy principles into the field of performing arts.

Keywords: ecoscenography, performing arts, circular design, ecotheatre, sustainability in culture

Creating Futures: Northern Youth, Media Art, and Relational Sustainability

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Sustainability transformation requires future-oriented approaches that address not only systemic change but also shifts in imaginaries, values, and relations between humans and more-than-human worlds. This presentation examines how images of the future can function as a form of transformative knowledge production within arts-based action research concerned with planetary well-being and health. In Indigenous and Arctic contexts, sustainability transformations are closely tied to land-based relations, ecocultural continuity, and intergenerational responsibility. The study positions images of the future as a means to explore how young people envision sustainable futures grounded in relational and place-responsive understandings of the world.

The research draws on arts-based action research and arts-based future image work conducted with youth in northern contexts, through media art workshops at a Sámi upper secondary school in Utsjoki, Finland, and with students at Inusullivik in Narsaq, Greenland. Participants collaboratively created audiovisual works that articulate images of the future in relation to land, ecocultures, and community life. These images of the future are approached as research material generated through embodied, situated, and practice-led inquiry. Knowledge production unfolded through artistic experimentation, relational engagement with place, and iterative reflection embedded in the making process.

The collaboratively produced images of the future reveal sustainability transformations imagined not as technological or abstract solutions, but as relational shifts involving humans, land, and more-than-human actors. The findings indicate that images of the future enable young people to express integrated understandings of planetary health that combine cultural continuity, environmental care, and ethical orientations toward future life. These future imaginaries foreground more-than-human agency by depicting land, weather, animals, and materials as active participants in sustaining life and shaping futures. As such, the visual material highlights how sustainability transformation is envisioned through everyday practices, local ecologies, and intergenerational knowledge.

The study demonstrates that working with images of the future through arts-based action research offers a valuable methodological contribution to sustainability transformation research and future studies. By framing images of the future as both research material and a mode of inquiry, the presentation shows how artistic practices can support plural, relational, and culturally grounded pathways toward planetary well-being and health. The findings suggest that engaging young people in creating images of the future can foster transformative ways of thinking about sustainability that recognise human and more-than-human agency in shaping liveable futures under conditions of ecological uncertainty.

Keywords: Art-based action research, Images of the future, Sustainability transformation, Ecocultures, Media art

Imagination as Anticipatory Practice: Reconfiguring Temporalities for Sustainability Transformation

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Sustainability transformation necessitates not only institutional and technological change but also a cultural reorientation in how we understand time, responsibility, and planetary limits. Although intergenerational decision-making within planetary boundaries is widely recognised as essential, translating this commitment into pedagogical practice remains a significant challenge. This paper proposes an arts- and design-based approach to address this need.

Developed through the About Time practice-based research initiative at the Institute of Art, Design and Technology (IADT), Ireland, and operationalised through The Barometer, an experiential futures literacy workbook centred on temporal inquiry, the framework is situated at the intersection of futures studies, sustainability scholarship, artistic research, and design-led pedagogy. It has evolved through iterative testing across higher education modules (including climate literacy, sustainability, business, and cross-disciplinary futures teaching), and has been piloted internationally in academic and community contexts. The approach is intentionally adaptable across disciplinary settings.

At its core, the framework advances an approach described here as anticipatory art practice, an arts-and-design-based methodological orientation that employs creative, material, and embodied inquiry to investigate how futures are imagined, experienced, and enacted. Participants engage with layered temporalities, including geological deep time, historical memory, the lived present, and imagined as well as activated futures, through visual mapping, worldbuilding, reflective making, and multisensory observations. These practices reveal tacit temporal norms such as acceleration, immediacy, and extractive growth, and invite critical reflection on their influence on governance, production, consumption, and everyday decision-making.

Particular emphasis is placed on intergenerational responsibility and more-than-human agency. By situating learners within extended ecological systems and collective futures, the framework connects personal

anticipation to broader sustainability transformation. Imagination is positioned as an anticipatory capacity and a structured and reflexive mode of inquiry that expands perceived possibilities and strengthens agency under conditions of uncertainty.

A qualitative reflective instrument, Futures Calibration, supports the recognition of shifts in temporal horizons and anticipatory assumptions. Evaluation data across diverse disciplinary backgrounds and communities indicate increased temporal consciousness, strengthened intergenerational empathy, and enhanced capacity to envision regenerative futures.

Sustainability transformation, this paper argues, depends upon reconfiguring temporal perception. Anticipatory art practice offers an interdisciplinary futures methodology for cultivating this shift by reshaping how time is experienced, narrated, and collectively imagined in the pursuit of just and regenerative futures within planetary boundaries.

Keywords: Temporality, Sustainability, Imagination, Anticipation, Arts-based

5. SPECIAL SESSION: Governing Sustainable Futures in Uncertain Times

Time: Wednesday 10 June at 10.45–12.15

Room: Skooppi 1 & 2

Chair: Antti Mäenpää & Johanna Kalliokoski

Time spans in managing sustainability amidst geopolitical turbulence

Karhu, Anna – Haaja, Eini – Mäkinen, Hanna

University of Turku, Finland

Geopolitical turbulence following Russia's war against Ukraine and the turn in US foreign and trade policy have made the international business environment more volatile and elevated security to a central concern alongside economic, environmental, and social sustainability. Finnish firms face conflicting pressures, as security risks are immediate while sustainability impacts unfold more slowly. This creates a clear need for new research on sustainability management in international business under varying temporal pressures and conditions of geopolitical turbulence. This study explores the following research question: How can Finnish firms manage sustainability in different operational time spans amidst geopolitical turbulence?

The empirical research is conducted in MANU project (Managing sustainability amidst geopolitical turbulence, funded by the Foundation for Economic Education in 2026–2028) through three case studies exploring different time spans. The short-term case focuses on resilience to hybrid threats. Firms are increasingly confronted with diverse tactics to damage reputation, disrupt operations, steal sensitive assets, or exert geoeconomic and political pressure. This makes it challenging to strengthen resilience without undermining key dimensions of business sustainability such as openness. The medium-term case explores Finnish firms' de-internationalisation from Russia, illustrating how withdrawal decisions driven by ethical, reputational, and geopolitical pressures create complex sustainability trade-offs, including negative social impacts such as mass layoffs. The third case explores a long-term time span by analysing the intensifying pressure for mineral extraction in Finland. It highlights how firms face growing challenges in balancing

environmental and social sustainability, legitimacy, and resource use, while raw materials' strategic importance for the green transition and European security embeds business decisions in wider geopolitical and geoeconomic power relations. The study builds on comparable interview and document data from each case, allowing cross-case synthesis. In addition, to deepen the cross-case synthesis we apply data from a reflective, co-creative futures workshop with invited interviewees from each case.

The study contributes to a deeper understanding of how Finnish firms manage sustainability in the business environment shaped by geopolitical turbulence in a way that addresses sustainability concerns at different time spans. Employing futures research approaches, we strive to provide concrete managerial recommendations to the use of Finnish firms and other actors, and to further develop futures research methodology to support the simultaneous exploration of futures in different time spans.

Keywords: Sustainability, security, geopolitics, management, time spans

Governing the Future: Lessons from the UK Foresight Programme

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Over more than two decades, the United Kingdom's National Foresight Programme (FP) has established a robust framework for integrating science, technology, and innovation (STI) insights into policymaking. The programme has evolved across multiple policy cycles, responding to shifts in government leadership, STI priorities, and major societal disruptions, including neoliberal restructuring, the global financial crisis, Brexit, and the COVID-19 pandemic. The COVID-19 pandemic, in particular, exposed structural limitations in the use of foresight, such as departmental silos and insufficient integration into political decision-making, highlighting the importance of long-term preparedness for effective policy responses and institutional resilience. In response, recent FP initiatives have sought to link anticipatory analysis more directly to policy decisions while promoting awareness of long-term societal challenges. These experiences offer valuable lessons for sustainability transformations, emphasising the need for a hybrid governance architecture that combines central coordination with regional and local autonomy. Foresight can function as a systematic knowledge infrastructure, guiding policy design, budget allocation, and public service delivery under conditions of uncertainty and rapid change. Recent evaluations, such as the 2024 report from the Parliamentary Liaison Committee, emphasise that the effectiveness of foresight depends on its integration into strategy implementation rather than serving merely as background intelligence. Maintaining project continuity, allocating resources carefully, and leveraging emerging technologies—particularly AI—are essential factors for sustaining foresight over time. AI can be applied throughout the foresight process and can play a crucial role in analysing and responding to the speed, impact, and trajectory of changes in VUCA (volatility, uncertainty, complexity, ambiguity) environments. The UK FP's experience demonstrates that adaptive, long-term thinking must be central to governance. Lessons from past projects, combined with systematic evaluation and AI-enhanced foresight tools, can help policymakers manage both immediate crises and long-term sustainability transformations. By providing structured knowledge and anticipatory capacity, foresight supports leadership that is proactive, flexible, and capable of steering complex societal transitions towards a just and sustainable future.

Keywords: UK Foresight Programme, British National Foresight, Sustainability Transformation, VUCA, crisis management, COVID19 pandemic, AI

Future competence as a basis for sustainability transformation

Gaspar, Tamas

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In the context of accelerating sustainability challenges, futures literacy (FL) is increasingly recognised as a key capability for enabling societal transformation towards more sustainable futures. Despite its growing prominence in futures studies and education, however, its empirical operationalisation and measurement remain limited. Existing approaches often frame futures literacy either normatively—as a desirable transformative capacity—or functionally—as a set of skills and methods—while rarely addressing its internal structure and the role of consciousness in an integrated way. This paper addresses this gap by conceptualising futures literacy as a socially and culturally embedded anticipation space and by examining how its structure can be explored empirically.

The study models futures literacy as a three-dimensional competence pattern consisting of: (1) knowledge expressed through different uses of the future, (2) futures-related skills and capabilities, and (3) consciousness, defined as the degree to which these uses and capabilities are intentionally recognised and applied. Using a mixed-methods design within participatory action research in higher education, the study combines a validated futures skills scale with qualitative data from case-study essays, reflective diaries, focus groups, and interviews conducted in both intensive and semester-long university courses.

The results suggest that the development of futures literacy is primarily structural rather than linear. Participants expanded their repertoire of future uses and skills, and their overall awareness increased, yet these changes occurred unevenly. While intensive courses produced stronger short-term shifts in openness and agency, full-semester courses fostered more integrated and stable patterns of futures thinking. At the same time, increasing openness proved ambivalent, strengthening agency but also generating uncertainty and future-related anxiety.

The findings suggest that assessing futures literacy requires profile- and pattern-based approaches that combine psychometric and reflective methods. More broadly, the development of futures literacy appears to be a gradual conceptual change process rather than a short-term training outcome. Understanding this process is particularly important in the context of sustainability transformation, where the capacity to question assumptions about the future, recognise alternative possibilities, and act upon them consciously becomes a crucial foundation for navigating complex and uncertain transitions.

Keywords: futures literacy, futures competence, anticipation, consciousness, sustainability

How to solve the future from bottom-up? Looking at geopolitical, sustainability and economic challenges and their potential local industrial solutions

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Europe and Finland are facing several challenges, where geopolitical turmoil forces us to re-think our approaches for solving issues. For example, sustainability requires clean energy solutions, but these cannot happen without China's involvement, which raises security concerns. Geopolitical turmoil on the other hand changes our economic landscape almost daily and uncertainty makes it difficult to see what lies ahead. This hinders sustainability work since defence takes more resources. Indeed, there seems to be a tug-of-war between geopolitical issues, economy and sustainability and it is difficult to say which team one should follow.

Despite all of these challenges, we do know that economic prosperity is a key for solving both sustainability issues and supporting our defence capabilities. This need for economic prosperity leads us to new industrialisation policies, which can be seen as important tools for increasing both Finnish and European economies. We are currently studying new industrial policies in Business Finland funded STRAIND-project (Bridging Strategic Spatial Policies and Returning Industrial Policies for Innovation and Growth). Our goal is to understand how strategic spatial properties should be considered in future industrial policies.

This study leads us to very important questions towards solving these big global issues. When one studies spatial elements, these happen in a local context. Therefore, we are looking at how local level (and geography) can help in solving the global issues and this creates an interesting perspective perhaps to the most important questions in these times: What should we do? And who should do and what?

In our presentation we look at this complex setting and how local level could help in solving global issues. One key element is the need for foresight, coordination and governance, since one has to see the multi-level effects of various initiatives and try to connect different interests in a local context, where the need for new actions is steadily increasing.

Keywords: industrial policy, geopolitics, sustainability, economy, multi-level

6. SPECIAL SESSION: Foresight as Social Infrastructure

Time: Wednesday 10 June at 10.45–12.15

Room: Laurén 1

Chair: Radu Gheorghiu

Gheorghiu, Radu^a – Warnke, Philine^b – Giesecke, Susanne^c – Dragomir, Bianca^d – Savvopoulou, Eliza^e – Kastner, Louisa^b – Knudsen, Mikkel^f – Kaskinen, Juha^f

^a UEFISCDI The Executive Agency for Higher Education, Research, Development and Innovation Funding of Romania, Romania; ^b Fraunhofer Institute for Systems and Innovation Research ISI, Germany; ^c Austrian Institute of Technology AIT, Austria; ^d Prospectiva, Romania; ^e Helenos Consulting, Greece; ^f Finland Futures Research Centre, University of Turku, Finland

Research and Innovation (R&I) remains one of humanity's strongest sources of hope for navigating the sustainability transition. Yet R&I itself is shaped by uncertainty, contestation, and rapidly shifting knowledge ecosystems—making foresight not only relevant, but increasingly essential. Foresight supports R&I by expanding the space of possibilities, questioning dominant assumptions, and enabling collective sense-making in contexts where futures cannot be predicted but must be actively shaped.

In autumn 2025, within the framework of the EU funded Eye of Europe project, more than thirty foresight experts and R&I policymakers from across Europe engaged in a dedicated “foresight on foresight” process to explore the evolving role of foresight in R&I and beyond. This collaborative inquiry resulted in an ambitious shared vision positioning foresight as a key social infrastructure—a public capability that enables Europe to live creatively with emergence, complexity, and diversity, while cultivating futures literacy and democratic participation.

This special session will present the main insights and outcomes of this vision-building process, and connect them to practice through three pilot foresight processes developed under Eye of Europe. These pilots explore futures at the interface of sustainability, culture, and societal transformation, focusing on: the future of emotions, the future of knowledge, and the future of sustainable fashion. Together, they illustrate how foresight can become a space for inspiration, disruption, and renewal—mobilising new imaginaries, values, and forms of agency.

Finally, the session will reflect on the role of futures4europe.eu as an emerging digital commons for the European foresight community: a platform for sharing practices, connecting actors, and strengthening foresight as an accessible and evolving infrastructure for collective futures work.

The session invites participants to engage with foresight not only as a method, but as a socio-technical and cultural practice that can strengthen Europe's capacity to anticipate, learn, and act in pursuit of sustainable and just futures. It will include presentations and discussions as well as an interactive visioning element. The session offers the opportunity for the participants to take active part in the sustainability of Foresight as social infrastructure and embraces innovative ideas to put this ambition into practice.

Keywords: Foresight, social infrastructure, research and innovation, vision, sustainability

7. WORKSHOP: Long-Term Futures Need Long-Term People

Time: Wednesday 10 June at 10.45–12.15

Room: Aistikattila

Steinzeig, Anna

Sustainability work demands long horizons, but many organizations still rely on short-term thinking. The business reality of today is: constant urgency, understaffed teams, unclear priorities & constant change.

The work is done either without consideration of human needs or as if people are disposable material that doesn't need to be sustainable by design.

We focus on numbers, targets, KPIs, but here's what nobody puts in the impact report: Hanna left after eighteen months. Mikko is on stress leave for a year. The new hire doesn't know why we dropped that partnership. Nobody remembers what we learned from the pilot that failed last year. And next quarter, we'll do it again, just faster.

That's not sustainable:

- We lose money (employee replacement costs 0.5–2×annual salary)
- We lose productivity
- We lose knowledge

And worst of all, it's all preventable if we change our thinking. This is what this workshop aims to do: to explore what would work look like if we designed for human needs and biology.

Workshop Structure (75–90 min) (subject to change based on the information from the conference organizers).

1. The scale of the problem: I'll present major numbers on work stress, absenteeism, burnout, disengagement, and turnover together with the cost of it for EU employers.

2. The normalized stressors: Together with participants, we'll explore the conditions we've normalized and stopped noticing and psychosocial hazards the WHO identifies as harmful working conditions.

3. What chronic stress does to work performance: I'll explain the damaging effects of unmanaged work stress on work performance from stress biology perspective.

4. Diagnosing your workplace: In small groups we will examine one real work situation using major frameworks:

- Job Demands–Resources (Bakker & Demerouti) — strain–engagement framework.
- Six Areas of Worklife (Maslach & Leiter) — burnout framework.
- Self-Determination Theory (Deci & Ryan) — motivation framework.

5. Redesign: Each group picks one job-related situation and re-designs it based on the material learned in order to increase human sustainability.

Participants leave with: shared language to talk about strain and human sustainability, useful for leaders, HR, and teams; one redesigned work practice ready to implement; 1–3 indicators to track progress

Keywords: human, sustainable, performance, wellbeing, burnout

8. WORKSHOP: Balancing Procedural and Skills-Centred Approach to Institutionalised Foresight in Governments

Time: Wednesday 10 June at 10.45–12.15

Room: Blokki 2 & 3

Djakonoff, Vera^a – Sokero, Mikael^a – Chung, Cheryl^b

^a Demos Helsinki, Finland

^b Tent Futures, Singapore

There is a well-documented gap between foresight and its potential impact in a policymaking context. In essence, the challenge is to sophisticatedly curate timely and useful foresight knowledge for the needs of decision making in a government context.

As both supply and demand for anticipatory governance approaches are growing, policymakers need to navigate different time horizons, from extremely short to extremely long, as part of their daily work. The impact gap has predominantly been tackled by tailoring and adapting foresight methods and frameworks to support the needs of policymakers and ultimately decision making. Many of the anticipatory governance approaches have been presented as standardised frameworks and tools to be applied in specific situations with an assumption of certain value. While this partly stems from the welcomed effort to demystify the function of foresight, the loss of nuance and context specificity risks foresight's efforts and their results to remain too general, theoretical and distant from the real-world considerations of decision makers, therefore unintentionally widening the impact gap. Hence a less standardised framework, process or method-centred approach is of high demand. We need a move from annual clocks of foresight to more foresight-as-a-service type of approach.

We argue that instead the focus should be given to the relationship between decision making settings and needs of the decision makers vis-a-vis the foresight knowledge creators. We propose a dialogical knowledge-brokering role and approach to be further developed. This could allow for a more futures literacy centred approach instead of a more process-oriented application of foresight to the policy cycle.

We propose a workshop to explore a potential new direction for applying foresight. The understanding and learning arising from the workshop will help foresight practitioners to better channel their expertise and design better fit-for-purpose foresight interventions in the light of the shifting needs of both policymakers and decision makers in governments.

During the workshop we present three real-life policy contexts and challenges with accompanying expected time horizons for the policy outcomes, short-term, mid-term and long-term with the immediate needs and contextual description of the decision making situation. Groups will work on responding to the demand: format of the approach and methods, output, meaningfully defined engagement with the decision maker. After this attendees will take the roles of decision makers and experts by means of facilitated roleplay, simulating the engagement through red teaming: "decision makers" challenge experts, "experts" practice dialogue and effort to build mutual understanding.

Keywords: anticipatory governance, policy, foresight, decision-making

Session 4:

Wednesday 10 June 2026 at 13.00–14.30

1. Emerging Futures in Sustainability and Urban Transformation

Time: Wednesday 10 June at 13.00–14.30

Room: Alhopuro

Chair: Meri Löyttyniemi

More-than-human engagement in the design of river basin infrastructure

Wentling, Kelsey – Warbroek, Beau – den Haan, Robert-Jan – Volker, Leentje – Vink-de Kruijf, Joanne

University of Twente, The Netherlands

River basins are complex, interconnected systems in which social institutions, ecological processes, and technical infrastructure jointly shape basin functions. Increasingly, basin infrastructure that “works with nature” is implemented to mitigate social vulnerability while providing secondary benefits to the ecosystem. However, these approaches are often anthropocentric in their design and implementation, obscuring the role of more-than-human species in shaping ecological, social, and technical conditions. This can create blind spots and unintended consequences that ultimately undermine both social and ecological goals. To address this gap, this study examines how the identification of more-than-human species can be strengthened and how their engagement can be enhanced in the design and implementation of river basin infrastructure. Drawing on justice theory, the study focuses first on recognitional justice by asking how human and more-than-human entities are identified and represented in infrastructure design. Building on this foundation, it then explores methods for representing the interests of more-than-human species to enhance procedural justice. To probe how these more-than-human engagement methods could be used in practice, we asked river basin practitioners to reflect on the processes, enablers, and barriers in qualitative, semi-structured interviews focused on their hypothetical application. We present developed methods for the identification and engagement of more-than-human species, together with practitioners’ reflections on their applicability and potential usefulness. We aim to use these reflections to further inform and refine the methods. By foregrounding more-than-human agency along with that of humans, this study contributes to efforts that seek to move more-than-human engagement from theory to practical application. We argue that taking the lens of recognitional and procedural justice may contribute to engagement with a broader set of humans and more-than-human species and ultimately to the design and implementation of river basin infrastructure to enhance the resilience of river basins.

Keywords: river basin infrastructure, justice, more-than-human, design

Anticipatory Fatigue, Epistemic Rupture, and the Rhythms of Climate Adaptation in Alpine Agriculture

Odella, Francesca

University of Trento

For centuries, Alpine agriculture operated within a cyclical temporality, where traditional ecological knowledge provided a reliable map for the future. However, the catastrophe of Storm Vaia in 2018 marked a definitive "epistemic rupture," shattering this continuity and replacing it with a regime of climatic volatility and non-linear risk. This contribution examines how the agricultural communities of Trentino (Italy)—a region defined by high-value viticulture and orchard production—navigate this temporal crisis, where the past no longer serves as a predictor of the future. As climate change accelerates, the Alpine sector faces a profound dilemma in reconstructing its concept of "the future." This systemic challenge is driven by three converging pressures. First, the physical reality of climate change necessitates a painful reconsideration of traditional cultivars and ancestral land-management practices. Second, the sector is undergoing a broader socio-technical transformation, where climatic adaptation must compete with immediate structural crises, including chronic labour shortages and the digitization of rural infrastructure. Third, the push for technological efficiency—including the introduction of AI-driven forecasting and digital tools applied to irrigation and cultivation tasks—frequently impacts the farmer's capacity to envision the future without necessarily enhancing their agency over the work itself. In this context, Storm Vaia was a watershed moment that signalled the obsolescence of the way Alpine agriculture represents itself and its resilience to mountain climate conditions. While current institutional responses prioritize investments in new crops and cultivars and the use of predictive weather technologies to fill this uncertainty gap, the "anticipatory fatigue" of dealing with the above systemic vulnerabilities emerges and erodes the capability of stakeholders. Farmers themselves experience a vacuum in cultural and symbolic frameworks through which to interpret their future challenges and their relationship with traditional knowledge. This paper questions whether the current drive for technological adaptation often overlooks the human and cultural dimensions of time, and considers the possible rebuilding of a culture of resilience that honors the specific temporalities, agency, and social values of the Alpine territory.

Keywords: anticipatory fatigue, epistemic rupture, alpine agriculture, temporality, socio-technical transitions

Dream the Future City Together – The New European Bauhaus Network App

Klößner, Hermann Wolfram^{a,b} – Roudyani, Siamak^a – Harthun, Jennifer^a – Hartman, Nigel^a – Stepnikova, Vitalina^a – Wiesner, Martin^a – Yigit Akyol^a

^a Anhalt University of Applied Sciences, Germany; ^b Technical University of Munich (TUM), Germany

Sustainability transformations are fundamentally temporal processes, yet citizens are often excluded from early decision-making phases when future trajectories are still malleable. This leads to the well-documented "participatory paradox": low engagement when choices matter most, and heightened participation only when options are constrained. Addressing this gap requires new ways of making future possibilities experientially present and collectively negotiable. Building on the principles of the New European Bauhaus (beautiful, sustainable, together), this paper investigates how augmented reality (AR) can mediate individual and collective understandings of time in urban sustainability transformation.

We present the design and early deployment of the NEB Network App, an open-source, location-based AR citizen application developed within a real-world laboratory context in Zeitz, Germany. The app visualizes networks of New European Bauhaus places and overlays spatial environments with sustainability-related data (e.g., energy flows, biodiversity) and alternative future scenarios. Methodologically, the project follows a research-through-design approach combining participatory service design, in-situ AR interaction design, and modular software architecture. A first empirical intervention involved an on-site citizen vote on alternative façade designs for a historic building, allowing participants to engage with futures directly at the place where their consequences would unfold.

Preliminary observations indicate that AR-based futures visualization supports a shift from abstract, distant notions of sustainability toward situated, experiential temporalities. Participants reported a stronger sense of agency and responsibility when future scenarios were anchored to physical locations. Collective voting and discussion transformed individual future imaginaries into shared temporal reference points, enabling negotiation between short-term aesthetic preferences and long-term sustainability considerations.

The NEB Network App demonstrates how immersive, place-based AR can function as a temporal boundary object in sustainability transformations. By rendering potential futures visible and discussable in the present, the approach fosters earlier and more meaningful citizen participation. The paper contributes to futures studies by showing how digital augmentation can bridge individual and collective temporal understandings, supporting more inclusive and anticipatory forms of urban sustainability governance.

Keywords: AI, AR, Participation, City-Development, Decision-Making

2. Learning Into the Future: Education, Youth, and Wellbeing

Time: Wednesday 10 June at 13.00–14.30

Room: Laurén 2

Chair: Akhgar Kaboli

Desired futures through an educational lens – a qualitative approach on futures consciousness

Hyypä, Iina – Södervik, Ilona – Krzywacki, Heidi – Laherto, Antti

University of Helsinki, Finland

Futures thinking skills have been shown to provide crucial perspectives to aid in imagining alternatives, navigating ambiguities, and perceiving systems of change, yet they remain undervalued and are rarely explored, taught, or developed. As a way of fostering futures thinking skills both immediately as well as on a longer-term return, this study took out to explore and foster futures thinking skills among teachers in training, pre-service teachers.

The aim of this study was to explore pre-service teachers' futures consciousness by analysing their narratives of a desired future school day as a teacher in 2050. This study focuses on their manifestations of futures consciousness, exploring its 5 dimensions of agency beliefs, systems perceptions, time perspectives, openness to alternatives, and concern for others. The study highlights pre-service teachers' key role amid societal and ecological crises by developing a qualitative methodology for the analysis of teachers' futures consciousness.

This paper explores: How do pre-service teachers' narratives of a desired future manifest different dimensions of futures consciousness? Pre-service teachers in a first-year university course answered short essay questions on their desired future workday and on the changes needed to achieve that future. An abductive thematic analysis of 100 narratives was conducted to search for manifestations of the dimensions of futures consciousness. Results indicate that collectively pre-service teachers manifest all five dimensions of futures consciousness, to varying degrees. Agency beliefs and systems perceptions are explored more deeply when writing a backcasting task. This paper presentation will explore the results of the study through main themes and citations, drawing to a discussion on how future narratives can be implemented, analysed, and developed.

By exploring connections between the academic fields of education and futures studies through the lens of pre-service teachers' futures consciousness, this research aims to develop teacher training to encourage teachers to act as societal changemakers. This requires long-term futures thinking regarding the school and the role of the teacher in the future, thus far an undervalued area in teacher education.

Keywords: futures consciousness; pre-service teachers; future narratives; futures thinking; futures education; qualitative analysis

University crisis as futures thinking opportunity: Collective post-qualitative methods in the development of higher education innovation practices

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The idea of the university is in crisis. In this context, recent data show that university degrees (undergraduate and graduate) have lost value; for example, in the Mexican case between 2016 and 2024, the income variation of those holding a bachelor's degree decreased from 395% to 222%, while for postgraduate degrees it fell from 1,261% to 491% (Toribio, 2026). In addition, during and after the Covid-19 pandemic, three impactful forces in higher education have accelerated: capitalist influence on university organization, ideological conservatism, and student movements advocating for decolonizing education (De Sousa Santos, 2024). Thus, it is necessary to understand the transitions the university is undergoing and the need to promote meaningful transformations for its communities through futures thinking. For this reason, a systematic literature review was conducted using the PRISMA (2021) methodology, in which 49 articles on the futures of higher education were identified and analysed in order to determine the axiological, theoretical, and methodological paradigms that reveal the need for collective futures literacy to establish innovative practices in higher education. One of the research questions guiding this inquiry was: What futures methods make it possible to analyse and create desirable scenarios in higher education? Accordingly, this article recovers collective post-qualitative methods as an alternative for imagining and speculating about new university models that respond efficiently to the needs, challenges, and characteristics of contemporary human communities in a world that works for everyone (Nørgård & Holflod, 2024; Webb, 2016). The results outline that there are six trends in collective post-qualitative methodologies that enable futures literacy and the development of human agency for decision-making: (a) speculation, (b) fiction, narrative, and science fiction, (c) strategic planning and decision-making, (d) utopias, dystopias, and imagination, and (e) transversal techniques. Therefore, their characteristics, conditions of application, epistemological principles, and derived techniques are discussed in order to highlight the importance of developing and implementing methodological frameworks that allow for the socialization of future-oriented ideas among the communities that experience university life (students, faculty, and administrative staff) and, thus, the implementation of meaningful changes in the new idea of the university.

Keywords: Higher education, Post-qualitative methods, Futures thinking, Innovation, Transformation

A Framework for Youth as Community Leaders for Sustainable Futures

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In this paper, we will describe a conceptual framework for young people as leaders for sustainability and futures thinking in their communities. The framework defines a space for learning as a transformative activity, in which young people collaborate on a creative, sustainability-focused project and leverage that project to engage intergenerational groups in their community, positioning them as changemakers. To test the framework, our research has implemented and studied an afterschool program at Arizona State University's Media and Immersive experience (MIX) Centre with 12 diverse teens.

The young people co-created an extended reality (XR) narrative game about a future world that was "immersive, encouraged collaboration, and sparked conversations about issues we cared about" (in their own words). In the game, the player faces challenges, navigates conflicts, and makes decisions that reveal the social, economic, and environmental complexity of climate change. The young people play tested the game with intergenerational audiences in communities in the Phoenix metro area and rural areas of Arizona. The players' choices have an impact on the story, creating opportunities for reflection and discussion about sustainability.

Findings from our mixed-methods research indicate that as a result of their participation in the program, young people: 1) deepened their knowledge within and across several STEM (science, technology, engineering, and math) domains, including climate science, sustainability, and game design; 2) increased their

sense of agency, empowerment to make a difference, and personal development in ways that are consistent with their definition of leadership; 3) strengthened their identity related to STEM; and 4) broadened and deepened their awareness of potential STEM careers.

Keywords: sustainability, futures, community, youth, leadership, narrative games

Strengthening Climate Change Education under Institutional Constraints

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Climate change education is increasingly recognized as a critical enabler of long-term climate adaptation and mitigation; however, empirical evidence on how education systems can be strategically strengthened under institutional and resource constraints remains limited. This study adopts a systems-informed, mixed-method research approach grounded in a Systems Thinking framework to examine key drivers, barriers, feedback dynamics, and leverage points shaping climate change education and pedagogy. Empirical evidence is drawn from national-level workshop on climate change education in Nepal, engaging 47 educators, researchers, policymakers, and practitioners who participated in a structured questionnaire survey. The analysis identifies three interlinked leverage domains with high potential for long-term impact. First, gaps in teacher capacity were identified, extending beyond climate science knowledge to include the application of climate concepts to local hazards, livelihoods, and community-based adaptation practices, underscoring the need for targeted in-service teacher training and pedagogical support. Second, climate change curricula were found to be weakly connected to real-world climate decision-making, indicating the need to better align content and teaching approaches with locally relevant adaptation and mitigation contexts. Third, fragmented coordination across education institutions, research bodies, and policy processes emerged as a major systemic constraint, limiting continuity, learning feedback, and policy uptake, and exacerbated by short-term funding cycles and weak research–policy linkages. The findings show that small, targeted actions, such as integrating climate modules within existing teacher training frameworks and strengthening cross-institutional coordination can produce system-wide effects when aligned with existing feedback mechanisms. By shifting from isolated initiatives to coordinated, system-level approaches, this study offers actionable insights for positioning education as a long-term pillar of national climate action in Nepal and comparable developing country contexts.

Keywords: Climate change education; Systems Thinking; Teacher capacity; Curriculum alignment; Climate adaptation and mitigation

3. Futures Literacy for Sustainable Transformation

Time: Wednesday 10 June at 13.00–14.30

Room: Säätiö

Chair: Markku Wilenius

Transforming the future sustainably – insights from a regional development and knowledge transfer project incorporating futures literacy labs in Southern Germany

Schönhofer, Gerhard

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UNESCO defines futures literacy as a key competence for the 21st century, enabling individuals and institutions to engage productively with uncertainty, complexity, and rapid socio-ecological change. In the context of climate change, digital transformation, and social disruption, futures literacy goes beyond forecasting: it strengthens the capacity to imagine alternative futures, recognize early signals of change, and translate anticipatory thinking into responsible action. This paper explores futures literacy as a future-shaping competence and presents an applied, interdisciplinary model rooted in regional transformation and educational practice.

Drawing on the joint project People in Motion, developed by the Technical University of Ingolstadt (THI) and the Catholic University of Eichstätt-Ingolstadt (KU), the contribution examines how futures literacy can be cultivated through participatory, creative, and experiential learning formats. Situated in the Ingolstadt region – currently undergoing profound economic, technological, and social transitions –the project connects universities, civil society, industry, and diverse social groups in co-creating shared images of possible, probable, and preferable futures.

The paper presents insights from 12 Futures Literacy Labs conducted over the past 2.5 years with heterogeneous groups including students, pupils, business executives, migrants, seniors, and academic staff. Using methods such as scenario building, collaging, short speculative science-fiction narratives, and LEGO® SERIOUS PLAY®, the labs addressed topics ranging from elderly care and education to social inclusion and voluntary work. These practices fostered ecological awareness, systemic thinking, and agency by making futures tangible and emotionally accessible.

Beyond workshop design, the contribution discusses didactic concepts for anchoring futures literacy in formal education and teacher training, as well as the role of creative, cultural, and artistic practices in transmitting futures thinking beyond academic contexts. Particular attention is given to documentation, curation, and translation of workshop outcomes into public formats such as exhibitions and immersive theatre, enabling futures to “exist” and “made accessible” in shared social and cultural spaces.

By linking futures literacy with regional innovation, science–society collaboration, and creative methodologies, this presentation demonstrates how future education can succeed in concrete terms. It offers a transferable model for empowering communities to read signals of change, navigate uncertainty, and actively shape sustainable futures.

Keywords: futures literacy, participation, sustainable futures, regional development, knowledge transfer

Futures Literacy Pedagogy: Towards Cultural Sustainability in Education

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Due to sociologist Gérard Delanty, the future is a way of experiencing the world. But how can we experience a world that exists in our imagination only, as a time yet to come? Due to UNESCO, being futures literate empowers the imagination. But shouldn't we rather strengthen our imagination in order to become futures literate? At the UNESCO Chair in Learning and Teaching Futures Literacy in the Anthropocene, futures literacy pedagogy is being developed. Futures literacy is used as an educational concept that needs to be translated into teaching methodologies for pedagogical practice. Didactic concepts, methods, and tools are being developed that foster futures thinking in lecture theatres and classrooms across the curriculum. Drawing on the craft-based approach of possibility studies, the econarratological approach of Environmental Humanities, inspired by temporal pedagogy based on Anthropocene studies, and committed to cultural sustainability in education, futures literacy pedagogy creates transformative learning experiences for practicing futures thinking, for imagining and narrating sustainable futures. This paper introduces foundational principles based on a pilot study.

In order to develop the foundational principles of futures literacy pedagogy, teaching formats are being tested, combining educational design research (EDR) and arts-based research (ABR). While ABR is responsible for the artistic and aesthetic dimension, EDR ensures the systematic, cyclical research and development process through which the formats are iteratively tested, reflected upon and improved. In a pilot study on soil futures, iterative cycles were used to investigate the extent to which the method “Futures Stories Lab” promotes futures thinking in primary education. A follow-up study investigates the potential of the interactive exhibition format “Future on Campus” for implementing futures literacy in teacher education. The interactive exhibition serves as a real-world laboratory in which futures thinking is explored co-creatively at interactive stations.

The pilot study allows to derive initial design principles for the teaching method “Futures Stories Lab” that will be outlined: relevance to everyday life (places, experiences, topics), multimodality and creative forms of expression (accessing factual knowledge with approaches from cultural, arts, and media education), reflection and participation, didactic framing by teachers, narration as the key to teaching futures literacy. Futures literacy pedagogy offers manifold possibilities for teaching futures thinking in structured, but flexible settings. Within the wider framework of cultural sustainability in education, a narrative-aesthetical approach is favoured for strengthening the power of the imagination.

Keywords: futures literacy pedagogy; Futures Stories Lab; cultural sustainability in education

From Products to Living Systems: Strategic Foresight for the Built Environment

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Buildings outlast the assumptions used to create them. Structures designed for century-long lifecycles are financed on quarterly returns, planned within electoral cycles, and briefed against demographics that are already shifting.

The world is already changing. By 2050, urban populations will rise from 52% to 68% globally (UN), while those over 60 will nearly double to 22% (WHO). Family structures will transform beyond recognition. The spaces we build today will serve needs we cannot yet anticipate.

This gap isn't poor planning. It's structural. Accountability ends at handover. Architects are judged at completion. Developers exit at stabilisation. Politicians move on after launch.

No one is responsible for how buildings perform across the decades they'll actually be used. Meanwhile, every design decision that optimises for today's efficiency eliminates tomorrow's adaptability.

Between 2024 and 2025, Perkins&Will, Portland Design, and the Royal College of Art's superFUTURES programme convened 80+ practitioners from architecture, real estate, policy, arts, and community engagement in a three-part roundtable series. Using futures thinking methods, participants interrogated inherited assumptions about how buildings shape human behaviour, social wellbeing, and intergenerational cohesion.

These conversations produced The Futures We Build playbook: seven provocations that challenge conventional briefs, including designing friction to counter algorithmic isolation, treating emptiness as essential cognitive space, positioning art as preventative healthcare, prototyping adaptive spaces as living labs, and extending design accountability beyond handover through ongoing curation.

The playbook reframes buildings not as fixed products but as adaptive systems requiring intergenerational governance.

This presentation introduces the seven provocations from The Futures We Build playbook and examines what they reveal about temporal conflicts in decision-making.

Each provocation challenges a convention in built environment practice, from designing friction to counter algorithmic isolation, to treating emptiness as essential cognitive space, to extending accountability beyond handover. Together, they demonstrate how futures literacy can shift design from delivery-focused transactions to intergenerational stewardship.

The session will explore how these provocations function as diagnostic tools for surfacing temporal tensions in any long-lifecycle system, with implications for policy, planning, and sustainability transformation.

As ESG mandates and social value requirements tighten, demonstrating intergenerational impact alongside financial returns becomes essential across sectors. Using the built environment as a case study, this presentation offers a replicable methodology for embedding futures literacy into any long-lifecycle system: treating uncertainty not as risk to mitigate, but as design material for the century ahead.

Keywords: Futures literacy, intergenerational governance, built environment, temporal conflicts, sustainability transformation, strategic foresight

From Imagined Futures to Everyday Agency: Behavioural Futures and Sustainability Transitions

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In 2000, children from around the world gathered at the UNEP Millennium Children's Conference on the Environment in Eastbourne, UK, to discuss the environmental future they would inherit — a moment that illustrates how sustainability challenges unfold across generations and long temporal horizons. Twenty-five years later, many of those children are entering positions where they can influence decisions related to sustainability transitions. This generational shift raises an important question: what enables individuals to translate awareness of future risks into meaningful everyday action?

Sustainability transitions are often discussed at the level of technological innovation, policy frameworks, and systemic change. Yet, these transformations ultimately depend on the everyday decisions of individuals operating within complex social, organisational, and behavioural environments. Futures literacy, as developed by UNESCO and articulated by Riel Miller (2018), emphasises the role of imagined futures in shaping present decisions. However, recognising alternative futures does not automatically translate into behavioural change. Behavioural science demonstrates that decision-making is shaped by cognitive biases, social norms, and institutional environments that influence how individuals interpret uncertainty and act upon future expectations.

Drawing on practice-based experimentation with reflective futures tools and collaborative futures initiatives — including engagement with communities such as Teach the Future and Futures Finland — this paper examines how structured reflection on assumptions about the future can increase awareness of behavioural patterns and strengthen both individual and collective agency in sustainability-related decision-making.

The paper proposes a behavioural futures perspective that explains how imagined futures, behavioural environments, and collaborative futures practices interact in shaping everyday sustainability decisions and pathways toward sustainable futures.

Keywords: futures literacy, behavioural futures, everyday agency, sustainability transitions, behavioural insights, intergenerational, responsibility

4. Rethinking What We Wear: Textile Sustainability Transformation

Time: Wednesday 10 June at 13.00–14.30

Room: Blokki 1

Chair: Marjukka Parkkinen

Sufficiency-based clothing consumption – a possible way forward?

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The fashion industry is well-known for its negative social and environmental impact which are strongly driven by overproduction and overconsumption. While sustainable fashion and consumption has been in the spotlight for some time, a narrower yet highly relevant aspect of sufficiency-driven consumption is often overlooked as a pathway for sustainability. Prior research on fashion consumption mainly focused on eco/green/sustainable fashion while consumer-level sufficiency, often defined as reducing consumption to what is “enough”, remains marginal in empirical studies. This research addresses the identified gap by examining how personal and social goals shape sufficiency-based clothing consumption and then further investigating the results through qualitative analysis to explore how Gen Z perceives its enablers and barriers.

The research adopts a sequential mixed-methods design. In the first phase, a quantitative survey (N = 336) measured sufficiency-oriented clothing behavior in the context of Theory of Reasoned Goal Pursuit and partial least squares structural equation modelling was applied to test the hypothesized TRGP relationships. The second phase builds partially on these findings and further deepens the understanding of sufficiency-driven clothing consumption through a qualitative study using Participatory Systems Mapping technique focusing on the Gen Z consumers.

The quantitative results indicate that both active procurement and active approval goals have strong, significant effects on motivation. Attitudes strongly predict motivation, which in turn drives intention, and intention shows a strong, significant effect on sufficiency-oriented clothing consumption behavior. Subjective norms do not significantly influence motivation, while perceived behavioral control has no effect on intention and only a weak effect on behavior. These findings suggest that internal, goal-driven mechanisms are more influential than external social pressures in shaping sufficiency-oriented clothing practices. The ongoing qualitative phase aims to further contextualize these results by identifying key points that can influence sufficiency-driven clothing consumption.

This research contributes novel empirical evidence by applying TRGP to sufficiency-based clothing consumption and extending its use beyond previously studied environmental and sustainable consumer behaviors. The findings highlight the central role of intrinsic motivations and personal goals. By integrating quantitative and qualitative approach the study offers a deeper understanding of how sufficiency can be implemented in everyday clothing consumption, with implications for future research, sustainable fashion strategies, and policy interventions.

Keywords: sufficient consumption, clothing consumption, Theory of Reasoned Goal Pursuit, sufficiency, consumer behaviour, sufficient consumption, clothing consumption, sufficiency

Consumer acceptance and perceptions on wood-based clothing in Finland

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The textile industry urgently needs to transition toward more sustainable practices. Currently, textile manufacturing places a significant burden on the environment through dominance of cotton production and the widespread use of synthetic fibres. Cotton cultivation consumes vast amounts of water, while synthetic fibres contribute to marine pollution through microplastic release. One promising solution is the adoption of sustainably produced wood-based fibres, which can be used to produce casual clothing in an eco-friendly way. There are already novel wood-based fibres created for textile production, such as innovative, sustainably produced human-made cellulosic fibres. The aim for this study is to gain better knowledge about the consumer acceptance towards wood-based casual clothing in Finland. New knowledge about how consumers evaluate the quality of casual-clothing and what quality attributes are affecting their purchase intentions is crucial for the fashion and textile industries to learn about which clothing materials the consumers prefer and how the materials are perceived. We also explore consumer acceptance for wood-based clothing. The study adopts theory of dimensionality of perceived quality, and the theory of innovations diffusion. The data consists of online consumer panel survey data of 2071 Finnish respondents, collected between 12/2025-01/2026. One part of the survey consists of claims about different quality attributes of textile products with linkages to consumers' purchase intentions and perceived quality. With these claims regarding quality attributes, we explore the product quality preferences of consumers. The other part of the survey explores the consumer perceptions of wood-based textiles aiming to enhance our understanding about consumer awareness and their market potential. The analysis is done with multivariate statistical methods, such as exploratory factor analysis of quality attributes (dimensions of quality perceptions); to investigate the most preferred quality attributes, and which quality dimensions can be seen to affect the purchasing intentions most clearly. Furthermore, the study explores, which consumer segments can be identified based on the consumers' quality preferences. The results can be used to promote more sustainable consumer practices and facilitate the market diffusion of wood-based textiles through enhanced attractiveness of new textile products by developing their relevant quality features. The study provides crucial insights for different actors in the textile, fashion and forest industries about the consumers purchase intentions towards wood-based clothing.

Keywords: quality, consumer, perception, textile

Pathways for meeting planetary boundaries in textile markets: A system dynamics approach

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The textile sector is among the largest industries globally, with the overall global consumption of textile fibres expected to grow from 132 Mt in 2024 to 169 Mt in 2030. The growth is primarily fuelled by the growing consumption per capita through increasing available income and fast fashion business models. This will further increase the environmental load of the sector in terms of climate change, waste production, and pollution.

Major changes in policy and businesses are required to curb overconsumption and to return to the safe operating space in respect to planetary boundaries. This study adopts a system dynamics modelling approach based on empirically estimated price elasticities. Adopting simulation modelling is crucial, as it

allows not only replicating a past development or projecting a future baseline, but also exploring alternative historical and future developments under various policy and strategy pathways. Moreover, system dynamics combines evidence and creativity by allowing soft variables with incomplete data and extensive and systematic sensitivity analysis.

The research questions are:

1. How much can selected policy and strategy options reduce the environmental load of the textiles sector?
2. Which policy and strategy options—if any—can reduce the environmental load of the textiles sector to meet planetary boundaries?

The identified policy and strategy options include i) feedstock substitution, ii) subsidies for low impact technologies, iii) taxes based on emissions, iv) emission caps, v) reuse and recycling, and vi) sufficiency lifestyles.

The preliminary results suggest that substitution plays a minor role in the production and consumption of textile fibres and is insufficient in addressing the adverse effects of overconsumption. That is, increasing the production of one fibre only results in a 0-30% reduction in the production of alternative fibres, while the rest of the increase in production merely contributes to expanding the total market volume. For the same reason, a subsidy scheme for a single technology or increased recycling are unlikely to be effective enough.

In the next steps, the effects of the remaining policy measures will be examined. It is hypothesized that global emission pricing, emission caps, and reduced consumption per capita would be more effective than substitution-based measures, yet they could be more difficult to implement. Preliminary analyses suggest that prices alone may be insufficient in steering the consumption back towards planetary boundaries, given the relatively inelastic demand in respect to price.

Keywords: absolute environmental sustainability assessment, overconsumption, planetary boundaries, price elasticities, system dynamics, textile fibres

Textile temporalities: natural dyes in the fashion and textile industry sustainability transformation

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University of Helsinki, Finland

As a fossil-dependent, material intensive and global industrial system, the fashion and textile industry is operating outside safe planetary boundaries and requires a systemic sustainability transformation. Against this backdrop, this study uses natural and bio-based textile colourants as a material lens through which to examine how collectively adopted temporal assumptions may limit imagining alternative futures. Natural colourants offer a potentially renewable, circular and biodegradable alternative to currently dominant, petroleum-derived synthetic dyes. Natural colourants can thus challenge, but are also challenged by, many of the dominant temporal paradigms of the textile industry, such as fast-changing trends, constant and unlimited availability of resources, material permanence and short-term economic profits.

This review synthesises the literature on natural textile colourants in practice-based socio-cultural contexts beyond the laboratory, using reflexive thematic analysis as a method, and the Three Horizons framework of change as an analytical lens. Through the framework's distinct time perspectives, we look at how the present, dominant textile colouration practices are problematised in Horizon-1, what alternative futures for natural colourants can be identified in Horizon-3, and if and how the intent towards natural colourants is portrayed in the transformational middle Horizon-2.

The literature recognised the largely hidden environmental and social costs of currently dominant synthetic dyes as a primary motivation to find alternatives to Horizon-1, and a growing interest towards natural colourants in Horizon-3 from all textile industry stakeholders. However, Horizon-2 tensions between a transformational intent and our established ways to think about textiles were also observed in the literature. Structural and mindset path dependencies, fragmented systems perspectives, and the unavoidable trade-offs of change illustrated how transformation is negotiations between what is imagined, what emerges and what is being replaced, as well as what persists, returns or is reintroduced.

At the intersection of cultural heritage and state-of-the-art technical innovations, the past, present and future coexist in natural colourants, blurring the temporal horizons and linearity of transformations. Natural colourants suggest that established and largely fossil-dependent industrial systems socio-technical change towards more regenerative and biobased models may require new perspectives to time. Not only from short-term profit to long-term viability but also from stability and control to variations and unpredictability; from excess and constancy to sufficiency and seasonal availability; from sameness and seriality to uniqueness; from perfection to stories, meaning and care.

Keywords: Sustainability transformation, sustainable textile, natural dye, bio-based colourant, textile dyeing, imaginaries

5. More-Than-Human Futures: Energy, Leadership, and Sustainability

Time: Wednesday 10 June at 13.00–14.30

Room: Skooppi 1 & 2

Chair: Veli Virmajoki

Mission Impossible? Governing Sustainability Futures Through a Research-Led Clean Energy Roadmap Process

Halonen, Minna – Kurki, Sofi – Sundqvist, Henna

VTT Technical Research Centre of Finland, Finland

This paper examines a national clean energy transition roadmap process as a case of anticipatory governance and organized future-making in a policy-driven setting without an established roadmap format. The starting point was an externally articulated policy need to produce a scientifically robust and policy-relevant long-term pathway toward a sustainable and just energy system transition. However, the initial research plan did not include a process for turning the project's extensive research results into a roadmap, and most participating researchers had no prior experience in roadmapping or futures methodologies. The authors joined the process as futures scholars and facilitators, introducing futures-oriented concepts and methods and helping to structure the ongoing work.

The roadmap was developed through iterative collective sense-making among approximately 80 researchers from three research organizations and multiple energy-related disciplines. Policymakers and other stakeholders contributed through related project workshops and consultations that informed the knowledge base, but they did not take part in defining the roadmap itself. The scope was broad, expectations for scientific credibility were high, and the timeline was externally driven. The roadmap therefore

emerged without a fixed template, through repeated negotiation about scope, audience, assumptions, uncertainties, and the kinds of future-oriented statements that could be justified.

We treat the roadmap as a boundary object in the making — a shared but still evolving artifact that supported collaboration across disciplines while allowing different interpretations and priorities to coexist. Building this shared object required continuous alignment work and many practical choices about what to include, how to present trade-offs and knowledge gaps, and how strongly the text could guide long-term societal choices. Researchers were asked to formulate a coherent multi-decade pathway despite uncertainties, differing values, and unclear future use of the final document.

The study examines how participating researchers experienced this process, how they understood their roles in producing the roadmap texts, and what they learned about futures thinking and future-making practices. The analysed material consists of two participant surveys, and facilitated reflective discussions among researchers; process documents, workshop materials and draft texts provide background context. The paper also reflects on our own role as facilitators in shaping both the process and its outputs.

We pay particular attention to questions of power and legitimacy in constructing the roadmap: researchers' perceived mandate to make normative claims about the future, and facilitators' influence in interpreting and translating workshop results into draft formulations. We show that producing a transition roadmap in this kind of setting is not only a synthesis task but a negotiated process of building a shared future-oriented object, where futures are actively framed, bounded, and made actionable.

Keywords: sustainability transitions, energy transition roadmaps, anticipatory governance, boundary objects, futures methods, expert roles and power

Transformational leadership as a predictor of pro-environmental behaviour and environmental footprint

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^c University of Basel, Switzerland

The society, and various organizations within it, need skilled leaders to push forward sustainability transformations. In organizational studies these skills, or individual characteristics, have been defined as transformational leadership. Transformational leadership is characterized by inspirational motivation, intellectual stimulation, and individualized consideration and it has been widely studied for its impact on organizational outcomes. However, its influence on personal environmental practices remains underexplored. We hypothesized that (1) transformational leadership is positively correlated with pro-environmental behaviour, and (2) transformational leadership is not correlated with environmental footprint.

A representative sample of 800 respondents from Finland participated in the study, completing standardized measures of transformational leadership and self-reported pro-environmental behaviour, as well as providing data on their environmental footprint. The results supported the first hypothesis, revealing a significant positive correlation between transformational leadership and pro-environmental behaviour. Transformational leaders were more likely to engage in actions such as signing petitions, tackling invasive species, and advocating for environmental issues in social media. Contrary to expectations, the second hypothesis was not supported; instead, there was a significant negative correlation between transformational leadership and environmental footprint, suggesting that the personal environmental impact of these leaders may actually be higher than that of average consumers.

These findings highlight the complexity of the relationship between leadership styles and environmental impact. The study underscores the importance of considering both behavioural and footprint metrics

when evaluating the environmental implications of leadership. While transformational leaders engage in pro-environmental behaviours, they also tend to have a larger environmental footprint, potentially due to the resource demands associated with their leadership roles and lifestyles. Future research should explore strategies to align the pro-environmental intentions of transformational leaders with reductions in their overall environmental footprint. Furthermore, the relevance of leaderships' level of environmental footprint vis-a-vis organizations' environmental outcomes should be established.

Keywords: transformational leadership, pro-environmental behaviour, environmental footprint, sustainability transformation

Building Synergetic Resilience in Island Energy Systems: Energy Storage-Enabled Pathways for Sustainable and Secure Electricity Supply

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Island energy and electricity systems are characterized by structural vulnerabilities arising from geographical isolation, limited interconnections, high dependence on imported fuels, and exposure to climate-related hazards. These challenges necessitate planning approaches that go beyond conventional reliability metrics and address the systemic resilience of energy systems in a multidimensional and long-term perspective, making resilience a central objective for sustainable island development. Beyond traditional notions of robustness and reliability, the concept of synergetic resilience is introduced to capture the ability of island energy systems to generate positive interactions among technologies, resources, and sectors, thereby enhancing overall system performance under stress.

This study develops an integrated framework for assessing synergetic resilience in island energy systems by combining the Climate–Land–Energy–Water (CLEW) nexus with a Political, Economic, Social, Technological, Environmental, Cultural, and Managerial (PESTECHM) approach. The methodology integrates system-level energy and electricity modelling, identification of resilience determinants, and scenario analysis to evaluate synergies and trade-offs among energy measures, resource-use patterns, and sectoral development pathways. Hydrogen is examined as a dynamizing energy vector due to its capacity to increase system flexibility, enable long-term energy storage, and facilitate sector coupling in renewable-based island power systems.

The framework is applied to the Cuban energy system as a representative island case study, analysing alternative future development pathways. Results show that scenarios combining renewable electricity expansion with green hydrogen integration significantly enhance synergetic resilience by improving supply security, operational flexibility, and cross-sectoral integration. Hydrogen supports higher renewable penetration in island grids, reduces vulnerability to fuel supply disruptions, and strengthens linkages between electricity, transport, and industrial sectors.

The findings demonstrate that synergetic resilience emerges from the coordinated interaction of technological, institutional, and resource-related factors rather than from isolated interventions. The proposed framework provides a robust basis for multisectoral energy planning in island contexts, supporting the transition toward resilient and sustainable energy and electricity systems in island economies.

Keywords: energy resilience; island energy systems; hydrogen economy; CLEW nexus; PESTECHM

6. SPECIAL SESSION: Our World of Futures Studies as a Mosaic, Part 2

Time: Wednesday 10 June at 13.00–14.30

Room: Laurén 1

Villman, Tero^a – Heinonen, Sirkka^a – Salminen, Hazel^b

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The Finnish Society for Futures Studies presents Our World of Futures Studies as a Mosaic, Part 2. Building on the positive reception of the first volume launched in 2024, the second volume further expands the mosaic metaphor inviting contributions that illuminate how varied histories, traditions, methodologies, and practices shape futures studies and foresight in and across various regions, communities, cultures, networks and professional contexts.

This special session introduces the publication and brings together authors who have contributed chapters, each offering a distinctive “piece” that adds depth, colour, and texture to the broader composition of the global field of futures studies. Rather than aiming for a comprehensive representation, the publication and session emphasise reflective and inspirational insights that underscore the richness and diversity inherent in the field and support learning from the different contexts.

During the session, the editors and contributing authors will share the perspectives, narratives, and conceptual framings they bring to the mosaic. Their contributions highlight the diverse intellectual lineages, communities of practice, and forward-looking orientations shaping futures studies and foresight around the world. Following these presentations, we will facilitate an interactive discussion that invites session participants to explore what can be learned from both the contributions of the authors and from the experiences and contexts of the participants. Attention will also be given to how these perspectives relate to current trends in the field and how they may inform and influence its further development.

Through this combination of shared reflections and open dialogue, the special session aims to strengthen mutual understanding, foster new connections, and contribute to the ongoing construction of a truly global mosaic of futures studies.

Keywords: futures studies, foresight, schools of thought, communities of practice, lessons learned

7. WORKSHOP: Designing Delphi Prompts for Sustainable Well-Being: Co-Creation Lab for Planetary Futures

Time: Wednesday 10 June at 13.00–14.30

Room: Aistikattila

Sherwood, Jessica – O'Mahony, Tadhg

University College Dublin, Ireland

How is “well-being” currently characterised across existing domain frameworks, and what changes when nature/environment is treated as a distinct domain under planetary limits? Conceptions of transformations to sustainability increasingly call for cross-disciplinary scrutiny of existing wellbeing frameworks to clarify what flourishing for all within planetary boundaries could mean in research and policy. Yet many dominant wellbeing and sustainability frameworks remain shaped by anthropocentric assumptions, with nature often positioned as a resource, backdrop, or instrument for human development, rather than a living context of interdependence. This creates a practical challenge: without a clearly specified and commonly understood baseline of well-being domains, claims about “sustainable well-being” risk talking past one another. The persistent mismatch, where sustainability debates foreground constraint, while well-being frameworks differ on whether nature/environment is merely a context or an explicit domain, makes it difficult to design futures-oriented inquiry that is both conceptually clear and usable across disciplines.

This 90-minute interactive workshop functions as a methods-development lab to co-design Delphi ready prompts for exploring plural visions of future well-being within Earth system constraints. Participants will work from a draft domain baseline, developed in an ongoing conceptual synthesis in my doctoral research in which recurrent themes are interpreted as candidate life domains and are cross-referenced across major well-being measurements and frameworks, as well as complementary normative traditions, with nature/environment treated as an explicit domain. The baseline is used here as a working scaffold for prompt design rather than as a final model. Using structured questions, participants will translate domains into draft Delphi questions and refine wording to improve clarity, scope and futures relevance. The session combines small-group domain selection and vision articulation, guided prompt writing, rapid peer feedback and collective synthesis.,

Participants will produce (1) a refined set of Delphi prompts (approximately 6-12) suitable to elicit experts’ visions of sustainable well-being, (2) a short checklist of quality criteria for effective prompts (clarity, scope, futures relevance, and cross-context transferability), and (3) a brief map of domains and framings that proved hardest to operationalise, including where “nature/environment” and more-than-human-agency raise wording or scope challenges.

By translating domain-based well-being concepts into well-scoped questions, the workshop supports transformation to sustainability by strengthening the design of deliberation and foresight inquiries. The outputs, including prototype Delphi questions and a brief prompt-design checklist, will be used to draft the subsequent Delphi as well as offering participants a reusable prompt-design template for their own sustainability and futures inquiries. The workshop provides a concrete foundation for subsequent Delphi research focused on visions of future well-being within planetary limits, including how rights-of-nature or intrinsic value framings can be reflected in the wording that shapes future well-being visions.

Keywords: wellbeing, nature, domains, agency, boundaries, Delphi

8. WORKSHOP: Designing Fair Futures through Strategic Fun

Time: Wednesday 10 June at 13.00–14.30

Room: Blokki 2 & 3

Zaitsev, Yuri

YZDesignWorks, United States

Strategic foresight is built for long-term planning, so how do we use it to make better decisions right now? Together, we'll use serious games to explore this paradox at the heart of futures work. While futures studies offer powerful tools for imagining long-term scenarios, practitioners often struggle to translate these perspectives into everyday decision-making contexts shaped by inequality, power asymmetries, and urgent present-day pressures. This challenge is prevalent in governance and sustainability, where decisions made today have uneven impacts across social groups, generations, and environments; where experts speak for communities they don't inhabit.

What to expect:

We will begin by looking at the elements that make up the strategic foresight methodology (what the tools and steps are doing and why). Then we will experience and dissect an award-winning serious game that was designed from these foresight tools to expand short vs. long term imaginations (evolving what matters to whom); the tabletop game has been adapted specifically for this conference. Finally, we will discuss what makes futurism more strategic, how to embed systems into serious games in a way that changes how we consider the future. By the end, you'll have (1) a way to bridge the gap between long-term foresight and immediate decision-making and (2) actionable insights on how to design serious games for your own systems and cultures.

Unpack an effective method:

Research-driven serious games can be designed as participatory futures instruments: this approach has been recognized by the Association of Professional Futurists for Participatory Futures, Experiential Futures, and Systems Approach in the 2025 IF Awards, underscoring its alignment with contemporary futures methodologies. The game we will play and analyze is called Arcadia. This game was designed to support cross-stakeholder dialogue on justice, governance, and futures and was recently used at The 5th World Congress on Justice With Children where teens and adults co-created fair futures.

Arcadia was developed for the Thailand Institute of Justice over years of community-based ethnographic practice, participatory design, and strategic foresight practice. In this workshop, we will discuss how to leverage the foresight tools, game mechanics, and emergent dynamics in this game for your context.

Keywords: participatory futures, serious games, governance, systems approach, experiential futures, inter-generational justice

Session 5:

Wednesday 10 June 2026 at 15.00–16.30

1. Youth Narratives for Future Worlds

Time: Wednesday 10 June at 15.00–16.30

Room: Alhopuro

Chair: Behin Abadian

Images of the Future and Temporal Complexity among Young Adult Asylum Seekers and Refugees in Finland

Kaboli, Akhgar

Finland Futures Research Centre, University of Turku, Finland

This paper explores how complex and non linear temporal experiences shaped by disrupted pasts and uncertain presents affect young adult asylum seekers' and refugees' capacity to imagine and engage with possible futures. Drawing on qualitative interview material, the study examines how participants navigate interrupted life histories, legal precarity, emotional uncertainty, and contested senses of belonging while negotiating future trajectories. Rather than treating time as linear or fragmented, the analysis foregrounds temporality as entangled and affective. The past functions simultaneously as burden and resource, the present as constrained yet imbued with hope, and the future as fragile but not foreclosed. The findings challenge normative models of future planning that assume individual autonomy and stable life conditions, highlighting the limitations of such frameworks in contexts of structural uncertainty. The paper argues that restoring personal agency particularly through legal recognition and opportunities for self determination plays a crucial role in enabling future oriented action. By centering the lived temporal experiences of young adult asylum seekers and refugees, the study contributes to more just and inclusive approaches to futures thinking, policy, and practice grounded in relational, situated, and socially embedded understandings of temporality and futurity.

Keywords: Images of the future, Young adults, Refugees and asylum seekers, Uncertainty, Temporal complexity, Agency

Mindful Mental Time Travel as a methodology for imagining transformative futures

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Mindful Mental Time Travel is a novel method that combines Mental Time Travel with mindful meditation, enabling individuals to imagine transformative futures. Mental Time Travel is a futures method often employed in a collective workshop setting. However, extending the application of Mental Time Travel, at the individual level, this paper examines how Mindful Mental Time Travel facilitates urban youth in Sri Lanka to construct desirable futures of good life in 2035. The case study discussed in this paper took place in Sri

Lanka during the 2023 economic crisis, when the hopes and dreams of youth had been drained by socio-economic challenges.

The paper describes how Mindful Mental Time Travel was empirically implemented in an individual interview setting through three stages: a brief mindful meditation, a “Voyage to the Future of Good Life” time travel exercise, and follow-up semi-structured questions. It also details how sensory and emotional practices are incorporated into the process to foster the participant’s engagement with the futures. The data was analysed thematically to examine their experiences of the method, and Causal Layered Analysis (CLA) was applied to construct future images of a good life for 2035.

Four future images of a good life were narrated using Causal Layered Analysis, progressing through the litany, system causes, worldviews, and metaphor levels of the iceberg. The first image, Back-to-Nature, emphasises reciprocal human–nature relationships in lifestyle. The second, Shangri-La, envisions life surrounded by spirituality, equality, and collective well-being. The third, Wanderlust, represents a lifestyle that seeks personal growth, mobility, and openness to diversity. The fourth, Minimalistic Urban Heaven, depicts a balanced urban life grounded in simplicity and technological integration. These findings demonstrate how Mindful Mental Time Travel, as a methodology, facilitates the construction of futures that are both disruptive, transformative and creative.

This paper contributes to futures and sustainability research by presenting Mindful Mental Time Travel as a methodological tool for individual-level engagement with futures, experiential reflection, and empowerment in the face of socio-economic precarity. Drawing on the constructed futures images, it demonstrates how sensory and emotional engagement with futures fosters hope and supports the construction of transformative futures. The paper also outlines practical guidance on applying Mindful Mental Time Travel, key considerations, effective strategies and potential pitfalls in facilitating reflective engagement with imagined futures.

Key terms. Mindful Mental Time Travel, transformed futures, imagination

Young adults’ narratives shaping economic futures: participatory and novel pathways beyond growth

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This research is motivated by the importance of narratives as drivers for societal change and the need to empower young people to imagine desirable societal futures. Current public economic discourse often emphasizes the necessity of economic growth for societal well-being and progress but lacks both diversity of expertise and young people’s participation. Additionally, the gap between desirable economic futures and the current societal situation can challenge creating new narratives.

In this study we used narrative foresight methods to find out young adults’ (aged 18–29) views on the economic futures of Finland through an open writing call and construct alternative future images for Finland’s economy in 2040.

The research material gathered in autumn 2025 consists of 87 written accounts envisioning societal futures, analysed using thematic analysis and further enriched by Causal Layered Analysis (CLA). By recognizing deeper underlying narratives, we could get a more profound insight into the imagined economic futures. As a result, four alternative future images for Finland’s national economy in 2040 were built to illustrate alternatives for economic development, different pace of societal change and key drivers shaping

that change. In addition, 85 stories of personal futures were collected, and elements from them were reshaped into four fictional personal future images to match each of the societal future images.

Based on the gathered narratives, young adults envision futures beyond growth where solidarity, sustainable development, personal connection with nature and self-actualization are emphasized. Additionally, young adults believed that a major upheaval is needed to shape the futures differently, and continuing the same path of growth-driven development would not lead to desirable futures envisioned. They advocated for improving democracy, increasing science-based decision-making, and the more direct involvement of citizens in decision-making. Young adults' wishes for stability and predictability as well as balance and meaningfulness in their daily future lives may even appear as utopian in the age of multiple crises.

The narrative foresight method suits very well to study the images of desirable economic futures. It reveals the differences and the similarities between the current narratives and the desired ones as well as the underlying tensions in the futures envisioned. The results of this study could be further enriched by inviting especially the young adults to join the public discussions on the change of economic narratives.

Keywords: future images, narratives, Critical Layered Analysis, economic discourse, beyond growth, youth participation

2. Foresight Methods for Policy, Education, and Entrepreneurship

Time: Wednesday 10 June at 15.00–16.30

Room: Laurén 2

Chair: Leena Jokinen

Futures without futures Evidential adequacy in AI-assisted scenario work

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Artificial intelligence (AI) is increasingly used in foresight. It is often discussed as a means of supporting anticipatory reasoning under conditions of growing informational complexity. This is particularly relevant for long-term investment decisions associated with sustainability transitions, where anticipatory reasoning cannot rely on trend projection alone and future contexts are characterised by heightened uncertainty and turbulence. As elements of anticipatory inference are delegated to computational systems, safeguards based on human judgement and facilitation no longer operate in the same way. This raises a foundational epistemic question: under what conditions can document-based representations function as acceptable evidential inputs for AI-assisted anticipatory inference.

Drawing on epistemic foundations in futures studies, particularly empirical realism, the paper argues that anticipatory justification depends on the plausibility of the inferential chain linking present knowledge to future-oriented claims. In data-intensive foresight, this chain is mediated by symbolic artefacts rather than ongoing human deliberation. Curated document collections therefore function as representational proxies through which complex socio-technical systems are rendered inferable in AI-assisted foresight. Under these conditions, the plausibility of AI-assisted scenario work depends primarily on the representational properties of the corpus, not only on downstream modelling procedures.

The paper suggests a set of representational conditions relevant for evidential adequacy in foresight corpora. Drawing on representativeness concepts from corpus linguistics, it specifies five interrelated dimensions: domain adequacy, coverage, distributional balance, traceability, and stability. These dimensions do not determine adequacy. They indicate the conditions under which corpus-based anticipatory inference can be treated as epistemically plausible.

The argument is situated in the context of carbon capture, utilisation, and storage investment decision-making. This domain is sustainability-relevant and characterised by long time horizons, path dependence, and regulatory and market uncertainty. The paper does not assess scenario quality or scenario design logics. Its contribution lies in clarifying the epistemic conditions under which human and computational forms of inference can be aligned in foresight practice without displacing the core commitments of the futures field.

Keywords: AI-assisted foresight, Futures studies, Scenario planning, Document-based inference, Representational adequacy

What scientific model should policy-focused foresight use to represent the future?

Galvin, Brian

Health Research Board, Ireland

When foresight supports governments in the planning and policy-making process it becomes primarily a political activity. If foresight is to be integrated into the policy-making process, it must demonstrate that its methodologies are robust, inclusive and capable of providing insights on which difficult decisions can be made.

These are philosophical and political challenges and are relevant to both foresight methodology and its scientific basis. How can foresight establish its epistemic authority when compared to natural science and social science disciplines? It is our contention that it is possible to describe a model for foresight which can both establish foresight's epistemic credentials and demonstrate its capacity to contribute to democratic decision making.

This work builds on a philosophical essay published in EJFR in 2025, which explored how normative aspects of foresight methodology are intertwined with the task of establishing foresight's epistemic value in the intricate process of policy development. It argued that foresight can benefit from developments in political theory and philosophy of science. Democratic deliberation is an approach to public discourse which emphasizes pluralism in debate and provides a detailed account of how reason-giving can add epistemic depth to foresight's contribution to policy. Perspectival realism is a theory in philosophy of science which identifies the interplay between separate epistemic communities as the key mechanism in scientific development.

The modal models that these epistemic communities create present a new way of understanding foresight's study of the future and its part in the weave of scientific evidence, opinion and analysis that constitute policy development in a democratic society. Foresight has certain similarities with scientific modelling, but many elements of an instrumental understanding of what constitutes a scientific model are not yet apparent. While the output of foresight is not typically used to test hypotheses, the way it represents the target system of the future suggests it can play a role in the type of large, intricate models that are valued by policymakers. This study examines the work of Morrison, Giere and Massimi and other philosophers of science who have advanced the theory on scientific modelling.

The theory of perspectivism, which is designed to respond to the challenge of inconsistent models in science, presents an opportunity for foresight to partake in realist theory development. The perspective that

foresight provides on the target system of the future can enrich policy-focused modelling and influence decisions regarding representation in these models.

Keywords: policy, modelling, deliberation, philosophy, science, perspectivism

Learning to Navigate Time: Students Working with Scenarios to Shape Future Logistics Competences for Sustainability Transitions

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^a Corvinus University of Budapest, Hungary; ^b Jan Kochanowski University of Kielce, Poland; ^c Tomas Bata University in Zlín, Czech Republic; ^d University of Žilina, Slovakia

The objective of the paper is to examine the design and outcomes of a multi-stage international pedagogical initiative aimed at developing future-oriented competencies among logistics students across four Visegrad countries. Developed within the Visegrad-funded project Competencies for Future Logistics in V4 Countries, the program combined national pilot workshops with a final international creative workshop to engage students in foresight-driven, participatory exploration of sustainability, temporalities, and long-term futures. The project relied on an original methodology integrating foresight and Futures Literacy approaches, refined using good practices gathered from national workshops involving 113 students across V4 countries.

The culminating international workshop, held in Budapest in November 2025, brought together 13 academics, 18 students onsite, and an additional 19 online participants to engage in structured future thinking tasks facilitated by experts and guest lecturers. The agenda combined expert insights on present and emerging competency needs in logistics—such as perspectives on graduate skills expectations and discussions of product development-driven logistical challenges—with highly interactive group work.

Students collaborated in international, mixed-country teams, each supported by a facilitator, and followed a multi step process: analysing current logistics job advertisements in their respective countries; synthesizing a comparative V4 regional competency profile; and then working with one of the Logistics 2040 scenarios—Technology Wins, Small Worlds, or Clinch—to envision future professional personas, define key future competencies, and design speculative job advertisements aligned with long term socio technical and environmental trajectories. This process encouraged students to consider how sustainability imperatives, decarbonization pressures, climate-induced regulatory shifts, and geopolitical instability alter future skill requirements and reshape logistics as a profession.

By situating student learning within multiple temporal scales—from present labour market signals to radically different 2040 scenarios—the workshop fostered anticipatory thinking, reflexivity, and the capacity to navigate uncertainty. The participatory format ensured that students from all four partner countries could compare cultural assumptions, share disciplinary perspectives, and co-construct alternate futures, aligning with the project's aim of cultivating transferable, long-term competencies for sustainability-oriented logistics practice.

The collaboration including national and international workshops demonstrates how internationally coordinated, foresight-based education can empower learners to understand and shape sustainable futures. Its methodology is intended not only for continued use within partner universities but also for broader

dissemination beyond the logistics domain, contributing to long-term capacity building across the V4 region and beyond.

Keywords: future-oriented competences, logistics, foresight, higher education, sustainability, V4 cooperation

Co-creating Opportunities toward a Vision: A Conceptual Framework for Entrepreneurial Foresight

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In the new global economy, implementing foresight in an organisational setting has become fundamental for entrepreneurs to engage with future possibilities and to address uncertainty. Existing research recognises the critical role played by foresight as a core ability of organisations to foster future-oriented thinking and to perceive new opportunities. However, most studies in the field of corporate foresight have primarily focused on how foresight is utilised as a strategic tool at the organisational level. To date, very little attention has been paid to the role of foresight through the lens of entrepreneurs. There remains a paucity of studies that explore foresight as a practice-oriented approach at an operational level and how foresight is connected to determining future opportunities.

This paper addresses this gap by adopting a conceptual approach to develop a theoretical model. The objective is to investigate the foresight practices that are implemented by entrepreneurs at an operational level to perceive future opportunities and to realise a desirable future. The model reflects how individuals imagine future possibilities, which are influenced by their collective surroundings, delineating how these interactions affect their decision-making. While foresight is known to be a major contributor to recognising opportunities, the adapted model will explore how foresight is implemented as an everyday practice to perceive, imagine and form future opportunities. Understanding this link is essential to exploring how entrepreneurs actualise opportunities to make their vision of the future come to life.

In conclusion, this paper elucidates how entrepreneurs implement foresight practices to gain insight into future possibilities, therefore shaping their future actions and present decision-making. Therefore, offering a new understanding of how entrepreneurs integrate foresight to promote opportunity formation which leads to fostering a desirable future.

Keywords: entrepreneurial foresight, opportunity, desirable future, vision

3. Governance, Welfare, and Digital Infrastructures in Sustainability Transitions

Time: Wednesday 10 June at 15.00–16.30

Room: Säätiö

Chair: Morgan Shaw

Is Anticipatory Governance an Effective Instrument for Sustainable Development? A European Countries Analysis

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Polytechnic University of Turin, Italy

The triple transition – demographic, technological and climatic – that we have been experiencing for many years now, is forcing governments to take proactive measures to steer their policies, as far as possible, towards the most favourable future, in order not to simply adapting to change but instead to shape sustainable models of development and transformation, with interventions tailored to the needs and prospects of specific places and people. In this scenario, Anticipatory Governance techniques might be strong instruments of analysis and action, allowing governments to be more prepared to face and manage complex and fast-paced changes and challenges.

Indeed, several European governments have already established state-level bodies whose main task is to support decision-making and policy processes through foresight-based advice and reports (European Union, 2024; OECD, 2025; United Nations University, 2025). Through an exploratory analysis of official data, this working paper investigates whether and how countries with such institutions have implemented European guidelines and funding (i.e. the SDGs and the Recovery and Resilience Facility) in peculiar ways, and whether this approach has proven to be more or less effective than that of other countries where there are no agencies of this sort. A possible correlation between the presence of these Anticipatory Governance institutions and the results achieved by the respective countries (Austria, Estonia, Finland, France, Ireland, Lithuania, Portugal and Spain) in achieving the SDGs and their positioning within the Global Innovation Index would contribute to expanding the literature that examines concrete results of futures studies application to governance and public policy; and more specifically, it would help define how foresight-based approaches could be used more effectively as tools to define political strategies for sustainable and innovative development.

Keywords: Anticipator Governance, Europe, Government, Public Policy

Re-imagining welfare state futures beyond "imaginaries of normality" – historical temporality and futures perspectives

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Recent debates on the future of the welfare state increasingly unfold within a transformed temporal regime. Contemporary societies appear marked by an intensified presentism, where the future is no longer imagined as fundamentally different from the past but rather as a fragile continuation of what has already

been achieved. Scholars have described this shift through concepts such as acceleration (Rosa), presentist historicity (Hartog), and crisis synchronization (Jordheim et al.), all pointing toward the dominance of re-active problem-solving in the present. This paper introduces the concept of "imaginaries of normality" to capture how (welfare state) futures become defined through nostalgic and linear narratives of an idealized past, analysed particularly through the institutionalized discourse of economic growth.

The paper combines futures studies approach with temporality studies within conceptual history. First, it traces the long-term institutionalization of economic growth as a central horizon of welfare state legitimacy in Finland from the post-war decades onward. Second, it applies the Futures Wheel method as an analytical tool to map how economic growth imaginaries generate systemic consequences for future orientations, expectations, and political possibilities. Empirically, the analysis draws on Finnish government programmes, party platforms, and key public debates.

The findings suggest a gradual temporal reversal: while economic growth discourse in the mid-20th century was closely tied to open-ended futures of modernization and progress, since the 1990s it has increasingly served as a mechanism for preserving a perceived "normal" welfare state past. Futures become framed as threats to an already completed societal achievement rather than as spaces of emergence and transformation. As a result, alternative welfare futures, utopian, discontinuous, or post-growth, tend to disappear from political imagination, replaced by anticipatory narratives of safeguarding stability.

By conceptualizing imaginaries of normality, this paper contributes to understanding how welfare state futures are constrained by historical temporality and institutionalized expectations. It argues that re-imagining welfare beyond normality requires breaking with linear progress narratives and reopening futures as genuinely plural and emergent. The paper thus bridges conceptual history and anticipation studies, offering new theoretical tools for futures research.

Keywords: historical temporality, welfare state futures, conceptual history, anticipation and futures methodologies, economic growth

Chained Areas of Social Order as roadmap towards the sustainable future of Nigeria

Kuusi, Osmo

What Futures Co, Finland

Nigeria has long history of conflicts between tribes and religious communities connected with the colonial and the slave trade time. After the colonial time, these controversies exaggerated in Biafra war 1967-1970. Nigeria is now in difficult economic and social situation looking for the roadmap towards sustainable future. One rather realistic but no way easy possibility is the Chained Areas of Social Order and Economic Progress scenario or roadmap. To be sustainable, the roadmap should solve four problems: 1) Where will the Chained Areas of Social Order (CASO) in question be located and who will finance them? 2) Who can live or visit an CASO, on what grounds are they selected and how are they supported/regulated? 3) What principles are used to promote the improvement of situations outside the CASOs? 4) How will relations between the CASOs and between the CASOs and the areas outside them be organized, how will the borders be monitored? The presentation discusses the alternative answers to these questions.

Keywords: Nigeria, roadmap, Sustainable transition, Social order

Public sector ICT infrastructures in sustainability transformations: Case X-Road

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ICT infrastructures are nowadays deeply built into modern digital societies and everyday lives. It follows that sustainability transformations incorporate increasingly and are affected by such systems.

It is important to understand what the roles of different knowledge systems are in sustainability transformation in public sector. Information and knowledge systems are implemented by various ICT infrastructures. It is thus essential to realize what all ICT-based systems are involved elements of sustainability transformations. Such infrastructures could be supporting and enabling or inhibiting elements of the transformations. For example, digital platforms have been utilized to support international crisis management activities.

Many public sector ICT systems and infrastructures are long-living and serve even every individual citizen (e.g., in well-being counties in Finland). It is thus fundamental to link long-term, strategic technology thinking with short-term ICT practices to facilitate sustainability transformation in everyday lives and decision making. ICT infrastructures can have both positive and negative impacts on different sustainability dimensions.

X-Road is open-source software that provides unified and secure data exchange between organizations in a collaborative ecosystem. It is also a Digital Public Good (DPI) verified by the Digital Public Goods Alliance.

X-Road has been utilized in many public sector information and knowledge systems connected to the Finnish X-Road ecosystem, Suomi.fi Data Exchange Layer. For example, currently the Finnish government is executing a large-scale transformation to decrease the amount of paper mail to citizens by moving it to digital e-mailing provided by the Suomi.fi messaging.

In 2024, we performed a sustainability research study (<https://www.niis.org/niis-publications/2024/8/14/report-x-road-sustainability-improvement-study-2>) including a theme of sustainability by X-Road through SDGs. We conducted a survey among the X-Road operators and X-Road user organizations. The results suggested that the organizations identify to contribute directly to multiple SDGs, SDG 9 mentioned most frequently. Considering the specific SDG targets, the following opportunities were seen most prospective for X-Road: Supporting equal access to digital financial services in developing countries (SDG1.4).

What inspiring ways can we imagine sustainable futures? The X-Road SDG survey was one way towards that. It could possibly be repeated also with other ICT infrastructure service cases.

In the future, AI agents could possibly be involved in many ways also in sustainability transformations. Such agentic technology involves information systems. Consequently, there would be even more subtle and complicated roles of ICT infrastructures in sustainability transformations—digital sustainability transformations.

Keywords: ICT; Sustainable Development Goals; Sustainable ICT; ICT for Sustainability; X-Road

4. Sustainable Pathways in Space and Advanced Communications

Time: Wednesday 10 June at 15.00–16.30

Room: Skooppi 1 & 2

Chair: Jyrki Luukkanen

Wild Cards in the Space Economy

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Human activities in space are growing rapidly, and new space is democratized with privately owned satellite mega-constellations. Continuous monitoring of the planet and tracking changes in our environment poses new opportunities to sustainability transformation. However, the new frontier entails many wild cards, opportunities and threats that may impact how the space economy develops in the future.

Weak signals and wild cards were monitored to scan the horizon for opportunities and threats for the space economy inspired by the Finland's national space strategy, adopted in December 2024. The space strategy aims to create the world's most advanced space operating environment by 2030, focusing on security, climate change, and commercial applications. In addition, a workshop was facilitated at the Space Generation Nordic Baltic Conference in January 2026 in Finland exploring the plausible future of the industry, from the perspective of the future generation working in the space industry.

The presentation will illustrate wild cards such as solar energy, asteroid mining, space debris, space law, as well as their implications for the society as a whole in the future. As an example, The Kessler syndrome emphasizes the critical need for effective space traffic management and collision avoidance strategies to ensure the long-term viability of space exploration and use. The Space Generation, the skilled workforce of the future, is aware of the risks, both mineral use and climate effects, but also space industry's potential to support sustainability efforts on a global scale. Some are motivated by a vision of a safe and secure space economy, and eager to innovate new solutions to tackle the wicked problems.

ESA's Zero Debris Vision sets six goals: preventing debris release, ensuring clearance at end-of-life, preventing break-ups, improving surveillance, avoiding ground casualties and mitigating adverse consequences. Futures conscious stakeholders see this as an opportunity to develop new innovations, laws and regulations and find ways to mitigate risks and develop safe and secure, resilient space together striving for a stable ecosystem of actors.

Keywords: new space, wild card, weak signals, satellite, sustainability

Decoupling from the Present: Speculative Foresight Workshops as Temporal Interventions for Sustainability in the European Space Sector

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Sustainability transformations and space-based infrastructures—such as Earth observation, climate monitoring, and navigation systems—are closely intertwined, with the United Nations recognising the essential role of space in supporting the Sustainable Development Goals (SDGs). Both sustainability transformations and outer space development require engagement with long-term, intergenerational futures, yet decision-making remains shaped by short-term temporalities such as budget cycles, political mandates, and geopolitical urgencies. This tension is particularly pronounced in the European space sector, where long-term infrastructures support sustained planetary monitoring but are governed through overlapping short-term national, budgetary, political, and organisational logics embedded in Europe’s multi-level institutional and member-state structures. This temporal tension was articulated by one of our interlocutors at the European Space Agency (ESA), who remarked that “there is no time for the future at ESA”.

The paper draws on experiences from hosting speculative foresight workshops within the ERC-funded project FutureSpace at the University of Vienna, involving a diverse set of stakeholders. It explores how speculative foresight workshops function as temporal interventions by enabling temporal decoupling—a temporary loosening of short-term imperatives that creates distance from immediate constraints and supports collective engagement with long-term sustainability futures. Space is approached as an exemplary domain in which long-term temporalities are both unavoidable and contested in practice. Through speculative scenarios, imaginative exercises, and collective assessment of future-making practices grounded in critical futures research, workshop participants were encouraged to reflect on planetary-scale sustainability challenges, intergenerational responsibility, and long-term socio-technical trajectories.

Empirically, the paper builds on qualitative reflections from workshop design, facilitation, and participant interactions, and on interviews with foresight and strategy practitioners in the European space sector. The paper positions speculative futuring as a form of collective anticipation that can strengthen futures consciousness by intervening in how temporality is collectively imagined and negotiated, while remaining attentive to the challenges of translating long-term temporalities into actionable strategies.

Theoretically, the contribution combines work in futures studies and science and technology studies (STS) by foregrounding the politics of temporality in space and sustainability governance. It suggests that the value of speculative foresight lies not only in the futures that are imagined, but in its capacity to reshape present-day relationships to time, agency, and responsibility. By conceptualising speculative foresight workshops as temporal interventions, the paper contributes to ongoing discussions on how futures thinking can support sustainability transformations across domains characterised by tensions between short-term decision-making and long-term planetary concerns.

Keywords: speculative foresight, temporal interventions, European space governance, temporal governance, futuring practices

A Safe and Resilient Career Path from Aviation to Space

Leskinen, Jenni – Pura, Minna

Laurea UAS, Finland

The rapid growth of the space economy is creating new jobs. Space needs people, but it is not yet designed for people. The aviation work force, such as pilots and cabin crew cultivate a strong safety culture, operational discipline, and human-centred competence. However, moving from the aviation to the space industry requires a career transition that raises critical sustainability questions about safety, working conditions, equality, responsibility, and long-term human endurance.

Sustainability in the aerospace industry is about people as much as technology: humans physical, mental, and psychological well-being, the ability to learn, adapt, and even the capacity to remain motivated and engaged over time. Careers that fail to support these dimensions may lead to burnout, loss of expertise, and weakened safety culture. A safe and resilient career path is therefore a core sustainability issue, linking human flourishing to the long-term stewardship of both orbital and planetary resources.

This presentation draws on professional experience from aviation, offering an insider perspective on safety culture and working life sustainability, combined with weak signals and driving forces in the space economy. In this presentation, a safe and resilient career path is defined as a transition that actively supports workers' safety, health, equality, and long-term employability while enabling learning across sectors.

Cabin crew and pilots represent an underrecognized sustainability resource: their expertise for example in emergency response, firefighting, medical care, conflict management, and psychological safety is critical for high-risk environments and often undervalued in space workforce planning.

A safe and resilient career path relies on four essential elements:

1. Human-centred safety: addressing physical, mental, and psychological strain
2. Social sustainability: fair working conditions, equality, inclusion, and trust
3. Recognition of tacit competence: preserving and valuing safety-critical knowledge
4. Career resilience: supporting recovery, learning, and long-term engagement.

Designing safe and resilient career paths from aviation to space helps the sector retain vital expertise and strengthen safety culture. It allows professionals to thrive in demanding roles while staying healthy, motivated, and capable over time. Just sustainability transformation will fail, if people are treated as replaceable resources instead of carriers of safety, responsibility, and care. By focusing on human well-being and considering our responsibilities to space and the planet, the space sector can be a pioneer in building long-term careers that are not only safe and resilient, but also meaningful and truly transformative for people and the planet.

Keywords: Aviation, Space, Career Path, Sustainability, Safety, Resilience

6G Communications and Sustainability Futures: An Analysis of 6G Visions

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Office of the National Broadcasting and Telecommunications Commission (NBTC), Thailand

Sixth-generation (6G) mobile communications is an emerging wireless technology, with commercial deployment expected in the 2030s. Beyond a technological upgrade, 6G is increasingly framed by various stakeholders in vision documents as contributing to environmental, social, and economic sustainability. These visions, when collectively shared, can contribute to sociotechnical imaginaries that shape technological development and governance. Prior research on sustainability transitions shows that such transformations are often characterised by tensions across stakeholders, domains, and temporal horizons. However, little research has examined how sustainability futures, including associated tensions, are framed in 6G visions. This study therefore asks: What sustainability futures are constructed in contemporary 6G vision documents, and what do they imply for governance?

This study conducts a document analysis of twenty-three 6G vision documents produced by international organisations, governments, industry consortia, and firms. It examines how the environmental, social, and economic dimensions of sustainability are framed and what they imply for governance.

The analysis reveals broad consensus on the importance of sustainability in 6G visions, framed in two ways: improving the sustainability of the communications sector itself (“Sustainable 6G”) and enabling sustainability across other sectors (“6G for Sustainability”). Environmental sustainability is mostly framed around energy efficiency and emissions reduction. Social sustainability converges around visions of digital inclusion and trustworthy connectivity, positioning 6G as essential infrastructure for society. Economic sustainability is framed through innovation enablement and economic growth. Some documents also propose sustainability metrics alongside traditional technical performance metrics.

However, several tensions arise from sustainability priorities yet are rarely acknowledged explicitly in the documents. Environmental sustainability tensions arise as ambitions for improved energy efficiency conflict with visions of ubiquitous connectivity and rising AI computing demands that may outweigh these efficiency gains, risking a rebound effect. Social sustainability tensions emerge when efforts to expand network coverage to support digital inclusion require more extensive network infrastructure, thereby increasing environmental impacts. Economic sustainability tensions arise as expectations of long-term value creation demand massive upfront infrastructure investment despite uncertain business models.

The findings suggest that contemporary 6G visions construct sustainability futures characterised largely by optimism, while marginalising unresolved tensions. This has important governance implications: policymakers and regulators could use emerging 6G sustainability metrics to make these tensions explicit and prioritize actions, thereby advancing 6G development from aspirational rhetoric toward actionable accountability. This study contributes to futures research by providing an academic analysis of sustainability framings in 6G visions, revealing marginalised sustainability tensions that require governance action.

Keywords: 6G, sustainability, telecommunications, vision, governance, sustainability tensions

5. WORKSHOP: Rehumanizing Profit: An Interactive Workshop on Regenerative Business and the Healing Economy

Time: Wednesday 10 June at 15.00–16.30

Room: Laurén 1

Deacu, Adina-Iuliana

Tianmei World Academy, China

Mainstream sustainability efforts often remain limited to technological optimization, overlooking the cultural and psychological roots of extractive economic systems. This interactive workshop builds on my current research at the Research Institute for Sustainability at GFZ (RIFS, Helmholtz Centre Potsdam), which reframes business as "an entity that solves social issues and creates social value in a financially sustainable way". Drawing from environmental psychology, systems thinking, and trauma-informed leadership, the session invites participants to reimagine profit not as accumulation, but as a feedback signal of collective wellbeing.

The 90-minute participatory session integrates dialogue, embodied reflection, and design-based learning to help participants experience the shift from extractive to regenerative logic. The workshop is structured in three modules:

1. Mapping Slow Violence in the Economy – participants identify invisible harms embedded in current economic models – burnout, alienation, ecological depletion – and trace their systemic causes.
2. Rehumanizing Profit Exercise – using examples from their own work or research, participants experiment with redefining value, success, and growth through regenerative principles.
3. Designing the Healing Enterprise – small groups co-create “business as social infrastructure,” exploring how cooperation, reciprocity, and care can guide financial sustainability.

Throughout, participants engage with case studies of regenerative enterprises in Europe and Asia drawn from the Beyond Profit project and apply simple systems-mapping and storytelling tools adaptable to their own contexts.

Expected outcomes:

- A deeper understanding of the slow violence inherent in dominant economic systems.
- Practical frameworks for embedding care, reciprocity, and interdependence in organizational practice.
- A shared vocabulary linking wellbeing, regeneration, and economic design.

Conclusion:

The workshop transforms the notion of sustainability from a technical goal into a participatory, healing process. By turning economic reflection into experiential practice, it offers a collective exploration of how businesses—and societies—can become ecosystems of care. Rather than a presentation of findings, the session becomes a lived experiment in futures literacy: imagining and enacting regenerative economies that move humanity from harm to hope.

Keywords: sustainability transformation; systems thinking; trauma-informed leadership; participatory design; economic justice; futures literacy

6. WORKSHOP: Drawing Time: Artifact-Based Explorations of Temporal Organization in Future Societies

Time: Wednesday 10 June at 15.00–16.30

Room: Aistikattila

Belmas, Alisa

Finland Futures Research Centre, University of Turku, Finland

How societies organize time is integral to sustainability transformation. The industrial era framed time as a commodity to be efficiently managed; if societies seek to transition towards living within planetary boundaries, this understanding is likely to shift. Yet in debates on sustainability, assumptions about temporalities often remain implicit (Rau 2015). When these assumptions are left unexamined, they can limit our capacity to imagine alternative futures.

This workshop explores our assumptions about the organization of time in future societies, including how time is structured, valued, and experienced. Rather than treating time as a neutral background or quantitative measure, the workshop foregrounds time as a central element of imagined futures.

The workshop employs speculative artifacts that are created and collectively “read” to uncover participants’ assumptions about a particular future they embody. It is organized around group activities such as drawing and guided discussions. Drawing serves as a low-threshold, visual method that allows us to “access those elusive, hard-to-put-into-words aspects of knowledge that might otherwise remain hidden” (Weber 2008) and to connect more abstract concepts of imagined futures – such as time – to our own experience. Through this process, participants are invited to collectively reflect on their own assumptions about the organization of time in future societies. The workshop offers tools for critically engaging with the dominant framing of time and for reimagining more desirable ways of organizing time in relation to sustainability transformation.

This workshop builds on my master’s thesis work on speculative artifacts as anticipatory objects and further develops the idea of “artifact-reading anticipation” as a futuring practice. It also feeds into my ongoing research on the temporal organization of everyday life in sustainable futures and contributes to the conference theme.

Keywords: speculative artifacts, temporal organization

7. WORKSHOP: Purpose Scanning: Horizon Scanning for Just and Inclusive Futures

Time: Wednesday 10 June at 15.00 – 16.30

Room: Blokki 2 & 3

Oliveira, Victória – Lydia, Caldana

Future Resources, Brazil

The Purpose Scanning Workshop is an applied foresight methodology designed to equip participants with tools to identify emerging signals of change and translate them into actionable insights for sustainability transformation. Developed by Victória Oliveira and Lydia Caldana and grounded in horizon scanning practices, the workshop integrates live sessions, practical exercises, and asynchronous research activities to offer a full-cycle experience of futures exploration.

Guided by a Global South perspective, the workshop emphasizes just and inclusive futures, encouraging participants to recognize the agency of diverse communities in shaping systemic change. Through structured scanning of social, cultural, environmental, and technological signals, participants uncover early indicators of transformation that highlight innovative approaches to planetary well-being, sustainable governance, and collective action.

By combining interdisciplinary research methods with narrative and sensemaking practices, Purpose Scanning fosters the ability to connect individual and collective anticipations, historical knowledge, and cultural memory to sustainability decision-making. The workshop demonstrates how participatory foresight can bridge cultural understanding, policy innovation, and systemic risk awareness, enabling participants to contribute meaningfully to long-term, regenerative, and equitable futures.

Keywords: horizon scanning, systemic foresight, Global South, sustainability transformation, participatory methods, just futures

Session 6:

Wednesday 10 June 2026 at 16.45–18.15

1. Sustainable Food Production and Consumption Futures

Time: Wednesday 10 June at 16.45–18.15

Room: Alhopuro

Chair: Katariina Heikkilä

Exploring the future imagines of the circular bioeconomy: Perspectives from the local food system

Kurkela, Lauri^a – Henttonen, Kaisa^b – Mäkelä, Marileena^c

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An unsustainable food system has led food system actors to seek more sustainable practices. Food systems are unsustainable in terms of socio-economic burdens and environmental degradation which accelerates the climate crisis. Circular bioeconomy (CBE), a combination of bio- and circular economy, is promoted as a solution to the transition toward a sustainable food system. The biomass that comes from the food systems in the form of food waste and production side streams are what CBE advocates to be circulated back to the soil or used as an energy source. While these technical points have been figured the transformation toward a sustainable CBE is stalled firstly because views, values, and practical realities of food system actors are not being incorporated into long-term decision-making about the food system. As a result, the multi-actor nature of the transformation is not being addressed. Secondly, understanding that views and values vary depending on the local context signifies the importance of understanding the local CBE transformation. Thirdly, the discrepancy in the literature on the type of socially grounded outcomes CBE should aim for creates the need to understand preferences of food system actors. These observation makes it meaningful to research the question “What could future of the local circular bioeconomy look like?”

Using semi-structured interviews as a method to gather data allows the creation of future imagines. By applying these methods, researchers can systematically explore and articulate alternative future imagines for the CBE considering perspectives and values of food system actors. Data consists of interviews with food processing companies, co-operations, unions, associations and public sector actors. Content analysis reveals which futures are aligned with the values of the actors.

The results of the study show how the food system actors see CBE, what are the future scenarios they imagine, outcomes of these scenarios. As managerial implications, identification of practical strategies and partnerships that actors see as necessary to move toward their preferred futures.

This research confronts the pressing challenge of transforming the unsustainable food systems. While the CBE is advocated as a pathway to sustainability, its preferred outcomes and realization remains contested and unclear. The transformation is not merely a technical endeavour but a socio-economic transformation that requires aligning diverse perspectives and values. By making CBE futures regarding food system

visible, the research contributes a vital foundation for collaborative action, and a more legitimate and effective sustainability transformation.

Keywords: Future imagines, circular bioeconomy, food system

Enabling the sustained effective use of foresight to improve food system sustainability in regulatory and policy contexts

Jones, Kate – Garnett, Kenisha – Burgess, Paul J.

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Due to increasing global uncertainty, regulatory and policy bodies need to be more effective in anticipating emerging issues that could undermine food system sustainability. Anticipatory governance offers a framework for navigating uncertainty, supported by a set of foresight practices - including horizon scanning and scenario planning - that identify emerging signals and support strategic exploration of alternative futures. However, questions remain regarding how organisations engage with foresight, how it translates into action, and how it is perceived by decision-makers. This study addresses three objectives: 1) to explain how regulatory and policy bodies identify, understand and respond to emerging issues; 2) to determine how foresight supports anticipatory action, including enablers and barriers to effective use; and 3) to examine how decision-makers perceive foresight tools, processes and capabilities.

This qualitative study encompassed semi-structured interviews with professionals working in strategy, foresight and science roles across a) UK and b) international government bodies in food and environment sectors, as well as c) wider governmental policy contexts. Purposive sampling resulted in 17 interviews comprising approximately 200,000 words of textual data. Thematic analysis was initially conducted to identify themes and develop a multi-level analytical framework, followed by AI-assisted thematic analysis with systematic inter-coder reliability calibration.

Several key findings emerged. While foresight literature positions horizon scanning as one of a set of practices applicable across timeframes, in current practice participants distinguished between short-term and longer-term foresight initiatives, viewing them as requiring different skills, tools and organisational cultures. A major barrier to the effective use of foresight was the difficulty of connecting foresight insights, often characterised by greater uncertainty, to longer-term decisions. Conversely, short-term scanning activities typically have clearer pathways to action, more easily supported by data. A critical capability for linking foresight to action was sense-making: the ability to interpret, synthesise and communicate emerging issues in ways that resonate with decision-makers. Foresight functions were often perceived as discretionary rather than essential and deprioritised under budget constraints.

The study identified several preconditions for more effective foresight. These include: capabilities in sense-making, advocacy and facilitation, particularly the ability to explain foresight processes and demonstrate their value; embedding foresight within established decision-making processes; and building futures literacy more broadly. Strengthening the anticipatory capacity of regulators and policy makers responsible for food system sustainability depends less on methodological sophistication than on addressing structural and cultural barriers and building the capabilities that connect foresight to action.

Keywords: Anticipatory governance, Foresight, Food systems, Sense-making, Uncertainty, Futures literacy

Across Imagined Pathways: Examining alternative sustainable development for primary production-consumption systems

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Fraunhofer ISI, Germany

This paper presents a methodological approach to the co-development of strategic pathways for sustainable development of key production/consumption systems in Europe. Upon a foundation of four distinct normative context scenarios, each narrating potential modes of defining and governing a sustainable transition by the year 2050, our team developed a unique methodological approach to outlining critical development pathways for food, energy, mobility, and built-environment systems by engaging critical actor groups and stakeholders. Using a systems-mapping approach, in combination with a participatory interactive interface, experts from research, industry, policy making and key stakeholders co-developed system model outlines and ideas for policy actions to support and sustain equitable access to essential services and products while accounting for trade-offs to pursue decarbonisation goals.

By translating the implicit structural and value-based differences underpinning each of the context scenarios into tangible and explicit systemic changes, participants were able to create plausible scenarios of 2040 for each of the production/consumption systems. These new scenarios demonstrated adherence to the normative context assumptions while advancing each system towards greater decarbonisation, resource circularity and ecological restoration. In a final step, interdependencies across production and consumption systems for overall sustainability transition proved critical points for development pathways and allowed participants to explore and share perspectives on the cascading, trans-system effects of decisions at these key intersections.

The model designs for future sustainable production/consumption systems were then used for scenario stress tests to examine the resilience of the designed system to selected disruptive events. Ideas for appropriate policy actions were developed for model-specific vulnerabilities to disruptions and advantageous characteristics. Only by comparing the effects and responses to disruptions in scenario-specific future models of mobility, built environment, food and energy systems was it possible to define ‘no-regret priorities’ that can be pursued with confidence for sustainable production/consumption systems in Europe. In addition, the stress test exercise enabled the identification of model-sensitive levers (e.g. industry-specific and cross-sectoral regulation or collectively anchored redundancies) so that key actors can improve systemic responsiveness.

We welcome productive dialogue and discussion on the continuous improvement of this approach and its application to inform policy portfolios that are considered useful, legitimate and coherent from the perspective of key stakeholders.

Keywords: production-consumption system models, sustainable resilience narratives, normative context scenarios, robust development pathways

Horizon scanning for sustainable consumption and production: emerging issues shaping Europe's futures

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This paper presents findings from a 2025 participatory horizon scan in Europe that identified 8 emerging issues, based on a set of 72 weak signals related to sustainable consumption and production (SCP).

Methodologically, the horizon scan followed a three-step approach of framing, scanning, and sensemaking, combining a STEEP-based systems map with structured signal collection and participatory expert workshops. In the scanning phase, 138 information items from scientific literature, media, foresight reports, and social media were curated in the Foresight Strategy Cockpit and consolidated into 72 weak signals related to consumption, production and broader context factors. Subsequent participatory sensemaking clustered these into eight policy-relevant emerging issues, demonstrating how distributed, qualitative signals can be translated into strategically actionable insights for SCP governance.

The paper highlights several illustrative weak signals pertinent to sustainable production and consumption. These include “addicted by design” interfaces that normalise overconsumption through persuasive digital environments; the “privilege of pollution” associated with highly unequal, high-emission lifestyles; and a “renaissance of mining in Europe” driven by critical raw material needs, new extraction technologies, and strategic autonomy ambitions. Additional signals concern the rise of digital “super-entities” in platform economies, the acceleration of product life cycles, and the blurring of production–consumption boundaries through prosumption and grassroots “unseen pioneers” experimenting with post-consumerist practices.

Taken together, these weak signals point to multiple possible futures: from lock-in to extreme, unequal consumption and resource-intensive industrial pathways, to more regenerative, human-centric and circular configurations of SCP if anticipatory, integrated policies are adopted. The paper discusses how horizon scanning can support European policymakers in detecting such early developments, navigating key trade-offs (e.g. strategic autonomy vs. environmental integrity, innovation speed vs. governance capacity), and designing interventions that align short-term decisions with long-term sustainability and justice goals. The underlying Horizon Scanning report on emerging issues for sustainable consumption and production in Europe is currently under preparation and in progress of publication.

Keywords: SCP, Horizon Scanning, Weak Signals, Emerging Issues

2. Designing Futures: Scenarios, Strategy, and Sustainability Transformation

Time: Wednesday 10 June at 16.45–18.15

Room: Laurén 2

Chair: Leena Jokinen

From cruise futures to public space design: a participatory scenario process for early-stage cruise ship concept development

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The cruise industry is increasingly challenged to consider environmental performance, evolving passenger expectations, destination constraints and long vessel lifecycles. These pressures raise questions not only about fuels and technologies, but also about future cruise concepts, the balance between onboard and shore-based value creation, and the design of public spaces that must remain useful over decades. This paper presents an exploratory process for developing future cruise ship scenarios and translating them into implications for public space design and ship operations.

The study is based on secondary data analysis, semi-structured interviews with cruise shipbuilding and design actors, and two collaborative workshops carried out within an industry-academia research project. The first phase identified key industry trends and emerging cruise concept directions, which differ in terms of vessel scale, passenger segments, the role of destinations, the distribution of functions between ship and shore, and the expected level of flexibility over the vessel lifecycle. These directions were used as starting points for the first workshop, where participants worked with a futures table to explore alternative future states across passenger demand, destinations, external pressures, business logic, technologies, cross-industry links and ship design logic. The results were then consolidated into a smaller set of concept scenarios. In the second workshop, these scenarios were used to discuss implications for public spaces, ship operations, lifecycle value and future design principles.

The paper contributes by showing how a structured and participatory futures process can support early-phase cruise ship design under uncertainty. Rather than treating scenarios as predictions, the process helps move from broad transition pressures to more concrete design questions: what should remain onboard, what could move ashore or to external platforms, and which spaces require greater flexibility, modularity or lifecycle adaptability. The study shows that the value of scenario work lies not only in the final scenarios, but also in the structured translation from drivers and emerging concepts to operational and spatial implications.

Keywords: cruiseshipping, cruise, tourism, sustainable, design

Tianmei World Academy as a Living Laboratory for Regenerative Business: Designing Social Value Creation Beyond Growth

Deacu, Adina-Iuliana

Contemporary sustainability transitions increasingly recognize that technological innovation alone is insufficient to address ecological degradation, social fragmentation, and declining human well-being. Dominant economic logics remain oriented toward growth, efficiency, and profit maximization, often reproducing extractive relationships with both human and more-than-human systems. This paper introduces an alternative practice-based approach that redefines business as an entity that solves social issues and creates social value in a financially sustainable way. It examines Tianmei World Academy, a decentralized “network of classrooms” operating across multiple cultural contexts, as a living laboratory for experimenting with regenerative business design, learning environments, and human agency beyond growth-oriented paradigms.

The study adopts a qualitative, practice-based research design combining longitudinal participant observation, reflective practice documentation, workshop-generated artifacts, and comparative case analysis across diverse learning interventions, including city walks, entrepreneurial laboratories, and community-based mapping workshops. These interventions integrate environmental psychology, futures thinking, and systems design to support participants in critically examining inherited assumptions about value, success, scarcity, and productivity, while prototyping alternative relational, economic, and organizational practices in real-world settings.

Preliminary results indicate that participants progressively shift from externally imposed performance metrics toward self-defined notions of contribution, well-being, and collective responsibility. The living laboratory format enables rapid cycles of experimentation, feedback, and adaptation, fostering learning ecosystems that cultivate agency, resilience, and cross-sector collaboration. The findings also suggest that regenerative business logics emerge through embodied practices, redesigned social environments, and iterative sense-making processes embedded in everyday life, not through policy mandates or abstract models.

The paper contributes to futures-oriented sustainability research by offering Tianmei World Academy as a transferable methodological model for cultural sustainability transformation. It demonstrates how living laboratories can function as infrastructures for prototyping post-growth economic imaginaries, bridging academic inquiry and societal experimentation. The approach offers practical insights for researchers, educators, policymakers, and practitioners seeking scalable pathways toward regenerative production, consumption, and institutional renewal grounded in human and more-than-human well-being.

Keywords: Living laboratories, Futures experimentation, Regenerative economies, Cultural transformation, Practice-based methodology

Strategy Disrupter Lab: Designing with Temporal Tensions for Sustainable Futures

Sd, Eliesh

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“Each age demands its own form,” wrote Bauhaus architect Hannes Meyer in 1926. In the Anthropocene, sustainable transformation demands anticipatory forms that can work with conflicting temporalities—political and market short-termism versus long-horizon ecological recovery—while resisting cognitive bias and enabling interdisciplinary creativity. Sustainability transformation is often less constrained by a lack of visions than by the difficulty of converting futures imaginaries into concrete short-term practices embedded in everyday life and organizational routines. Many futures practices remain anchored in present-day assumptions, limiting their capacity to support transformative leadership, governance, and business decision-making

In response, this paper introduces the Strategy Disrupter Lab (from the FHH Toolkit), a scalable futures-and-transformation methodology that treats temporal tension as a design material. The Lab is designed to help groups link long-term thinking to short-term action by producing “decision bridges”: boundary-aware choices, governance options, and business practices that remain robust across multiple futures. Rather than pursuing consensus around a single preferred future, the approach structures learning through comparison, allowing dysfunctional or unequal futures to function as warnings and learning devices, not just failures to avoid.

The methodology combines scenario comparison (probable/possible/plausible), deliberately designed collective intelligence, systems thinking, ethnographic narrative prototyping, backcasting, and iterative alternative-building. A key design choice is a distant systemic horizon (e.g., 2065) to reduce present bias, loosen institutional path dependencies, and open space for complexity and interdisciplinarity. The process unfolds in four phases: (1) Complexity, using three contrasting pre-developed scenarios as lenses to surface interdependencies and uncertainty; (2) Intimacy, developing “day-in-the-life” narratives that make overlooked temporalities legible (care time, adaptive time, ecological and more-than-human rhythms); (3) Connection, using PESTLE+V and backcasting to build decision bridges between 2065 conditions and near-term levers (policy, investment, procurement, spatial strategies, business practices); and (4) Carving, comparing outcomes across scenarios to sculpt new alternatives and identify innovative actions. A posteriori, qualitative analysis assesses the novelty and boundary-compatibility of the alternatives and identifies implications for implementation

The paper presents “FHH is to EVOLVE” experimentation as a trial application of the Strategy Disrupter Lab on neighbourhood-scale transformation across two contrasting European contexts (Nice and Copenhagen). The method uses the future as a catalyser of invention, shifts participants from preference-based visioning to comparative learning, revealing trade-offs, lock-ins, and temporal injustices obscured by single-future planning, while strengthening co-creativity and actionable innovation. It offers a scalable methodology for futures research that strengthens leadership, creativity, anticipatory governance and sustainable transformation by operationalizing long-term thinking as everyday decision practice grounded in temporal pluralism

Keywords: Temporalities; Scenario comparison; Backcasting; cognitive biases; system thinking; disruption

Transformation Through Different Lenses: Comparing Futures and Sustainability Approaches and Exploring CLA's Potential as a Bridging Concept

Warnke, Philine – Kastner, Louisa

Futures and sustainability studies are deeply intertwined. The two communities collaborate extensively and draw on overlapping theoretical concepts and methods due to their mutual focus on long-term thinking. Yet, important differences and tensions remain. Futures studies stress the openness of the future and alternative scenarios, while sustainability scholars often pursue pathways towards normative goals. Some concepts, such as the “Three Horizon Framework”, are heavily used by both communities but with distinctly different variations.

A key challenge for both communities is addressing transformation. In sustainability studies, this involves imagining and specifying transformative changes in systems of production, consumption or values, using approaches such as pathway scenarios and visioning/backcasting combinations. Such approaches often draw on theories of socio-technical change such as Johan Schot’s “deep transitions” or the “Multi Level Framework (MLP)” to conceptualize, imagine and support transitions.

Futures scholars, particularly within the “futures literacy” discourse, emphasize the importance of questioning routinized anticipatory assumptions to envision paradigmatic “change in the conditions of change”. Common foresight methods addressing transformation include “Futures Literacy Labs”, exploratory scenarios, scenario archetypes, wildcard-based scenarios, experiential foresight techniques and visioning approaches, all encouraging participants to imagine radical change.

One futures approach distinguished by its focus on radical transformation is Sohail Inayatullah’s “Causal Layered Analysis” (CLA). CLA deconstructs present images of the future through four interdependent layers: (1) litany, (2) systems, (3) worldviews/discourses, and (4) myths/metaphors. These layers reflect different epistemological ways of knowing that shape present realities and, in turn, future imaginaries. Progressing from the surface litany level to the deeper level of myths/metaphors enables distancing from current images of the future, recognizing their historicity and denaturalizing the present. Transforming this foundational fourth layer allows for the reconstruction of alternative futures, which can ultimately foster more sustainable action even at the litany level.

In our contribution we will systematically analyze and compare approaches to addressing transformation in both the futures/foresight and sustainability fields. We will then explore CLA’s potential to function as a bridging concept for the two domains and to support engagement with transformation in a meaningful way for both communities. In doing so, we build on recent experience in setting up CLA processes in the context of the EU funded Eye of Europe project.

Keywords: Transformation, Futures Studies, Foresight, Sustainability Studies, Causal Layered Analysis CLA

3. Sustainability Transformations: Bridging the Gap between Adhering to Present-Day Standards and Longer-Term Desired Outcomes

Time: Wednesday 10 June at 16.45–18.15

Room: Säätiö

Chair: Tero Villman

Multiple timelines of innovation pathways: understanding conflicts and trade-offs between feasibility concerns and long-term transformation of offshore aquaculture

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Moving aquaculture from inshore to offshore areas is driven by efforts to meet the world’s growing protein demand, while reducing environmental impact on land and in coastal areas. Yet, it remains uncertain how offshore aquaculture and ecosystems will interact and who will benefit from offshore production (that is capital-intensive). In a previous study, in the Netherlands, we distinguished various directions in which societal actors innovate for offshore aquaculture, including for production-centred systems, and systems integrated with nature or local communities. These directions are associated with distinct timelines, as actors enacting production-centred directions focus on short-term trends and feasibility concerns, whereas actors pursuing radically different futures rely on long-term horizons. As such, this paper asks

how actors involved in offshore aquaculture identify key drivers and uncertainties and how multiple interacting timelines give rise to trade-offs, and risks of locking offshore innovation into particular pathways.

Taking offshore aquaculture innovation in the Netherlands as a case, we combine the scenario-from-seeds methodology, three horizons-framework and food system transformation methodologies to study how actors identify and act upon drivers and uncertainties in their innovation efforts. Empirically, the study draws on transdisciplinary interviews and workshops conducted with policy makers, industry actors, societal stakeholders and researchers. In addition, we use companion modelling as reflective tool explicate underlying assumptions, explore uncertainties and support conversations about possible innovation pathways and futures.

We analyse stakeholders' interpretations of key drivers and uncertainties, how these interact and give rise to tensions and trade-offs. First, we show that different interpretations of key drivers leads to different spatial and temporal claims on the North Sea, having effect on who is included in the present as not all actors have the capacity to go far offshore and invest long-term. Second, we analyse how actors interpret and understand long-term uncertainties, such as climate change and ecosystem effects, showing how they are used to prioritize feasibility concerns and use 'uncertainty' to avoid fundamental discussions on longer term futures.

Reflecting on the implications of our findings for the governance of sustainable offshore aquaculture innovation, we argue that engaging explicitly with conflicting temporalities, uncertainties and value contestations is crucial for steering innovation processes in a way that meets feasibility concerns while keeping open pathways toward more transformative futures. We also reflect on our methodology, specifically how our approach helped to make long-term uncertainties more tangible, how this supported conversations on trade-offs and helped articulate choices for a desirable future.

Keywords: Temporality; innovation; futures; companion modelling; aquaculture; governance

Operationalizing Futures: An Architectural Approach to Institutional Sustainability Transformation and Public Value

Kotlarska, Marta

NASK PIB, Poland

Visionary scenarios for a digitally integrated and sustainable Europe frequently encounter a significant "execution gap" within public administration and business sectors, primarily driven by institutional short-termism and bureaucratic inertia. While high-level mandates like the Interoperable Europe Act (IEA) provide a legal framework for change, a systemic disconnect remains between abstract policy goals and the practical transformation of deeply embedded legacy infrastructures. The inability to translate these "paper visions" into operational systems poses a threat to the long-term sustainability of European governance. This paper argues that closing this gap is essential for upholding Public Value Management (PVM), ensuring that digital transformation serves the collective interest.

This paper proposes that Corporate and IT Architecture serves as a vital interdisciplinary bridge between speculative foresight and institutional implementation. By utilizing architectural frameworks, stakeholders can deconstruct complex futures into manageable legal, organizational, semantic, and technical viewpoints. The methodology, developed within the INVEST project, integrates "Future Scenario Workshops"—utilizing speculative world-building to identify failure pathways and collective fears—with architectural process modelling to map the temporality of system evolution. This dual approach allows for the operationalization of abstract visions for 2075 into concrete, actionable implementation roadmaps for 2030.

Expert interviews and project findings identify the "Legacy Trap" as the primary barrier to systemic change: legacy systems create technical and psychological dependencies that stifle innovation. Experts also highlight "organizational silos" and "legal ambiguity" as major blockers, leading to a "Dystopian Default" in collective anticipation, where risk-aversion is prioritized over collaboration. Conversely, opportunities for transformation lie in "Interoperability on Demand" and "Digital-ready Policymaking." These strategies prioritize the reuse of common building blocks and standardized data languages, significantly reducing redundant administrative burdens and enhancing the efficiency of public service delivery.

Architectural thinking supports long-term sustainability by establishing a "firm spine" of mandatory standards while allowing for "agile limbs" in local implementation. This model enables public administrations to transition from isolated projects toward a federated, resilient ecosystem of shared responsibility. By anchoring institutional transformation in Public Value Management, this approach ensures that digital infrastructure remains human-centric across long-term temporalities. Ultimately, the integration of architecture and foresight facilitates a "proactive, invisible government" that enhances the quality of life and reinforces the democratic fabric of European society.

Keywords: Institutional Interoperability, Participatory Foresight, Futures Literacy, Public Administration Transformation, Trust Fabric, Interoperable Europe Act

Sustainability of Digital Livelihoods in Platform Work: Uneven Capability Formation and Long-Term Outcomes in Kenya

Latif, Farhan

United Nations University Macau, Macau

Online freelancing through digital platforms is often framed as a precarious yet important livelihood pathway in contexts where formal labour markets do not absorb growing pools of educated workers; however, the long-term sustainability of these livelihood ecosystems remains largely unexplored, as the normative evaluation of work quality is often assessed through conventional measures of decent work. Drawing on mixed-methods evidence from Kenya, this paper examines how globalized platform labour interacts with local socioeconomic constraints to shape developmentally favourable outcomes or persistent deficits in workers' capability formation and livelihood trajectories. It shows that conventional decent work standards can capture visible aspects of work quality while often overlooking core dynamics of livelihood sustainability, particularly the less visible effort, risk, and resource burdens that workers must absorb to secure opportunities and sustain them over time. By grounding evaluation in workers' own criteria for what makes platform work worthwhile in the long term, the paper clarifies what decent work measures capture in new forms of work, what they overlook, and why those omissions matter for conceptualizing and assessing the livelihood sustainability of platform work.

Keywords: Livelihood sustainability, platform labour, Decent work standards, Capability formation, Online Freelancing

4. Digital Infrastructures, AI Foresight, and the Governance of Sustainable Futures

Time: Wednesday 10 June at 16.45–18.15

Room: Skooppi 1 & 2

Chair: Nariman Pahlavanyali

AI-Augmented Horizon Scanning: Methodological Advances for Organizational Foresight Systems

Grabtchak, Anna – Nisula, Sakari

FIBRES, Finland

Increasing acceleration of uncertainty across technological, socio-economic, and geopolitical domains demands rethinking of how organizations spot changes in their operating environment. Being prepared for using change related opportunities and moderate the threats is important. Horizon scanning and integrating foresight results into strategic decision-making becomes vital. However, scouting for signals is usually work intensive, mapping of the key findings requires structural arrangement of database feeding into other foresight activities, such as scenario building or strategy stress-testing. AI tools embedded into the specific steps of the horizon scanning process can assist foresight team's in speeding the slow and simple steps of the process, thus leverage team's foresight capabilities. The question is: How organizations utilize AI-human collaboration potential? What kind of benefits such collaboration offers in the context of horizon scanning?

This article presents a case study, an overview of human-AI collaboration horizon scanning practice. During the Futures Conference 2026 we would present the case details and allow testing of the platform. The platform allows combining human foresight expertise with artificial intelligence (AI) tools seamlessly embedded within each phase of the horizon scanning process. Rather than treating AI as an external or separate analytical function, a chat for discussion, we would demonstrate how AI tools and Foresight Agents can:

1. Scan for latest news on the predefined topic,
2. Enable multilingual scanning and translation across sources in different languages,
3. Help in summarizing findings,
4. Assist in mapping the missing point of views and potential connections between findings,
5. Unbiased human thinking,
6. Perform deep-dive research in specific themes,
7. Accelerate human-led scenario work and action planning.

Human futurist role is still crucial in each step of data gathering, signal detection, phenomena clustering, and sense-making to ensure the interpretation insights, contextual relevance, in-depth analysis, ethical issues, and the translation of futures intelligence into actionable strategic options. The studied hybrid model not only increases the efficiency and comprehensiveness of scanning activities but also allows to strengthen the feedback loop between foresight and organizational strategy processes.

Keywords: Human-AI collaboration, Horizon Scanning, Strategic Foresight

What Role Should AI Play Across Different Futures?

Mäki-Teeri, Marianna^{a,b} – Stucki, Max^a

Artificial intelligence (AI) is rapidly reshaping how futures researchers and foresight practitioners explore, generate and evaluate alternative futures. Yet a fundamental question remains underexamined: What roles should AI play across different futures types?

This paper addresses this gap by drawing on Joseph Voros's Futures Cone as a conceptual framework to analyse AI's appropriate role across projected, probable, plausible, possible, preferable, and preposterous futures. By explicitly distinguishing between futures types, it investigates whether the reliance on AI should vary across futures types that serve distinct functions, use different forms of evidence, and contribute in different ways to futures inquiry.

The paper reports a result from a case study in which a set of large language model-based generative AI systems were used to generate scenarios across the six regions of the Futures Cone. The AI-generated scenarios were then evaluated drawing on principles from the Scenario Quality Assessment Method (SQAM) to understand their quality and the perceived suitability of AI's role in each region. The analysis provides perspectives on the potentials and limitations of AI in practice when applied to building different futures and highlights how AI can both expand and constrain the space of potential futures.

The results of the study emphasise a need for stronger theoretical foundations and clearer practical guidance to support a balanced partnership between human and artificial intelligence in futures thinking. They suggest a need for creating principles and practices for AI-augmented futures and contribute to an emerging conversation about how AI may responsibly shape the exploration of alternative futures.

Keywords: AI-augmented Foresight, Strategic Foresight, Ethics of AI Foresight, Human-AI collaboration, Scenario Creation, Futures Cone

AI as Epistemic, Material, and Imaginary Infrastructure: A Reflexive Framework for Sustainability Futures

Mahanty, Sampriti

University College London, United Kingdom

Artificial intelligence (AI) is gaining growing prominence within sustainability discourse, shaping approaches to governance, research, foresight, circular economy transitions, and higher education. On one hand AI systems are being used to process large volumes of data, generate scenarios, optimise infrastructures, and support decision-making in areas such as energy transitions, resource management, and circular economy strategies. At the same time, AI is expanding as a resource-intensive socio-technical system that relies on electricity, water, semiconductor manufacturing, and global supply chains for critical minerals. In policy and industry discourse, AI is sometimes being portrayed as a driver of sustainability transitions, tied to efficiency and optimisation, while also embedded in polarised debates suggesting it will either eliminate jobs at scale or open new forms of work. Yet these aspects are usually discussed separately: AI as an analytical tool, AI as an environmental burden, or AI as a powerful narrative in society's development (or deterioration!). Treating these dimensions in isolation makes it difficult to see how AI actively shapes the kinds of sustainability futures that are imagined, planned, and pursued.

Underpinned by the above context, this paper takes a conceptual approach based on secondary data analysis. It brings together insights from three strands of literature that do not essentially intersect in the dominant discourse: research on AI in foresight and knowledge production, studies of the environmental and material footprint of digital and AI infrastructures, and critical futures scholarship on socio-technical imaginaries. By comparing these bodies of work, the paper develops an integrated framework that

understands AI through three interrelated dimensions: epistemic, material, and imaginary. Vignettes from existing studies are used illustratively to show how these dimensions play out in sustainability-related contexts.

The analysis suggests that AI operates as an epistemic infrastructure that influences how sustainability futures are analysed and presented; as a material infrastructure embedded in energy systems, water resources, and global material flows; and as an imaginary infrastructure sustained by narratives of optimisation or deterioration with each of these dimensions reinforcing one another. Dominant ideas about AI-enabled sustainability help justify the growth of digital infrastructures. These infrastructures influence what data can be collected and what kinds of analysis are possible. In turn, AI-based knowledge practices reinforce particular views about which futures are desirable. This creates a reflexive challenge: AI is increasingly used to imagine sustainability futures that are themselves shaped by the material and political dynamics of AI systems, potentially obscuring resource constraints, justice concerns, and long-term trade-offs.

Understanding AI as simultaneously epistemic, material, and imaginary offers a reflexive framework for examining its role in sustainability transitions and for supporting more critically informed futures practice.

Keywords: artificial intelligence, sustainability, futures, foresight, responsible innovation, critical metals

Scientific Imaginaries of Artificial Intelligence Futures: A Discourse Analysis of Scenario Narratives from Interdisciplinary AI Researchers

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Contemporary debates on the future artificial intelligence (AI) developments, capabilities and impact are often structured through dominant discursive frames such as techno-optimism and techno-pessimism, which shape expectations about how technology may impact society at individual, interpersonal, economic, and environmental levels. While these paradigms are frequently used to position beliefs about technological change, there is comparatively limited empirical insight into how future-oriented narratives themselves are articulated, particularly within the scientific community. Existing research tends to focus on mainstream media representations (e.g. media discourse analysis) or publicly available policy documents, leaving scientific perspectives (of those actually involved in early R&D developments) on AI futures relatively underexplored. This gap is partly due to the disciplinary fragmentation of AI research, as scholars typically engage with AI within the boundaries of their own fields, often taking an outsider perspective to emerging technology developments.

This paper aims to map and analyse future-oriented AI discourses as articulated ‘from within’ by scientists across disciplines. It presents findings from a qualitative discourse analysis based on a unique case study of the Flanders AI initiative, a regional think tank focused on the future of AI in Flanders. As part of this initiative, 230 Belgian AI researchers from Belgium, representing diverse disciplinary backgrounds, participated in a structured workshop process exploring the future of AI in the year 2040.

During these workshops, the participants of this study worked in small interdisciplinary groups of four to five participants to develop two types of scenarios, grounded in their own knowledge and assumptions: (1) an expected future scenario and (2) a preferred future scenario. Each scenario addressed anticipated developments across individual, interpersonal, economic, and environmental dimensions. The discussions within ten groups, together with their written scenarios, were subsequently analysed by three researchers using a two-step analytical approach. First, the scenarios were mapped onto established futures archetypes derived from the Manoa School of Futures. Second, a normative assessment examined whether the envisioned futures were framed as positive, negative, or conditional.

The preliminary analysis identifies recurring linguistic patterns that give rise to four dominant future discourses within the scientific narratives on AI. These discourses reveal how normative assumptions about AI futures are constructed, negotiated, and legitimized within scientific communities. By making these discursive structures explicit, the paper contributes to a deeper understanding of scientific future imaginaries of AI and offers a meta-analytical framework that can support critical reflection, anticipatory governance, and future-oriented research practices.

Keywords: Artificial intelligence futures; Scientific imaginaries; Discourse analysis; Scenario building; Manoa archetypes; Normative assumptions

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