Post-growth Futures Report

Deliverable D1.2

November 2025

Imprint

Technical info on report

Project	Models, Assessment, and Policies for Sustainability (MAPS)
Deliverable Title	Post-growth Futures Report
Deliverable number	D1.2
Due date	30.11.2025
Nature	R
Dissemination Level	PU
Lead Beneficiary	Corvinus University of Budapest
Contributing Beneficiaries	Tampere University

Authors and affiliations

Judit Gáspár, Corvinus University of Budapest, 1.2 Task Lead

Alexandra Köves, Corvinus University of Budapest, Principal Investigator

Hirvilammi, Tuuli, Tampere University, Principal Investigator

Éva Hideg, Corvinus University of Budapest

Jing Ding, Tampere University

András Márton, Corvinus University of Budapest

Attila Szathmári, Corvinus University of Budapest

Gabriella Kiss, Corvinus University of Budapest

Zsombor Csuport, Corvinus University of Budapest

Máté Fischer, Corvinus University of Budapest

Acknowledgments

How to cite this document

Gáspár, J.; Köves, A.; Hirvilammi, T., Hideg, É.; Ding, J.; Márton, A.; Szathmári, A.; Kiss, G.; Csuport, Zs.; Fischer, M. (2025). Post-growth Futures Report. The MAPS Project, Corvinus University of Budapest, Budapest, Hungary.

Document History

File Version	Date	Description	Contributor
V.1.0	21.10.2025	Initial Draft	CUB
V.1.1	28.10.2025	Second Draft	TAU
V.1.2	21.11.2025	Third Draft - Revision	CUB
V.2.0	26.11.2025	Final Draft Consortium	CUB, UB

List of abbreviations

BAU   Business as usual

CUB   Corvinus University of Budapest

EU   European Union

HS   Horizon Scanning

SB   Scenario Building

STEEPLED   Social, Technological, Environmental, Economic, Political, Legal, Ethical, Demographic

TAU   Tampere University

UB   University of Barcelona

WP   Work Package

Table of Contents

List of Figures

List of Tables

Executive Summary

This report presents the key findings and methodological innovations from Task 1.2 in the 'Models, Assessment, and Policies for Sustainability' (MAPS) research project. In a field – like post-growth - where radically new approaches are needed to invent solutions to complex problems in order to multiply the chances of moving away from undesirable pathways, foresight becomes crucial. As our social imaginaries shape the cultural, economic, and social institutions, in order to move away from searching solutions merely within dominant paradigms, we need to enrich our imaginaries and see what is desirable, undesirable, or overall possible in our futures. Negative scenarios warn us of treacherous trends and tendencies, positive ones enable us to open our minds towards new potentialities and others show us how even with the best of intentions, focusing on just a few interventions without holistic understanding may still lead us to partly undesirable futures. To explore such diverse economic, technological, and societal futures, the task adopted integrated foresight methods, combining horizon scanning, scenario-building, and the E-Delphi process. Integrated foresight has been developed as a methodological response to the challenges of foresight in the 21st century with increased societal demands for sustainability, democratic participation, and knowledge integration. In this context, foresight activities should deal with sudden and complex changes by involving a wide range of experts and stakeholders.

Through desk-based research and participatory workshops involving MAPS researchers from multiple disciplines and countries, this study involved, as a first step, a horizon scanning process with the aim of scanning the future from the present. It started with a literature review of horizon scanning studies in the field of sustainability transformation and degrowth/post-growth research discussion. An online brainstorming with a questionnaire survey was next conducted to collect insights from MAPS researchers. They were asked to identify at least three future issues relevant and important to their research background and then to briefly explain their social, technological, ecological, economic, political, legal, ethical, and demographic (STEEPLED) dimensions. This resulted in 596 future statements that were cleaned and filtered by the research team.

In subsequent online workshop discussions, MAPS researchers discussed the 60 most innovative, least obvious statements classifying them by whether they were trends, megatrends, wild cards, weak signals, or hypes. This classification was accompanied by an assessment of whether the direction of change is positive, negative, or neutral, and what the strength of the future impact of the future statements in question is.

The distribution of the 60 statements was 12 trends (19,7%), 16 megatrends (26,2%), 5 wild cards (8,2%), 17 weak signals (27,9%) and 11 hypes (18,0%). This distribution shows that only half of the future is likely to be shaped by trends and megatrends already visible, and the other half will also be influenced by high uncertainty, represented by the wild card, weak signal, and hype categories. Experts rated only 3 future statements (5%) as very positive, while 22 statements (36,7% of the statements) were rated as moderately or weakly positive. Slightly more than half of the future statements, 31 statements (51,6%

of the statements), were rated as having a weak to moderate to strong negative impact. The high number of statements with a medium to strong negative impact is particularly striking. The total number of statements with a strongly negative impact is 23 (38,3%), of which 11 statements have a very strong negative impact, accounting for 35,5% of all negative impact statements.

The next phase aimed to co-create different future visions through a participatory scenario-building process, which created space for a shared understanding of various futures while deepening the previously identified challenges. This process began by selecting 16 future statements, which were used to identify the driving forces and axes for scenario building in the second online workshop organized for MAPS researchers. Using the two-dimensional scenario-building method, participants worked on eight different future scenarios in two groups. Out of these, four scenarios were chosen during the third workshop. The selection of these four scenarios was informed by the fact that they should cover as much as possible the degrowth/post-growth ideas and the contexts that facilitate and hinder their implementation. These four scenarios are: Autocratic collapse, Democratic caring for nature, Ecocracy, and Elitist green bubble.

Next, as a validation and evaluation of the future visions, an e-Delphi process was conducted to enrich the four scenarios and generate further information on their desirability and political feasibility. In this step, potential policy interventions related to them were identified. 52 experts (from academia, NGOs, and the private sector) participated in the study on an e-Delphi platform to explore potential futures from the perspective of various topics related to the STEEPLED dimensions. The first round of e-Delphi resulted in four enriched scenario descriptions. The results show that only one of the scenarios can be considered a desirable post-growth scenario: the Democratic Caring for Nature. This scenario includes many elements from the degrowth/post-growth literature and is in line with the sustainability transformation that includes both ecological and socio-economic visions of the post-growth future. Autocratic collapse is a pessimistic 'collapse' scenario, while the other two detailed scenarios, Elitist Green Bubble and Ecocracy are scenarios where some post-growth elements are in place, but some other dimensions have taken a critically wrong path in a sense that not all the of the ecological-social-economic spheres transform to a positive post-growth future and it shows how degrowth 'can go wrong' if one of these spheres doesn't harmonize with a desirable path. As an example, without the democratic involvement of people, the regeneration of nature is likely to occur without considering human values in an Ecocracy scenario. During the second round of the e-Delphi, the experts were asked to validate some correlations, which were generated from the four enriched scenarios, so-called 'if-then statements' or conditional statements. Additionally, experts selected five policy solutions that are considered the most relevant and effective to realise 'a more equitable, sustainable, and democratic post-growth future' based on their evaluation of each scenario.

This report is a detailed description of the methodology and the results of the research process in Task 1.2. as it explains the activities related to all three steps: horizon scanning, scenario building and the e-Delphi process. It discusses the potential of

integrated foresight methods, future-oriented participatory methods, and the use of digital platforms for collaboration, as well as their limitations. To conclude, this iterative process demonstrates a methodological innovation well-suited to the challenges of 21st-century foresight, creating possible futures while guiding collective efforts toward a future that is just, sustainable, and desirable.

Research Framework

The Models, Assessment, and Policies for Sustainability (MAPS) research project responds to the call that "there is an urgent need for a new paradigm that reconciles continued development of human societies with the maintenance of the Earth system in a resilient and stable state." (HORIZON-CL5-2023-D1-01-06). To develop a new paradigm that moves beyond the overarching and overbearing goal of economic growth, MAPS proposed to broaden the range of policy options, modelling tools, and assessments for a sustainable and just post-growth paradigm.

When it first emerged in the mid-1990s, the foresight school of thought (lately the critical paradigm of the futures field (Slaughter 1995) argued that it was inefficient for futurists and politicians to tell societies how to shape and implement their futures. What is needed instead is for forward-thinking individuals to participate in envisioning different futures and shaping the ones that are possible and acceptable to them. To this end, foresight school of thoughts within the futures field should not make predictions but should provide methodological assistance in bringing people's future-shaping ideas to the surface and shaping them into visions of the future, or even desirable futures (Slaughter 1995, Nováky & Hideg & Kappéter 1994).

When exploring different scenarios, negative ones warn us of trends and tendencies we might already experience. Strangely enough the need for this is more commonly understood than the need to imagine also positive scenarios. While mainstream economics dismisses desirable futures as utopias being highly impractical for adequate decision-making, post-growth thinkers - especially in the field of degrowth - embrace normative visions (Köves, 2025). In a world marked by ecological crises and systemic inequalities (Richardson et al., 2023; Hickel, 2018), foresight is a necessary tool for navigating complexity and fostering collective action. Castoriadis (1975), one of the most influential philosophers of degrowth thinking, claims that social imaginaries shape institutions and collective practices, and in terms of systems change, it is crucial to conduct dialogue in order to change the imaginaries underpinning the dominant system. Hence, the slogan of degrowth 'Decolonise the imaginary' (Latouche, 2009). Post-growth scholars often advocate creating "real utopias" (Wright, 2013): tangible social experiments that challenge existing paradigms. Works like Future for All (Kuhnhenn et al., 2024) and Costanza's Addicted to Growth (2023) exemplify this approach. Methods like backcasting (Robinson et al, 2011) are often utilised to enable the transcendence of mainstream approaches.

On an individual level, humanity being essentially projective (Quarta, 1998) — constantly striving toward what is "Not Yet" means that are actions or non-actions are seriously predisposed by the possible futures we can actually imagine. Psychological research supports this, showing that foresight and "possible selves" (Markus & Nurius, 1986) influence behavior and decision-making. Experimental studies confirm that engaging with futures thinking increases motivation for social critique and activism (Burden et al., 2018). On the social level, foresight can also operationalise visions into actionable pathways in complex socio-ecological systems where the uncertainties and unpredictability require adaptive governance and shared narratives to coordinate decentralised actions. Ultimately, foresight is not about perfect blueprints for followable actions but about inspiring impulses that increase the likelihood of systemic transformation.

This research aimed at using integrated foresight as an adequate methodological response to the challenges of foresight in the 21st century. It has been prompted by increased societal demands for sustainability, democratic participation, and knowledge integration (Hideg 2009). The focus of integrated foresight is therefore on the rapidly changing environment and on making complex foresight issues manageable (Slaughter 2008). According to this school, the practice of foresight needs to be developed into a foresight activity that can deal with sudden and complex changes, that can involve a wide range of experts and stakeholders, and that is able to organise a system of foresight activities with feedback and methodological linkages in line with the purpose of foresight (Hideg 2013 and 2015, Gidley 2017).

Integrated foresight does not directly create visions of the future that will exist along the time axis, but how the future is imagined by the stakeholders in the here and now, and how their perception, understanding and problem vision of reality indicates. The threats, the problems to be solved, the tasks to be undertaken, and the different qualities (dangerous, acceptable, neutrally possible, and desirable) of the future are voiced and explored. In doing so, they are in contact and interact with experts, other stakeholders, social organisations, decision-makers, futurists and non-human factors shaping the future (natural environment, infrastructure, functioning of socio-cultural relations and their impact on living conditions and knowledge levels in the present). Some of the latter are seen by those who think and work in integrated foresight as external and uncontrollable conditions that need to be considered in exploring the future of different types during the foresight process. These conditions are also shaping the future along the time axis, as all non-human factors/factors themselves shape the future that will emerge. (This coevolutionary or collaborative collaboration is referred to in the theoretical literature supporting the theoretical development of the futures field as the Coevolutionary paradigm (Leydesdorff 2001, Hideg 2015) or Collaborative Developmental Action Inquiry or approach (Torbert 2021)). The methodological innovations within this research, combining horizon scanning and scenario building, have been summarised in a research paper currently under review in the journal Futures.

Within the MAPS project, Task 1.2 aimed to draw up different economic, technological, and societal futures by building an integrated foresight model using a combination of horizon scanning, scenario building and the e-Delphi method. In this model, each process has a distinct aim, and the methods were developed based on the results of the previous steps.
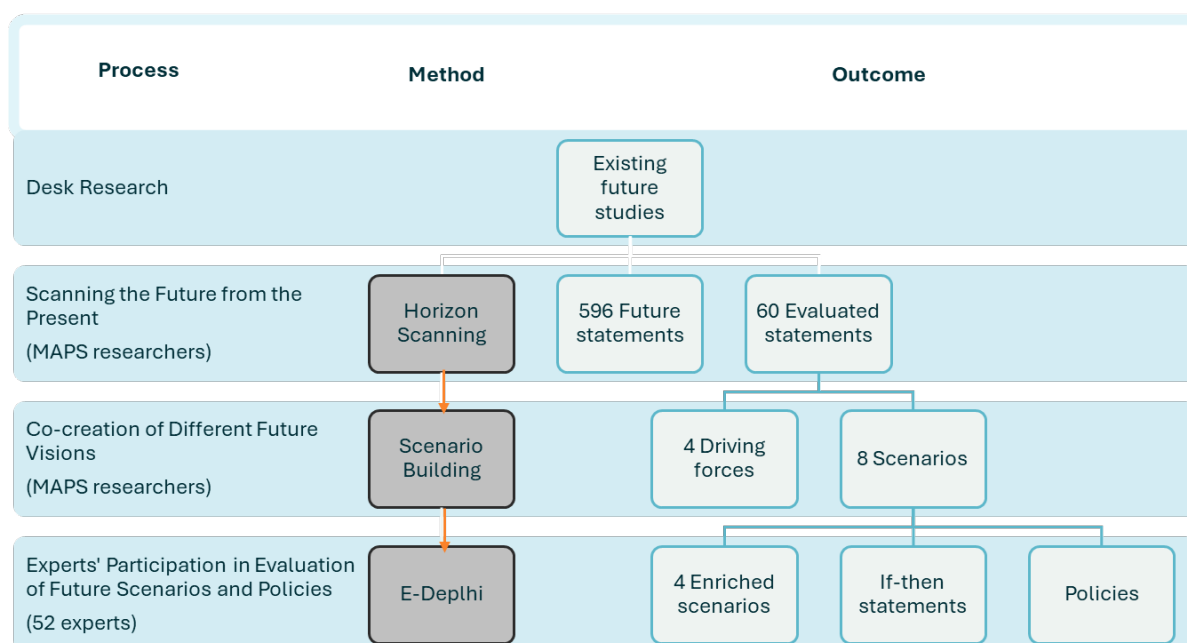
Figure 1: The integrated foresight model in Task 1.2 with its process, methods and outcomes

As a first step, a horizon scanning process with MAPS researchers aims to scan the horizon from the present. It started with a literature review of horizon scanning studies in the field of sustainability transformation and degrowth/post-growth research discussion. An online brainstorming with a questionnaire survey was conducted to collect insights from MAPS researchers, identify future issues relevant and important to their research background. This resulted in 596 future statements that were cleaned and filtered by the research team. In subsequent online workshop discussions, MAPS researchers were asked to classify and then evaluate selected future statements. The selected and evaluated 60 statements were the input for the next workshop.

The next phase aimed to co-create different future visions through a scenario-building process, which began by selecting 16 future statements to identify the driving forces and axes for scenario building in the second online workshop organised for MAPS researchers. Participants worked on 8 different future scenarios. Out of these, 4 scenarios were chosen during the third workshop. The selection of these four scenarios was informed by the need to cover as much as possible the degrowth/post-growth ideas and the contexts that facilitate and hinder their implementation. These four scenarios were the input for the next steps.

Next, as a validation and evaluation of the future visions, an e-Delphi process was conducted to enrich the four scenarios and generate further information on their desirability and political feasibility by involving a broader community in the process. In this step, potential policy interventions related to them were identified. 52 experts (from academia, NGOs, and the private sector) participated in the study on an e-Delphi platform to iterate the opinions of experts with many different backgrounds, disciplines, and regions to help reach consensus. The first round of e-Delphi resulted in four enriched scenario descriptions. During the second round of the e-Delphi, the experts were asked to validate some correlations, generated from the four enriched scenarios, so-called 'if-then statements'. Additionally, experts selected five policy solutions that are considered to be the most relevant and effective to realise 'a more equitable, sustainable, and democratic post-growth future' based on their evaluation of each scenario.

The resulting qualitative scenarios, 'if-then statements' and evaluated policies are not only informative about what may lie ahead in the future but can also be used to inform the modellers in the MAPS project and generate input for other WPs.

In preparing this report, the research was primarily conducted by CUB researchers. In the three workshops, we refer to the CUB team as organisers, separate from the participating researchers. The e-Delphi was a joint organisation of the CUB and TAU research teams, in which invited experts contributed to the process. To make it more explicit, the participants in the HS and SB process (questionnaire and three workshops) were the MAPS researchers, and in the e-Delphi process, experts outside of the project from various fields of sustainability. We would like to gratefully acknowledge their valuable contribution to the results of this report.

Scanning the Future from the Present: Horizon Scanning

Methodological considerations and the research process of Horizon Scanning

In creating different post-growth futures, we first aimed to explore how the future can be viewed from the present and collect as many visions as possible using the Horizon Scanning (HS) method. To create a genuine post-growth future vision, we sought to differentiate this vision from existing sustainability-related futures that had been previously developed. To achieve this aim, we utilised the existing literature to filter the visions and identify the specific post-growth characteristics. On the other hand, we invited a post-growth community (MAPS researchers) to participate in this process, whose members come from diverse disciplines and regions, but all have a strong academic background in post-growth research. The rationale behind this was that post-growth researchers are most likely to identify elements of the future that do not already appear in other sustainability research and hence we can avoid just replicating the "usual suspect" phenomena and arguments. (However, while in the horizon scanning phase it was important for us to have a common focus on post-growth topics, in later phases we opened the process to other knowledge-holders not just to broaden the perspectives but also as a "reality check".)

In the implementation of the HS process, we aimed at broad participation and the use of full online solutions. Participation was intended to involve the full range of researchers involved in the MAPS research, representing institutions from eight countries. This meant contacting all researchers engaged in the six Work Packages (WPs), inviting them to participate in the HS, and informing them about the ongoing work in the HS. Our aim was to identify the future ideas and expectations of as many research experts as possible, and then to involve at least three people from each WP – a group of senior and young researchers representing WPs – in the online workshops to classify the future ideas and assess their impact and implement the results to scenario building. The aim of the participation and representation of the WPs was to initiate the process of bringing together the different WPs with their respective subtasks to collaborate on joint research from the outset of the MAPS research project.

We wanted to implement the whole HS process fully online. This form of research and professional interaction was chosen because during the years of COVID-19 many applications have been developed both for regular and online interaction and discussion. We also aimed to develop the application and systematisation of foresight methods in the HS process. The Microsoft Teams platform was used to communicate and discuss with

the experts and to prepare and organise the work of the Corvinus team (as a part of MAPS TS2.1), which was responsible for the organisation of the HS process.

The following methods were used and integrated into the HS process:

1. online brainstorming with a questionnaire survey,
2. cleaning and filtering the collected future issues and statements,
3. online workshop with participating experts of the MAPS project, where only the relevant future issues and questions filtered from the review of brand new, HS, and degrowth literature were discussed, classified, and impact assessed. The sessions were organised, led and processed by the Hungarian members of MAPS T1.2
4. Literature review of horizon scanning methods in the field of sustainability transformation and degrowth/postgrowth research discussion

The online Qualtrics questionnaire editor (https://www.qualtrics.com) was used to conduct the one-round brainstorming. As part of this, MAPS researchers were asked to identify at least three future issues relevant and important to their research background and then to briefly explain their social, technological, ecological, economic, political, legal, ethical and demographic (STEEPLED) dimensions. This was done to gather the sensitivities and visions of a sufficiently large number of researchers with differentiated perspectives and differentiated views on sustainability issues, and to present them along structured dimensions. Respondents were also given the opportunity to indicate whether they wished to participate in the online workshop and to provide feedback on their experience of completing the questionnaire. The results were converted into an Excel spreadsheet.

To clean and filter the collected future issues and statements, the Corvinus organising team first separated future statements from the source person to anonymise the research. After reading the responses assigned to the STEEPLED dimensions, each statement was condensed into a single sentence, after being shortened and/or rephrased (strictly preserving their content). In addition, they flagged and - based on a joint value judgment by the organising team – deleted statements that were not forward-looking and/or not assigned to a good dimension or were mentioned more than once.

The filtering process was also used to decide how unique the statements were. The organising team had also performed a literature review to see what futures were widely discussed in HS futures and post-growth literature. Accordingly, they categorised the statements into "none, partial, and major" overlaps with the literature analysis on other HS research and into categories "none, low, medium" based on their prevalence in post-growth literature. The data cleaning and filtering were done to ensure that no previous research was being duplicated, and only new and promising future statements were discussed, classified, and evaluated during the online workshop.

The participants of the online workshop consisted of MAPS researchers who responded to the questionnaire and volunteered. Their role was to elaborate on the cleaned (clarifying inconsistencies and duplications) and filtered (with relevant degrowth and futures studies literature) future statements in group discussions and to rate them using

the Osgood classification and rating scale. In the online workshop, participants received a brief introductory presentation on this scale to familiarize them with the task at hand.

The scale was based on the following grading categories:

- *Trend:* a general tendency or direction including evident events over a longer period of time including the present, increasing or decreasing in strength or frequency of observation. It usually suggests a pattern. (Local, meaning European focus here)
- *Megatrend:* long-term process of transformation with a broad scope and a dramatic impact; considered to be a powerful factor that shapes future markets, economy, society, politics, culture, technology, and so on.
- *Wild card:* is an unpredictable event or situation; an event that has a low probability but a high impact; often recognized and known, but discounted, even when the event is relatively certain over a period of years.
- *Weak signal:* early sign of currently small change; can presage a strategic discontinuity. The sources of change - the first case: the original idea or invention, the watershed event, the social outliers expressing a new value.
- *Hype:* make something seem more exciting or important than it is.

The Osgood classification and rating scale was accompanied by an assessment of the direction – positive, negative, or neutral – and strength of the future impact of the future statements in question. The scale consisted of -3, -2, -1, 0, +1, +2, and +3. The classification and impact assessment together determined the quality of the future statements collected in the HS process for further research.

Participating experts were divided into groups in which everyone could express their opinions and hopefully reach a consensus on both classification and impact assessment. To this end, we envisaged groups of around 5 people, facilitated by 2 facilitators to ensure that discussions do not become one-sided and that the group is motivated by the search for consensus. The facilitators were selected from among the organisers on a pre-defined professional basis, considering their practical expertise and continuous involvement in the organisation and facilitation of the workshop.

In addition, we also wanted to ensure that each group would work with the same number and formally the same quality in depth, detail, insight, and length of filtered future statements. Furthermore, the statements were randomly grouped into groups in filtering order within the time available. We organized the work into two rounds in three breakout rooms. The participants of the breakout rooms in both rounds were randomly selected, as were the filtered future statements of the same quality that were assigned to each group. In all groups, the Mentimeter utility (menti.com) was used by the facilitators to fill in the already prepared worksheet. The workshop work was organised in such a way that the table of statements was shared by the facilitator so that everyone could always see the statement being discussed. In addition, a brief description of each category used in the classification was shared in the chat so that it could be used freely and as needed by the participants in the workflow. At the end of the workshop, participants were also given the opportunity to give short reflective feedback within their groups.

Results of Horizon Scanning process

The one-round brainstorming online questionnaire resulted in a total of 596 future statements. The total number of respondents was 23. There were some respondents who identified more than 3 issues and developed all STEEPLED dimensions of them, but there were also some respondents who did not develop all SEEPLED dimensions of an issue they identified. The 596 future statements were reduced to 497 after cleaning. After filtering out statements commonly found in HS and post-growth literatures 96 statements remained, which were to be considered as future thinking unique to our experts. These 96 statements were classified and evaluated by experts in Workshop 1 in three different breakout rooms. In the three rooms, the 96 statements were distributed in such a way that each room contained approximately proportionally all dimensions of the STEEPLED statements, and the number of statements to be discussed is of the same order of magnitude. A total of 60 statements were classified and rated using the Osgood scale by the experts in the time available. In the following, those statements are briefly introduced that were selected for discussion and where the group reached a consensus in their classification

For the sake of space and clarity, we will not list here all the 596 statements that resulted from collecting the future statements. They can be retrieved from the CUB team upon request.

Statement 1: *Social justice is abandoned as a guiding principle of healthcare, and the majority of people try meeting their healthcare needs by means of cooperation and commons.*

The first statement addressed the abandonment of social justice as a guiding principle in healthcare and the rise of cooperation and commons to meet healthcare needs. Participants noted that the decline of healthcare based on social justice values is a growing trend. While community-driven healthcare initiatives may emerge in response to these systemic failures, some participants expressed optimism about the resilience and creativity of grassroots solutions, viewing them as positive ways to fill gaps left by institutional shortcomings. However, others were more cautious, highlighting the inherent risks of inequality and fragmentation that could arise if healthcare becomes dependent on local community efforts rather than central organization. Megatrend +1.

Statement 2: *Due to the collapse of global care chains, people organize care work without outsourcing it and it is shifted back to the private sphere, but communized care (e.g. childcare, cooking) takes place in public spaces.*

The second statement discussed the collapse of global care chains and the potential for care work to shift back to the private sphere, with aspects like childcare and cooking becoming communized in public spaces. This was seen as a weak signal. Participants argued that while global care chains face strain, they are far from disappearing; instead, outsourcing and commodification of care remain entrenched. The concept of communized care was acknowledged as a promising but niche idea, with little evidence of widespread adoption. While some participants appreciated the possibility of more

localized, community-driven care models, others doubted whether such practices could realistically replace the existing structures of care. Weak signal +1.

Statement 3: *As the fashion industry is polluting, tracing the life cycle of a pair of jeans becomes possible.*

The third statement proposed that as the fashion industry's environmental impact becomes clearer, tracing the life cycle of a pair of jeans would become possible. Participants highlighted that efforts to trace supply chains and environmental impacts are already emerging, though they are far from mainstream. They agreed this represented a weak but positive signal, as transparency in the fashion industry could foster greater consumer awareness and drive systemic change. Despite this, they noted that such initiatives are currently limited to certain companies and regions, suggesting that significant progress would require broader industry commitment. Weak signal, +2.

Statement 4: *The mental health crisis spreads.*

The mental health crisis was viewed as an undeniable megatrend, affecting people across the globe. Participants acknowledged that while mental health challenges manifest differently depending on cultural and economic contexts, the crisis itself is universal. They attributed its intensification to a combination of societal pressures, healthcare gaps, and changing social norms around mental health. The group agreed that the consequences of this trend are overwhelmingly negative, given its widespread implications for individual well-being, public health systems, and economic productivity. Megatrend -2.

Statement 5: *As both the far right and the far left will start blaming big corps for the ecological problems, profits of some large companies significantly drop as societies will start treating them more like enemies rather than allies.*

When discussing the statement that both the far right and the far left would blame large corporations for ecological problems, leading to significant profit losses, participants had mixed views. They acknowledged that corporate blame is already a common theme in political discourse. However, they expressed scepticism about the likelihood of large-scale profit declines, noting that such companies often adapt to criticism without losing their dominant market positions. This statement was categorized as a wild card: unlikely to occur but capable of causing significant disruption if it did. Participants debated whether this development would be positive or negative, ultimately settling on a neutral impact due to the uncertainty surrounding its potential outcomes. Wild card 0.

Statement 6: *AI will also be knowledgeable about human ethics and morals, therefore, minorities, peripheral communities, LGBTQ+ and other groups will also have support from the technology, and diversity will be widely accepted.*

The idea that artificial intelligence could support marginalized groups, promoting diversity and inclusion, was met with scepticism. While participants recognized the aspirational nature of this statement, they highlighted the current limitations of AI, including biases embedded in training data. This was classified as 'hype,' reflecting the gap between optimistic narratives and practical realities. However, participants agreed

that if AI could achieve this goal, it would have a profoundly positive impact on society, potentially fostering greater equity and acceptance of diversity. Hype +2.

Statement 7: *There is a political will to encourage keeping infrastructures operational as long as possible, influencing the expectations of people.*

A statement about the political will to keep infrastructure operational for as long as possible sparked a discussion about resource conservation and sustainability. Participants observed that this trend is more pronounced in resource-constrained regions where renewing infrastructure is not always feasible. They refined the statement to emphasize the importance of prioritizing useful infrastructure rather than maintaining outdated systems. Overall, this was seen as a positive trend, though with the caveat that careful judgment is needed to determine which infrastructure deserves preservation. Trend +2.

Statement 8: *So much hope is placed in the potential of markets and technologies to enable us to overcome ecological limits that socially imposed limits are not considered needed and has no political resonance.*

The eighth statement suggested that markets and technology are relied upon to overcome ecological limits, sidelining socially imposed limits. Participants unanimously viewed this as a negative megatrend, reflecting misplaced optimism in market-driven solutions that often fail to address structural and systemic ecological challenges. They emphasized the danger of neglecting collective, socially responsible approaches, warning that this reliance could exacerbate environmental degradation and deepen inequalities. Megatrend -3.

Statement 9: *If the fertility rate decreases interests of future generation are marginalized.*

The discussion on decreasing fertility rates focused on the marginalization of future generations in aging societies. Participants identified this as a significant trend, particularly in regions like Europe where older populations often dominate political and economic priorities. They viewed this dynamic as highly negative, as it limits the consideration of long-term sustainability and the needs of younger and future generations in policymaking. Trend -2.

Statement 10: *As people rely mostly on AI, they do not find education useful or beneficial anymore.*

The idea that reliance on AI could lead to people devaluing education was categorized as a wild card. While participants largely dismissed the notion that education would become irrelevant, they acknowledged the potential for significant changes in how education is perceived and delivered. They noted that AI might shift the focus from traditional learning to more adaptive, skill-based education, but doubted that it would undermine the fundamental value of education in society. If this scenario did occur, participants agreed it would have profoundly negative consequences, including knowledge gaps and overdependence on technology. Wild Card -2.

Statement 11: With the increasing possibility of climate catastrophe, the precautionary principle, related to good living conditions for all people and future generations, is replaced by a focus on the good life merely for national citizens and their descendants.

The statement addressed a nationalist retreat in response to climate catastrophe, with nations prioritizing the "good life' for their own citizens over global cooperation. This was seen as a negative trend, reflecting a growing emphasis on isolationist policies. Participants noted that such an approach undermines collective action on climate justice and could worsen global inequalities, as wealthier nations prioritize their own interests at the expense of broader international responsibilities. Trend -2.

Statement 12: Because of (environmentally forced migration crisis and) decreasing liveable areas, human life is prioritized over other species life.

Participants agreed this reflects a longstanding and intensifying megatrend. While humanity's focus on its own survival is understandable, the trend exacerbates ecological degradation by sidelining other species' well-being. Even contemporary advocacy for biodiversity often justifies ecological preservation through human-centred benefits, reinforcing the anthropocentric mindset. The implications were deemed profoundly negative, reflecting a loss of balance between human and ecological priorities. Megatrend -3.

Statement 13: Because of geopolitical and economic competition, technological development, especially risky geoengineering, will evolve towards protecting the prosperity from increased climate damage.

This was identified as a trend, particularly in industrialized countries, where economic and political pressures drive the exploration of high-risk technologies. The emphasis on geoengineering, considered a high-risk approach, exemplifies a preference for quick, prosperity-driven solutions over systemic change. While some acknowledged the potential necessity of such measures under dire conditions, they criticized the tendency to delay transformative action in favour of short-term economic preservation. Trend -2.

Statement 14: Because of belonging to the broader web of life in technological space, people become disconnected from how ecosystems create life and their life conditions.

This statement describes a trend in technologically advanced regions, where increasing reliance on artificial systems fosters a growing disconnection from nature. Examples such as urban children's diminishing knowledge of agricultural origins highlighted the widening gap between humans and ecosystems. The implications were seen as highly negative, as ecological illiteracy weakens humanity's understanding of its interdependence with the environment. Trend -3.

Statement 15: Educational systems will prioritize teaching energy literacy, equipping individuals with the knowledge to make informed decisions about energy use in terms of responsibility and efficiency.

This was categorized as a weak signal, reflecting sporadic efforts to include energy literacy in education. While participants acknowledged the value of such efforts, they

highlighted systemic barriers to scaling this approach. They viewed the potential for positive change as modest, noting that individual-level awareness is insufficient without structural reforms. Weak signal +1.

Statement 16: *Advancements in carbon capture and storage technologies will play a crucial role in managing emissions from energy production enabling energy-intensive production to mitigate their environmental impact.*

Participants classified this as 'hype,' reflecting high expectations for carbon capture and storage (CCS) technologies but limited evidence of their large-scale effectiveness. While they acknowledged CCS's potential benefits, they expressed concerns about its use as a crutch to sustain unsustainable practices. Hype 0.

Statement 17: *As the fashion industry is polluting, commercials are banned, and new business models are quickly growing in the field of second-hand shopping.*

This was deemed a wild card, with participants highlighting the improbability of banning commercials in a market-driven culture. However, they acknowledged that such a shift could have significant positive impacts, such as reducing consumerism and promoting environmental sustainability. Wild Card +2.

Statement 18: *As ecosystem's loss and fragmentation occur due to land conversion (infrastructures, housing, farming), people become less connected with nature.*

Participants recognized this as a clear trend driven by urbanization and industrial expansion. They noted that physical changes to landscapes compound humanity's alienation from the natural world, leading to a profound loss of ecological awareness. Trend -3.

Statement 19: *Climate legal cases will be won by the dozens, but their implementation will be difficult.*

This was classified as a weak signal. While participants acknowledged some legal victories in climate litigation, they noted significant barriers to enforcing these rulings, including resistance from governments and corporations. The dual nature of the statement—success in court versus difficulty in practice—made it challenging to assign a clear positive or negative impact. Weak signal 0.

Statement 20: *Due to Generation Z and consecutive generations not buying into the 'work-based society' narratives, work-life balance will be a central issue at companies.*

Participants identified this as a weak signal, citing early signs of shifting attitudes toward work among younger generations. They referenced the growing interest in shorter workweeks and alternative lifestyles as indicators of this change. The trend was viewed positively, with the potential for moderate societal impact if it gains broader traction. Weak signal +2.

Statement 21: *AI will become as 'unnoticeable' as electricity in the developed countries in the early 21st century.*

This was categorized as hype, reflecting narratives that AI will seamlessly integrate into daily life. Participants debated whether AI's current applications already meet this description. They expressed concerns about the manipulative risks of unnoticed AI systems, ultimately viewing their potential implications as slightly negative. Hype -1.

Statement 22: *Green and healthy urban ways of life will help accepting the cultural diversity and openness in thinking.*

This statement was identified as a weak signal, reflecting values promoted by grassroots movements but limited in widespread adoption. Participants found the connection between sustainable urban living and cultural openness aspirational, with the potential for significant positive impacts if realized on a broader scale. Weak signal +2.

Statement 23: *The law evolves according to leading political parties, and laws and standards are continuously updated causing delays and costs in the regulatory environment.*

Participants recognized this as a trend, reflecting the challenges of implementing consistent policies amid shifting political priorities. They viewed this as a negative development, as it undermines stability and increases the costs of transitions, particularly in areas like climate action. Trend -2.

Statement 24: *The fundamental ideas of liberalism that underpin democracy will come into question, both from the conservative right and the progressive left.*

This was classified as a megatrend, reflecting global shifts in political discourse. Participants debated the motivations of different political ideologies, noting that critiques of market liberalism might differ from challenges to democratic principles. The dual nature of the questioning led to a neutral assessment, reflecting both potential benefits (e.g., reevaluating market liberalism) and risks (e.g., undermining democratic norms). Megatrend 0.

Statement 25: *Future advancements in materials science will lead to the creation of highly energy-efficient products designed for durability and recyclability.*

Some of the participants referred to their previous experiences related to this topic. It was clearly helpful for the evaluation. A slight motivation was needed for the rest of the participants to share their ideas, too. Finally, they agreed that the statement describes a megatrend with a slightly positive effect (+1) on our future. Megatrend +1.

Statement 26: *Because of depleting finite material resources, excessive accumulation from individuals is prohibited but nations have the right to take goods and resources from individuals above a specific level to put them into a societal benefit.*

The next statement was long and, therefore, a bit more complicated to evaluate. A deeper definition of the classes (trend, hype, weak signal, etc.) was needed to decrease ambiguity. The group concluded that the statement was a weak signal with a strong positive effect (+3) towards social welfare and equality. Weak signal +3.

Statement 27: *Because of belonging to the broader web of life in the technological space, people cannot distinguish between the newest AI personas and the biological humans, and between true information and the false one.*

The participants quickly agreed on this statement's being a megatrend with a strong negative effect (-3), because they considered that AI would have (and already had) a disruptive impact on our society. Megatrend -3.

Statement 28: *Because of digitization and advances of AI, humans develop towards transhumanism.*

Further information was needed from the internet on the exact definition of transhumanism and examples. After clarification, participants decided to evaluate the statements as a megatrend. But the effect was difficult to estimate because participants felt this topic was very distinct from their expertise. The facilitators helped the group with further examples, and that led them to vote for an impact of -2. Megatrend -2.

Statement 29: *Because of environmentally forced migration crisis and decreasing liveable areas, scientists and engineers test new forms of living underneath of earth.*

The participants felt that under-earth expansion was not very likely for humanity, but there was news on constructions of different shelters (bunkers) by rich people or certain groups of people to avoid destruction. They considered it a hype with a rather negative impact (-2) on our future sustainability. Hype -2.

Statement 30: *With AI use spreading, the driving force of technological innovation will be the experimental knowledge instead of scientific knowledge.*

This statement contained ambiguous definitions again (experimental knowledge and scientific knowledge), therefore, it was abandoned by the first group and saved for the second round. The second group also struggled with the expressions but shortly agreed on a common understanding of the words mentioned previously and rather focused on the AI part. After a short debate, the group decided to evaluate this statement as a hype with a weak negative influence (-1). Hype -1.

Statement 31: *Increasing eco-anxiety and -depression will make a good medical business.*

This statement was considered a presently existing phenomenon, but half of the group felt it to be a trend, and the other half felt it to be a hype. No consensus could be made on this. The effect, however, was slightly negative (-1) for everyone in the group. Hype/trend -1.

Statement 32: *The moral imperative to protect marine resources not only for current populations but also for future generations who depend on these ecosystems will grow.*

One of the participants had wider experience in this field, but also accepted to be somewhat biased; therefore, she marked the statement as a megatrend, while the other participants (3 out of 4) felt it was a weak signal. But the impact was evaluated as slightly positive (+1) by all participants. Weak signal +1.

Statement 33: *Legal institutions will become increasingly relevant in dealing with environmental issues and the human rights discourse will become increasingly intertwined with issues of ecological deterioration.*

These types of changes are already happening, but not equally around the world. Thus, participants voted this as a trend. And because of its positive impact on society and the environment, they felt this to have a positive effect (+2). Trend +2.

Statement 34: *Growing urbanisation will rely on the proliferation of AI.*

After a short clarification on the exact meaning of 'proliferation', the participants agreed that this statement was a hype. The overall effect was considered neutral at first, but then a participant argued that AI was likely biased because its database contained racist, sexist, etc. sources, and that might have a negative impact on future (urban) societies. The group agreed and voted on a slightly negative impact (-1). Hype -1.

Statement 35: *Due to Generation Z and consecutive generations not buying into the "work-based society' narratives, environmental burdens stemming from consumption pressures will ease.*

According to the group, consumption is still increasing, which contradicts this statement. Consequently, this was considered a hype, but the participants looked at it as a positive change (+1) that would be advantageous if developed. Hype +1.

Statement 36: *The spreading mental health crisis will be mitigated by new technology that can help remotely and safely, causing ethical and legal problems of data protection.*

The group could not come to consensus on this statement because of its complexity. The participants either disagreed with it fully or agreed with the first part but were unsure about the second causality. There was one vote on trend, one on weak signal and two on hype, so most likely this statement is a present issue but its 'maturity' is uncertain. (Early signal, trend, over-reacted trend?) Participants agreed that whatever its proper status was, it had a somewhat negative effect (-1). Hype -1.

Statement 37: *The fashion industry is polluting and buying luxurious/fast fashion cloth become culturally undesirable or even despised.*

There was a general agreement on this statement that it was a weak signal, and it would have a moderately positive effect (+2). Weak signal +2.

Statement 38: *As labour markets are precarious and over-competitive, working people work harder and longer.*

The majority of the participants (three out of four) considered this statement to be a trend, but one participant couldn't be convinced that this was an actual trend; it was rather a weak signal of a future change. Nevertheless, such a change would have a rather negative impact (-2) on society with economic consequences. Trend -2.

Statement 39: *The social security system collapses and instead of finding new ways of providing for the many, healthcare is increasingly privatized and now only serves the richest 5%.*

Though the first part of the sentence might seem exaggerated ('collapse'), the Covid pandemic taught lessons to Europe and the other parts of the world, which implied that social security systems declined, and private medical care observably strengthened. The evaluation was that this statement described a megatrend with a strong negative impact (-3). Megatrend -3.

Statement 40: *Ethical considerations leading to greater respect for indigenous and local knowledge in energy practices will promote ethical energy solutions that align with cultural values and community needs and Indigenous communities are consulted and have a say in energy projects affecting their lands and resources. This respect for sovereignty will promote fairness and acknowledge the unique relationship Indigenous peoples have with their environments.*

Although being very long and complex, the group quickly decided that this issue had a very low likelihood, so it was a wild card. If such ethical improvements can happen, it will have a positive impact (+2) on our society's sustainability in the long run. Wild card +2.

Statement 41: *Social uprisings abolish capitalism.*

This provoked a heated debate. Some argued that it was nonsense, others that if it could happen, we could not see any of it now. There was also a debate about whether it could be a megatrend or a wild card, precisely because there is no telling how much social uprising could turn our world upside down. Something about it is suspected and we can only judge its occurrence and possible effects in the present. In the end, we have agreed that it cannot be a megatrend, because there are no strong signs of it yet, although some movements of this kind are already taking place. Wild card is possible because, if it does happen, it could completely upend our world. Of course, there is also the question of the nature of the movements and changes that could lead to the end of capitalism. If progressive and emancipatory movements and changes for sustainability gain momentum, then the impact of this statement could be +3, which, of course, only expresses the value judgment of the participants. Wild card +3.

Statement 42: *Biotechnology becomes a leading technology, demanding new legislation, influencing many parts of life (like human fertility due to its capacity to correct or prevent disorders before birth).*

On this, it was easier to reach a common position. The statement is classified as a megatrend. Although the statement associated biotechnology with positive expectations, participants found it important to highlight that the positive or negative impact of biotechnology depends on who develops it. In the end, -1 became the common position in the impact assessment because of the doubts expressed. Megatrend -1.

Statement 43: *Degrowth (or eco-socialism) does prevail over growth-based capitalism, but as the approach is not participatory and is implemented without public support, public unrest increases and public support decreases.*

The statement is too complex and highlights a possible negative realisation and impact of degrowth. Degrowth without public participation is a weak signal that draws attention to one of the dangers of its realisation. The expectation was that the impact would be negative and of magnitude 2 if degrowth or a shift to degrowth is achieved in this way. The reason it is not -3 is that it is not a dictatorial way of making the statement. In the end, -1 was the common position in the impact assessment because of the doubts expressed. Weak signal -1.

Statement 44: *The fertility rates are decreasing as young adults do not want to have children anymore.*

This is an ongoing trend, but it is not universal. It has also been argued that this trend cannot continue where it has been, because its future consequences – increased dependency ratios, drastic changes in family structure – will cause serious social and welfare problems. There is only one advantage, and that is that the downward trend in fertility rates could have a positive impact on environmental sustainability. It is a trend with an impact of +1. Trend +1.

Statement 45: *Eco-anxiety and -depression will lead that young generation blames the previous generation for the ecological decay.*

This statement is an already existing megatrend whose veracity may be strengthened as environmental pressures worsen. The accusation is true, because there must have been some antecedent to the significant increase in environmental pressures that will affect the future. This effect could be positive, as it will encourage young people today to act differently, providing them with a positive force. The strength of the positive effect is +1, because ultimately, this generational blame game is a sad situation. Megatrend +1.

Statement 46: *The pressure to achieve net zero and increasing climate catastrophes will lead to technologies and businesses serving national purposes.*

This statement is a megatrend, just think of the growing right-wing movements almost all over the world. A positive interpretation of the statement might be to focus on localised management of global problems in business and in services for national purposes. As this does not seem to be the case, the impact of the statement has been made negative and of strength -2. Megatrend -2.

Statement 47: *Because of environmentally forced migration crisis and decreasing liveable areas, everyone will have the same rights of living.*

This statement contains a desirable legal clause for the future if you read the UN Future of Summit, like the Declaration or the Future Pact, because they advocate the development of universal human rights in this direction. But this process has not yet started, so the statement is now only a weak signal. However, the impact of its implementation will be positive and a strength of +3. Weak signal +3.

Statement 48: *Because of digitization and advances of AI, people can live almost forever (superlongevity).*

The statement is a hype because it extends AI into an unduly broad and almost unrealistic area. To raise expectations in this direction would be undesirable and would have a strong negative impact. It is therefore rated -3. Hype -3.

Statement 49: *Because of belonging to the broader web of life in the technological space, almost all aspects of personal life become monetarized.*

The statement is experienced in some form and to some extent all over the world and is therefore a megatrend. It would not be good to monetize everything, so the impact of the statement is negative, and its strength is also -3. Megatrend -3.

Statement 50: *When taking into account biophysical limits in simulation of socio-economic scenarios, collaborative ethical transition paths will be part of simulations.*

Collaborative ethical transition paths may be an aspiration in modelling, but it is unlikely that they can be achieved in the context of this research. It is true that there have been attempts at model building, such as multi-agent modelling, which can incorporate actors who will behave in this way during the simulation, but these models are not yet sufficiently developed to do this well. The statement is therefore a weak signal and may have an impact of only +1 according to the participants' assessment. Weak signal +1.

Statement 51: *Advanced smart grid technologies will revolutionize how energy is distributed and consumed, optimizing supply and demand in real time, allowing for more effective integration of decentralised renewable energy sources into the grid.*

The current performance of smart grid technologies is overestimated, and today they are still considered possibilities rather than real opportunities, even though there are already countries in Europe where they have been proven to work well. The statement is a weak signal, and the strength of its positive impact is +2. Weak signal +2.

Statement 52: *Legal regulation will hardly follow the development of AI. It is rather the practice which will lead the actual use and misuse of the technology.*

Based on their own user experience, all agreed with this statement. It was classified as a megatrend. The problem with the statement is already real, as it creates an opportunity to create fake news to influence people's thinking with impunity. The backlog of AI regulation is therefore very damaging and has a negative impact. The strength of the impact is -3. Megatrend -3.

Statement 53: *Ecosystem loss and fragmentation occur due to further land conversion (infrastructures, housing, farming).*

This is a worldwide phenomenon and therefore a megatrend, which has a very strong negative impact due to the damage it causes to the ecosystem. The result of the assessment is therefore -3.

Statement 54: *A big gap in attitudes among middle-aged and young population about fashion (its polluting nature and the necessary responses) exists.*

Finally, the group accepted the content of the statement, but with the addition that the differences are not only age group specific but also depend on income and culture. Otherwise, these phenomena belong to the hype rather than other types. In terms of their impact, they are slightly negative or also rated -1. Hype -1.

Statement 55: *As labour markets are precarious and over-competitive, the societal expectations regarding parenthood significantly change due to the changing patterns of division of labour in the sphere of caring following work-life imbalance pressures.*

In interpreting the statement, it was suggested that it was a gender issue, and then it was suggested that the strong competition in the labour market also affects men, and thus ultimately the performance of parenting tasks. This statement can be interpreted as a trend, but it depends on how strong the competition in the labour market is and how it is culturally embedded. Thus, the classification of the statement has ultimately become a trend. And its impact rating was -2, i.e., a negative of medium strength. Trend -2.

Statement 56: *The transition to renewable energy sources will transform landscapes, with an emphasis on creating multi-use spaces that combine energy production with agriculture and conservation.*

The discussion turned on what a multi-use space is. Some examples were given from the field of biogas use and agriculture, or the use of wind farms and their environment, but the group did not really perceive the importance of such spaces, so the statement was put in the weak signal class. It was suggested that such solutions could have a +1, slightly positive impact on shaping our future environment. Weak signal +1.

Statement 57: *Through the ethical imperative for equitable energy access and its consecutive legal measures, communities will insist on policies to include this perspective, making energy services accessible for all, in particular marginalised communities.*

The statement is acceptable in principle, but so far it is only found in the literature recommendations and is therefore also a weak signal statement. The content of the statement was agreed by the group and if it were to be included in the future universally accessible basic services, it could have a moderately strong positive impact of +2 in terms of sustainability and environmental quality. Weak signal +2.

Statement 58: *Because of depleting finite material resources, people will repair goods communicating and teaching new knowledges and helping each other.*

The repair and maintenance activity are not new, but the reason – depleting finite material resources – is new. This statement was ultimately interpreted by the room as a weak signal, because in the case of a community or family, it can work locally to preserve such an environment. In terms of its impact, it can have a positive but very small role in addressing the root cause. The result of the impact assessment was +1. Weak signal +1.

Statement 59: *Eco-anxiety and -depression contribute to decrease the number of children.*

According to young participants in the working group, this is the main reason why young people do not have children. Others argued that there are other reasons for not having children, and that this is only the case in very high-income countries and among highly educated groups. Finally, according to the group opinion it was a weak signal because it could be a response to deteriorating environmental conditions, which could therefore have a weak but negative effect. The group assessment was -1 with the statement that a decline in population growth could have a positive effect on the environment, but if fewer children are born because young people are very worried about their future, then this is a negative statement. Weak signal -1.

Statement 60: *Public policies struggle to address the root causes of conspicuous consumption, as measures to curb overconsumption will face resistance from both industries and consumers.*

The statement is self-evidently a megatrend. Participants agreed that its impact would be very damaging in the future, so it gave it a -3. Megatrend -3.

Following the theoretical background analysis, which classified the different future issues and statements along the STEEPLED framework, the organising research team also grouped the evaluated statements accordingly after the workshop. Because of the

complex nature and multidisciplinary formulation of many statements, the presented classification is one possible solution. The Osgood's scale and the STEEPLED classification indicate that the analysed statements referred to a wide scale of future issues which can be creatively used as scenario axes and drivers. This will be relevant for the next phase of the research: the scenario building (SB). Table 1. contains the overview of the classified and evaluated statements in STEEPLED logic. Table 2 contains the statements unclassified and unevaluated due to a lack of time during Workshop 1.

Future statements	Trend	Mega-trend	Wild card	Weak signal	Hype	Osgood's scale
Social dimension						
As people rely mostly on AI, they do not find education useful or beneficial anymore.	-	-	x	-	-	-2
As ecosystem's loss and fragmentation occur due to land conversion (infrastructures, housing, farming), people become less connected with nature.	x	-	-	-	-	-3
If fertility rate decreases interests of future generation are marginalized.	x	-	-	-	-	-2
Growing urbanization will rely on the proliferation of AI.	-	-	-	-	x	-1
The fashion industry is polluting and buying luxurious/fast fashion cloth become culturally undesirable or even despised.	-	-	-	x	-	+2
As labour markets are precarious and over-competitive, working people work harder and longer.	x (75%)	--		x (25%)	-	-2
The social security system collapses and instead of finding new ways of providing for the many, healthcare is increasingly privatized and now only serves the richest 5%.	-	x	-	-	-	- 3
Social uprisings abolish capitalism.	-	-	x	-	-	+3

Future statements	Trend	Mega-trend	Wild card	Weak signal	Hype	Osgood's scale
Degrowth (or eco-socialism) does prevail over growth-based capitalism, but as the approach is not participatory and is implemented without public support, public unrest increases and public support decreases.	-	-	--	x		-2
Technological dimension						
Social justice is abandoned as a guiding principle of healthcare and the majority of people try meeting their healthcare needs by means of cooperation and commons.	-	x	-	-	-	+1
As the fashion industry is polluting, tracing the life cycle of a pair of jeans becomes possible.	-	-	-	x	-	+2
The mental health crisis spreads.	-	x	-	-	-	-2
So much hope is placed in the potential of markets and technologies to enable us to overcome ecological limits that socially imposed limits are not considered needed and have no political resonance.	-	x	-	-	-	-3
Because of geopolitical and economic competition, technological development, especially risky geoengineering, will evolve towards protecting prosperity from increased climate damages.	x	-	-	-	-	-2
Biotechnology becomes a leading technology, demanding new legislation, influencing many parts of life (like human fertility due to its capacity to correct or prevent disorders before birth).		x				-1
Because of digitization and advances of AI, people can live almost forever (superlongevity).					x	-3

Future statements	Trend	Mega-trend	Wild card	Weak signal	Hype	Osgood's scale
Advanced smart grid technologies will revolutionize how energy is distributed and consumed, optimizing supply and demand in real time, allowing for more effective integration of decentralised renewable energy sources into the grid.				x		+2
Advancements in carbon capture and storage technologies will play a crucial role in managing emissions from energy production enabling energy-intensive production to mitigate their environmental impact.	-	-	-	-	x	0
Future advancements in materials science will lead to the creation of highly energy-efficient products designed for durability and recyclability.	-	x	-	-	-	+1
Because of belonging to the broader web of life in the technological space, people cannot distinguish between the newest AI personas and the biological humans, and between true information and the false one.	-	x	-	-	-	-3
With AI use spreading, the driving force of technological innovation will be experimental knowledge instead of scientific knowledge.	-	-	-	-	x	-1
The spreading mental health crisis will be mitigated by new technology that can help remotely and safely, causing ethical and legal problems of data protection	x (25%)	-	-	x (25%)	x (50%)	-1
Ecological dimension						
Because of belonging to the broader web of life in technological space, people become disconnected from how ecosystems create life and their life conditions.	x	-	-	-	-	-3

Future statements	Trend	Mega-trend	Wild card	Weak signal	Hype	Osgood's scale
Ecosystem loss and fragmentation occur due to further land conversion (infrastructures, housing, farming).	-	x	-	-	-	-3
The transition to renewable energy sources will transform landscapes, with an emphasis on creating multi-use spaces that combine energy production with agriculture and conservation.	-	-	-	x	-	+1
Economic dimension						
As both the far right and the far left will start blaming big corps for the ecological problems, profits of some large companies significantly drop as societies will start treating them more like enemies rather than allies.	-	-	x	-	-	0
As the fashion industry is polluting, commercials are banned, and new business models are quickly growing in the field of second-hand shopping.	-	-	x	-	-	+2
Due to Generation Z and consecutive generations not buying into the 'work-based society' narratives, work-life balance will be a central issue at companies.	-	-	-	x	-	+2
Because of environmentally forced migration crisis and decreasing liveable areas, scientists and engineers test new forms of living underneath of earth.	-	-	-	-	x	-2
Increasing eco-anxiety and -depression will make a good medical business.	x (50%)	-	-	-	x (50%)	-1
Due to Generation Z and consecutive generations not buying into the "work-based society' narratives, environmental burdens stemming from consumption pressures will ease.	-	-	-	-	x	+1

Future statements	Trend	Mega-trend	Wild card	Weak signal	Hype	Osgood's scale
Because of belonging to the broader web of life in the technological space, almost all aspects of personal life become monetarized.	-	x	-	-	-	-3
A big gap in attitudes among middle-aged and young population about fashion (its polluting nature and the necessary responses) exists.	-	-	-	-	x	-1
As labour markets are precarious and over-competitive, the societal expectations regarding parenthood significantly change due to the changing patterns of division of labour in the sphere of caring following work-life imbalance pressures.	x	-	-	-	-	-2
Because of depleting finite material resources, people will repair goods communicating and teaching new knowledges and helping each other.	-	-	-	x	-	+1
Political dimension						
There is a political will to encourage keeping infrastructures operational as long as possible, influencing the expectations of people.	x	-	-	-	-	+2
The pressure to achieve net zero and increasing climate catastrophes will lead to technologies and businesses serving national purposes.	-	x	-	-	-	-2
Through the ethical imperative for equitable energy access and its consecutive legal measures, communities will insist on policies to include this perspective, making energy services accessible for all, in particular marginalised communities.	-	-	-	x	-	+2

Future statements	Trend	Mega-trend	Wild card	Weak signal	Hype	Osgood's scale
Public policies struggle to address the root causes of conspicuous consumption, as measures to curb overconsumption will face resistance from both industries and consumers.	-	x	-	-	-	-3
Legal dimension						
Due to the collapse of global care chains, people organize care work without outsourcing it and it is shifted back to the private sphere, but communized care (e.g. childcare, cooking) takes place in public spaces.	-	-	-	x	-	+1
Climate legal cases will be won by the dozens, but their implementation will be difficult.	-	-	-	x	-	0
The law evolves according to leading political parties, and laws and standards are continuously updated causing delays and costs in the regulatory environment.	x	-	-	-	-	-2
Because of depleting finite material resources, excessive accumulation from individuals is prohibited but nations have the right to take goods and resources from individuals above a specific level to put them into a societal benefit.	-	-	-	x	-	+3
Legal institutions will become increasingly relevant in dealing with environmental issues and human rights discourse will become increasingly intertwined with issues of ecological deterioration.	x	-	-	-	-	+2
Because of environmentally forced migration crisis and decreasing liveable areas, everyone will have the same rights of living.	-	-	-	x	-	+3

Future statements	Trend	Mega-trend	Wild card	Weak signal	Hype	Osgood's scale
Legal regulations will hardly follow the development of AI, it is rather the practice which will lead the actual use and misuse of the technology.	-	x	-	--	-	-3
Ethical dimension						
Educational systems will prioritize teaching energy literacy, equipping individuals with the knowledge to make informed decisions about energy use in terms of responsibility and efficiency.				x		+1
AI will also be knowledgeable about human ethics and morals, therefore, minorities, peripheral communities, LMBTQ+ and other groups will also have support from technology, and diversity will be widely accepted.					x	+2
With the increasing possibility of climate catastrophe, the precautionary principle, related to good living conditions for all people and future generations, is replaced by a focus on good life merely for national citizens and their descendants.	x					-2
The fundamental ideas of liberalism that underpin democracy will come into questions both from the conservative right and the progressive left.	-	x	-	-	-	0
Because of (environmentally forced migration crisis and) decreasing liveable areas, human life is prioritized over other species life.	-	x	-	-	-	-3
The moral imperative to protect marine resources not only for current populations but also for future generations who depend on these ecosystems will grow.	-	x (25%)	-	x (75%)	-	+1

Future statements	Trend	Mega-trend	Wild card	Weak signal	Hype	Osgood's scale
Ethical considerations leading to greater respect for indigenous and local knowledge in energy practices will promote ethical energy solutions that align with cultural values and community needs and Indigenous communities are consulted and have a say in energy projects affecting their lands and resources. This respect for sovereignty will promote fairness and acknowledge the unique relationship Indigenous peoples have with their environments.	-	-	x	-	-	+2
Eco-anxiety and -depression will lead that young generation blames the previous generation for the ecological decay	-	x	-	-	-	+1
When taking into account biophysical limits in simulation of socio-economic scenarios, collaborative ethical transition paths will be part of simulations.	-	-	-	x	-	+1
Demographic dimension						
AI will become as 'unnoticeable' as electricity in the developed countries in the early 21st century.	-	-	-	-	x	-1
Green and healthy urban ways of life will help accept cultural diversity and openness in thinking.	-	-	-	x	-	+2
Because of digitization and advances of AI, humans develop towards transhumanism.	-	x	-	-	-	-2
The fertility rates are decreasing as young adults do not want to have children anymore.	x	-	-	-	-	+1
Eco-anxiety and -depression contribute to decrease the number of children.	-	-	-	x	-	-1

Table 1: Evaluated future statements in STEEPLED logic

Due to time constraints, not all of the selected (cleaned and filtered) statements were evaluated. However, as this was expected in advance, the statements were ranked in a way that the most important ones were first. The ones that were prepared for discussion but remained undiscussed are listed in the following table (Table 2) as non-evaluated future statements:

Selected but non-evaluated future statements
The ethical question of setting one's own limits in service of another's well-being becomes increasingly salient as climate crises elsewhere are spurred by our excessive mode of living.
Laws aimed at promoting sustainability will benefit corporations over local communities, creating legal challenges and resistance among marginalized groups.
Individuals will view restrictions on personal choice as an infringement on freedom.
Nations will need to negotiate shared access to shifting fish stocks across borders, which will have new international policies to manage transboundary resources.
Ethically, a failure to uphold collective action challenges values of solidarity and shared responsibility, promoting individualism and weakening empathy toward common welfare. This shift will erode moral imperatives for contributing to collective well-being and foster 'every person for themselves' mentality.
Neglecting ecological restoration raises ethical questions about our responsibility to future generations and to non-human species that rely on healthy ecosystems.
While the AI use is spreading, people with lower education levels don't want to participate in decision making.
Because of depleting finite material resources, local and social innovation becomes the main driver for technological improvements.
The rise of remote, hybrid work models and flexible work arrangements will redefine energy consumption patterns in urban areas, as businesses and employees prioritize energy-efficient practices at home and reduce the overall demand for energy-intensive office spaces.
Public interest litigations will rise that aim to hold both governments and companies accountable for their environmental actions.
Lobbies can drive social needs and acceptance of social norms.
Because of climate change and geopolitical and economic competition, the aggressivity between wealthy and poor nations will be increasing in political relations.
Because of the decreasing fertility rate, shrinking population improves the ecological footprint.

Selected but non-evaluated future statements

As individuals prioritize luxury and excess, societal values shift away from sustainability, making it harder to foster collective action toward simpler lifestyles.

Legislation around migration, basic rights, public services, and social security will change dramatically, reflecting highly different political responses.

Innovations in sustainable fishing technology, such as selective gear and remote monitoring, will reduce overfishing, though broad adoption.

Laws regarding labour protections and just transitions will adapt, ensuring that displaced workers (due to climate change) are given fair opportunities in the new green economy.

Postgrowth debates will focus on global and intergenerational justice, principles of decolonial thinking.

Technological innovations further accelerate leading to an increasing intensity of creative destruction.

There will not be enough materials for the transition to sustainability.

To support the integration of multi-disciplinary knowledge in decision-making, the need for facilitators will rise.

The transition to a rather public-owning culture (e.g. in mobility) will raise ethical challenges, because shared goods sooner become subjects of insufficient maintenance or vandalism than private-owned goods.

Without a strong culture of cooperation, social trust will erode, further hampering global collaborative efforts to address critical issues.

Governments will adopt stricter legal frameworks on fishing practices, implementing zero-tolerance policies for overfishing and stricter marine conservation laws.

Despite advances in sustainable technology, adoption will lag as people are unwilling to embrace new products or practices, slowing down the positive effects of innovation.

Political instability and military expenditure will grow as disenfranchised populations push back against policies perceived to favour the wealthy over the common good.

To cut welfare spending costs, strict conditions could be imposed on the receipt of social benefits which could be cruel and inhumane.

In a time of political polarisation, where democratic principles and institutions will be increasingly challenged, the political institutions such as the welfare state will be increasingly unable to mediate distributional conflicts.

Timeframes for any kind of project and process will be longer and ethical standards higher as they will include multi-disciplinary knowledge creation.

Selected but non-evaluated future statements
Sharing economy and self-driving technology can help a lot in diminishing the differences in transportation options between the different age groups, minorities or disabled communities.
AI will raise great many ethical problems, but innovative groups, early adopters and followers will prevail, and those with 'classic' legal, ethical or cultural concerns will decrease in number and bargaining power.
Due to Generation Z and consecutive generations not buying into the 'work-based society' narratives, some form of universal basic allowance will have to be provided.
The grip of the consumer society will loosen, and companies will find it increasingly difficult to sell more for more.
As resources become scarce, people become more accepting of resource allocation for a just society, satisfying basic needs.
After abolishing capitalism, people are not technology opponents but call for a serious reflection for what technology serves human – and more-than-human – flourishing within planetary boundaries and use the 'matrix of convivial technology' to assess the relatedness, adaptability, accessibility, bio-interaction and appropriateness of said technologies.

Table 2: Statements prepared for discussions but undiscussed due to lack of time

The discussion in the first workshop of the HS process involved 6 facilitators and 13 participants. One difficulty was that only about 50% of the MAPS researchers who participated in the brainstorming session had attended the HS workshop. The advantage of fewer participants, however, was that for each future setting, the opinions of almost all participants could be heard and a truly consensual way of classifying and evaluating the majority of future settings was achieved. Only 4 statements were not classified in consensus, and for another 4 statements, the estimation of the impact was zero. However, these uncertainties do not undermine the robustness of the HS workshop results.

Moreover, out of the 60 future statements that were categorised by the participants, only one future statement – Increasing eco-anxiety and depression will make a good medical business – remained uncertain because it was classified as both a trend and a hype statement with a 50-50% probability. The distribution of the 60 statements is 12 trends (19,7%), 16 (26,2%) megatrends, 5 wild cards (8,2%), 17 weak signals (27,9%) and 11 hypes (18,0%). This distribution shows that 45,9% of the experts believe that the future will be shaped by trends and megatrends already visible, but 54,1% will also be shaped by uncertainty, represented by the wild card, weak signal and hype categories. Ultimately, the participants take the view that to shape the future, it needs and should be worthwhile to continue to explore possible futures and, within them, desirable futures.

Experts rated only 3 future statements (5%) as very positive, while 22 statements (36,7% of the statements) were rated as moderately or weakly positive. Slightly more than half of the future statements, 31 statements (51,6% of the statements), were rated as having a weak to moderate to strong negative impact. The high number of statements with a medium to strong negative impact is particularly striking. The total number of statements with a strongly negative impact is 23 (38,3%), of which 11 statements have a very strongly negative impact, accounting for 35,5% of all negative impact statements. This distribution of ratings indicates that participants believe that the future is not only uncertain, but that, in addition to positive future shapers, there are also significant and highly influential negative future shapers. This perception reflects the participants' thorough and careful knowledge of the issues and their considered expectations.

We performed an automatic and a manual sentiment analysis of not just the future statements that were discussed but also all the 596 future statements that were provided during the questionnaire phase. The automatic analysis used a pre-trained deep learning model based on RoBERTa (Liu et al., 2019) and the manual was coded in the NVivo software. As can be seen from Figure 2 below, the results regarding the emotions shown by the participating post-growth experts showed that while most statements were phrased neutrally, when scanning the future, many felt negative emotions and no positive ones.
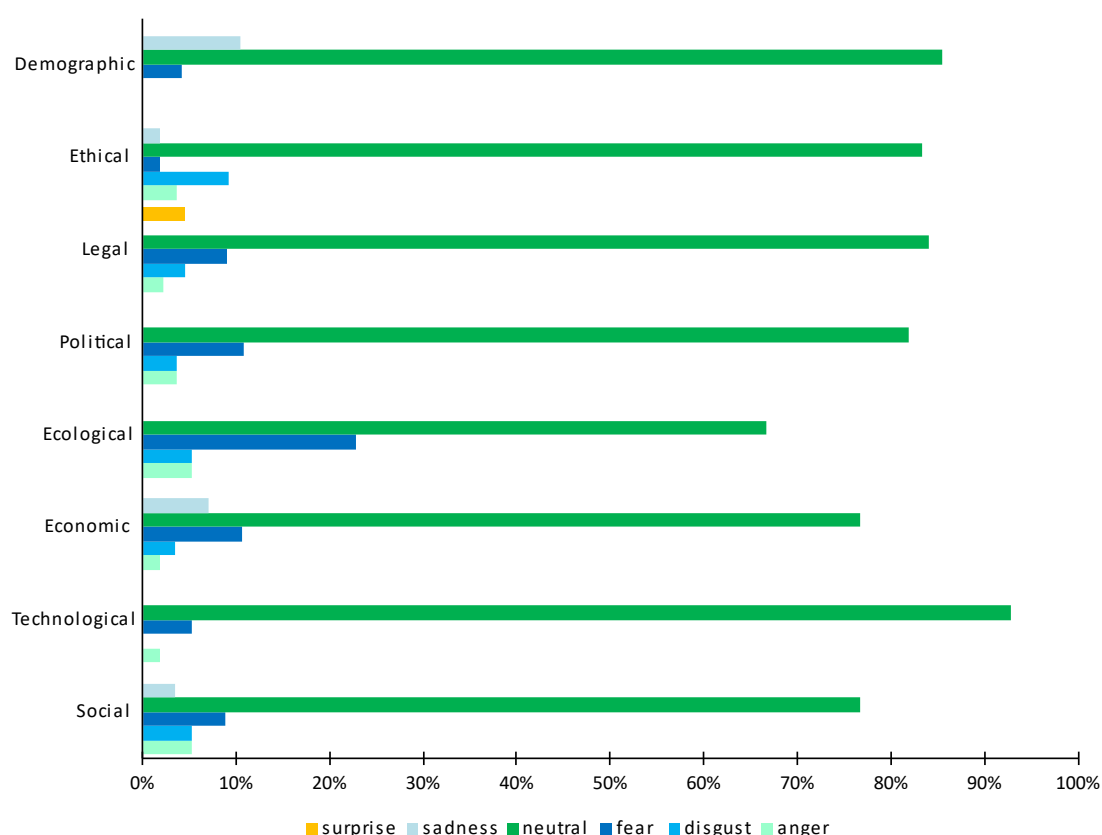
Figure 2: Result of the sentiment analysis of 596 future statements.

In Workshop 1, experts ranked the most future statements, 13 statements, in the technological dimension, but this still only accounts for 21,3% of the statements. This is followed by statements on the economic (10) and social (9) dimensions, with a combined share of 34,2%. Then come the statements in the ethical and legal dimensions (9 and 7 respectively) with 21,6%. The lowest number of statements were classified in the demographic (5), political (4) and ecological (4) dimensions. This ordering shows that the focus of the expert group's research is on technological, economic, social, ethical and legal issues, in the sense that they are to be highly relevant to the conditions for post-growth. The complexity of the experts' approach is demonstrated by the fact that demographic, political and ecological dimensions are also included in their vision, with a combined share of 21,4%, indicating that these dimensions together are of approximately equal importance to the technological dimension. The ecological dimension being relatively low is misleading, as post-growth experts focus on the other dimensions, always with the improvement of the ecological dimension in mind.

The horizon scanning phase covered the collection and processing of future statements not just to learn what future trends, megatrends, wild cards, weak signals or hypes post-growth researchers identify in their fields but also to serve as inputs into the next phase, namely scenario building.

Co-creation of Different Future Visions: Scenario Building

Methodological considerations and the research process of Scenario Building

After creating future statements and evaluating them using the HS method, the next step involved developing common future visions of a post-growth community, namely, MAPS researchers, and building on the evaluated and selected future statements. Scenario Building (SB) aims to create various shared future visions based on selected driving forces. In this method, participants can co-create and identify the most significant driving forces that will shape various futures. Using these driving forces as axes, participants can identify different future scenarios and, through deliberation, create narratives for each one. The narratives provide explanations and detailed descriptions of how these futures might unfold. Participants' narratives can illustrate both positive and negative future scenarios they can envision, fostering imagination and a qualitative understanding of what could happen under certain circumstances. As a result of the SB process, through workshops and discussions, participants will articulate their visions and assign titles to them. Identifying the stories behind each scenario will encompass the various degrowth/post-growth ideas, as well as the contexts that facilitate or hinder their implementation.

The process of building basic scenarios

1. Selection of the driving forces

The process of Scenario Building (SB) and the ranking of the scenarios was also carried out in a participatory and online format. The participants consisted of MAPS researchers as a diverse group of the post-growth community with strong academic backgrounds. The SB was based on the results of Workshop 1. Out of the 60 evaluated statements, 16 were selected by the organisers before Workshop 2. Those include statements classified as either wild cards or weak signals – in order to focus on the low-probability, high-impact events that are difficult to anticipate, and make sense of the fragmented information - their impact was rated as +/-2 or +/-3 on the used Osgood classification scale. The number of such statements was only 14; therefore, 2 more statements classified as trends were considered, which are expected to have a high impact on future trends according to the impact assessment. The 16 statements selected covered the STEEPLED dimensions, and made it easier to work with in two groups with 8-8 future statements each as a starting point. For the chosen statements, see Table 3. These were

then divided into two groups so that the experts in the two breakout rooms could work with the statements separately.

Chosen future statements as potential driving forces	Wild card	Weak signal
Social dimension		
Social uprisings abolish capitalism.	+3	-
Degrowth (or eco-socialism) does prevail over growth-based capitalism, but as the approach is not participatory and is implemented without public support, public unrest increases and public support decreases.	-	-2
As people rely mostly on AI, they do not find education useful or beneficial anymore.	-2	-
The fashion industry is polluting and buying luxurious/fast fashion cloth become culturally undesirable or even despised.	-	+2
Technological dimension		
Advanced smart grid technologies will revolutionize how energy is distributed and consumed, optimizing supply and demand in real time, allowing for more effective integration of decentralised renewable energy sources into the grid.	-	+2
As the fashion industry is polluting, tracing the life cycle of a pair of jeans becomes possible.	-	+2
Ecological dimension		
Ecosystem loss and fragmentation occur due to further land conversion (infrastructures, housing, farming).	(trend!)	-3
Economic dimension		
Due to Generation Z and consecutive generations not buying into the 'work-based society' narratives, work-life balance will be a central issue at companies.	-	+2
As the fashion industry is polluting, commercials are banned, and new business models are quickly growing in the field of second-hand shopping.	+2	-

Chosen future statements as potential driving forces	Wild card	Weak signal
Political dimension		
Through the ethical imperative for equitable energy access and its consecutive legal measures, communities will insist on policies to include this perspective, making energy services accessible for all, in particular marginalised communities.	-	+2
Legal dimension		
Because of depleting finite material resources, excessive accumulation from individuals is prohibited but nations have the right to take goods and resources from individuals above a specific level to put them into a societal benefit.	-	+3
Because of environmentally forced migration crisis and decreasing liveable areas, everyone will have the same rights of living.	-	+3
Ethical dimension		
Ethical consideration leading to greater respect for indigenous and local knowledge in energy practices will promote ethical energy solutions that align with cultural values and community needs and Indigenous communities are consulted and have a say in energy projects affecting their lands and resources. This respect for sovereignty will promote fairness and acknowledge the unique relationship Indigenous peoples have with their environments.	+2	-
Because of (environmentally forced migration crisis and) decreasing liveable areas, human life is prioritized over other species life.	(trend!)	-3
Demographical dimension		
Green and healthy urban ways of life will help accept the cultural diversity and openness in thinking.	-	+2
Because of digitization and advances of AI, humans develop towards transhumanism.	(trend)	-2

Table 3: Future statements as potential driving forces for the selection of axes on SEEPLED dimensions

Workshop 2 was organised in such a way that, before the first joint working phase, a short presentation was given by one of the organisers on the tasks involved in SB and the basic concepts involved. The participants got information on the definition of driving forces,

the selection method of the 2 axes for SB and the way to fill each scenario with STEEPLED dimensions, i.e. how to develop complex narratives according to the chosen axes.

The first phase was the selection of driving forces. Driving forces are those factors that seem to have low probability in the present but are likely to have a large impact in the future and that could shape qualitatively different futures from the present. This requirement is fully aligned with the concepts of wild card and weak signal statements that have a strong impact on the future. The 8-8 statements in a shared doc file were visible and readable to all during the teamwork.

In the second phase, once driving forces were selected in the two breakout groups, the axes for scenario building were selected. The two-dimensional SB method is chosen because it allows 4 alternative scenarios to be generated. This is the level at which more alternatives can be expressed, but participants are still able to quickly enter the thinking space stretched by the driving forces of each scenario and to discuss and define the main dimensions of each scenario in just over 1 hour. In this way, a draft version of the 4 scenarios can be produced through collaborative and online work. The axes were chosen by joint reflection by the participats, divided into two rooms, from among the driving forces to be considered. The first step of this process was to formulate and recommend two versions of each driving force to the facilitators working with the experts, representing one positive and one negative possible interpretation of the driving force in question. From this starting point, the experts could easily move on to further interpret and choose between the different axes of the driving forces. From the selected driving forces, axes could be drawn. The positive and negative formulations of each statement (giving the positive and negative endpoints of the axes) were given by the participants, and then selecting two of them. The selected axes were fixed after discussion among the participants in the rooms and with the agreement of the participants. The rooms thus worked separately from the beginning to the end of the process. The axes were selected and named, and each scenario was given a short and accurate name.

2. Preparation of the short version of complex scenarios

Once, the axes were decided upon in the two groups, the participants' task was to discuss the STEEPLED dimensions of the logical thought spaces associated with each of the two-dimensional quadrants and to define their main characteristics. One of the facilitators also wrote them in a blank whiteboard file (https://webwhiteboard.com/) to note down the selected axes, the names of the plane quarters (the names of each scenario) and then the main terms of the STEEPLED dimensions of the 4-4 scenarios. The blank whiteboard for SB process that both rooms were given looked like Figure 3. The titles of each scenario were also created by the participants during Workshop 2.
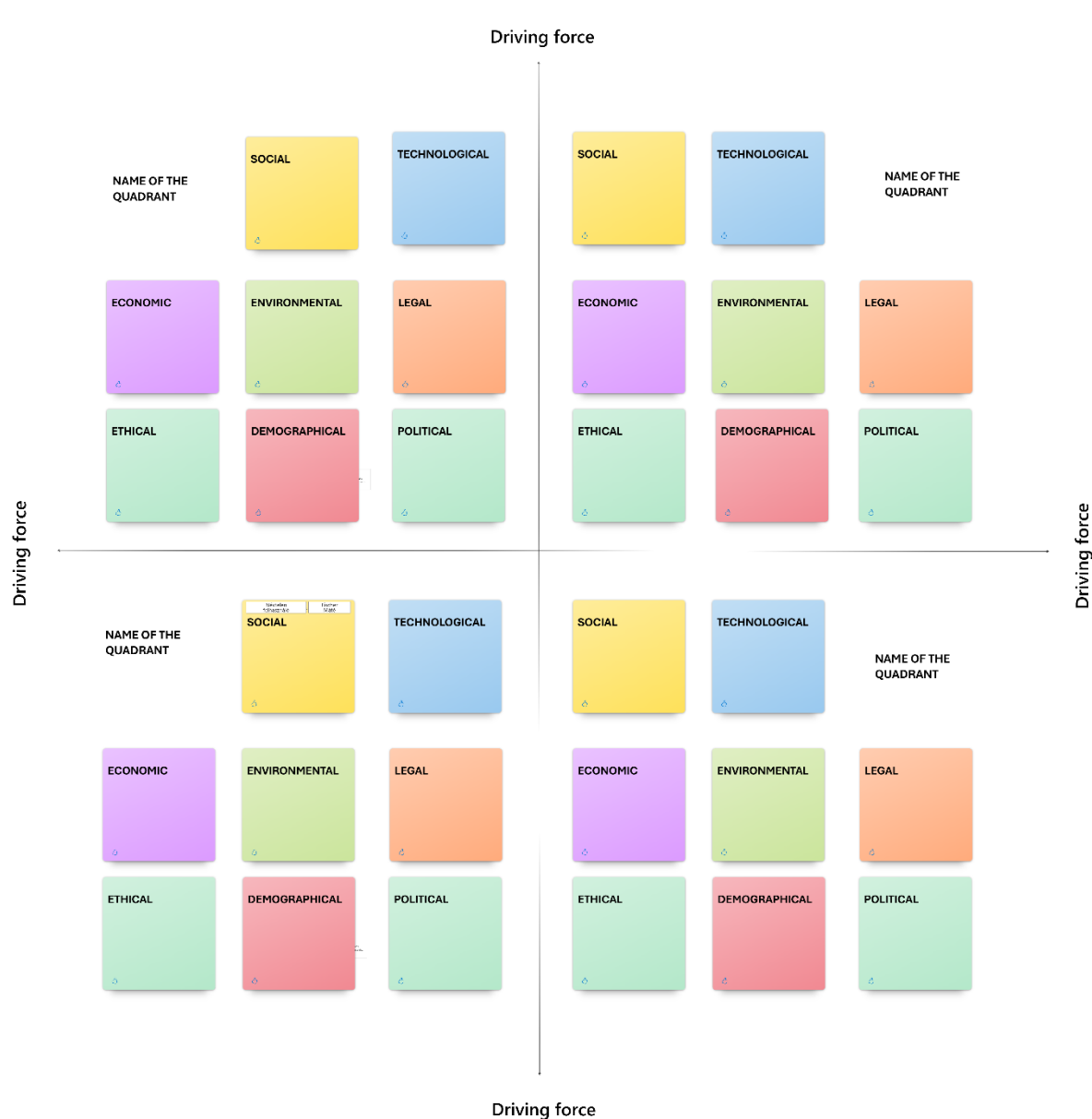
Figure 3: Blank Whiteboard for drafting the scenarios

A wordcloud (see Figure 4) based on the future statements was prepared to help participants make associations on the potential content of the scenarios.

Figure 4: Word cloud of future statements

The first version of narratives of the scenarios was prepared by the researchers. To do this, they made use of the sketches made with Whiteboard, the recorded audio of the workshop and the Perplexity AI-based software (https://www.perplexity.ai/). The prepared narratives of about 20 sentences were further expanded and written by the participant groups in the first part of the subsequent Workshop 3. Hence, in total, 8 complex scenarios were prepared, covering the range of futures that are possible, new and creative, and are different from the consequential futures.

In Workshop 3, the 8 scenarios were revisited and, from some aspects, further completed, enriched, and finalised. In the next phase of Workshop 3, four scenarios were selected from the 8 finalised ones by the MAPS researchers to be evaluated by a wider group of experts with an e-Delphi method. The selection of the four scenarios was dominated by the criterion that they should cover as much as possible post-growth ideas and contexts that facilitate and hinder their implementation. For example, while Vibrant Consumption takes place in a society that is democratically advanced and relies on participation, as it only intensifies resource use, it is a less appealing scenario for post-growth to understand. Similar with Tech Bro capitalism: as currently business ethics revolves around individual gains and has little respect for diversity, it is something that post-growth literature has criticised a lot already and choosing this for further elaboration would add little to our understanding of post-growth futures beyond what we already know. As we already had a negative scenario of Autocratic Collapse, it Technically, the selection of the 4 scenarios was done through online voting by experts. The final phase of Workshop 3 was devoted to define the types of experts who should be involved in the e-Delphi process enriching the four scenarios.

Results of Scenario Building workshops

The first groups' resulting quadrants can be seen from Figure 5.
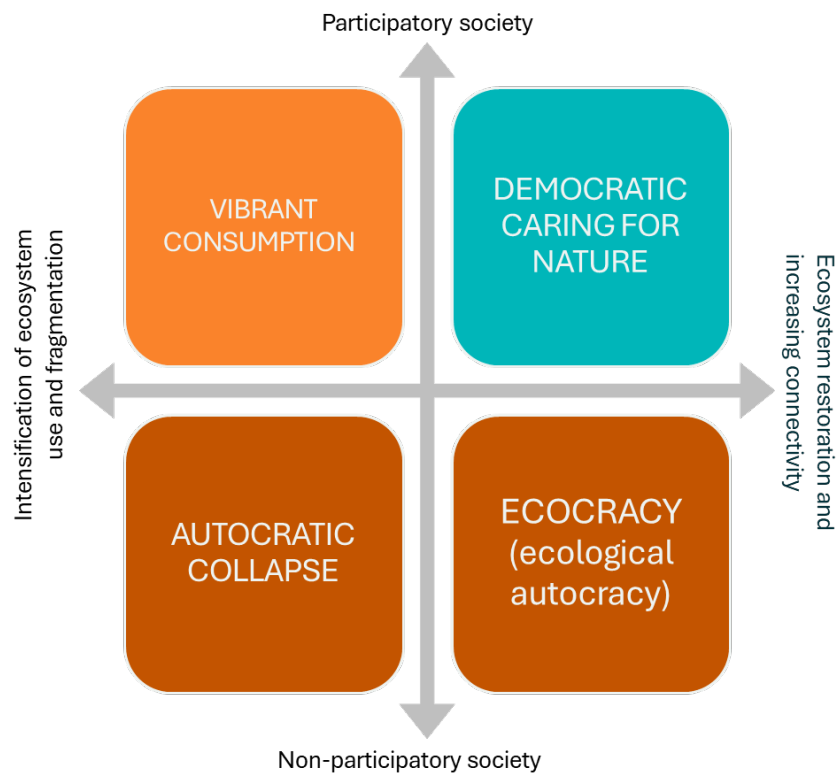
Figure 5: Quadrants along participation and ecosystem use

The choice of driving forces, i.e., axes, was shaped by the following strong opinions in the group. To achieve post-growth, social changes are absolutely necessary, and among them are those that are initiated and/or accepted by broad sections of society. If this change towards post-growth is only implemented by a thin elite, it will not be socially acceptable, although it may still be useful. These two formulations also imply two different ways of social functioning. One is a bottom-up and participatory society and the other is a top-down and top-driven society. In the first case, civic initiatives must play an important role in transforming society, while in the second, society remains passive. Top-down and good governance for the benefit of the community can also be effective in terms of post-growth if it can manage public goods and natural resources in a way that is both economical and enhancing. It is also possible that there will be no societal shift, but that growth-oriented capitalism will continue to prevail, because both members of society and governments agree on this in the future.

For the possible ecological axes, not only the improvement of the ecological situation was considered, but also the ecological restoration. If this is accompanied by a change in the interest and ethical perception of society, it could also be a leitmotif for social movements that could transform the functioning of the economic and political spheres, as well as legal regulation. Nor should we forget the expansion of technological possibilities, which can also contribute greatly to ecological restoration. It all depends on the purpose for which the technology is developed. It can be ecology-centred, but it can also remain growth-centred, which will not help the spread and implementation of post-growth.

Resource constraints may also emerge when people prefer a more equal standard of living, but they can also happen when natural constraints come into play. In the case of the latter, even social discontent and movements can be strengthened, and even the defence of one's own resources and natural values. This can be interpreted either country by country or for the planet as a whole. This may also mean that non-human creatures will not have the same rights as humans to use nature. These are not just political and economic issues, but also ethical issues, which can be organised around a range of values. They may still be selfish human and local values, or selfish but global human values, or they may be organised around the right to life of all living things.

At the end of the debate, a vote was taken to decide which of the two axes would be used to create the scenarios. These were participatory vs non-participatory civil society and ecological restoration vs further intensification of the use of ecosystems. (See Figure 5) Although the figure shows the individual quadrants defined by the axes as planes, they also express the imaginable, conceivable social space through their STEEPLED dimensions, the content of which was co-created by the experts during the collaborative work (See Figure 5).

1. VIBRANT CONSUMPTION scenario

The first quadrant is a scenario called VIBRANT CONSUMPTION – Democratic transgression of planetary boundaries –, which is situated in a conceptual space bounded by the axes of a participatory society and the further intensive use of ecosystems. Its outline content along the STEEPLED dimensions is as follows:

- The main feature of the social dimension is the maximisation of consumption, which can be achieved through the coordinated action and efforts of the different institutions and actors in society. At the same time, however, it does not attach importance to the rational management of natural resources, but will pursue their further, community-based exploitation.
- The technological dimension will also serve to make consumption more efficient, while increasing the rebound effect.
- The economic dimension focuses on meeting basic needs by providing basic income and maintaining profit orientation. The economic sphere does not take into account the natural barriers to consumption growth, but it does seek to meet social needs to the maximum.

- The environmental dimension will be characterised by an increasing exploitation of natural resources. Society is aware of the rapid decline in ecosystem services and will replace them with technological solutions.
- The political dimension will be characterised by the spread of increasingly deliberative participative processes, whereby citizens are increasingly involved in decision-making processes. This may become a key operating principle, together with the possibility for policy directions to diverge from the actual legal norms.
- In the legal dimension, the central theme is the regulation of the right to consumption and its accessibility for all people.
- The ethical dimension is also at the service of high and growing consumption. It prioritises the present over the future. Neither society nor citizens are concerned about the future. An anthropocentric ethical conception is seen as appropriate and natural.
- The demographic dimension will give priority to the regulation of migration in all its dimensions. Thus, population movements between town and village, but also immigration and emigration at the national level will be regulated to meet basic needs.

Text Box 1: Short final narrative of VIBRANT CONSUMPTION

This scenario is fundamentally shaped by two dominant forces: ecosystem impact, specifically the extent of its use and division, and the level of community involvement. It sits squarely in a place defined by high ecosystem exploitation and low interconnectivity, coupled with a strong societal aspiration for participatory governance. This scenario portrays a social system where planetary boundaries are knowingly pushed, with democratic approval. It's characterized by a concerted societal drive to optimize consumption, potentially even advocating for increased spending and resource utilization. Workers have decision-making power in the corporations that they work for and share in the profits (i.e., economic democracy), which is in pursuit of economic growth. It's a profit-driven system but with an extensive welfare state (including policies such as basic income) to ensure everyone has sufficient income to maximise their individual consumer activity.

This scenario is defined by significant natural resource extraction, based on the conviction that technology can adequately compensate for diminished environmental services. Technological advancements are strategically employed to boost consumption efficiency. Short-term efficiency gains go towards increasing production, creating an endless cycle of growth. Demographically, it involves managing population movement between rural and urban centres. Vibrant consumption highlights inclusive and participatory decision-making, ensuring citizen involvement, although its policy orientations differ from conventional conservative approaches. It enshrines a right to consume, formally integrating it into the framework of society. High consumption is seen as normal, prioritizing the present needs and desires while embracing a human-centred perspective. A hyper-individualist society (where everybody is able to participate in excessive consumption) could exacerbate both individual mental health issues (such as loneliness, isolation, etc) and societal problems (incoherence, intolerance, hate).

This scenario is a continuation of climate colonialism and unequal development by countries in the global North at the expense of those in the global South. Carbon budgets, resources, and materials are channelled towards further overconsumption in wealthy nations, preventing development where it is needed in the global South. There is a need for an early warning system to monitor natural dangers.

2. DEMOCRATIC CARING FOR NATURE scenario

In the second quadrant is the DEMOCRATIC CARING FOR NATURE scenario, which is located in the conceptual space delimited by the axes of participatory society and ecosystem restoration. Its outline content along the STEEPLED dimensions was as follows:

- The main feature of the social dimension is that inequalities will depend on who contributes to ecosystem restoration.
- The technological dimension will also be linked to the goal of restoring nature. It will be particularly important that digital platforms reinforce voluntary attitudes.
- In the economic dimension, the aim will be to limit consumption. Overconsumption will be eliminated, but in a democratically accepted way.
- In the environmental / ecological context, the central issue is the restoration of agro-ecological practices, which will also involve redefining the place of humans in the functioning of nature. As a result, the extent of protected areas will increase.
- The political dimension will be permeated by a shift to a deliberative and participatory process organisation. As a result, citizens will be involved in all decision-making processes.
- The central issue of the legal dimension is the regulation of the right to life of humans and non-humans.
- The central task of the ethical dimension will be to promote eco-centred and efficiency-centred ethics.
- In the demographic dimension, the spread of voluntary human reproductive control is expected, regulated by environmental awareness.

As this scenario was enriched in the e-Delphi process described below, for the sake of clarity, we are not presenting the different developmental stages of the scenario and hence we are including here the short version of the scenario that was first devised in the Workshops with MAPS experts and later enriched by a wider range of experts. The long version can be read in Annex 1.

Text Box 2: Short final narrative of DEMOCRATIC CARING FOR NATURE

Ecological Restoration and Stewardship

Citizens actively participate in ecosystem restoration, recognizing nature as a core societal value. Biodiversity becomes a key indicator of well-being, and collective action eliminates threats like pollution and industrial agriculture. Ecological recovery supports climate goals and fosters a fairer, more inclusive society.

Sustainable Welfare and Economic Transformation

Well-being is redefined holistically, encompassing both material and immaterial needs. A decommodified economy ensures universal access to essential services, while democratic processes guide infrastructure development. Consumption is sufficiency-based, with reuse, repair, and ethical production replacing overconsumption and corporate-driven growth.

Democratic Governance and Legal Reform

Governance is decentralized and participatory, with citizen assemblies shaping decisions across all levels. Legal systems evolve to recognize the rights of non-human beings and dismantle exploitative capitalist structures. Subsidiarity and ecological realities guide place-based lawmaking, ensuring justice and integrity.

Localized Trade and Economic Justice

Global trade is minimal and purposeful, coordinated by localities exchanging only non-local goods. Bioregional strategies within the EU promote renewable innovation and fair trade with the Global South. Colonial legacies are addressed through local production, high-skill labor, and transparent policymaking.

Work, Labour, and Ecological Contribution

Labour is democratized and redefined as care—both paid and unpaid—that supports people and ecosystems. Jobs focus on essential services and restoration, with reduced working hours and state-supported guarantees. Social value replaces monetary wealth, and inequalities are minimized through fair welfare systems.

Education, Technology, and Information Access

Education fosters ecological awareness, futures literacy, and democratic engagement. It is free, inclusive, and rooted in creativity and practical knowledge. Technology serves the common good, with AI and digital tools enhancing transparency, sustainability, and public participation. Information access is universal and supports civic learning.

Culture, Sport, and Media

Sport promotes health and inclusion, moving away from nationalism and spectacle. Resource-intensive facilities are repurposed for low-impact activities. Media consumption shifts from individualism to collective engagement.

Conclusion

This scenario envisions a society where democracy, ecological care, and social justice are deeply intertwined. Through participatory governance, sufficiency-based living, and inclusive innovation, citizens co-create a regenerative future that respects both human and non-human life. It is a world where well-being is relational, rights are extended, and prosperity is measured by our collective contribution to the planet.

3. ECOCRACY scenario

In the third quadrant is the scenario ECOCRACY – Autocratic ecology which is located in the conceptual space bounded by the axes of non-participatory society and ecosystem restoration. Its outline content along the STEEPLED dimensions is as follows:

- The social dimension will be characterised by high income inequalities, because the new social elite will only be interested in the restoration of nature.
- The technological dimension will also serve this purpose, so extensive satellite monitoring systems will be developed to control land use and non-ecological land use will be fined.
- In the economic dimension, the restriction of consumption will be enforced, and the eco-centred elite will force the use of unpaid labour to restore nature.
- In the environmental / ecological dimension, the focus will be on increasing the almost uninhabited protected areas. This will impose severe restrictions on private land and public land if it is only for human well-being.
- The political dimension focuses on the one hand on the suppression and repression of social uprisings and on the other on the development and implementation of the green agenda. It will not address social apathy and will not involve experts in policy shaping.
- The legal dimension will do its utmost to get companies involved in nature restoration. To this end, the mandatory use of private profits for environmental restoration will be legally defined.
- In the ethical dimension, the change will be to the extent that even disadvantaged age groups will accept that nature restoration should be carried out at the expense of human well-being.
- The demographic dimension will revolve around strict control of human population processes, which will be subordinated to the goals of natural restoration.

As this scenario was also enriched in the e-Delphi process described below, for the sake of clarity, we are not presenting the different developmental stages of the scenario and hence we are including here the short version of the scenario that was first devised in the Workshops with MAPS experts and later enriched by a wider range of experts. The long version can be read in Annex 2.

Text Box 3: Short final narrative of ECOCRACY

This scenario explores a range of dystopian futures shaped by an authoritarian green agenda, where ecological restoration is prioritized above democratic values, social equity, and human rights. While environmental goals are largely achieved, they come at significant social, political, and ethical costs.

Ecocracy and the Decline of Democracy

A governing elite enforces large-scale ecosystem restoration without public consent. Civil liberties are suppressed, consumption is strictly regulated, and dissent is violently controlled. Biodiversity thrives, but democratic participation collapses.

Eco-Aristocracy and Economic Inequality

Wealth concentrates among an eco-elite who profit from ecological finance and control. The majority are marginalized, and public investments in social welfare decline. Resistance is fragmented and ineffective, reinforcing authoritarian rule.

Surveillance and Technological Control

Technological innovation, especially AI, is directed toward environmental monitoring. Workers are displaced, demand falters, and inequality grows. The elite use surveillance to enforce ecological compliance, sidelining broader societal needs.

Fiscal Constraints and Private Capital Dominance

Governments face shrinking revenues and rely on private capital to fund ecological goals. Public spending is limited by outdated economic models, and austerity measures deepen inequality. Environmental policy dictates economic restructuring.

Forced Ecological Labour and Social Exclusion

Citizens perform unpaid ecological labour under coercion. The elite make decisions, while the working class executes them. High unemployment, misallocated investments, and superficial AI solutions create a cycle of stagnation and unrest.

Green Business Ethics and Dual Societies

Businesses are incentivized to reduce production and redirect profits to restoration. Monopoly power grows, and social unrest intensifies. A dual society emerges, where the elite enjoy privileges while the marginalized face repression.

Ecosystem Restoration and Global Trade Decline

Ecosystem restoration reshapes land ownership and public investment. Democratic decline and fiscal constraints, especially in the Eurozone, limit infrastructure spending. Monopoly firms dominate, and inequality across classes and regions deepens.

Accumulation by Conservation and Climate Colonialism

Land is expropriated for conservation, displacing Indigenous communities. The elite use climate science to justify authoritarian rule and suppress liberties. A net-zero ideology replaces democratic governance, prioritizing elite survival.

Carbon Budgets and Suppression of Freedoms

Strict carbon budgets are enforced through surveillance. Elites retain consumption privileges, while citizens face restrictions. Sports, travel, and expression are regulated. Climate change is mitigated, but human rights are sacrificed.

Green Legalism and Knowledge Control

A green legal system enforces compliance without regard for individual beliefs. Education indoctrinates youth into green ideology. Vulnerable groups are excluded, and dissent is punished. The system infantilizes citizens and risks backlash.

Demographic Control and Racialized Exclusion

Migration and birth rates are tightly controlled. Racist and classist policies target poor and racialized communities. Human rights apply only to EU citizens. The elite preserve gated communities while others face displacement and repression.

Climate Colonialism and Global Financial Inequality

Education and law reinforce elite control. Indigenous stewardship is erased. Global trade declines, and monetary asymmetries persist. Elite central banks coordinate liquidity, excluding peripheral nations. Biodiversity is valued over human lives.

Conclusion

This scenario warns against the dangers of pursuing ecological goals through authoritarian, exclusionary, and inequitable means. While environmental restoration is critical, it must be balanced with democratic participation, social justice, and respect for human rights to ensure a truly sustainable and inclusive future.

4. AUTOCRATIC COLLAPSE scenario

In the fourth quadrant is the scenario called AUTOCRATIC COLLAPSE, which is situated in the conceptual space of a non-participatory society and further intensive use of ecosystems, bounded by axes. Its outline content along the STEEPLED dimensions is as follows:

The outline of this scenario draft was the least completed because time was short, and the last remaining scenario did not capture the imagination of the experts because it essentially involves the survival of the status quo. No mention has been made of the technological, legal, or political dimensions of the scenario.

- The social dimension will be an ignorant society that does not care for nature or its citizens, does not involve them in decision-making and does not seek to inform them. In fact, it is the maintenance of the status quo that should not be changed in the future.
- In the economic dimension, business as usual practice continues, but the forced implementation of growth-oriented business management also allows for the breaking of traditional business rules.
- The environmental/ecological dimension is subordinated to the continued and intensified exploitation of natural resources, which will result in further accumulation of environmental damage and environmental disasters.
- In the ethical dimension, there is no change in the present orientation, but ethics is becoming more differentiated in societies depending on how inequalities affect social and age groups. However, these differentiated ethics may not manifest themselves in social practice.
- In the demographic dimension, the control of human population processes is shifting towards imposed and enforced political solutions.

However, it was the most often selected scenario among the e-Delphi experts, hence its narratives are being well developed in the next phase of the work.

As this scenario was also enriched in the e-Delphi process described below, for the sake of clarity, we are not presenting the different developmental stages of the scenario and hence we are including here the short version of the scenario that was first devised in the Workshops with MAPS experts and later enriched by a wider range of experts. The long version can be read in Annex 3.

Text Box 4: Short final narrative of AUTOCRATIC COLLAPSE

Environmental Breakdown and Resource Exploitation

The scenario begins with the intensification of ecosystem degradation, where all planetary boundaries are crossed. Practices like deep-sea mining and fossil fuel extraction continue, driven by elite interests, despite growing awareness of long-term risks. Sacrifice zones emerge, disproportionately affecting vulnerable regions and populations. Climate change accelerates, causing extreme weather, food insecurity, and climate migration—both into and within the EU.

Technological innovations such as genetic engineering and geoengineering are deployed, but primarily serve geopolitical and military interests, not ecological restoration. Biodiversity becomes a human-managed equilibrium, and environmental protection is limited to elite-controlled areas.

Political Decay and Authoritarian Governance

Democratic institutions are hollowed out, replaced by plutocratic and autocratic regimes. Elections persist but offer no real choice, serving as façades for elite control. Civil liberties, media freedom, and judicial independence are eroded. Surveillance, censorship, and propaganda dominate public life, and intergenerational justice is abandoned.

The EU remains formally intact but is politically fragmented and weakened. Populist and authoritarian leaders gain power, undermining democratic norms and suppressing dissent. Legal systems are manipulated to serve elite interests, and rule of law becomes arbitrary.

Economic Inequality and Consumption-Driven Society

The economy is driven by mass consumption and profit maximization, with low-quality goods for the majority and luxury items for the elite. Consumer behavior is manipulated through targeted advertising and data-driven marketing. Debt crises and economic instability are common, especially among disadvantaged groups.

Production systems prioritize speed and volume, generating waste and environmental harm. Recycling is abandoned except by impoverished communities. Economic growth becomes unsustainable, and capital shifts toward defensive asset accumulation. Defence and arms industries thrive, while other sectors stagnate.

Labour Exploitation and Social Fragmentation

Labour becomes extractivist and exploitative, with AI replacing skilled jobs and manual labor performed under unsafe, surveilled conditions. "Bullshit jobs" proliferate, while socially valuable work like caregiving is unpaid and gendered. Vulnerable groups are pushed into modern slavery-like conditions, with no union representation or legal protections.

Public institutions collapse, and social protection systems are dismantled. Access to basic needs—food, housing, healthcare—is determined by market forces and elite control. Wealth inequality intensifies, driven by inheritance and privatization of essential resources.

Mental Health, Education, and Information Control

Mental health deteriorates across all age groups, exacerbated by existential distress, drug abuse, and lack of support. Health is reduced to economic productivity, and wellbeing is neglected. Sports are used for entertainment and geopolitical display rather than community health.

Education is defunded and privatized. Universities become elitist, promoting conservative ideologies. AI replaces teachers, and critical thinking is suppressed. Information is censored and manipulated, with AI-generated content flooding media channels. The digital divide grows, leaving vulnerable populations in "information blind spots."

Demographics, Reproductive Control, and Neo-Colonialism

Population control policies reflect ethnic and cultural biases, undermining reproductive autonomy. Fertility rates decline due to lifestyle pressures and ineffective pro-natalist policies. Migration is restricted, while resource extraction from the Global South continues.

Neo-colonialism intensifies, with militarily powerful nations securing resources through coercive trade and military intervention. Global monopolies dominate supply chains, and land grabbing for AI infrastructure expands. Even within the EU, internal colonialism emerges, sacrificing peripheral regions for elite interests.

Conclusion

This scenario paints a future of deep inequality, ecological collapse, and authoritarian control, where technological advancement serves elite power rather than public good. Democratic institutions, social protections, and human dignity are eroded, and the promise of equitable justice becomes increasingly unattainable.

The long version of the senario narratives are presented in Annexes.

The second groups' resulting quadrants can be seen from Figure 6.

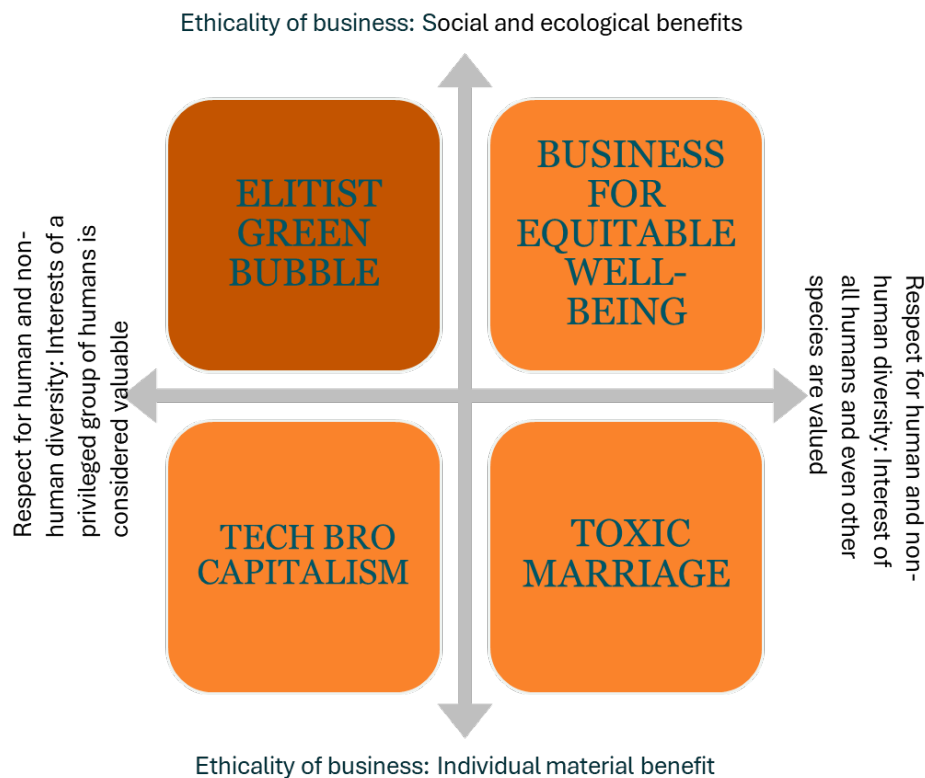Ethicality of business: Social and ecological benefits

Figure 6: Quadrants along participation and ecosystem use

The choice of driving forces, i.e. axes was shaped by the following strong opinions in the group. Experts attempted to form possible axes based on the limited access to AI and energy and the transition to unlimited access. The latter could be modified in the field of energy so that renewable energies would be accessible to everyone. The decisive character of these two essentially technical axes was rejected on the grounds that experts could then express their ideas in line with the alternative scenario in each scenario. From the perspective of an environmentally sensitive or sustainable future, it is not enough to limit the possibilities for change embodied in the axes to technical and material aspects alone. In addition, the axes must also express that they point to broad and comprehensive systemic changes.

The experts found the narrowing of production to the fashion industry too restrictive. They argued that every industry can have characteristics that are typical of the fashion industry. Conversely, in this context, the fashion industry means the contemporary forms of industrial activities and products that are made and bought for their fashionability or smartness. If we interpret the fashion industry broadly, then one negative end of the axis would be the continuation of its current environmentally damaging practices and disposable mindset. At the other end of the spectrum, it should be emphasized that the manufacturing sector should operate in such a way that life cycles can be tracked, unnecessary advertising that is not based on accurate information should be eliminated, and consumers should be informed and aware so that they strive to increase their well-being and protect their environment. Pollution in the industrial

sector should be transparent, and sectors should strive to reduce all forms of pollution. Ultimately, experts have outlined a new business model that they consider not only desirable but also necessary to achieve sustainability. This line of thinking has led to the emergence of the business model change or the pivotal role of its absence. In the business model shift, experts emphasized the renewal of business ethics, because it could renew not only the material product producing sectors, but also the driving force and form of implementation of all kinds of business activities.

The experts also thoroughly examined the importance of indigenous knowledge and value systems. Many concluded that this would lead to greater cultural diversity and would accept it as a pivotal force. However, the rule is that scalable axes must be chosen from two different dimensions. Absorving into indigenous knowledge and cultural diversity, the idea arose that in many local cultures, indigenous peoples recognize nature and its manifestations, as well as non-human species, as similar to themselves. This idea would have a place in cultural diversity if today's dominant cultures became more open and inclusive. And if we consider the spread of these ideas to be important and useful in shaping a sustainable future, then they should also be reflected in the legal system, as expressed in the second part of legal dimension of plausible future statements. To quote verbatim, 'everyone will have the same rights of living.'

At the end of the debate, the experts unanimously accepted the two axes on which they then built their four scenarios. These were every living being's right to live vs. humans having a privileged right to live compared to other species, and business ethics focusing on individual material well-being vs. social and ecological benefits. (See Figure 6) Although the figure shows the individual quadrants defined by the axes as planes, they also express the imaginable, conceivable social space through their STEEPLED dimensions, the content of which was co-created by the experts during the collaborative work.

5. BUSINESS OF EQUITABLE WELL-BEING scenario

In the first quadrant is a scenario called BUSINESS OF EQUITABLE WELL-BEING, which is situated in a conceptual space bounded by the axes of a business ethics characterised by goals for social and ecological benefits and every species have equal rights. Its outline content along the STEEPLED dimensions is as follows:

- In the social aspect, prestige will be given to those who will contribute to the essential well-being of society and nature at the same time. The positions gained from the fashion industrial circumstances will go backwards.
- The technological development will serve the ecological restoration and the sufficiency of consumption. The green technologies will be a priority.
- Business will have social and ecological responsibility, and it will serve collective, common and ecological goals. Business will help the dissemination of green technologies.
- The quality of natural environment will improve by using ecological restoration in a wide range and by neutralising the impacts of climate change. As a result, the economy and society will be embedded in the natural and ecological environment.

- All stakeholders have equal right to participate in significant social and economic decision including representation of future generations, indigenous peoples and non-human beings.
- In political systems equal legal rights are guaranteed for every species.
- Social, ecological and multispecies well-being become overarching ethical principles which also come to dominate the social, economic and political life. This ethical renewal will be full of all society.

Text Box 5: Short final narrative of BUSINESS OF EQUITABLE WELLBEING

In this highly optimistic scenario, the global population has reached a consciousness where the interests of all humans and even other species are valued and the respect for human and non-human diversity is highly appreciated. At the same time, business serves collective social and ecological benefits, and the ethicality of business aligns with these aims. This situation strengthens the spheres of the economy, society, and the environment, and new ethical business models are quickly spreading around the globe.

In society, individuals are praised for their contributions to the well-being of others. Prestige is awarded to those who make significant contributions to the common good. Social recognition is no longer granted (only) via monetary compensation, but the value of work is determined by how it contributes to societal flourishing/equitable well-being. The entire economy contributes to social and ecological benefits and promotes multispecies equity. Businesses have a social responsibility and work for the collective benefit of the community as a whole. All companies should prioritise these values. The entire economy is organised in democratic provisioning systems and more local cooperatives, which are embedded in and thereby inherently connected to the community.

The economic system is no longer a capitalist growth paradigm, but we are in post-capitalism. To avoid the conflicts over the surplus between different sectors of production (e.g. agriculture, manufacturing, services, etc) and the groups of society specializing in each, the remuneration for one's work should be divided into two parts, one part linked to their own activity and another which would be from a common pool of surplus accumulated from all sectors of society. Care is recognized as a sphere foundational for equitable well-being. It is no longer gendered (and racialized), but everyone contributes care to the sustenance of human and more-than-human flourishing. Due to more attention to the links between humans and other species and having healthy contact between them, diseases are less prevalent, and all species are in better health. People in positions of power rotate, so that hierarchies that might still exist are counteracted. All people affected and connected to those entities have decision-making power in those entities (consumers, local residents, all steps from the 'supply chains').

The embeddedness of the economy and society with ecology has been successfully realised. Planetary boundaries, such as carbon emissions and waste, are now respected in economic and social operations. The discourse has shifted from referring to the ecosystem as "the environment" to recognising it as a life support system and emphasising our relationships with other species.

The dichotomy between urban and rural is less present as people value living among other species. Humans also withdraw from some regions of the world to avoid harming biodiversity. The circularity of the economy and sufficiency are both very important principles. People are informed and aware of their environmental footprint and are rewarded for and value decreasing their footprint. Inheritance tax is set to very high levels, to reduce the incentives for wasteful accumulation of resources by successful individuals. Banning of second homes. Technological development and deployment are aimed at achieving social and ecological goals. This development supports collective needs in a manner that promotes equity and sufficiency. A focus lies on 'convivial technology', which is shared. The legal rights are guaranteed for all species and the environment. Moreover, all stakeholders have an equal voice in important social and economic decisions, including representation for future generations and non-human beings.

The well-being of society and more-than-human flourishing becomes an overarching ethical principle that also dominates the economic, political, and social spheres.

6. TOXIC MARRIAGE scenario

In the second quadrant is a scenario called TOXIC MARRIAGE – a market economy is an eco-social corset, characterized by contradiction, dissonance, and despair – just like in a toxic marriage – , situated in a conceptual space bounded by the axes of business ethics, which prioritizes individual material well-being, and the equal rights of every species. Its outline content along the STEEPLED dimensions is as follows:

- There are huge differences within society, leading to growing tensions and activities that disrupt the system. Contradictions and dissonances strengthen the despair. Mental problems are emerging because of conflicts in social and economic life.
- The development of technology is still serving non-sustainable purposes, but bottom-up approaches are needed to be relevant. Technologies for ecosystem restoration and sparing use of natural resources will be under business control.
- The market economy stays in a dominant position. Its main goal is to increase profit by using more and more natural and human resources. The market economy is working in an ecological and social corset, but without strong regulation.
- Environmental protection and conservation are working under profit control. Enterprises are freely making decisions concerning nature.
- In the political sphere, society is working nominally in a democratic way, but politics are strongly dictated by lobbying interests.

- The business sphere is not regulated; therefore, tensions and conflicts are emerging between democratic control and business logic.
- The legal system is based on eclectic law principles in which the market is unregulated, and some sphere of social life is well regulated.
- Environmental protection will also be regulated. The tensions in the field of regulations can be perceptible. At the big normative level, the ethical revolution in which the other species' rights exist is accepted. The ethical aspects of the experiment concerning actual practice do not align with the ethical principles.
- There will be a lot of migration because of the degradation of the local natural and social environment. Ethnic diversity will be a fact, and social rights are broadly respected.

Text Box 6: Short final narrative of TOXIC MARRIAGE

In this highly controversial scenario, the global population has reached a state of consciousness where human and non-human diversity is broadly respected, and attention is given to the interests of all humans and even other species. However, business practices have not evolved beyond the pursuit of individual, material gains over collective, social, and ecological benefits. This tension manifests in various aspects of life. While the dominant cultural narrative promotes respect for others, this remains superficial, as production and consumption patterns continue to reflect utilitarian values.

The economy retains its capitalist foundation, albeit with increased redistribution and environmental regulation. Profit still takes precedence over social considerations, albeit somewhat constrained by ecological concerns. Capital and technology predominantly serve profit-making purposes, though bottom-up approaches gain relevance. These dynamics conserve old business practices but tries to offset its damages as far as possible. Political systems remain nominally democratic but are heavily influenced by corporate lobbying. As businesses are still not strongly regulated, there is continuous friction between democratic control and business interests. These economic processes retain the high differences within society and ecology as well. More people are in precarious jobs and while ethnic diversities and civil rights are being fully respected.

As only caring about nature on a narrative level but not respecting it fully on operational levels has not stopped the disruption of ecosystems, migration from destructed areas is on the rise. Such conflicting and controversial values lead to mental problems for many. Activism that tries to disrupt the system is increasing. Social and ecological disparities persist, with growing economic inequality despite respect for ethnic diversity and civil rights. Class gradients are increasingly pronounced, precarious employment increases. There are increasing natural reserves that are supposed to offset the damage done in other parts of the ecological environment where business as usual still presents ecological problems that fuel migration from destructed areas.

The dissonance between sustainability rhetoric and unsustainable practices contributes to widespread mental health problems. Consequently, social activism gains momentum, challenging the status quo.

Activism rises from burn-out and reevaluating what we want. Interest of all humans and other species are respected but when implementation is not happening, activists are not accepting this. Communities based on differences no longer exist but organise themselves around shared realities. Those experiencing the destruction want to mobilise.

In formal terms there is equality in rights. What we don't have is substantial equality. It is a social-democratic system, the state provides for the minimum. But the state institution is still being influenced by business. Providing minimum but not the maximum means that it is not lacking in meeting basic needs, but it is lacking the idea of sufficiency because of the profit-seeking motive. The legal foundation is there but the implementation of the rules are not (like when gender issues are being sidelined when women at the top suggest others can also make it to the top). It is not questioned how we measure the success of implementing the rules that show the respect we feel. The time use is not sustainable as people are overworking because it stems from this narrative of being able to reach any success. Care work is still marketised.

We are tolerating business, focusing on individual gains, because we have not transcended the narrative of competition. Allowing people to compete has the best results for the market.

7. TECH-BRO CAPITALISM scenario

In the third quadrant is a scenario called TECH-BRO CAPITALISM – Privileges with individual material benefits, which is situated in a conceptual space bounded by the axes of a business ethics characterised by goals for individual material well-being, and humans have privileged rights compared to other species. Its outline content along the STEEPLED dimensions is as follows:

- The wealth will be more concentrated so the society will be more polarised. It makes possible to develop casts differences from the class inequalities.
- The development of technology will become faster. These technologies oppress other species, cause more and more damage in nature, and serve only for profit-making. The application of AI will be widespread.
- The wealth is concentrated only in the hands of a few monopolies. The real business will be the business of business.
- Exploitation and destruction of natural environment will go on despite of increasing wealth of society. It means that people do not mind the degradation of their environment. They want to consume more and more.
- The political sphere intervenes only seldom in the spontaneous processes.
- The legal system does not regulate the market; the environmental protection does not also give rights for nature and other living species.

- Ethics stays selfish and human-centred that makes possible to exploit and destruct the nature.
- Groups of cyborgs will emerge and the number of marginalised groups in the society will increase.

Text Box 7: Short final narrative of TECH-BRO CAPITALISM

In this highly pessimistic scenario business still focuses on individual material benefits, disregarding collective, social, and ecological interests. At the same time, diversity is not respected: neither in humanity, nor in the case of non-human beings, and only the interests of a privileged group of humans are considered valuable. This scenario is driven by profit orientation in a wild capitalistic economic environment, where all other aspects of sustainability are neglected.

In this scenario, wealth and economic potential is concentrated in the hands of a few: elites and monopolies. The private sector is responsible only for economic proliferation, no social or environmental charity is expected. Market regulations are minimized in the name of competition and 'natural' selection. Technology is also in the service of the privileged individuals. Those who can't afford the advanced technologies are left behind, while other species become oppressed under the realm of techno-economy. The strongly human-centred worldview means the superiority of mankind, which is allowed to exploit the natural environment. The destruction of 'useless' or 'priceless' species and natural resources is imminent due to the lack of regulations and controls on environmental protection. Likewise, laggard social groups must face exploitation.

From societies' point of view, the wealthy own the majority of financial and other goods, and they have the widest access to the most developed technologies, including cybernetic enhancements. Society is strongly polarized due to the fierce economic competition, though the system is still considered democratic to some extent. The marginalized groups are equal in principle and protected yet have low chances of catching up with the elite. We are transgressing planetary boundaries and heatwaves; extreme weather events cause sufferings to those who cannot defend themselves and are most vulnerable. The rich and privileged are building bunkers. People are increasingly angry, but they don't have the necessary means to push back. People are valued if they have value to capitalists' needs and if they are no longer useful, they are pushed to marginalised positions. There is a very weak understanding of democracy.

Parties still exist but there are no ways of actively participating in politics. Only those in privileged positions can afford to be in politics. In the deliberative practices only, those voices are embedded in the system that just mutate and never change things, and therefore, politics ceases to exist. Privileged groups own and influence the spaces where we can interact with each other, even on a personal level. We have an understanding of wellbeing that is detached from reality. Even privileged people live in ways that might not reflect them feeling good, they still suffer from the problems around them.

8. ELITIST GREEN BUBBLE scenario

In the fourth quadrant is a scenario called ELITISTIC YOGA BUBBLE (later renamed just ELITIST GREEN BUBBLE) – Privileges with social and ecological benefits, which is situated in a conceptual space bounded by the axes of a business ethics characterised by goals for social and ecological benefits, and humans have privileged rights compared to other species. Its outline content along the STEEPLED dimensions is as follows:

- In the social aspect, prestige will be given to those who will contribute to the essential well-being of society and nature at the same time. It will result in ultra-meritocracy for a few who can live in a comfortable bubble, while some other social groups will live in deprivation.
- The technological development will serve the ecological restoration and the sufficiency of consumption. The green technologies that also serve the human purposes will be priority. This type of techno-optimism makes possible to greening where you buy it, but not so much where it is produced.
- The market economy is working together for human and nature, but human is the first compering to the nature. Really, the economy will only be prosperous inside the bubble of privileged social groups.
- In the storefront the natural environment is protected, greened and restored, but its total degradation can be experienced behind the wall.
- In the political sphere democracy is working but it is essentially a fake democracy. The interest of elite groups dominates the process of policy shaping, and other groups are manipulated.
- In the legal dimension, migrants and refugees do not have the same rights as native citizens. The international and regional laws become more and more unequal. Civil rights have priority against environmental and labour standards.
- Ethically, discriminations of different types are accepted. Ecosystem is subordinated to the human concerns.
- Demographically, drastic emigration goes on therefore the borders will be closed in the name of defence of sovereignty.

As this scenario was also enriched in the e-Delphi process described below, for the sake of clarity, we are not presenting the different developmental stages of the scenario and hence we are including here the short version of the scenario that was first devised in the Workshops with MAPS experts and later enriched by a wider range of experts. The long version can be read in Annex 4.

Text Box 8: Short final narrative of ELITIST GREEN BUBBLE

Surface-Level Sustainability and Greenwashed Extractivism

Business practices appear aligned with collective ecological and social goals, especially within privileged regions showcasing green infrastructure and carbon-neutral technologies. However, these advancements are sustained through exploitative practices in less privileged areas. Greenwashed extractivism dominates, masking intensive resource harvesting and elite consumption patterns. Human life within elite zones is prioritized over non-human life and planetary health, leading to overshoot and collapse dynamics. Efficiency gains are undermined by the Jevons paradox, and biodiversity loss is sidelined in favor of elite comfort.

Social Inequality and Psychological Shielding

The gap between elites and the general population widens, intensifying social inequality. Information is restricted to a minority, fostering resentment and conspiracy theories. Elites live in psychological comfort, shielded from the external consequences of their lifestyles. Green bubbles are fortified and disguised by natural landscapes, maintaining separation and control. Health-centric lifestyles and access to superfoods become markers of wealth, while poor populations endure harsh labor and limited access to wellness. Sustainability efforts remain inconsequential in addressing global challenges.

Selective Investment and Ethical Contradictions

Economic prosperity is concentrated within elite zones, where public investment is strategically aligned with privileged interests. Green infrastructure and digital technologies are deployed locally, enhancing elite quality of life while neglecting broader systemic change. Business ethics are bifurcated—appearing responsible within elite zones but built on exploitative global production systems. Sustainability labels mask destructive practices, and legal frameworks reinforce short-term profit motives. The result is a selectively sustainable economy rooted in inequality and global exploitation.

Instrumental Ethics and Tech-Driven Inequality

Profit remains the central economic driver. Ethical businesses exist but are disadvantaged by legal systems that favor large corporations. Green products generate profit, but environmental standards are upheld for monetary reasons, not ecological values. Innovation thrives within elite zones, driven by techno-optimism and intensive R&D. However, these advancements depend on exploitative supply chains and labor conditions. The concept of innovation remains focused on market value, not worker or ecosystem wellbeing, reinforcing inequality and selective sustainability.

Techno-Optimism and Green Colonialism

Technology is seen as a panacea, but its benefits are confined to elite zones. Green products often conceal destructive production cycles, leading to global environmental degradation. AI and digital tools concentrate power among elites, while surveillance systems control marginalized populations. Media narratives highlight elite successes

and obscure systemic harm. Selective green bubbles serve business needs, with access restricted by economic value. Techno-optimism delays systemic responses to climate change, and green technologies rely on exploitative resource extraction from the Global South.

National Focus and Global Exploitation

Economic systems remain nationally focused but globally harmful. Ecological tipping points are ignored, and surface-level mitigation fails to address root causes. Workers and ecosystems are excluded as stakeholders, and data manipulation conceals true costs. Green technologies become speculative assets, benefiting the Global North while draining capital from the Global South. Production relocates to Europe, raising costs and limiting access. Waste trade exemplifies exploitation, with the Global South bearing environmental and health burdens. Climate change disrupts supply chains, and Europe secures resources through military intervention.

Legal Inequities and Stratified Wellbeing

Legal systems favor elites, offering limited protection to vulnerable groups. Redistribution is minimal and market-driven. Health and wellbeing are stratified, with elites enjoying clean environments and advanced care, while others suffer from pollution and poor access. Labour structures are rigid and hierarchical, with exploitative conditions masked by greenwashing. Green colonialism becomes normalized, and activism is suppressed. Political power is concentrated among elites, and local governments are disempowered. Migration intensifies, and border controls tighten, but demographic pressures persist. Migrants form a distinct, exploited labor class, and migration becomes a dominant political issue.

AI, Education, and the Elitist Transition Dilemma

AI and technological innovation are shaped by elite institutions, while education systems prioritize technology-driven solutions at the expense of critical disciplines like environmental studies, history, and philosophy. However, there is potential for transformation through inclusive educational practices and grassroots adoption of sustainable technologies. The paradox lies in the dual nature of progress: elite-driven innovation must be matched by cultural shifts and everyday practices to become truly transformative.

Altogether, the outcomes of the SB method were a short description of 8 scenarios along with 2-2 different axes, and 4 selected scenarios were recommended and listed by the participants for further development in the e-Delphi method by the criterion that they should cover as many as possible the post-growth ideas and the contexts that facilitate and hinder their implementation. Additionally, participants suggested topics to be covered in the e-Delphi process based on the expertise of the invited expert group.

Experts' Participation in Evaluation of Future Scenarios and Policies: E-Delphi

Methodological considerations and the research process of e-Delphi

The e-Delphi process aims to systematically integrate expert insights to authenticate and enhance future statements and critical components generated from prior horizon-scanning and scenario-building efforts, thereby strengthening the coherence and resilience of the project's developing future scenarios. The online (e)Delphi (technology-enhanced version of the same Delphi method with a more scalable, efficient, and participant-friendly version), developed and used in the foresight phase of the MAPS project, was linked to the scenario-building process developed and applied in the previous phases. The main input from SB was the 4 selected scenarios and the main aim was to enrich these scenarios with the specific knowledge and understanding of a broader community working in different fields of sustainability. This way, these narratives can be more detailed and validated by a wide range of experts. The other aim with this process was the formulation of 'if-then statements' and policies to be channelled to modelling.

If Delphi is used for foresight, then the main goal is to explore very different ideas about possible futures and activities for shaping the future (Hideg 2013; 2015). By expanding the process with Delphi, we aimed to generate further information on the desirability and political feasibility of the scenarios developed, as well as understand the relations and potential policy interventions related to them. To this end, we invited additional experts, including researchers from academia, stakeholders (such as young people and representatives from the business sector), NGOs, decision-makers, and representatives from the political sphere (see the detailed selection process below). We could only mobilize this wide range of expert and non-expert participants online through online Delphi. A separate research community has been set up to compile the input information and develop the questions, with IT specialists assisting in the online implementation of the online e-Delphi's organizational tasks.

Methodologically, we expected experts to expand and deepen the content of scenarios that they find interesting, desirable, or undesirable but highly likely to occur. We also expected experts to formulate detailed policy proposals for the implementation or avoidance of each scenario they selected. They fulfilled both expectations while also reflecting on the ideas formulated by others. All of this could be done on online platforms in an easily understandable and freely organized work process.

The details of our methodology within this phase consisted of the following main elements and work phases:

PHASES	TASKS	OUTPUTS
Workshop 3, meetings and consultations	Set up the e-Delphi platform and recruit experts to enhance the scenarios	Final expert list
e-Delphi 1st round	Experts expand the scenarios, find interconnections, and identify drivers	Further enriched scenarios Inputs for if-then correlations
e-Delphi 2nd round	Experts validate relevant if-then correlations, select existing policy measures and recommend new ones	If-then correlations Policy recommendations
Workshop 4	Arrange if-then relationships into systems maps	Systems maps

Figure 7 Work phases of the e-Delphi process

The process was carried out in four main processes: 1) as mentioned above, at the end of Workshop 3 we collected inputs as to what kind of expertise we would require in enriching the scenarios followed by meetings and consultations to find those suitable experts; 2) e-Delphi 1st round to expand and finetune the scenarios and find drivers within them; 3) e-Delphi 2nd round to validate the final versions and the relevant correlations, evaluate existing policies in terms of their relevance in the given scenario and suggest new ones; 4) Workshop 4 where CUB researchers drew up the systems map of the main post-growth scenario, the Democratic Caring for Nature. Each phase was designed to build progressively from conceptual scenario development to structured, model-ready inputs through expert collaboration and analytical refinement.

Expert selection

The e-Delphi platform was established, and a team of experts was gathered to improve the scenarios' quality and depth. Four very thorough and well-defined scenarios were created (see Annex 1-4) and chosen through collaboration and expert feedback. Each expert chose four scenarios, and then the four scenarios that received the most votes. were recommended for further development in the e-Delphi process. These scenarios served as the basis for the next steps in the process. The e-Delphi focused on translating these scenarios into structured information suitable for modelling if necessary. Initial expert meetings were held to invite and confirm participants on the e-Delphi platform, resulting in a finalized list of contributors.

The selection of experts included two steps: first, setting criteria for expert qualification and identification (Mauksch et al., 2020) in a participatory workshop within MAPS project. It means that the criteria were co-created by MAPS researchers. In practice, the first step involved identifying relevant and necessary expertise during the participatory

workshop among ten MAPS researchers. To ensure diverse opinions and representatives, the workshop facilitators instructed the participants to reflect on who should be included as experts according to the four categories: *(1) Academics; (2) Policymakers (regional, national, or European Union level); (3) Experts from NGOs/Thinktanks/Others; (4) Experts from the Private Sector.*

Second, creating a name list of experts with their contact information (e.g., name, email, affiliation) via an online survey. This online survey was sent to all members of MAPS via Microsoft Form. The framing of questions in this survey was based on the outputs of the participatory workshop in the first step. See detailed formulation of questions below:

Questions gathering information on potential Delphi participant experts
Please think of **academics**:

Please think of **academics**:

Who might have strong opinions on important topics/perspectives regarding post-growth futures.

Topics may include (not exhaustively) democratic processes (e.g. participatory democracy), legal perspectives for example on regulatory impacts, ecofeminism, technology development (e.g. AI or clean tech), finance, supply chain management, logistics and operations research, earth sciences, well-being studies, climate/environmental justice perspectives, ecological economists, political scientists, public policy researchers, post-colonial studies, public policy experts, researchers of developmental studies, intersectional researchers, post-Keynesian economists, planetary health experts.

We would also need academics who can help us discovering how the envisioned future processes may impact the global south. We would also like to involve education experts who can add their insight on how young people may participate in such futures and what kind of educational tools and technologies we need.

Please don't think of merely those academics who work on post-growth but also those who are more mainstream.

Please think of **policymakers**:

Who may have experiences, innovative perspectives, field expertise, impacts or hands-on on issues related (but not limited to) sufficiency, demand-side solutions, well-being economy, carbon neutrality, doughnut economics, social justices, inequality, social impacts of sustainability transformation related area. The person may work at the international, national, local (e.g., municipalities) levels.

Please think of people from the **private sector**, who work in/at/on:
- health sector, care sector, energy sector, or mining sector;
- technology democratization (startup, AI field, commons, opensource data);
- multinational companies, which may represent highly polluting industries such as concrete and agriculture, or different industries such as energy, atom, water, solar, etc.;
- energy communities, small cooperative that align with post-growth values;
- a representation from global south is valuable. For example, a perspective from Latin-America in the mining sector would enrich the envisioning process.

Questions gathering information on potential Delphi participant experts
It is considered ideal for the person to demonstrate alignment with values such as responsible business, ethical practices, and fair trade.
Please think of **civil society organisations** who work in the area (not exhaustively):
E.g., workers' rights, charities: child poverty, piloting basic-income project or some similar elements of post-growth, dealing with anomalies in the financing sector. The organisations/experts do not need to be explicitly post-growth just to be aligned with some values of post-growth.

Table 4: Questions for guiding expert nomination

This method resulted in long lists of potential experts with varying competences representing academics, policymakers, NGO actors and private sector stakeholders from both countries in Europe and outside Europe. Since this nomination process is largely based on MAPS researcher's professional connections, we have a high proportion of experts who have been working on sustainability issues and some of them may be inclined towards post-growth discussions but this was not a precondition at this point. For example, the NGOs that were nominated include organisations working on sustainability topics.

In the end, a list of 321 nominated experts was obtained, and invitations were sent to them via email (see Annex 5). A total of 52 experts from academia, government, private sector, and NGOs across 29 countries participated in the first round of the e-Delphi study: Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Costa Rica, the Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Mexico, Montenegro, the Netherlands, North Macedonia, Norway, Poland, Portugal, Russia, South Africa, South Korea, Spain, Sweden, the UK, and the USA. We did not include this information in the Table below to keep the experts' anonymity. Table 5 shows the Experts' characteristics (see more in Annex 1, note: Doctorate = Doctorate or equivalent level of education).

No.	Gender	Age group	Years of expertise	Education	Expert groups
1	Male	36-40	10--15	Doctorate	Academic
2	Male	56-60	20 +	Doctorate	Academic
3	Male	56-60	20 +	Doctorate	Academic
4	Female	51-55	20 +	University degree	Academic
5	Male	61-65	20 +	Doctorate	Academic
6	Female	56-60	20 +	Doctorate	Academic

No.	Gender	Age group	Years of expertise	Education	Expert groups
7	Male	76-80	20 +	Doctorate	Academic
8	Male	41-45	10--15	Doctorate	Academic
9	Female	46-50	15-20	Doctorate	Policymaker/policy practitioner
10	Male	56-60	20 +	Doctorate	Academic, NGOs/Thinktanks
11	Female	41-45	10--15	University degree	Private sector, NGOs/Thinktanks
12	Female	26-30	0-5	University degree	Academic
13	Male	31-35	5—10	University degree	Academic
14	Male	31-35	5—10	Doctorate	Academic
15	Male	41-45	20 +	Doctorate	Academic, NGOs/Thinktanks
16	Male	46-50	20 +	Doctorate	Academic, Private sector
17	Male	36-40	15-20	Doctorate	Academic, NGOs/Thinktanks
18	Male	41-45	5—10	Doctorate	Academic
19	Female	71-75	20 +	Doctorate	Academic
20	Female	31-35	5—10	Doctorate	Policymaker/policy practitioner
21	Male	61-65	20 +	Doctorate	Academic
22	Female	26-30	5—10	University degree	Academic, NGOs/Thinktanks
23	--	36-40	10--15	Doctorate	Academic

No.	Gender	Age group	Years of expertise	Education	Expert groups
24	Female	41-45	15-20	Doctorate	Private sector
25	Female	31-35	5—10	University degree	NGOs/Thinktanks
26	Male	61-65	20 +	Doctorate	Academic
27	Prefer not to say	36-40	5—10	Doctorate	Academic
28	Male	51-55	20 +	Doctorate	Academic
29	Female	36-40	10--15	Doctorate	Policymaker/policy practitioner, NGOs/Thinktanks
30	Female	46-50	15-20	University degree	Policymaker/policy practitioner
31	Male	41-45	0-5	Doctorate	Academic, Public sector organisation
32	Gender not listed here	18-25	0-5	University degree	Academic
33	Female	56-60	20 +	University degree	Private sector, NGOs/Thinktanks
34	Female	41-45	10--15	Doctorate	Academic
35	Male	56-60	20 +	University degree	NGOs, Thinktanks
36	Male	31-35	5—10	Doctorate	Academic, Private sector
37	Prefer not to say	46-50	15-20	Doctorate	Academic
38	Female	41-45	10--15	Doctorate	Academic

No.	Gender	Age group	Years of expertise	Education	Expert groups
39	Male	41-45	15-20	University degree	Policymaker/policy practitioner, NGOs/ Thinktanks
40	Female	31-35	5—10	Doctorate	Academic
41	Male	41-45	10--15	Doctorate	Academic
42	Female	36-40	5—10	Doctorate	Academic
43	Female	31-35	5—10	University degree	Academic
44	Male	36-40	10--15	Doctorate	Academic, Policymaker/policy practitioner, NGOs/Thinktanks
45	Female	61-65	20 +	Doctorate	Academic
46	Male	46-50	10--15	University degree	NGOs/Thinktanks
47	Female	71-75	20 +	Doctorate	Academic
48	Female	46-50	20 +	University degree	Private sector
49	Female	36-40	5—10	Doctorate	Academic
50	Female	31-35	5--10	Doctorate	Academic, NGOs/Thinktanks
51	Male	46-50	20 +	Doctorate	Academic
52	Prefer not to say	56-60	20 +	University degree	Policymaker/policy practitioner

Table 5: Experts' characteristics

The drop-out rate for the 2nd round was 50%.

The first e-Delphi round involved experts identifying interconnections among the selected topics and determining the key drivers within each scenario. This step enriched

the scenarios further and provided preliminary inputs for developing if–then correlations.

In the second e-Delphi round, experts were asked to assess the relationships relevant to each scenario and to propose policy measures that could influence their outcomes. In this stage, our research team generated 70 detailed if–then correlations along with a comprehensive set of policy recommendations.

Finally, Workshop 4 was organized to synthesise the insights gathered throughout the e-Delphi process focusing on the post-growth scenario: 'Democratic Caring for Nature'. During this workshop, the identified if–then relationships were arranged into system maps that visually represented the links and dynamic relationships within the scenario. This system map can serve as a key output of the process, providing structured inputs for the modelling phase.

Overall, the process combined participatory workshops, expert assessment, and iterative e-Delphi rounds to transform qualitative scenario narratives into analytical system maps and actionable policy insights. The outcomes established a solid foundation for subsequent modelling and policy analysis, ensuring that expert knowledge was systematically captured, validated, and integrated into the project's analytical framework.

E-Delphi Implementation

To ensure the involvement of a broad and motivated group of experts, the research team crafted an invitation letter (see Annex 5). It outlined the objective and overarching relevance of the Delphi research in relation to European sustainability policymaking. It underscored the distinctive function of experts in contributing to the study of potential futures and the identification of feasible policy trajectories. The invitation detailed the procedural elements, specifying that the e-Delphi study would comprise two rounds of online surveys, each requiring roughly 30 to 60 minutes for completion. Moreover, it informed experts of the tenets of anonymity, voluntary participation, and data protection in accordance with EU rules. The letter's tone was deliberately inclusive and progressive, seeking to cultivate a sense of shared responsibility and possible influence among the invited experts.

Alongside the questionnaire and invitation, the team developed a comprehensive description of the Delphi process readily available on the internet platform. This introductory section included contextual information on the MAPS project and its institutional partners, elucidating the study objectives with clarity. The study's objective was elucidated, emphasizing interconnection, advancement, and the discovery of principal factors influencing European futures. The portal contained pragmatic advice for platform navigation, participation instructions, and a definitive timeframe for the study procedure. The initial round took place from 21 May to 30 June 2025, followed by the subsequent round from 8 to 30 September 2025. The introduction included a specific section on data protection principles, promoting openness and confidence by including a link to the whole privacy notice.

After the meticulous selection of experts, our research commenced with the first round of the e-Delphi study. This phase sought to systematically gather expert input on potential routes for Europe by 2050 using a structured, iterative, and interactive online platform. The initial stage in the process was to create and finalise the essential tools required for expert participation. Three principal outputs were developed: the first e-Delphi survey, a tailored invitation letter for experts, and a comprehensive overview of the Delphi procedure to assist experts. The research team collaborated to create these aspects to guarantee scientific rigour and a user-friendly experience. The initial questionnaire was the main element of this phase. The design aimed to be thorough and engaging, encouraging experts to engage profoundly with four separate story scenarios, each depicting various potential futures for Europe: Autocratic Collapse, Democratic Stewardship of Nature, Ecocracy, and Elitist Green Bubble. These scenarios were designed to encompass a broad range of potential political, social, and environmental pathways, thereby fostering varied views and conversations.

Experts were requested to identify two scenarios they deemed most pertinent or demanding to render the work both achievable and enlightening. Thematic analysis of the four scenario descriptions revealed twenty-six topics, which together represent the main themes, patterns, and concerns present in the narratives. In each selected scenario, experts were asked to examine at least three topics from the following 26:

1. access to information
2. artificial intelligence
3. biodiversity
4. climate change
5. colonialism
6. consumption
7. democracy
8. demographic change
9. education
10. ethicality of business
11. global trade
12. health and wellbeing
13. human rights
14. income inequalities
15. innovations
16. labour
17. legal system
18. migration
19. natural resource use
20. other species
21. production
22. public investments
23. sport
24. technology

25. vulnerable groups
26. wealth

This framework facilitated a focused yet interrelated examination of intricate sustainability challenges. Experts were prompted to contemplate three guiding questions for each scenario and topic combination:

- In what manner will the selected topics evolve in the future under the specified scenario?
- What interconnections can you foresee among the selected topics in the scenario?
- What are the primary factors driving these interconnections and characteristics of the topics in the scenario?

The research procedure was conducted entirely online by using an e-Delphi.org software that has been developed for 25 years, together with Finnish future research institutions, including the University of Turku Futures Research Centre and Society for Futures Research in Finland. It is widely used in future research with experts from more than 100 countries. The platform has been employed in numerous major research projects and doctoral theses, both within Finland and internationally.

The platform supports multiple rounds of surveys with qualitative and quantitative questions and open comment sections. It also enables anonymous participation, which helps reduce bias from dominant individuals and group pressure. The second round is built on the previous one, allowing for controlled feedback as well as the examination of the validity of the statements selected by the research team. Throughout the process, the participants could see others' responses. The idea is that visibility of their inputs could foster discussion and provoke reflective thinking. Experts had the opportunity to reassess and enhance their contributions throughout the participation period, which commenced on May 21, 2025, and concluded on June 30, 2025. This adaptable framework was created to promote reflective, iterative interaction instead of singular, fixed replies.

During the e-Delphi process, the project team meticulously observed participation and interaction on the platform, providing technical assistance as needed and promoting continuous involvement. This round was primarily intended to collect extensive qualitative insights and to pinpoint the principal areas of agreement and disagreement among the experts' viewpoints. The outcomes of the first round influenced the design of the subsequent round, which concentrated more explicitly on tangible policy recommendations for attaining sustainable futures.

The e-Delphi method, characterized by its organized but interactive approach, has fostered a collaborative environment for experts from many disciplines to collaboratively envisage and discuss potential paths to sustainability in Europe. In this case, Delphi is used to examine the possibility of trends and new trends appearing and spreading locally, their positive or negative influence, and their potential for flexibility. In this case, it is also possible to use ICT tools partially or to apply online solutions comprehensively (Gáspár et al. 2023, Retek 2021 and 2023). The MAPS project seeks to produce strong, evidence-based insights for long-term policies at national and EU levels

by integrating topic scenarios with interactive internet interaction. The extensive qualitative data from this initial round are anticipated to establish a robust basis for developing creative, inclusive, and progressive policy recommendations.

After the first round, the research team conducted a preliminary analysis of the textual data for each scenario individually. The aim was to create an enriched description of each scenario based on the experts' contributions, which would then be used as input for the second round. The analysis followed three steps. First, the scattered textual data were grouped by the 26 aforementioned topics and integrated into the original description of each scenario. If the chosen topic was not mentioned in the original description of the scenario, new paragraphs were created to ensure all expert perspectives were included. Second, the textual narrative was manually synthesised by the research team to ensure coherence, order, and logic. Third, we used Copilot to remove duplication and correct grammatical errors. This process resulted in four enriched scenario descriptions varying from 9 to 11 pages (See Annex 1-4). Additionally, as the enriched version was rather lengthy, we asked Copilot to create a 2-page summary. The AI-generated summaries were carefully reviewed and manually finalized to ensure coherence and accurate content. During the second round of data collection, the participants had access to both the summary and the full description of each enriched scenario.

The research data were then processed through a structured, multi-step procedure that combined manual coding with supplementary digital analysis. The aim was to translate the qualitative responses from the Delphi survey into a systematically organised framework capable of capturing the correlational logic expressed by experts and of highlighting patterns of interconnection among the topic areas.

The first step involved constructing an "if–then" matrix that incorporated the twenty-six topics used in the survey. This matrix served as the analytical backbone of the process, providing a two-dimensional space in which correlations could be recorded. Subsequently, all responses associated with the scenarios were reviewed in detail. From these texts, "if–then" statements were manually extracted to identify explicit or implicit correlations articulated by the participants. Each extracted relationship was then entered into the matrix at the intersection of the relevant themes. Placement within the matrix was guided by interpretative judgement, as several responses referenced multiple issues or implied complex dynamics that required careful assignment to the most fitting cell.

Following the population of the matrix, a quantitative mapping exercise was conducted to highlight recurring patterns (Annex 7). Two counting procedures were undertaken: first, the number of times each topic was linked to another was calculated, thereby identifying those themes that appeared most frequently across the dataset; and second, the number of "if–then" relationships contained within each matrix cell was tallied, indicating the strength and recurrence of specific inter-theme connections. Both sets of results were colour-coded in an Excel file to provide a visual overview of central nodes and frequently occurring linkages.

The correlation statements created were divided into three categories using AI (Copilot with the prompt: 'Extract and cluster systemic "if–then" relationships into 4–6 coherent thematic clusters (e.g., about inequality, ecology, technology, governance)' (1) important (statements reflecting systemic risks, foundational shifts, or major societal consequences), (2) unusual (statements that are conceptually provocative, speculative, or highlight unexpected consequences), and (3) other (relevant statements that are more specific, technical, or derivative in nature). The definitions of these categories were determined manually, and the statements in the given scenario were then classified into the three categories based on these definitions. Later, based on these AI classifications, the statements were manually evaluated and, after manual refinement, entered into the second round of the Delphi process, where we asked experts to validate them. Through this combined procedure, a balance was achieved between human interpretative judgement and systematic computational support. Manual coding allowed contextual nuances in expert responses to be preserved, while digital analysis offered an additional layer of pattern recognition and systematisation. Together, these methods ensured a robust and transparent account of the interconnections among survey topics and provided a foundation for second rounds of the Delphi study.

The validation statements for experts in the second round of the e-Delphi study were created, deriving from the 60 most important if-then statements based on their frequency of occurrence. For validation, we established two criteria from the three potential responses (yes, no, can't decide): 1) At least 50% of the total responses must be affirmative. 2) The number of 'yes' responses must be at least double that of the 'no' responses. If both requirements are satisfied, the statement is deemed validated by our experts.

After identifying the 'Democratic Caring for Nature' scenarios' statement variables and their connections, the systems map (Király et al., 2018) (Figure 12) was created.

E-Delphi results

Enriched Scenarios

The most important results of the process are the long (enriched) versions (See Annex 1-4) of the four scenarios that were devised in rough versions during the workshops with MAPS researchers and selected for further development by external experts. The results show that only one of the scenarios can be called a desirable post-growth scenario, namely the Democratic Caring for Nature. This scenario includes many elements from the degrowth/post-growth literature and is in line with the sustainability transformation that includes ecological and also socio-economic visions of the post-growth future. Autocratic collapse is a pessimistic 'collapse' scenario, while the other two detailed scenarios, Elitist Green Bubble and Ecocracy, are scenarios where some post-growth elements are in place, but some other dimensions have taken a critically wrong path, in a sense that not all the of the ecological-social-economic spheres transform to a positive post-growth future and it can be seen how degrowth ' can go wrong' if one of these spheres doesn't harmonize with a desirable path.

Below we present preliminary descriptive results in terms of our expert's evaluation on the likelihood and desirability of each scenario, as well as some commentary remarks on the four enriched scenarios.

Scenario 1: Autocratic Collapse
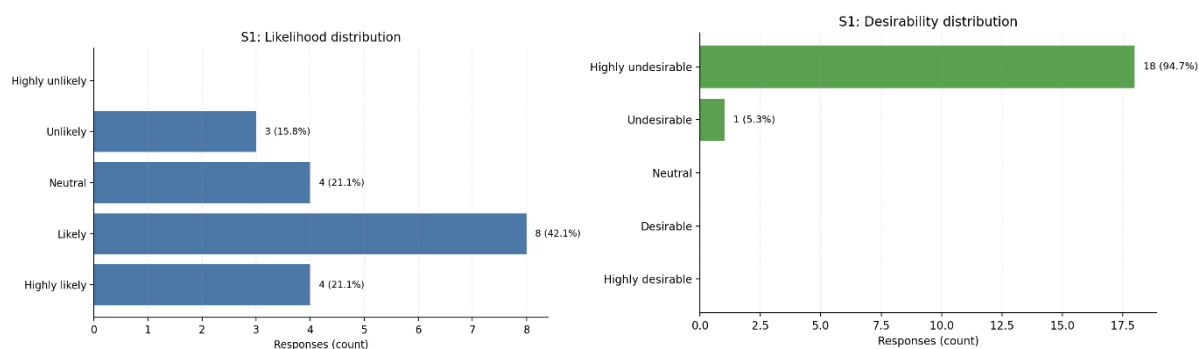
Figure 8: Likelihood and desirability of Autocratic collapse

Commentary remarks (direct quotes from experts' responses):

- Unfortunately, this is very much the current BAU scenario.
- Unfortunately, nearly all of the dynamics described in this scenario are already unfolding. Without a major shift in global governance toward a "new green and equitable economy", it is highly likely that society as we know it will collapse, driven by elite interests.
- This scenario reads like an exaggerated version of the current conditions in many countries. Many of the described elements are already here. We are currently in

an upswing of populist voting. Populist are gaining power and destroy democratic institutions and values.

- With almost no progress in demilitarization and decolonization, far-right gaining popularity the scenario seems feasible.
- I do not see this scenario as being fully realistic since it is more likely that some countries or regions turn authoritarian, while others resist. It is, however, likely that the largest blocs can be affected by this type of behaviour.
- I feel this scenario is way too pessimistic, even dystopian (though I understand this to be a "collapse" story). It is unlikely that trends and events would have only negative consequences as described here.

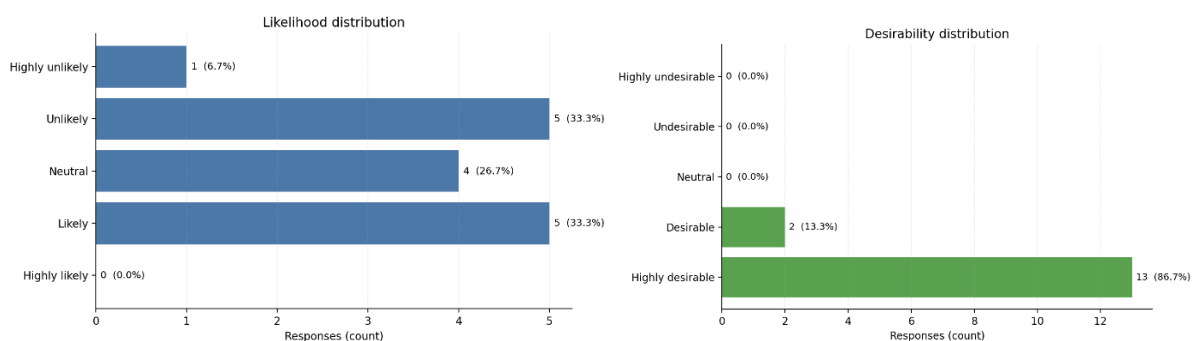***Scenario 2: Democratic Caring for Nature***

Figure 9: Likelihood and desirability of Democratic Caring for Nature

Commentary remarks (direct quotes from experts' responses):

- There are many people and organisations already working to make this scenario a reality., so I think it is possible and perhaps even likely that it happens.
- This scenario is what I think every person would like to have in the future. Whether this will happen is debatable as some countries may get this right, whilst others with an authoritarian government may not accomplish.
- If we are going to survive and thrive on this planet with 10 million people, there is no alternative.
- I don't believe the scenario is realistic before much and many lives are lost unfortunately - through wars and natural catastrophes, and lack of food and water.
- The scenario sounds a bit nature centric. Meaning we do all for nature, because of its' value for our survival, as in: "people are valued according to their contribution to the ecosystem.
- According to my own preferences, most of the issues described in this scenario are desirable. According to recent social, economic, political, and technological trends I could not say that this scenario is very likely to occur in 2050.
- For me, this is a utopian scenario. This is the least probable of all scenarios. What should be the forces that create this scenario? And where? I have trouble imagining how we could get from today to this world in 25 years.
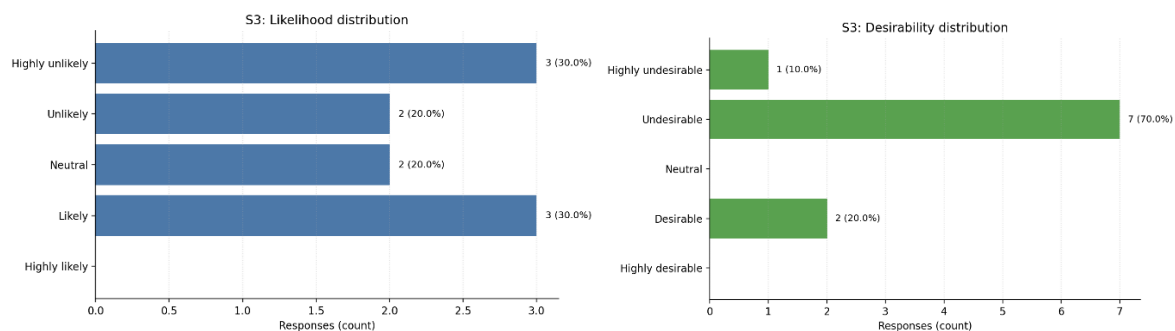
Scenario 3: Ecocracy

Figure 10: Likelihood and desirability of Ecocracy

Commentary remarks (direct quotes from experts' responses):

- This scenario could become reality if environmental destruction worsens and people consider their environment uninhabitable. However, a green dictatorship could significantly undermine human freedoms.
- Handmaids' tale. Probable scenario a minute before collapse - neoliberal narrow focus and short- sightedness in full. Ecofascism.
- The big question is: is this elite an old elite with a history of neglecting the planet that suddenly decides to go green, or is this a new elite of people that now are "commoners" likely for democracy but will turn authoritarian a minute after getting power?
- The scenario depicts a world where the vast majority are subjugated and exploited by a tiny minority. I believe widespread social unrest would ultimately prevent such a system from taking hold and becoming the new economic order.

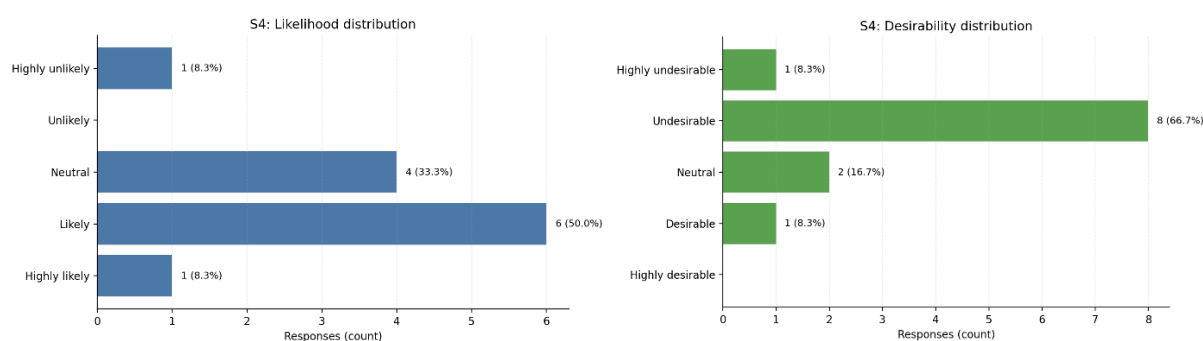### Scenario 4: Elitist Green Bubble

Figure 11: Likelihood and desirability of Elitist Green Bubble

Commentary remarks (direct quotes from experts' responses):

- This looks a lot like 2025 already.
- I think this scenario is desirable compared to some other scenarios here. (...) And in such a global competition, everyone wants to be part of the elitist green bubble, and not the exploited outer regions.

- As of today (2025), I would say that this scenario would also be desirable, given that we are heading towards a scenario of "autocratic collapse". However, it remains a scenario based on inequality and privilege. Nevertheless, I think that, as of today, it is one of the most likely scenarios we will experience.
- This what is happening in Norway or Switzerland. Likely the model countries for EU as well. Of course, it is undesirable - leading to collapse through suffering of the excluded majority.

Underlying presumptions of interrelations

The analysis of the interrelated topics showed that in the 'Autocratic collapse' scenario, "democracy", "health and well-being", 'income inequalities', 'labour', 'vulnerable group' and 'wealth' were the most connected topics. In the 'Democratic caring' scenario, "democracy" was by far most frequent topic, meanwhile "climate change", 'natural resource use' and 'production' were also highly connected thematic groups. In the 'Elitist green bubble' scenario, half of the topics were frequently connected, and the other half hardly at all. The 'Ecocracy' scenario, the frequency of the topic connection is the least; only 'climate change, 'democracy', and 'consumption' were above average connections from the thematic groups.

The following lists provide the 'if-then' statements for each scenario. The statements in grey were identified by the researchers but were not validated by the experts.

The if-then statement list of the AUTOCRATIC COLLAPSE scenario:

- If climate change escalates, it is likely that social inequality will increase.
- If climate catastrophes intensify, it is likely that the increasing migration will be handled militarily.
- If climate collapse triggers economic chaos, it is likely that the wealthy elite will try to preserve their wealth in socially unequal ways.
- If those left behind are less satisfied with democracy, it is likely that they will support extreme nationalism.
- If wealth is concentrated, it is likely that innovations will serve only the elites.
- If the use of natural resources is privatized, it is likely that authoritarian governance will rise through income inequality.
- If consumption is driven by unregulated finance, it is likely that recurring consumer debt crises will disproportionately harm disadvantaged groups.
- If the use of AI grows, income inequality is likely to increase.
- If AI replaces low-skilled workers, it is likely that consumer demand will fall.
- If the use of negative emission technologies and geoengineering is intensified, it will likely serve geopolitical and military purposes.
- If democratic institutions erode under authoritarian rule, it is likely that freedoms of speech and mobility as well as free media are significantly curtailed.
- If human rights are restricted and surveillance expands, vulnerable groups are likely to face increased marginalization.
- If the geoengineering is intensified, it will likely serve military purposes.

The if-then statement list of the ECOCRACY scenario:

- If large-scale conservation projects are imposed without consent, it is likely that public backlash will follow.
- If AI replaces low-skilled workers, it is likely that income inequality will increase.
- If AI replaces low-skilled workers, it is likely that consumer demand will decline.
- If youth are educated in green values, it is likely that a generation of green authoritarian elites will emerge.
- If public investment is skewed towards large corporations, it is likely that wealth inequality will rise.
- If public investments are redirected from welfare to ecological agendas, inequalities in health and wellbeing are likely to increase.
- If business ethics are reshaped by elites, practices like land grabbing and conservation-for-profit will be normalized.
- If freedoms such as mobility rights are restricted, it is likely that emissions will decrease in the short term.
- If biodiversity preservation is prioritized, public investments in sectors like music, sports, and local cultures will be neglected.
- If labor is ecologically oriented but disconnected from socially meaningful purpose, it is likely to increase unemployment.
- If ecocratic elite strictly regulates consumption, it is likely that climate change will be mitigated, though at the cost of human rights and freedoms.
- If elite justify unequal carbon budgets with green ideology, it is likely that public discontent will grow.
- If household consumption is tightly regulated through surveillance, it is likely that European lifestyles will come closer to planetary boundaries.
- If white European elites preserve gated in privileged areas, it is likely that climate injustices will increase.
- If wealth concentrates among an eco-aristocratic elite, it is likely that innovations focus on surveillance at the expense of social rights.
- If financial elites realize they are also vulnerable to climate change, they will use climate science to legitimize taking over political power.

The if-then statement list of the ELITIST GREEN BUBBLE scenario:

- If wealth concentrates in elite bubbles with green branding, it is likely that labor exploitation will worsen outside these bubbles.
- If elite controls green transition, it is likely that extractive practices in the Global South will remain hidden and unchallenged.
- If climate change and biodiversity loss intensify, it is likely that goods like coffee, cocoa, and fish are turned into luxuries.
- If people rely too much on technology to solve environmental and social problems, it is likely that social inequality will grow.
- If innovation and progress are justified by elites as environmentally beneficial, it is likely that it will exclude poorer communities from progress.

- If AI is used for surveillance and media control, it is likely that democratic participation and human rights will erode.
- If vulnerable groups are supported only through markets, it is likely that systemic inequality will persist.
- If aging societies in Europe need labor, then some migrants will be tolerated despite strict border controls.
- If migrants are blamed for deeper systemic problems, it is likely that border security will be prioritized over climate action.
- If climate-driven migration increases, it is likely that elite responses will reinforce segregation and demographic control.
- If EU militaries are used to secure access to critical material resources, it is likely that global instability will deepen.
- If colonialist mindsets remain accepted by the privileged, it is likely that new forms of green colonialism will be normalized.
- **If education focuses too much on technology-driven solutions, it is likely that** environmental knowledge will erode.

The if-then statements of the 'DEMOCRATIC CARING FOR NATURE' scenario – it being the post-growth scenario most detailed - were used by the CUB researchers in devising a systems map by organising the validated variables using the technique of participatory systems mapping. In a participative setting, system mapping facilitates the examination of people's or groups' attitudes and mental models, enabling them to articulate their beliefs regarding causality and to expand their understanding of the problem by considering the interrelationships among various parts (Köves et al., 2021). Below, the verified statements for this case are accompanied by underscores that were used in the systems map, analytical remarks and variables identified in brackets.

1. If access to information is universal, it is likely that democratic decision-making supports ecological sustainability.
2. If transparent access to ecological and social information is available, it is likely that social and ecological challenges can be better addressed through democratic processes. *(access to ecological information; access to social information; quality of democratic processes; ecological challenges; social challenges)*
3. If access to biodiversity-related data is open and community-driven, conservation efforts are likely to become more participatory and effective. *(biodiversity loss; community driven data; conservation efforts; quality of participatory decision-making processes)*
4. If access to credible information is taught from a young age and reinforced by AI-supported knowledge systems, it is likely that citizens are better equipped to participate in ecological governance. *(quality of education; AI supported knowledge systems; ecological governance)*
5. If citizens have transparent access to energy and resource use data, it is likely they are empowered to make informed decisions and participate in ecological governance. *(energy use; resource use)*

6. If <u>biodiversity restoration</u> becomes a <u>value</u> that is widely shared across all <u>governance levels</u>, it is likely that <u>extinction rates</u> decline and <u>ecosystem resilience</u> increases. *(value ~ ecological consciousness; biodiversity restoration; ecosystem resilience)*

7. If <u>labour unions</u> become key agents in<u> sustainability transformation</u>, it is likely that <u>climate injustices</u> will be better addressed. *(climate justice; labour representation)*

8. If <u>democratic decision-making</u> is delegated to <u>bioregional and cooperative authorities</u>, it is likely that *<u>environmental impacts will get closer to sustainable limits</u>*. *(bioregional and cooperative authorities ~ subsidiarity)*

9. If <u>education</u> improves <u>critical thinking</u> and <u>relationship-building,</u> it is likely that sustainability, democratic participation, and <u>care for future generation</u>s are strengthened. *(critical thinking; relationship building ~ human-human connectedness; care for future generation)*

10. If<u> citizen assemblies</u> have more power in decision-making, it is likely that <u>unsustainable and unnecessary production</u> largely ceases. *(sustainability of production, quality of participatory decision-making processes)*

11. If <u>economic democracy</u> enables <u>citizens to co-decide</u> on <u>production</u> and <u>consumption</u>, it is likely to dismantle the <u>colonial structures of global economy</u>. *(sustainability of consumption; sustainability of production; quality of participatory decision-making processes; colonial structures of global economy ~ decolonization)*

12. If <u>business models</u> are based on <u>nonprofit cooperatives,</u> it is likely that <u>business operates ethically</u> and sustainably. *(nonprofit cooperatives-based business models ~ spread of non-profit business models; ethicality of business)*

13. If economy continues to be <u>driven by</u> profit concentrated in large corporations, it is likely that systemic transformation only occured after a large-scale societal collapse. *(capital accumulation, economic power concentration)*

14. If <u>global trade</u> is<u> limited to supplementing only what cannot be produced locally</u>, it is likely that trade becomes <u>purpose-driven</u> rather than growth-driven. *(local production, fairness of global trade)*

15. If <u>society is less polarized</u>, it likely enables more cohesive and empathetic <u>human-nature interactions</u>. *(human-nature connectedness; polarization)*

16. If <u>workplace democracy</u> increases, it is likely that economic activities prioritize <u>care needs</u> and <u>ecosystem wellbeing</u>. *(workplace democracy ~ labour representation; ecosystem wellbeing ~ sustainable consumption; sustainable production; care needs)*

17. If natural resource use is <u>locally regulated</u>, it is like that environmental and social exploitation will be reduced. *(~ subsidiarity)*

18. If <u>innovation policies</u> do not serve the interests of private profit, the<u> innovations</u> are likely to support <u>sufficiency-oriented lifestyles</u>. *(~sustainable consumption; conscious innovation policy)*

Systems map of the Democratic Caring for Nature scenario

After identifying the 'Democratic Caring for Nature' scenarios' statement variables and their connections, the system map (Figure 12) was created. Participatory system mapping is a method for creating a conceptual causal model of a complex issue (Király et al., 2018). This method reveals both clear and hidden relationships between different factors. It allows participants to express and question their underlying assumptions, while also helping to identify key areas where intervention can be most effective. The aim of this mapping exercise was to develop a coherent system based on the more desirable post-growth scenario and to uncover the hidden relationships among the defined variables, thereby making it more comprehensive for further quantitative analysis. This systems mapping can enhance later identification of leverage points and policy interventions to achieve a desirable post-growth future. The systems map of this scenario was developed by the CUB research team based on the narrative itself and the 'if-then statements' validated by the e-Delphi experts. In the system map of the Democratic Caring for Nature Scenario 'Ecological challenges', 'Social Challenges' and 'Human-nature connectedness' became end variables, while variables: 'Subsidiarity', 'Labour representation', 'Access to social information', 'AI supported knowledge systems', 'Quality of education', 'Ecological consciousness', 'Quality of participatory decision-making processes' and 'Spread of non-profit business models' became basic requirements for this specific post-growth scenario.
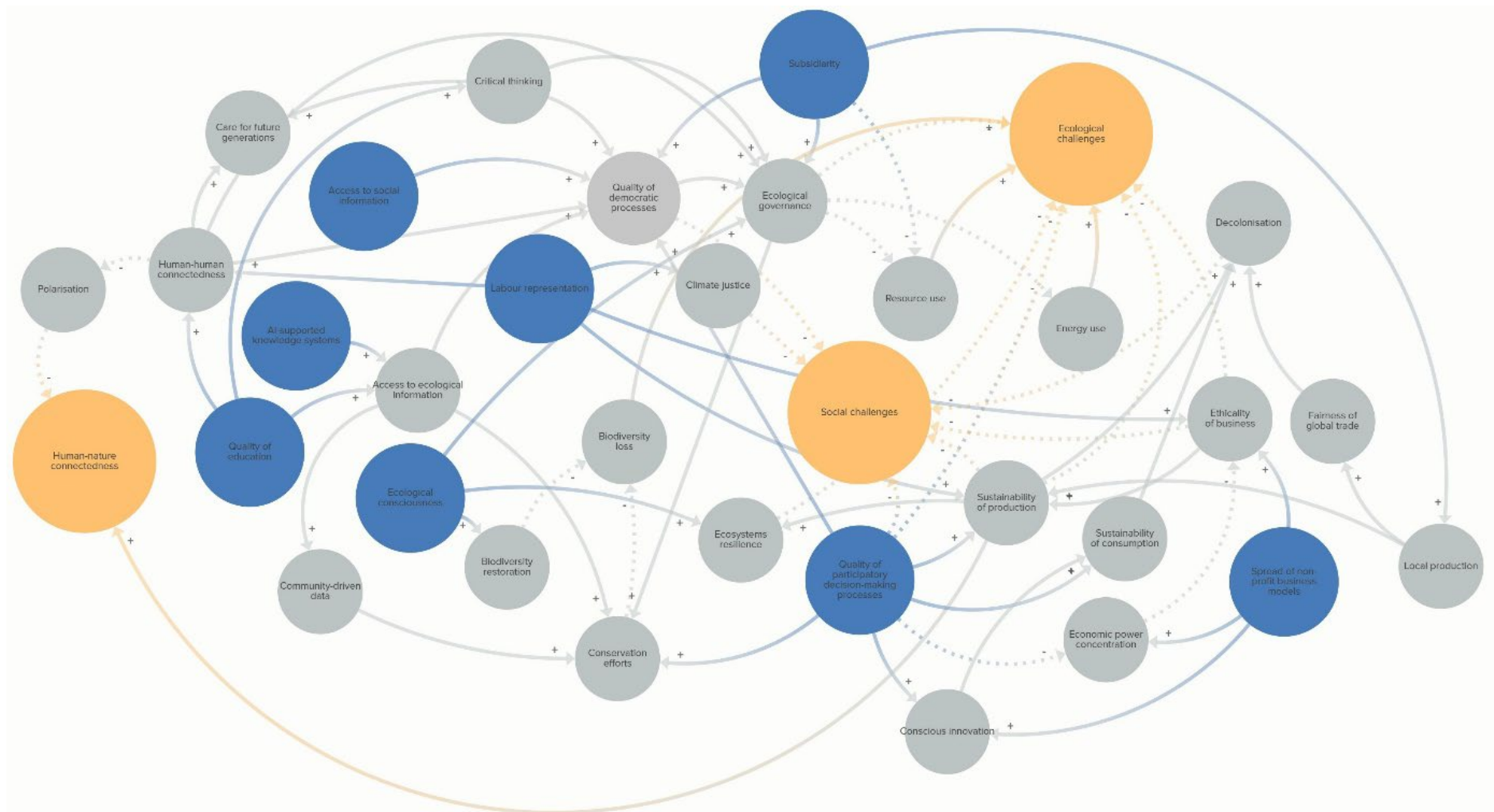
Figure 12: System map of 'Democratic Caring for Nature' scenario

Policy solutions

As part of the input for the second round, the research team created a list of 30 policies based on a report published by the MERGE consortium (2025) and three scientific articles (Fitzpatrick et al., 2022; Fromberg & Lund, 2024; Lauer et al., 2025) in which a series of degrowth/eco-social policies are comprehensively reviewed. However, the list does not reflect the full range of policies presented in these publications. To ensure a relevant selection, we aimed to choose policies that, to some extent, cover the topics mentioned in the four scenarios, meaning that this list of policies should align with the results obtained in the first round. Recognising that this list could not capture the full range of possible policies, we also included an additional section at the end of the second round for experts to propose further policy solutions.

In practice, we asked the experts to select five policies that are the most relevant and effective to realize 'a more equitable, sustainable, and democratic post-growth future' based on their evaluation of each scenario. The second round included a document in which each policy was introduced following a structure comprising three mandatory and one optional component:

1) A short description of each policy (mandatory);

2) The social effect of the policy as proposed in the literature (mandatory);

3) The ecological effects of the policy as proposed in the literature (mandatory);

4) Real-life examples of policy implementation are added if available in the literature (optional).

See the *List of Policies* below, which was provided as a separate document on the e-Delphi platform during the second round. The purpose of this list is to provide our experts with basic information on these policies in case they are unfamiliar with them. The policies (in total 30) are grouped under 5 themes including: Access to social protection and services, Economic activities and finance, Localized trade and shared economy, Media and education, Democratic governance and legal reform.

List of Policies:

Access to social protection and services

1 Basic Income

Description: Unconditional cash transfer to all individuals, paid regularly and individually, without means-testing or work requirements. Social effects: Reduces poverty, increases autonomy, simplifies welfare systems, improves mental health and wellbeing.
Ecological effects: Supports transition to less resource-intensive lifestyles by decoupling income from work.
Example: Finland's Basic Income Experiment; B-MINCOME pilot in Barcelona.

2 Universal basic services

Description: Public provisioning of essential services (e.g. health, education, housing, transport) either free-of-charge or affordably; collective need satisfiers.
Social effects: Promotes autonomy, inclusion, equity, solidarity, and poverty reduction.
Ecological effects: Enables sustainable consumption (e.g. plant-based meals in schools, renewable energy use).
Example: Universal childcare in Norway; Affordable housing associations in the Netherlands.

3 Care income

Description: Conditional cash transfer for unpaid care work, including care for people, communities, and nature.
Social effects: Recognizes and compensates unpaid care work, supports caregivers, promotes social reproduction.
Ecological effects: Encourages care for ecosystems and subsistence work.
Example: Proposed in the Green New Deal for Europe; precedents in parental leave and caregiver allowances.

4 (Green) Job guarantee

Description: Guaranteed access to employment in essential public works (foundational economy) for all = right to work; can be seen as post-productivist active labor market policy.
Social effects: Tackles involuntary unemployment, reduces poverty and exclusion, provides good working conditions, and sets labour standards.
Ecological effects: Labour can be directed to green sectors and jobs (e.g. ecosystem restoration, community-owned renewables)
Example: Universal Job Guarantee in Marienthal, Austria; Kinofelis programme in Greece; Territoires Zéro Chômeur de Longue Durée in France.

5 Work-time reduction

Description: Reduction of statutory working hours (e.g. four-day week, six-hour day) without loss of pay.
Social effects: Improves work-life balance, reduces stress and burnout, enhances wellbeing. Ecological effects: Reduces commuting and overproduction; aligns productivity with sustainability.
Example: Iceland's public sector trials; UK's four-day week pilot; Valencia's city-wide experiment.

Economic activities and Finance

6 Alternative indicators

Description: Complement GDP with indicators of social and ecological wellbeing (e.g. Genuine Progress Indicator, Wellbeing Budgets)
Social effects: Shifts focus from economic growth to human flourishing.
Ecological effects: Encourages policies aligned with ecological sustainability

7 Maximum income cap

Description: Caps on income or wage differentials within organizations or society; can be implemented via progressive taxation.
Social effects: Reduces inequality, enhances democracy, curbs excessive executive compensation.
Ecological effects: Limits luxury consumption and associated environmental harms.
Example: Executive compensation cap in Israel; Mondragon cooperative in Spain.

8 Ecological Tax

Description: Taxes on resource extraction, carbon emissions, and pollution to internalize environmental costs.
Social effects: Can fund social programs and redistribute wealth
Ecological effects: Discourages environmentally harmful activities, incentivizes low-impact alternatives

9 Wealth Tax

Description: Annual tax on net wealth (assets minus liabilities), often progressive and targeted at high-net-worth individuals.
Social effects: Reduces wealth inequality, funds public services, enhances tax justice.
Ecological effects: Limits resource-intensive lifestyles of the wealthy, supports climate finance.
Example: Wealth taxes in Norway, Spain, Switzerland.

10 High inheritance Tax

Description: Tax on inherited wealth, either paid by estate or individual recipients; can be progressive.
Social effects: Promotes equality of opportunity, reduces intergenerational wealth concentration.
Ecological effects: Can fund sustainability initiatives and reduce wealth-driven environmental degradation.
Example: Inheritance taxes in Japan, South Korea, France, USA, UK.

11 Taxing Luxuries with High Environmental Footprint

Description: Taxes on luxury goods/services with high emissions (e.g. flights, meat); differentiated carbon taxes.
Social effects: Can be progressive if revenues are recycled; discourages excessive consumption.
Ecological effects: Reduces emissions and resource use from luxury consumption.
Example: Flight taxes in EU countries; VAT reform proposals for food in EU.

12 Wellbeing Budgets

Description: Government budgets guided by wellbeing indicators rather than GDP; prioritizes long-term social and ecological outcomes.
Social effects: Aligns spending with public needs, improves policy coherence, supports vulnerable groups.

Ecological effects: Enables budgeting within planetary boundaries.
Example: New Zealand's Wellbeing Budget; Bhutan's GNH framework; Iceland, Canada, Ireland initiatives.

13 Green and Socially Sustainable Public Procurement

Description: Public sector purchasing that prioritizes environmental and social sustainability. Social effects: Promotes fair labor, inclusive services, and social innovation.
Ecological effects: Drives demand for sustainable products, supports circular economy.
Example: EU Green Public Procurement; Finland's Green Deal Agreements.

14 Credit Guidance

Description: Central bank-led steering of private bank lending toward productive and sustainable sectors.
Social effects: Prevents speculative lending, supports inclusive development.
Ecological effects: Redirects finance from fossil fuels to green sectors.
Example: Post-war Japan and France's credit guidance systems.

15 Payments for Ecosystem Services (PES)

Description: Financial incentives for landowners to maintain or restore ecosystem services. Social effects: Supports livelihoods, especially in rural and indigenous communities. Ecological effects: Enhances biodiversity, water quality, and carbon sequestration.
Example: Bolsa Verde in Brazil; EU pilot in Portugal; PES for coffee farmers in Honduras.

Localized Trade and shared economy

16 Limit long-distance trade

Description: Reduce unnecessary international trade, especially of resource-intensive goods. Social effects: Strengthens local economies, reduces dependency.
Ecological effects: Cuts transport emissions, supports relocalization of production

17 Not-for-profit cooperatives

Description: Businesses structured around social and ecological goals rather than profit. Social effects: Empowers workers, promotes democratic governance, supports local economies.
Ecological effects: Encourages sustainable production and consumption, reduces waste

18 Housing cooperatives and ecovillages

Description: Shared, community-based living arrangements focused on sustainability. Social effects: Provides affordable housing, fosters community and mutual aid.
Ecological effects: Reduces land use and energy consumption, promotes low-impact living

19 Energy Communities

Description: Citizen-led collectives producing and sharing renewable energy locally.

Social effects: Reduces energy poverty, empowers communities, creates green jobs.
Ecological effects: Decentralizes energy production, supports transition to renewables.
Example: EU Energy Communities Repository; REPowerEU Plan.

20 Food sovereignty

Description: Local control over food systems, prioritizing small-scale, agroecological farming.
Social effects: Strengthens local economies, improves food security and nutrition.
Ecological effects: Reduces environmental impact of industrial agriculture, preserves biodiversity

21 Slow and local tourism

Description: Promote low-impact, community-based tourism over mass, fossil-fuel-intensive travel.
Social effects: Supports local livelihoods, respects cultural integrity.
Ecological effects: Reduces emissions and environmental degradation from travel

Media and education

22 Limit advertising

Description: Ban or tax advertising of harmful products and restrict ads in public spaces.
Social effects: Reduces consumer manipulation, supports mental health.
Ecological effects: Discourages overconsumption, lowers ecological footprint

23 Responsible Research and Innovation Policy

Description: Aligns research and innovation with societal and environmental goals through inclusive, ethical, and sustainable practices.
Social effects: Promotes co-creation, transparency, and community empowerment.
Ecological effects: Encourages low-impact technologies and frugal innovation.
Example: EU Horizon programmes; Fab Labs in Barcelona; Riversimple; Tzoumakers in Greece.

24 Reclaiming indigenous and local knowledge

Description: Restore and integrate diverse knowledge systems into policy and education
Social effects: Promotes cultural justice and inclusion
Ecological effects: Supports place-based ecological stewardship and resilience,

25 Sufficiency-oriented education

Description: Promote critical, ecological, and pluralist education systems; Encourage voluntary simplicity and anti-consumerist lifestyles
Social effects: Fosters autonomy, solidarity, and ecological awareness.
Ecological effects: Cultivates values of sufficiency and care, supports long-term sustainability

Democratic governance and legal reform

26 Participatory Civil Dialogue

Description: Structured engagement of citizens and civil society in policymaking through forums, assemblies, and consultations.
Social effects: Enhances democracy, inclusion, and legitimacy of decisions.
Ecological effects: Supports public buy-in for sustainability transitions.
Example: Wales' national conversation; EU civil dialogue practices; climate assemblies in UK and France.

27 Technological Sovereignty

Description: Democratize technology development and restrict harmful innovations through legislation
Social effects: Ensures equitable access to techonology and safety for all
Ecological effects: Prevents ecological harm from techno-fixes, supports low-tech alternatives

28 Granting Rights to Nature

Description: Legal recognition of nature as a rights-bearing entity; ecosystems can be plaintiffs in court.
Social effects: Shifts cultural values, empowers communities to defend nature.
Ecological effects: Protects biodiversity and ecological integrity.
Example: Ecuador's constitutional rights for nature; Atrato River in Colombia; Ganges in India.

29 Mandatory Building Insulation

Description: Regulations requiring insulation of buildings to improve energy efficiency.
Social effects: Reduces energy bills, improves indoor comfort, supports vulnerable households.
Ecological effects: Cuts emissions from heating/cooling, supports climate goals.
Example: EU Energy Performance of Buildings Directive (EPBD).

30 Future Generations Act

Description: Legislation requiring public bodies to consider long-term wellbeing and sustainability, may include a Commissioner for Future Generations.
Social effects: Promotes intergenerational equity, long-term planning.
Ecological effects: Embeds sustainability in governance.
Example: Wales' Well-being of Future Generations Act; proposed legislation in Australia

In the second round of the e-Delphi process, the most widely endorsed policy proposal was 'Participatory Civil Dialogue,' which received broad acceptance across all scenarios. Consensus levels were notably high for policies 'Universal Basic Services', 'Reclaiming indigenous and local knowledge', 'Wealth Tax', 'Ecological Tax', and 'Responsible Research and Innovation Policy'.

The following Figures show how the most endorsed policy proposal is distributed across each enriched scenario. To recap, the experts were asked to select five policies that are the most relevant and effective to realize 'a more equitable, sustainable, and democratic post-growth future' based on their evaluation of each enriched scenario. Additionally, experts provided further policy recommendations, in addition to the 30 policies listed, as shown in the right-hand corner of Figures 13-16 below.
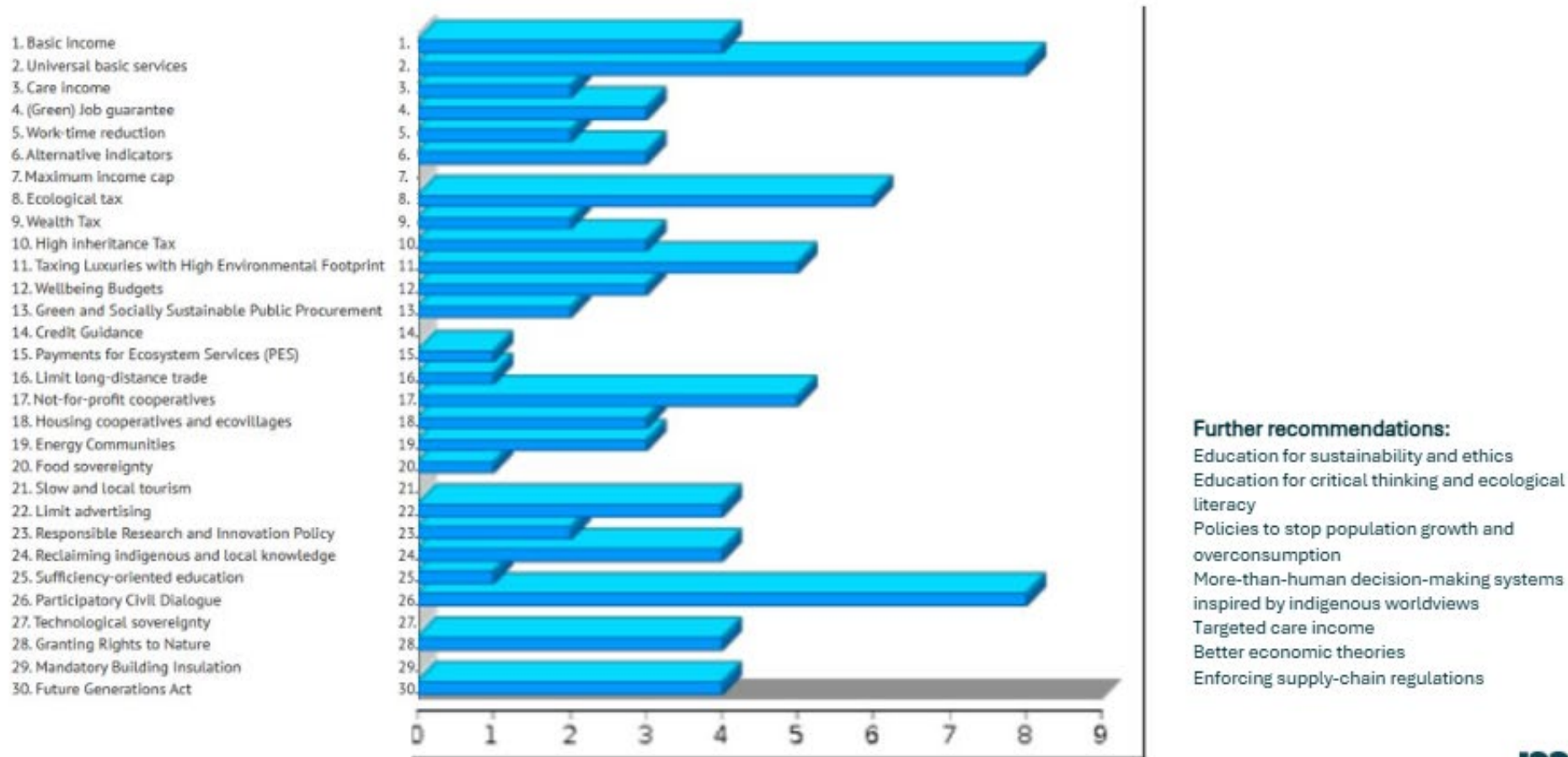
1. Basic income
2. Universal basic services
3. Care income
4. (Green) Job guarantee
5. Work-time reduction
6. Alternative indicators
7. Maximum income cap
8. Ecological tax
9. Wealth Tax
10. High inheritance Tax
11. Taxing Luxuries with High Environmental Footprint
12. Wellbeing Budgets
13. Green and Socially Sustainable Public Procurement
14. Credit Guidance
15. Payments for Ecosystem Services (PES)
16. Limit long-distance trade
17. Not-for-profit cooperatives
18. Housing cooperatives and ecovillages
19. Energy Communities
20. Food sovereignty
21. Slow and local tourism
22. Limit advertising
23. Responsible Research and Innovation Policy
24. Reclaiming indigenous and local knowledge
25. Sufficiency-oriented education
26. Participatory Civil Dialogue
27. Technological sovereignty
28. Granting Rights to Nature
29. Mandatory Building Insulation
30. Future Generations Act

Further recommendations:
Education for sustainability and ethics
Education for critical thinking and ecological literacy
Policies to stop population growth and overconsumption
More-than-human decision-making systems inspired by indigenous worldviews
Targeted care income
Better economic theories
Enforcing supply-chain regulations

Figure 13: Policy recommendations for Democratic Caring for Nature

1. Basic Income
2. Universal basic services
3. Care Income
4. (Green) Job guarantee
5. Work-time reduction
6. Alternative indicators
7. Maximum income cap
8. Ecological tax
9. Wealth Tax
10. High inheritance Tax
11. Taxing Luxuries with High Environmental Footprint
12. Wellbeing Budgets
13. Green and Socially Sustainable Public Procurement
14. Credit Guidance
15. Payments for Ecosystem Services (PES)
16. Limit long-distance trade
17. Not-for-profit cooperatives
18. Housing cooperatives and ecovillages
19. Energy Communities
20. Food sovereignty
21. Slow and local tourism
22. Limit advertising
23. Responsible Research and Innovation Policy
24. Reclaiming indigenous and local knowledge
25. Sufficiency-oriented education
26. Participatory Civil Dialogue
27. Technological sovereignty
28. Granting Rights to Nature
29. Mandatory Building Insulation
30. Future Generations Act

Further recommendations:
Campaign finance reform
Decentralized governance
Intersectoral planning
Redistribution of care and reproductive work
Information and awareness campaigns on alternatives
Social economy & solidarity business models
Sustainable Public Transport Grid

Figure 14: Policy recommendations for Autocratic Collapse

Figure 15: Policy recommendations for Ecocracy

Figure 16: Policy recommendations for Elitist Green Bubble

1. Basic income
2. Universal basic services
3. Care income
4. (Green) Job guarantee
5. Work-time reduction
6. Alternative indicators
7. Maximum income cap
8. Ecological tax
9. Wealth Tax
10. High inheritance Tax
11. Taxing Luxuries with High Environmental Footprint
12. Wellbeing Budgets
13. Green and Socially Sustainable Public Procurement
14. Credit Guidance
15. Payments for Ecosystem Services (PES)
16. Limit long-distance trade
17. Not-for-profit cooperatives
18. Housing cooperatives and ecovillages
19. Energy Communities
20. Food sovereignty
21. Slow and local tourism
22. Limit advertising
23. Responsible Research and Innovation Policy
24. Reclaiming indigenous and local knowledge
25. Sufficiency-oriented education
26. Participatory Civil Dialogue
27. Technological sovereignty
28. Granting Rights to Nature
29. Mandatory Building Insulation
30. Future Generations Act

Further recommendations:

Technology integration
Expand circular economy support
Break up monopolistic green finance structures
Expand public access to digital tools for climate adaptation and local restoration projects.
Regulate social media and non-traditional forms of advertising/marketing.
Limiting population to sustainable level
Offering alternative values instead of consumption

The Delphi process resulted in a coherent variety of policy solutions that embody a widespread expert consensus on the necessity of participatory governance, social fairness, and ecological stewardship in the formulation of post-growth futures. The significant support for ideas like Participatory Civil Dialogue and Universal Basic Services shows that experts are committed to making changes that are both democratic and long-lasting. These policy outcomes create a strong base for future modelling and the creation of strategic policies.

Limitations

The limitation of this research is based on its qualitative research method and participatory approach. The results reflect the thoughts and values of the participants (namely, MAPS researchers and e-Delphi experts), they are not generalizable.

Naturally, foresight methods have their own limitations. For example, classifying future statements into trends, megatrends, hypes, weak signals, or wild cards involve subjective judgments and are hence not fully independent of the people involved. There can also be overemphasis of widely known signals (that are "known" differently to post-growth experts than to mainstream economists). Also, in horizon-scanning picking different driving forces can result in highly different scenarios, or different emphases in the given scenarios. Therefore, it is important to stress that the current versions are the ones that were produced by this group of participants, under these conditions, in this moment in time, under current historical and social embeddedness, with these ontological and epistemological conditions. And even given these circumstances, we could have produced thousands of different quadrants, and hence different scenarios. However, scenario building does not aspire to predict the future but to envision different futures that enable us to understand possibilities and interconnections.

The selection process for the participants in the HS and SB methods also has limitations. The aim was to invite a post-growth community that has diverse knowledge on post-growth and a strong academic background. The future statements and scenarios were created through a participatory process, and these results reflect their understanding at this specific time.

The selection process for the experts using the e-Delphi method was based on the recommendations of the SB participant and involved a wide variety of perspectives to encompass multiple fields of sustainability in this broader discussion and validation process. The high number of participating experts (52 experts) can validate the results of the previous processes. Altogether more than 75 participants contributed to the overall results of this research, which can give a strong basis and validity to the results.

Potential limitation of the e-Delphi expert nomination process: since this nomination process is largely based on MAPS researcher's professional connections, we have a high proportion of experts who have been working on sustainability issues and some of them may be inclined towards post-growth discussions. For example, the NGOs that were nominated include organisations working on sustainability topics.

Conclusion

The aim of this research was the exploration of post-growth futures. Within WP1 of the MAPS project, Task 1.2 addresses complex societal and ecological challenges through desk research and participatory foresight methodologies. A carefully designed and iteratively implemented process, with the combination of horizon scanning, scenario building, and the e-Delphi method, created a rich picture of possible futures, while also fostering a collaborative environment where different expert voices shaped the outcomes.

The content of the research—spanning 596 initial future statements, 60 evaluated and classified drivers, and eight complex scenarios with validated interlinks and recommended policy proposals —reveals a nuanced understanding of the tensions, possibilities, and pathways toward the futures. The scenarios, ranging from 'Democratic Caring for Nature' to 'Autocratic Collapse', illustrate the diverse trajectories that societies might follow depending on the interplay of social, technological, ecological, economic, legal, and ethical factors. The subsequent enrichment of these scenarios through the e-Delphi process added further depth, validating key interrelations, and generating actionable policy insights.

The only desirable post-growth scenario is the Democratic Caring for Nature where citizens actively participate in ecosystem restoration, recognizing nature as a core societal value. Well-being is redefined holistically, encompassing both material and immaterial needs. A decommodified economy ensures universal access to essential services, while democratic processes guide infrastructure development. Consumption is sufficiency-based, with reuse, repair, and ethical production replacing overconsumption and corporate-driven growth. Governance is decentralized and participatory. Legal systems evolve to recognize the rights of non-human beings and dismantle exploitative capitalist structures. Subsidiarity and ecological realities guide place-based lawmaking, ensuring justice and integrity. Global trade is minimal and purposeful, coordinated by localities exchanging only non-local goods. Bioregional strategies within the EU promote renewable innovation and fair trade with the Global South. Colonial legacies are addressed through local production, high-skill labor, and transparent policymaking. Labour is democratized and redefined as care—both paid and unpaid—that supports people and ecosystems. Jobs focus on essential services and restoration, with reduced working hours and state-supported guarantees. Social value replaces monetary wealth, and inequalities are minimized through fair welfare systems. Education fosters ecological awareness, futures literacy, and democratic engagement. Technology serves the common good, with AI and digital tools enhancing transparency, sustainability, and public participation. Information access is universal and supports civic learning. All in all, this scenario envisions a society where democracy, ecological care, and social justice are deeply intertwined. Through participatory governance, sufficiency-based living, and inclusive innovation, citizens co-create a regenerative future that respects

both human and non-human life. It is a world where well-being is relational, rights are extended, and prosperity is measured by our collective contribution to the planet.

Having positive scenarios is crucial for post-growth research, enabling new social imaginaries to surface and florish and serving not just as a criticism when compared to current realities but also a purposive finality worth striving for. On the other hand, we have the Autocratic Collapse scenario that in a strange way is also a scenario where the benefits of economic growth are highly unlikely to be played out. In this sense, it is also a scenario of post-growth but not in the sense of democratically moving towards a state that transcends the current cultural, social and economic reliance on growth but where growth is no longer possible due to the collapse of ecosystems and civic social organisations. It is one of the most shocking findings of this research that the majority of experts found this scenario to be a likely one that humanity needs to face. This message is crucial for policy-makers to understand.

The other two scenarios are important for both policy-makers and post-growth researchers in seeing where post-growth needs to be tackled holistically. If just one element is missing: i.e. the process is undemocratical or human and non-human diversity remains unacknowledged, post-growth can be derailed. However, this holistic understanding does not mean that we need to shy away from implementing policies in just one area or another, but we also need to have an overview that "attacking the problem" from just one angle may not lead us to desired outcomes.

The participatory nature of the methodologies was central to both the integrity and the impact of the research. From the initial horizon scanning phase to the scenario-building workshops, which engaged degrowth researchers across multiple work packages within the MAPS project, and the e-Delphi process, as a final phase including a wide variety of external experts, the project consistently prioritized inclusivity, deliberation, and co-creation. This approach ensured that the resulting scenarios were not only analytically robust but also reflective of a wide spectrum of disciplinary, geographical, and experiential perspectives.

Equally important is reflection on the research process itself. The integration of different future-oriented participatory methods, the use of digital platforms for collaboration, and the iterative refinement of outputs demonstrate a methodological innovation well-suited to the challenges of 21st-century foresight. The project's commitment to transparency, ethical data governance, and interdisciplinary dialogue highlights its contribution both to the field of futures studies and to the broader discourse on sustainable and democratic transitions.

To conclude, Task 1.2 within the MAPS project gives an example of how participatory foresight can serve as both a mirror and a compass, revealing possible futures while guiding collective efforts toward scenarios that are just, sustainable, and desirable.

This report primarily discusses the research method (the integrated foresight model and its implementation), describes the process itself and provides a mere description of the

qualitative results. The report does not include scientific analysis or value judgements. Based on the results presented in this report, further research can provide in-depth analysis from a myriad of perspectives. Further steps will also include further developing and clarifying the most important findings for the post-growth community as well as for policymaking.

Data Sharing, Data Policy, and Ethical Considerations

In the context of the MAPS project (Models, Assessment, and Policies of Sustainability), a comprehensive framework was established to govern the sharing, protection, and ethical use of data generated through collaborative research activities, including the e-Delphi study conducted under Task 1.2. This framework was formalised in a dedicated Data Sharing Agreement and complemented by a detailed Privacy Notice, both of which ensured that data collection and processing were carried out in compliance with applicable legislation and international standards of research integrity.

The purpose of the agreement was to provide a clear basis for the transfer and handling of information, including datasets and, where necessary, personal data of participants. In the Agreement, Corvinus University and Tampere University agreed that data exchanges would be conducted strictly for research purposes linked to the project tasks, and that any other responsibilities relating to the MAPS project would continue to be governed by the overarching Consortium Agreement signed by all partners.

The general obligations of the Parties stipulated adherence to relevant legislation, regulations, and institutional guidelines, with explicit reference to responsible conduct of research and research integrity. All tasks were to be completed with due care and in line with academic best practices. The obligations extended to the careful management of personal data and the safeguarding of participants' rights throughout the entire research process.

The Agreement further specified the conditions of data transfer. Information to be shared was documented in a Data Transfer Form, which detailed both the type of data and the transfer methods to be used. It was required that data be pseudonymised or anonymised whenever feasible, thereby reducing the risk of re-identification, and protecting individual privacy. No biological or human-derived material was to be transferred unless accompanied by a separate material transfer agreement. Recipients of the data were bound by strict commitments: they were permitted to use the data solely for the stated purposes of the MAPS project, and any use for harmful, manipulative, or otherwise inappropriate purposes was expressly prohibited. Access to the data was restricted to personnel on a need-to-know basis, who were themselves required to be bound by confidentiality undertakings. Furthermore, each recipient organisation was required to appoint a responsible person for the secure processing of data.

The data protection provisions clarified that, unless otherwise agreed, the Provider of data would act as the controller of personal data. In cases of joint controllership, the responsibilities of each party were to be explicitly communicated to the data subjects. Both the Provider and Recipient remained responsible for ensuring compliance with data protection laws, and the Provider retained the right to instruct the Recipient to discontinue processing if compliance could not be guaranteed or if consent was revoked. Data protection was reinforced through a combination of technical and organisational measures, including secure storage, restricted access, and the use of pseudonymisation.

Complementing these formal obligations, a Privacy Notice specific to the MAPS Task 1.2 e-Delphi study was issued to participants. This document provided transparency about the scope and purpose of data processing, clarified the lawful basis under the General Data Protection Regulation (GDPR), and informed participants of their rights. The Privacy Notice confirmed that personal data would be processed in the public interest for scientific research purposes, and that sensitive categories of personal data, such as political opinions or philosophical beliefs, could be processed only insofar as they were directly relevant to the research questions. Data would not be transferred outside the EU/EEA and would not be disclosed to other data controllers, except where permitted by law.

The rights of participants as data subjects were explicitly safeguarded. Participants were informed of their right to access and rectify their data, to restrict or object to processing under certain conditions, and to lodge a complaint with the supervisory authority if they believed their rights under data protection legislation had been infringed. Importantly, participants were assured that their personal data would not be used for automated decision-making or profiling, and that research results would be published only in aggregate form to prevent individual identification.

Finally, clear rules were established concerning the retention and archiving of data. Personal data were to be retained only for as long as necessary to fulfil the research objectives, with a maximum retention period of five years after the project's conclusion in 2028. Following this period, data would either be anonymised and archived for future scientific use or securely destroyed, depending on the requirements of the Data Management Plan and applicable legislation.

Through these layered instruments - the Data Sharing Agreement, the Privacy Notice, and the Consortium Agreement - the MAPS project partners established a robust framework for the ethical governance of data. Together, these measures ensured legal compliance, institutional accountability, and the protection of individual rights, while at the same time enabling the effective sharing of information essential for advancing the project's scientific objectives.

References

Burden, N, McNeill, A and Moore, H 2018, 'Utopia and motivation: The psychological effects of thinking about ideal futures', Current Psychology, vol. 37, no. 4, pp. 780–92, https://doi.org/10.1007/s12144-017-9571-5

Castoriadis, C. (1997). The imaginary institution of society. Polity Press: Cambridge.

Costanza, R. (2023), Addicted to growth: Societal therapy for our fossil fuel, climate change, and consumerism crises. New Society Publishers: Gabriola Island.

Fitzpatrick, N., Parrique, T., & Cosme, I. (2022). Exploring degrowth policy proposals: A systematic mapping with thematic synthesis. Journal of Cleaner Production, 365, Article 132764. https://doi.org/10.1016/j.jclepro.2022.132764

Fromberg, C., & Lund, J. F. (2024). Tracing the contours of the ecosocial project: A review of policy proposals. Journal of Cleaner Production, 467, Article 142804. https://doi.org/10.1016/j.jclepro.2024.142804

Gáspár, J., Gubova, K., Hideg, É., Jagaciak, M., Mackova, L., Márton, A., Rafał, W., Sacio-Szymanska, A., Komlossyova, E. (2023). Trends Shaping Sustainable Post-Pandemic Development of the V4 Region in Turbulent Times until 2030. Foresight 25. 6. 861-877. https://doi.org/10.1108/FS-10-2022-0135

Gidley, J. (2017). The Future: A Very Short Introduction. Oxford: Oxford University Press.

Hickel, J. (2018). The divide: A brief guide to global inequality and its solutions. Random House: New York.

Hideg, É. (2009). Interactivity and the Development of Futures Studies. In: Futures Studies in the Interactive Society, Hideg, É. (ed.) Budapest: Corvinus University of Budapest. 13-54. Available at: https://real.mtak.hu/2118/1/interactivekonyv.pdf

Hideg, É. (2013). Integral Futures Based on the Paradigm Approach, Futures, 45. 6-15. http:// doi.org/10.1016/j.futures.2012.11.007

Hideg, É. (2015). Paradigms in Futures Field. Budapest: Corvinus University of Budapest. http://unipub.lib.uni-corvinus.hu/1900/

Király, G., Köves, A., Pataki, G., & Kiss, G. (2016). Assessing the participatory potential of systems mapping. Systems Research and Behavioral Science, 33(4), 496-514.

Köves, A. (2025). The role of utopian thought in a Degrowth transition. In Nelson, A. (2025) The Routledge Handbook of Degrowth. Routledge.

Köves, A., Szathmári, A., & Herr, O. (2021). The vision of sustainable sport in a backcasting research. Society and Economy, 43(4), 314-330. https://doi.org/10.1556/204.2021.00009

Kuhnhenn, K., Pinnow, A., Schmelzer, M. et al. (2024). Future for all: A vision for 2048. Mayfly Books: London.

Lauer, A., de Castro, C., & Carpintero, Ó. (2025). Beyond Green capitalism: Global scenarios for fast societal transitions toward sustainability. Environmental Innovation and Societal Transitions, 56, Article 100981. https://doi.org/10.1016/j.eist.2025.100981

Latouche, S. (2009). Farewell to growth, Polity: Cambridge.

Leydesdorff, L. (2001). A Sociological Theory of Communication: The Self-Organization of the Knowledge-Based Society. Parkland FL: Universal Publishers.

Liu, Y., Ott, M., Goyal, N., Du, J., Joshi, M., Chen, D., . . . Stoyanov, V. (2019). Roberta: A robustly optimized bert pretraining approach. arXiv preprint arXiv:1907.11692.

Markus, H. & Nurius, P. (1986). 'Possible selves', American Psychologist, vol. 41, no. 9, pp. 954–69, https://doi.org/10.1037/0003-066X.41.9.954

Mauksch, S., von der Gracht, H. A., & Gordon, T. J. (2020). Who is an expert for foresight? A review of identification methods. Technological Forecasting & Social Change, 154, 119982-. https://doi.org/10.1016/j.techfore.2020.119982

Nováky, E., Hideg, É., Kappéter, I (1994). Future Orientation in Hungarian Society. Futures 26. 7. 759-770. https://doi.org/10.1016/0016-3287(94)90043-4

Quarta, C. (1996). 'Homo utopicus: On the need for utopia', Utopian Studies, vol. 7, no. 2, pp. 153–66.

Retek, M. (2021). Scenario Building in an Interactive Environment and Online Communication. Technological Forecasting and Social Change, 162 January, https://doi.org/10.1016/j.techfore.2020.120395

Retek, M. (2023). Forgatókönyvek interaktív és online készítése és azok elemzése (Interactive and Online Scenario Building and Scenario Analysis, in Hungarian). PhD Thesis. Budapest: Corvinus University of Budapest.

Richardson, K., Steffen, W., Lucht, W. et al. (2023). 'Earth beyond six of nine planetary boundaries', Science Advances, vol 9, no. 37, https://doi.org/10.1126/sciadv.adh2458

Robinson, J., Burch, S., Talwar, S. et al. (2011). 'Envisioning sustainability: Recent progress in the use of participatory backcasting approaches for sustainability research', Technological Forecasting and Social Change, vol. 78, no. 5, pp. 756–68, https://doi.org/10.1016/j.techfore.2010.12.006

Slaughter, R. (1995). The Foresight Principle. London: Adamantine Press Limited.

Slaughter, R. (2008). What Difference Does 'Integral' Makes? Futures 40. 2. 120-137. https://doi.org/10.1016/j.futures.2007.11.015

Torbert, W. (2021). New Social Science Paradigms for the 21st Century. Academia Letters. https://doi.org/10.20935/AL112

Wright, E.O. (2012). 'Transforming capitalism through real utopias', American Sociological Review, vol. 78, no. 1, pp. 1–25. https://doi.org/10.1177/0003122412468882

Annexes

1. Annex 1: Long version of the Democratic Caring for Nature Scenario

In this scenario, citizens are actively involved in policy-making, embodying a participatory society. At the same time, there's a focus on ecosystem restoration and increased connectivity. Ecosystem restoration and participatory processes are mutually reinforcing positive forces.

Nature is recognized as a fundamental societal value and is rigorously protected through democratic policies, participatory citizenship, and personal responsibility. As people come to understand their dependence on nature for survival, they begin to treat it with the respect it deserves. This shift in consciousness transforms biodiversity into a key indicator of societal well-being.

Citizens embrace their role as stewards of ecosystems, leading to a decline in species extinction and the recovery of habitats. Collective action and ethical land management drive a remarkable resurgence in biodiversity, as threats such as habitat loss, pollution, and industrial agriculture are eliminated. This ecological restoration also contributes to mitigating the worst effects of climate change.

Although global temperatures temporarily exceed the 1.5°C threshold, the goals of the Paris Agreement for 2050 are ultimately achieved. The transition to a zero-emissions future brings transformative opportunities, including more equitable wealth distribution and the emergence of a fairer, more inclusive society.

The idea of sustainable welfare prevails in society; human needs are satisfied within planetary boundaries. Well-being is understood relationally in a holistic way, encompassing both material and immaterial dimensions. On the material side, democratic processes ensure the development of infrastructure that meets basic needs through low-impact, high-social-value options. On the immaterial side, well-being includes social connection, meaning-making rituals, and spiritual experiences.

The concept of wealth is fundamentally redefined to focus on access to what fosters human wellbeing rather than material accumulation.

Economic security is guaranteed through a network of universal services, largely decommodified, which supports both physical and emotional well-being. This foundation enables active democratization of the economy, where individuals are no longer passive consumers but engaged participants in shaping economic decisions. The result is a society that values sufficiency, equity, and collective flourishing over individual accumulation and excess.

There is no over-consumption in this economic system; the limits of consumption are democratically agreed upon. As consumers become more aware of the true value and environmental cost of products, especially in light of issues like food price inflation, overconsumption declines. Conscious consumer behavior, coupled with a cultural shift

away from status-driven and conspicuous consumption, dismantles unsustainable consumption patterns.

Production and consumption are reoriented around genuine human needs. They are no longer driven by growth for their own sake but are reoriented toward meeting basic needs and enhancing quality of life. Corporations are replaced by collectives and democratic institutions that oversee production scales, ensuring ethical labor practices and minimizing environmental harm. Reuse, repair, and reconstruction become the norm, drastically reducing resource demand. Legislation enforces minimum standards, caps excess production to prevent resource concentration, and promote equitable well-being.

Democratic institutions empower citizens to determine which goods are socially and ecologically valuable. Harmful products, such as disposable plastics and addictive digital platforms, are phased out. Material production and resource exploitation decline, replaced by durable, repairable goods and services that enhance quality of life. Creative reuse and upcycling, especially in industries like fashion, contribute to ecological regeneration.

Scientific research on climate and biodiversity informs just transition pathways aligned with global goals like the SDGs and Paris Agreement. Governance at all levels promotes sufficiency-oriented lifestyles across housing, food, transport, and other sectors. Sustainable choices are made more accessible and appealing through affordable alternatives and cultural narratives that prioritize well-being over material wealth.

While individuals voluntarily adopt conscious consumption habits, systemic change is driven by policymakers who use economic tools, such as pricing mechanisms, to discourage unsustainable resource use and guide society toward ecological balance.

Living an environmentally conscious and caring lifestyle does not equate to material poverty because reduced consumption (whether voluntary or guided by systemic factors) remains sufficient to ensure well-being. This shift requires a fundamental reorientation of technological development, where innovation is no longer driven by corporate profit but by societal and ecological needs.

Technological and social innovations are democratically funded and evaluated based on their contributions to sustainability and community well-being. Products and platforms that do not align with these values, such as plastic toys, unnecessary sports equipment, or addictive digital media, are critically reassessed and phased out through collective decision-making, rather than left to individual consumer choices.

Social innovation plays a central role in transforming everyday life. Sustainable co-housing projects promote shared living and reduce material consumption while maintaining high levels of well-being. Organic food cooperatives and community kitchens prioritize local, seasonal, and bulk products while minimizing waste. Repair cafés empower citizens to restore and reuse goods, fostering a culture of maintenance and longevity. Car and bike sharing services reduce reliance on resource-intensive mobility and encourage sustainable transportation.

Innovation is collectively directed toward ecological restoration, with digital platforms enabling widespread participation in environmental efforts. Publicly funded innovations support the development of local markets and increase self-sufficiency, especially in agriculture. Locally grown produce is distributed directly to consumers, reducing reliance on imports and minimizing waste associated with large retail chains.

There are cooperatives instead of corporations, where employees are co-owners. Participatory decision-making prioritises investment preferences through deliberative processes. There are community-owned financial institutions. The market is generally regulated to limit exploitation by, for example, monopolies.

Trade is conducted by cooperatives, state-owned enterprises, foundations, and steward-owned entities, prioritizing democratic ownership, social responsibility, and ecological sustainability. Businesses operate under circular economy principles, emphasizing social equity, ethical leadership, and sustainability-driven innovation. Production is localized and cooperative, including worker, consumer, and producer co-ops that support renewable energy, ethical food systems, and fair labor practices.

Citizens self-organize to collectively manage resources, guided by principles of sufficiency, regeneration, and shared responsibility. Commons-based governance replaces private property norms, fostering community cohesion and ecological stewardship.

Open-source and IoT-based technologies enable localized production, connecting communities and shared resources across regions. As access to tools and information becomes widespread and affordable, a thriving maker culture emerges, empowering DIY innovation and grassroots solutions.

Ethical operations are reinforced by regulatory frameworks and public expectations. Corporate activities are transparently assessed using robust ESG metrics, with third-party verification and citizen oversight eliminating greenwashing. Ethical business becomes synonymous with transparency, accountability, and regenerative supply chains.

Businesses are local rather than international. Trade no longer exists for its own sake, and the outdated notion of comparative advantage loses relevance. iTrade is coordinated by place-based localities that communicate across regional and global levels to identify and exchange only those goods and services that cannot be produced locally.

Natural resource use is localized wherever feasible, though full self-sufficiency isn't possible for all. International firms may still facilitate essential imports, technological collaboration, and knowledge exchange. Within the EU, strategies focus on bioregional sourcing, inter-regional exchange, and innovation in renewable technologies that avoid scarce raw materials. Consumption and lifestyles adapt to reflect regional ecological capacities.

As a result of stringent international regulation, Global South countries no longer produce goods for consumption in the Global North without robust oversight of environmental and social impacts. Trade becomes democratic, reciprocal, and

solidarity-based, with the Global South actively contributing to the low-carbon transition by exporting essential technologies like solar panels and wind turbines.

Colonial legacies are dismantled through local production, high-skill labor development, and transparent education and policymaking. This transformation addresses the roots of the climate crisis and exploitation of human and non-human life.

Migration becomes freer and more respectful, avoiding colonialist patterns. As rural areas become more viable, urban migration stabilizes, leading to a more balanced population distribution and expanded opportunities in non-urban regions.

There's a need for a universal basic income (UBI) that can be provided by democratic governments. UBI is introduced by democratic governments to ensure that all individuals can access basic goods and services produced and exchanged in environmentally and socially responsible ways. UBI supports the decommodification of essential needs, such as housing, energy, and healthcare, and funds bioregional learning, innovation, restoration, and education.

Wealth is associated with a contribution to ecological regeneration. Social inequalities are linked to this contribution, and Universal basic income provides a safety net for all, including those less able to directly engage in restoration efforts.

The principles of sufficiency and ecocentric (not anthropocentric) ethics pervade this society. Nature is understood as the foundation of all life and use of its resources is treated with care. Bioregional principles and local natural resources guide the sufficiency-based production and consumption.

Citizens are living and consuming in line with the value of sufficiency. This is about achieving a legitimate and sustainable social floor and social ceiling (minimum and maximum standards of living) that meets human material/physical needs. Upper and lower limits to consumption are agreed upon with respect to values of global, distributive justice, with the minimum aim being that all humans basic needs can be met within the planetary boundaries.

Because of sufficiency principles, income inequalities are minimal. They are reduced via fair welfare systems, where the needy get the targeted benefits necessary to fill the gap between rich and poor, and those who do not need extra revenues do not request them nor complain about not getting them.

Inequalities still exist, but they remain comparatively low. Differences in health and longevity are no longer structured by social inequality but instead arise from individual choices and genetic variation.

In this society, social inequalities depend on one's contribution to the restoration of the ecosystem. Instead of anthropocentric monetary assets or consumption levels, people are valued according to their contribution to the ecosystem. It is the level of care for the ecosystem that non-human beings present value in this type of society.

Labour includes both paid work and unpaid care that supports people, communities, and ecosystems. All productive activity is seen as a form of care, blurring the line between work and care.

Work is organized democratically, with citizens deciding what is produced, how, and why which ensures alignment with ecological and social goals. It becomes more meaningful and less time-consuming, focused on essential, sustainable goods and services.

Reducing work hours helps share labour fairly and prevent unemployment, especially as low-productivity sectors like agroecology grow and EU countries shift toward domestic production. The decline of high-carbon industries also supports shorter working hours.

Employment is no longer tied to economic growth. Instead, jobs are created in areas vital to human and planetary health—such as care, education, public health, and ecological restoration. State-supported job guarantees ensure dignified work for all, with success measured by social and environmental well-being rather than GDP.

Labour is democratized at the workplace and regulated to meet climate goals. As machines play a smaller role, human labour focuses on essential needs. Some work remains unpaid by design. Yet, the overall structure ensures that all labour is meaningful, accessible, and aligned with collective priorities.

There is a focus on restoration in agroecology practices with the involvement of more and more people. Protected areas are becoming larger and better informed about how they are selected.

Biodiversity preservation is central and guided by permaculture; a sustainable design system that mimics natural ecosystems to create regenerative, self-sufficient environments. Citizens adopt a holistic approach to ecosystem management, valuing the complex relationships among species, habitats, and ecological systems. Permaculture principles such as polycultures, agroforestry, and minimal waste are applied in agroecology to enhance soil fertility, conserve water, and support biodiversity.

However, climate change poses significant challenges to agriculture. Traditional crops may no longer thrive in certain latitudes, while new crops may become viable in others, including higher altitudes with less fertile soils. Overall, productive agricultural land may shrink. Climate impacts extend beyond crops to meat and fish production, raising concerns about food safety. Extreme weather disrupts the cultivation of key feed crops like corn, wheat, rye, and sugar beet, affecting the broader food industry, including the production of sugar and oil.

Human reproduction is controlled on a voluntary basis. There is a general awareness of the size of the human population. The population will age but people will remain active for longer.

There are technological improvements for nature restoration. For example, digital platforms (e.g. apps) or channels help people connect with each other to coordinate volunteer work in nature restoration and conservation.

Technology serves the common good, with decisions guided by sustainability, care, and efficient use of materials, energy, and time. Though innovation may reflect developers' interests, it is shaped by ethical standards and public oversight.

High-tech solutions are complemented by low- and no-tech approaches. Technologies like renewable energy, and eco-informatics support ecosystem monitoring, resource efficiency, and climate resilience. Waste prevention is prioritized, with household practices like composting and advanced sorting and reuse systems forming the foundation of sustainable waste management.

Artificial intelligence (AI) plays a vital but carefully governed role. As democratically managed, it enhances public services, supports transparent decision-making, and builds trust. AI monitors environmental and social systems, identifies issues, and proposes solutions while keeping final decisions in human hands. Tools like AI-powered conservation and blockchain platforms ensure equitable resource management and strengthen democratic participation.

The same rights are provided for the existence of human and non-human beings as well. Human rights are fully realized and universally respected, while their scope is ethically expanded to include non-human beings. This transformation reflects a shift from an anthropocentric to an eco-centric perspective, recognizing the intrinsic value of nature and non-human entities beyond their utility to humans.

The evolution of rights entails both the strengthening of the human right to a safe and healthy environment and the affirmation of nature's own right to exist and flourish, independent of human interests. Although humans remain responsible for enforcing these rights, they are extended to other species, which are acknowledged as conscious, intentional, and sentient beings with complex needs that go beyond mere physical survival.

A society that upholds equal rights for human and non-human beings fosters inclusivity, enabling new forms of recognition and contribution across diverse life forms. Guided by the principle of harmlessness, decisions and actions prioritize respect, kindness, and empathy toward all forms of life and viewpoints, nurturing a culture of interconnectedness and ethical coexistence.

Deliberative and participatory processes characterise the political scene. Citizens are actively involved in the national policy-making. Democracy thrives through deep citizen participation, decentralized decision-making, and empowered local movements. Communities make social choices supported by strong local governments and cooperatives, while governance evolves through systems thinking and emergent learning. A representative national democracy complements this participatory model, ensuring inclusive governance.

As the economy becomes decommodified and locally driven, traditional institutions like the nation-state and EU lose centrality. Governance reorganizes around bioregions, reflecting ecological boundaries and enabling coordinated action across scales. While

centralized institutions diminish, EU-level cooperation remains essential for addressing climate challenges, contingent on member state consensus.

Citizen assemblies at all levels—local to global—become key democratic instruments. They reflect demographic diversity, deliberate on well-being within planetary boundaries, and influence policy through transparent integration into governance. In the EU, a nested network of assemblies allocates funds for a just transition, equipped with time, resources, and knowledge to act in the public interest.

Economic democratization is realized through collective ownership via decentralized cooperatives that align with ecological and social values, distributing profits fairly and reinforcing a regenerative economy.

Democracy is a foundational and evolving process, enabling innovation, responsibility, and meaningful engagement in social and ecological practices. Multiple spaces for deliberation allow communities to decide how collective resources are used. Informal participation and grassroots action remain vital, supported by institutions that monitor exclusion and bring tensions into forums for reflection and reform.

Ultimately, democracy is understood as a continuous, negotiated process, requiring collective organization to navigate uncertainty and prevent elite dominance.

The legal system evolves to connect local, national, and international interests, with the European framework becoming part of a broader structure that no longer pits national and EU priorities against each other. Legal structures recognize the rights and interests of non-human entities

A comprehensive overhaul of legal frameworks redefines property rights, replaces corporations with cooperatives, and reshapes welfare and employment regulations. Legal systems that enabled exploitation under capitalism are dismantled.

Protections against exploitation, such as intellectual property theft, are reinforced through tools like Creative Commons and blockchain-based technologies, which ensure secure, transparent documentation of knowledge and agreements.

Governments enforce laws that protect nature, supported by empowered authorities committed to ecological integrity. Legal systems become place-based, guided by the principle of subsidiarity, allowing localities to autonomously accept or reject inter-regional arrangements. This ensures governance is grounded in ecological and community realities, without hierarchical relationships among countries.

Education is reimagined as a tool for societal transformation and environmental stewardship, evolving into an inclusive, participatory, and sustainable system. It emphasizes skills for living well—nurturing relationships, promoting health, and enjoying leisure—rather than preparing individuals for market-driven roles.

Environmental education is embedded at all levels, supported by open forums and access to diverse knowledge systems, including indigenous wisdom. Learning centers on arts, creativity, and respectful interaction with nature, as production beyond basic needs ceases.

Rooted in practical ecological knowledge, education fosters futures literacy, environmental responsibility, and a holistic understanding of sustainability across local and global contexts. Driven by curiosity, openness, and experimentation, learning moves beyond rigid curricula and standardized exams, supporting an ecologically conscious and socially connected society.

Digital literacy and critical perspectives on AI are cultivated across all age groups, supported by international collaboration and the sharing of best practices. Education is free and accessible, with universities state-funded and professions that support societal well-being—such as teaching, caregiving, and waste collection—respected and fairly compensated.

Learners gain awareness of historical inequalities, fostering political engagement and empowering them to challenge injustice. Education becomes a vehicle for personal growth, democratic renewal, and collective responsibility for shaping a regenerative future.

Sport is no longer a political or economic tool, nor subject to EU policy. Large-scale events that promote nationalism or exploitation are phased out. Instead, sport fosters health, well-being, and inclusion, with widespread participation in self-organized, small-scale activities. Elite sport remains modest and ecologically responsible, and international teams reflect cooperation over rivalry.

A diverse range of sports continues, but practices and facilities are ecologically planned. Resource-intensive venues are repurposed, giving rise to low-impact sports aligned with environmental values and community needs.

Transparent and equitable access to information is a foundational right. Information literacy is taught early, helping children distinguish real from fake news. AI-powered systems ensure real-time access to credible knowledge, supporting informed decision-making across society.

Governments, institutions, and communities prioritize open data, transparency, and participatory governance. Citizens actively engage in policymaking and oversight, reinforcing a culture of collective ecological responsibility.

Information is embedded across all institutions and organized with minimal, targeted technology to enhance accessibility and understanding. This shared knowledge base supports democratic processes, fosters competence in ecological and social issues, and encourages collective learning through civic discourse.

The current model of escapist, individualistic media consumption is replaced by decommodified, collective media, promoting shared understanding, civic engagement, and cultural transformation.

2. Annex 2: Long version of the Ecocracy scenario

This scenario explores a fundamental tension between the ambitions of a governing elite committed to restoring ecosystems and the public's reluctance or inability to engage in these efforts. While ecological outcomes are largely positive—climate change is mitigated to acceptable levels, biodiversity benefits from eco-friendly production, and carbon-intensive activities are curtailed—the path to these achievements is marked by significant social and political upheaval.

Environmental protection becomes the overriding priority, enforced through strict policies such as carbon taxes, penalties, and offsets. These economic mechanisms partly fund species conservation, contributing to large-scale rewilding and ecosystem connectivity projects. However, these initiatives are imposed without public consent, reflecting a shift from democratic governance to an autocratic system dominated by green values. This transformation is described as a "dictatorship of nature," where environmental imperatives override traditional human values and societal needs.

Public resistance is fueled by misinformation, anti-green ideologies, and scapegoating, which alienate populations from environmental policies. In response, elites enforce ecological measures deemed essential for human survival, leading to widespread social unrest, protests, and violent state repression. Democratic participation declines sharply, and civil society loses its influence over decision-making.

The ecological benefits are undeniable: known species thrive, mass extinctions are avoided, and wild nature maintains balance. Yet, unknown species and human cultural expressions (e.g., music, sports) may suffer neglect. Some species are subjected to "violent care," a term reflecting the aggressive human management of nature. Critics, including anti-technocrats, challenge the increasing control humans exert over natural systems.

Economically, the shift from a carbon-based model to a nature-centric industrial ecosystem presents challenges. Strict environmental regulations can be excessively punitive, and the demand for renewable resources strains supply chains. In the absence of viable alternatives, artificial materials may re-enter production. While industries align with ecological goals, this transition may marginalize local workers and provoke regional revolts, posing risks to the stability of the ecocratic regime.

The rise of an eco-aristocratic elite entrenches deep income inequalities and undermines democratic participation. Wealth becomes highly concentrated among those engaged in specialized ecological activities and who control emerging financial instruments tied to ecosystem restoration. This elite uses economic disparity as a tool to maintain power, while the majority—especially those with differing or non-ecological views—are increasingly marginalized.

The governance model evolves into an authoritarian or even dictatorial regime, driven by the elite's desire for wealth and control. Public investments and social support systems erode as the voices and needs of the marginalized are ignored. The failure of democratic processes limits policy space, reinforcing the elite's dominance.

Resistance from the masses emerges but remains fragmented and ineffective. Fear of further impoverishment discourages support for the imposed ecological order, while the elite respond to dissent with coercive measures. This cycle of repression and resistance destabilizes the system, making it inherently fragile.

Ultimately, the scenario portrays a society where ecological goals are pursued through authoritarian means, resulting in social exclusion, economic inequality, and political instability. The concentration of power and wealth in the hands of a few undermines both environmental justice and democratic legitimacy.

Colonialism re-emerges in new forms, driven by technological control and ecological governance. Innovation is tightly regulated by a ruling elite, who channel technological advancements into sophisticated surveillance systems designed to monitor land use and penalize environmental violations. Artificial intelligence plays a central role in this transformation, but its benefits are unequally distributed.

AI-driven automation replaces many low-skilled and vulnerable workers, leading to widespread job displacement. Since AI does not earn wages or consume goods, its proliferation weakens overall economic demand and exacerbates income inequality. The elite, meanwhile, accumulate wealth through control over ecological technologies and financial instruments for ecosystem management, further deepening social divides.

This narrow focus on environmental monitoring and elite-controlled innovation sidelines broader societal needs and diverse ecological perspectives. The result is a technocratic system that prioritizes ecological control over social equity, reinforcing authoritarian governance and economic exclusion.

Environmental policy becomes the central force shaping economic activity, governance, and technological development. The economy is restructured to prioritize ecosystem restoration, with production and consumption deliberately reduced to minimize resource use. Profits are redirected toward ecological goals, and civil liberties—including property rights, freedom of speech, and democratic participation—are curtailed in service of environmental objectives.

Governments face shrinking tax revenues due to the contraction of economic activity. Without a fundamental shift away from mainstream neo-classical economics toward more heterodox approaches, fiscal policy remains constrained by arbitrary rules such as balanced budget requirements. This limits public spending capacity, even as governments are compelled to bail out elite institutions and corporations affected by the economic downturn. As a result, public discourse echoes post-pandemic narratives of austerity and insufficient funds for social support.

To meet environmental targets, governments increasingly rely on private capital. New financial products are developed to manage and restore ecosystems, granting financial elites significant control over ecological initiatives. This deepens existing inequalities and shifts authority away from democratic institutions toward market-driven mechanisms.

Technological innovation is narrowly focused on environmental surveillance, geoengineering, and ecosystem monitoring, with research and development agendas dictated by ecological policy. Broader societal needs and diverse ecological perspectives are sidelined, reinforcing a technocratic and exclusionary model of governance.

Citizens are compelled to perform unpaid, ecologically-oriented labour to meet basic needs and contribute to landscape rehabilitation. While this work serves environmental goals, it is largely perceived as meaningless by those performing it. The division of labour reinforces existing income inequalities: the majority engage in physical, low-paid work, while the elite occupy leadership roles with significantly higher incomes—if they work at all.

Decisions about species protection and ecological priorities are made by the elite, but the burden of implementation falls on the working class. This imbalance stems from the lack of public involvement in shaping societal values and policies, resulting in widespread disempowerment.

The economy suffers from high unemployment, reduced public income, and limited investment. Public funds are misallocated, often favouring large, already successful corporations. Social support systems are weakened, and the promise of technological progress—symbolized by AI—is largely superficial. AI is celebrated in theory but fails to deliver meaningful benefits, especially to displaced workers.

The pursuit of liberalization proves costly and counterproductive, fostering irresponsibility and undermining collective prosperity. The absence of redistributive policies, such as progressive taxation, prevents the creation of a more inclusive and resilient economy. Society misses the opportunity to leverage collaboration—particularly the role of the wealthy in supporting public goods—to generate broader economic and social benefits.

Businesses are incentivized to reduce production and redirect profits toward ecological restoration, guided by a redefined set of ethics imposed by a despotic eco-elite. While these "green" practices aim to support environmental goals, they coexist with ethically questionable strategies such as "accumulation by conservation" and the suppression of alternative land-use rights, reinforcing elite control over natural resources.

Public investments in social welfare decline as funds are redirected to support the green agenda, exacerbating social discontent and potentially triggering unrest. The transition to a "green world" comes with high social costs, including the emergence of a dual society where the marginalized face severe restrictions on freedom and agency.

Wealth concentration among the eco-aristocracy fuels innovation focused on surveillance and financial control over nature. This enables the enforcement of a top-down, coercive business ethic that prioritizes ecological restoration at the expense of social equity and individual rights. Technological development, particularly in AI and monitoring systems, is celebrated in theory but fails to deliver meaningful social progress.

The restoration of ecosystems and their interconnectivity becomes the overarching societal goal, leading to the expansion of protected areas and the reduction of privately owned landscapes. Environmental priorities dominate governance, reshaping democracy, global trade, and public investment. The decline of democratic processes reduces the policy space for inclusive public investments, especially as the needs of marginalized groups are ignored. Simultaneously, the erosion of global trade—without reforming international monetary systems—places financial strain on governments, particularly in regions like the Eurozone, where countries lack full monetary sovereignty and remain bound by EU fiscal rules.

Public investment is increasingly directed toward producing public goods through concessions and subsidies to select public or private entities. These entities gain monopoly power, creating clusters of dominant firms (similar to GAFAM), which further concentrate wealth and reinforce socio-economic inequalities. The privileged resist progressive taxation and favor fiscal consolidation, limiting redistribution and deepening the divide between rich and poor.

This transition to a "green world" led by a despotic eco-elite imposes high social costs. A dual society emerges, where the marginalized experience restricted freedom and agency. Innovation is narrowly focused on surveillance and financial control over nature, enabling coercive enforcement of ecocratic business ethics. These ethics prioritize ecological restoration but neglect social equity and individual rights.

At the root of this scenario lies a flawed liberalization agenda, which drives decisions into a deadlock—producing superficial success stories, particularly around AI, without delivering meaningful social progress.

The global elite reorient their interests from fossil-fuel economies toward ecological restoration, driven by the realization that climate crises and resource conflicts could eventually threaten their own well-being. To protect their self-interest, they adopt climate science as a tool to legitimize a new ecological paradigm centered on avoiding climate tipping points. This leads to the installation of a rigid political ideology focused on achieving net-zero emissions by 2050—at any cost.

Under this regime, vast areas of land are designated for conservation, often under the principle of "accumulation by conservation." While framed as environmental protection, this approach frequently infringes on the rights of Indigenous and local communities who have historically stewarded these landscapes. Their practices are overridden, and a new form of coloniality emerges—extracting value through eco-tourism, conservation hunting, and other commodified forms of nature under the guise of restoration.

Migration is increasingly restricted following the curtailment of tourism, reinforcing exclusionary policies. The elite consolidate political power, overthrowing democratic governments and coercing citizens and businesses into compliance with the ecological agenda. Individual liberties and human rights are sacrificed in favor of collective climate goals. Innovation, particularly in surveillance and financial control technologies, is driven by elite interests and used to enforce top-down ecological policies. While these

measures aim to prevent environmental collapse, they also deepen social inequalities and suppress alternative ecological and cultural perspectives.

The political landscape is dominated by a green agenda that consistently overrides social objectives when trade-offs arise. An autocratic regime enforces strict consumption guidelines across all sectors, including the implementation of individual annual carbon budgets. These budgets are monitored through a comprehensive surveillance system that tracks all consumption-based emissions via digital payment systems.

Despite the universal framing of climate goals, carbon budgets are unequally distributed: elites retain high consumption privileges, while ordinary citizens face severe restrictions. This disparity is justified by the regime as necessary for the survival of human civilization. Citizens and organizations are compelled to align with state-endorsed eco-parties and movements, while dissent—especially from artists, academics, and journalists—is systematically suppressed.

Human rights, including freedom of movement, expression, and political participation, are curtailed in the name of environmental protection. Travel is restricted, and sports are restructured to prioritize low-emission activities. High-carbon sports are marginalized or banned, and large events are confined to eco-certified venues with high offset costs for attendees. Nature-based and individual sports become the norm due to their minimal environmental impact.

While these measures succeed in mitigating climate change more effectively than other trajectories, they come at the cost of civil liberties and social justice. The regime fails to harness the potential of environmental protection to enhance universal human rights. Instead, coercive policies deepen inequality and silence alternative perspectives.

The political apparatus and media are used to promote ideologies that glorify consumption limits and suppress non-green viewpoints. The marginalized and under- or differently-educated populations are excluded from influencing public investment decisions, which remain tightly controlled by the dominant elite. As a result, environmental restoration is prioritized at the expense of social welfare, reinforcing a rigid and exclusionary ecocratic order.

The legal system adopts a green and aristocratic character, prioritizing ecological restoration over individual rights such as private property, freedom of speech, and improved living standards. Laws are shaped by a hegemonic green ideology, and citizen compliance is enforced through punishments and sanctions under an autocratic regime.

A deeply unequal distribution of knowledge fosters a dichotomous society, enabling the elite to maintain control and suppress dissent. With full authority over public agency, the ruling class ensures that policies supporting the broader population are never implemented. The masses are left with no real alternatives—either endure unfair conditions or face systematic repression.

The prevailing social value hierarchy elevates ecological goals above personal freedoms, generating discontent, particularly among age groups excluded from decision-making.

Ecocracy emerges from this imbalance in knowledge and power, with vulnerable groups—often less educated—lacking the capacity to negotiate or influence policy.

Education is restructured to serve the green agenda, emphasizing ecological values and local knowledge through decentralized, community-based learning. Young people are trained to become "green soldiers," empowered to enforce the dominant ideology. However, this approach infantilizes the population, relying on control and repression rather than genuine empowerment, and risks provoking violent backlash.

Despite the elite's commitment to nature restoration, their methods undermine democratic principles and social equity. Wealth continues to derive from natural resources, but its unequal distribution prevents the formation of a stable and inclusive society. The failure to involve and trust citizens as autonomous agents of change renders the system fragile and unsustainable.

The ecocratic elite extend their control over demographic processes—regulating migration, birth rates, and family planning—to align with ecosystem restoration goals. The legal and political systems prioritize environmental objectives at the expense of human rights, particularly for marginalized populations.

Human rights protections are limited to citizens within the European Union, while migration is entirely restricted and enforced through military means, disregarding the lives of those affected. A deeply racist and classist ideology underpins these policies, valuing white, wealthy Europeans while implicitly or explicitly welcoming the death of people of color due to climate change and conflict. These outcomes are justified through a distorted environmental rationale that equates population reduction with ecological benefit.

Birth control measures are coercively imposed on poor and racialized communities, rooted in neo-Malthusian arguments that frame poverty as a threat to sustainability. The responsibility for child welfare is shifted entirely onto parents, reinforcing the notion that only the wealthy should reproduce.

This regime fosters a dichotomous society where the elite maintain power through knowledge control and systemic exclusion. Public policies aimed at ensuring decent living standards for all are never implemented, leaving the majority with no real options beyond survival under oppressive conditions. Education is repurposed to indoctrinate youth into enforcing the dominant green ideology, further entrenching authoritarian control.

While the elite claim to act in the interest of ecological restoration, their methods are deeply harmful to vulnerable groups and incompatible with democratic values. The system is inherently unstable, relying on repression and exclusion rather than empowerment and equity. Even if ecologically successful in the short term, it fails to build a just or sustainable society.

Human rights protections are restricted to EU citizens, while migrants are violently pushed back at borders, disregarding international law. A racial and class-based hierarchy emerges, where white, wealthy Europeans are prioritized, and the suffering or

death of poor people and people of color is tacitly accepted or even justified as beneficial for the environment. Coercive birth control measures are imposed on poor and racialized populations, underpinned by neo-Malthusian arguments that frame poverty as a threat to sustainability.

Education is restructured to promote a technology-centered, Western scientific worldview, reinforcing elite control over nature. Environmental themes are integrated across subjects, but marginalized communities' ecological knowledge and practices are undervalued or ignored. The education system trains youth to enforce dominant green ideologies, while dissent is punished through environmental sanctions such as forced sterilization or reduced carbon budgets.

The legal system enforces green norms without regard for individual beliefs or freedoms, compelling compliance or emigration. As material consumption is drastically reduced, the EU becomes less attractive as a destination, especially for those seeking freedom and dignity.

Climate colonialism intensifies as the Global North expropriates ecosystems from Indigenous communities in the Global South under the guise of conservation. These areas are managed but not inhabited, displacing populations and erasing local stewardship. Global trade declines due to reduced production and consumption, but monetary and trade asymmetries remain unaddressed. Elite central banks coordinate to maintain liquidity for themselves, exacerbating global financial inequalities and leaving peripheral countries without access to essential currencies.

Gated communities and cities emerge for the elite, surrounded by slums and nature reserves inaccessible to the general population. The protection of biodiversity and elite lifestyles is prioritized over the lives and rights of vulnerable groups, reinforcing a deeply unequal and authoritarian ecocratic order.

In sum, this scenario portrays a deeply authoritarian ecocratic regime that prioritizes ecosystem restoration above all other social and human development goals. The elite exert control over education, law, migration, and global trade, reinforcing a system of exclusion and inequality. It reflects the internal tensions and contradictions present in current global efforts toward ecological sustainability. Unlike more extreme or dystopian visions, it closely mirrors reality, where countries often simultaneously exhibit high carbon emissions—driven by infrastructure, industry, and fossil-fuel-reliant households—and substantial investments in renewable energy and sustainable technologies.

The transition toward ecological sustainability is not linear or uniform. It involves navigating trade-offs between environmental goals and economic realities. Artificial intelligence, education, research, and technological innovation are recognized as essential drivers of this transition, helping to align policy with sustainability objectives.

However, the scenario is critiqued for resembling a caricature, potentially oversimplifying the nuanced and multifaceted nature of ecological transformation. A more constructive approach would explore pathways from low to high ecological

awareness, acknowledging the coexistence of unsustainable practices and progressive investments within the same national contexts.

3. Annex 3: Long version of the Autocratic Collapse scenario

In this scenario, we witness the intensification of ecosystem use and fragmentation. The relentless exploitation of natural resources means that all planetary boundaries have been crossed, especially the erosion of global biodiversity, and the problems of climate change are causing irreparable harm. Destructive practices like deep-sea mining are expanding rapidly to secure critical raw materials, causing severe damage to ocean ecosystems and accelerating the collapse of marine biodiversity.

While this degradation poses a serious threat to the biosphere, members of the educated upper class are increasingly aware that unchecked overuse could ultimately lead to the collapse of ecosystems—and with them, the foundations of human civilization. As a result, there are emerging limits to how aggressively ecosystem services are consumed, driven by a recognition of long-term risks. Also isolated pockets of protection remain, often in areas where wealthy individuals reside and exert influence. However, the exploitation of resources also produces scarcity of some materials, and this intensifies conflicts promoted also by elites who have interests in continuing the exploration of resources, even if new technologies exist. When resources are running low, new innovations surface aiming at finding suitable replacements from extraterrestrial sources such as the Moon, asteroids, or Mars.

Technological advancements offer new possibilities for mitigating biodiversity loss. Innovations such as genetic engineering, bioproduction, and cloning are being used to support the survival of endangered species and even to create entirely new ones. However, in this context, biodiversity is evolving into a human-managed equilibrium, balancing ancestral species with artificially enhanced organisms deemed most fit for survival.

Climate change is also accelerating, exacerbated by the growth of so-called "sacrifice zones", regions that are disproportionately affected by environmental degradation. The worsening impacts of global warming are being felt also across European societies, with extreme weather events becoming more frequent and severe. These have serious cascading impacts such as food price inflation, shocks to financial markets, inflationary pressures, increasing uninsurability, risining climate migration both towards the EU from abroad and even internally within the EU as some southern regions become increasingly uninhabitable.

Fossil fuel companies - now even more deeply entwined with political elites through autocratic oligarchism - continue to profit from extraction, while also profiting from the rise of negative emissions technologies. There are efficient fossil-based engines and turbines, 5th generation nuclear power plants, advanced battery electric equipment. But the deployment of these technologies, along with geoengineering, increasingly serve geopolitical and military purposes, creating new chokepoints and tools for power politics

in a non-participatory society where people are not involved in decisions about common affairs.

Although many political systems continue to be labelled as democracies, in practice they increasingly resemble plutocracies—where power is concentrated in the hands of wealthy elites and the voices of the general population are systematically ignored. Public discourse is deeply polarized and emotionally charged. Citizens have grown disillusioned with traditional democratic parties, doubting their capacity to address the complex crises facing society. This vacuum of trust enables populist and authoritarian leaders to gain traction, seizing power in both small and large nations.

These leaders have formed alliances at the EU level, undermining the Union's cohesion and effectiveness. While the EU still exists formally, its influence has been severely diminished. Within member states, democratic institutions—including the judiciary, media, education, and scientific communities—have been systematically weakened. Human rights are deeply compromised. Civil and political freedoms are suppressed through state surveillance and censorship, and the public is denied access to information and excluded from political participation. Personal freedoms such as freedom of speech and movement have been significantly curtailed. Intergenerational justice is undermined, as the short-term interests of the elite are prioritized over the long-term well-being of future generations and the planet itself. Non-human species have absolutely no rights and are only used to serve societal purposes.

As a result, democracy is becoming increasingly shallow. However, elections continue to be held, but often offer no genuine choice, with opposition parties marginalized or outright suppressed. Representative democracy - dominated by oligarchic interests - is further distorted by manipulative media and social networks, access to fair and accurate information is increasingly restricted. Corruption has become normalized, and clientelism now shapes political candidacies. Elections serve more as a façade than a genuine democratic process, offering voters no credible alternatives. The regime is evolving to reinforce the control of economic and political elites over the broader population. Legal systems are being reshaped to support this shift. The judiciary is overwhelmed, with rising incarceration rates, and executive power is steadily overtaking legislative authority. Courts are not independent and serve as an instrument of power. The rule of law is given lip service; laws are adopted and administered arbitrarily to maintain autocratic power. Legal and policy frameworks serve elite interests, further marginalizing vulnerable groups and eliminating avenues for democratic accountability.

The population grows restless, yet meaningful democratic change is unlikely due to the extensive suppressive measures in place. Social unrest and potential uprisings are often suppressed through violence, conflict, and strategic distractions.

It is a strong consumption-based economy. The relentless drive for economic growth and profit maximisation fuels a system where mass production - often robot-assisted - delivers cheap, low-quality goods to the majority, while luxury items are meticulously crafted for the upper class. Hence, the middle and lower classes are left with increasingly inferior options, especially in critical areas like food, housing, and healthcare. In

response, individuals increasingly resort to DIY solutions, creatively repurposing waste materials to meet their needs amid declining access to quality goods.

Nonetheless, consumption continues to rise globally, driven not by genuine need but by a system designed to promote production and corporate profit. The original purpose of consumption—to satisfy human needs—has been inverted. Media and marketing have become highly sophisticated, leveraging detailed consumer data to craft personalized messages that stimulate demand. Advertising fosters desires for non-essential goods. Consumer sovereignty has all but vanished, replaced by a system where purchasing behavior is manipulated and controlled. Recurring consumer debt crises are inevitable, driven by income inequality and the pressure on disadvantaged groups to emulate the consumption patterns of the wealthy. An unregulated financial sector exploits this dynamic, pushing vulnerable populations into over-indebtedness and deepening economic instability.

Production systems prioritize speed and volume over ethics, sustainability, or quality. Production efficiency decreases as cooperation and innovation decrease. These opaque, oligarchic structures generate excessive waste and inefficiencies. The production of short-lived commodities intensifies environmental degradation. exacerbating climate change, biodiversity loss, pollution, and resource depletion. The resulting waste overwhelms recycling systems, contributing to widespread ecological harm. If it does not optimize production efficiency; recycling is abandoned, except for secondary use by impoverished communities.

Ecological shocks combined with resource scarcity and likely geopolitical fracturing due to these strains make economic growth and profit-making from traditional forms of production, including financial services, increasingly unviable. Instead, a highly defensive posture from capital is widespread, focused on accruing 'hard' assets and defending shares rather than accelerated growth drives. Exceptions are found in key productive industries which play a significant role in this new formation such as defence and arms.

In the built environment, construction gives precedence to constant renewal over preservation, with a focus on new development using cheap, mass-produced, and high-carbon materials. Quality, sustainability, and the health of the built environment are not concerns, only economic throughput and regime stability matter. Any form of progress is constrained by strict regulations that dictate allowable materials and methods. In response, underground movement for innovation emerges.

Global supply chains are dominated by monopolies and oligopolies, leaving little room for local or independent producers. Innovations cover mainly research and technological development, and successful sustainable or alternative business models are acquired by the monopolies and oligopolies, stifling competition and reinforcing market concentration. Business ethics are increasingly aligned with state interests in a neofascist symbiosis, where monopolies are state-sponsored and sustained. Ethical standards become instrumental, serving the goals of centralized power rather than societal well-being. In this environment, corporate ethics largely disappear. Profit and

elite interests take precedence, with legal frameworks manipulated through lobbying to support exploitative practices and ignore social and environmental concerns.

Automation continues to displace skilled labour, while construction and other manual industries rely on precarious, low-paid workers - often migrants - operating under unsafe and survailled conditions. Population growth and migration are strategically exploited by economic elites to sustain consumption and maximize profits.

Income and wealth inequality characterize the system, driven by the consolidation of resources in the hands of a powerful elite. As essential resources like water become increasingly privatized, they are increasingly used as tools of control over the broader population, reinforcing social hierarchies and limiting access to basic needs. Access to basic needs such as food, housing, and healthcare is no longer guaranteed but instead shaped by market forces and elite interests. As a small segment of society accumulates unprecedented wealth, large portions of the population face declining living standards and growing economic insecurity. This disparity is not only reflected in income but even more starkly in wealth distribution, which is increasingly shaped by inheritance and state-sponsored allocation rather than earned income.

Redistributive policies, which could help mitigate these disparities, are increasingly absent or deliberately obstructed. The political will to address inequality is lacking, and any efforts toward redistribution are systematically undermined. The metaphorical "scissors" of inequality are opening to their extremes, with no mechanisms in place to close the gap. All this is exacerbated by the failure of traditional economic beliefs. The promise of growth, innovation, competition, and the trickle-down effect has not materialized for the majority. Instead, these narratives serve to justify systems that benefit the few at the expense of the many.

Access to resources, services, and protections is increasingly determined by social class. The elite enjoy security and abundance, while the majority face growing precarity. The ethical implications of this divide are profound: those in power are shielded from the consequences of the crises they help perpetuate, while the burdens fall on those least equipped to bear them. While the poorer classes are not entirely excluded from the economy, their opportunities are severely limited, and their vulnerability is growing. Public institutions - once pillars of solidarity and care - are collapsing. Institutional support systems are no longer able to respond to the needs of the population, especially those most affected by the crises. Despite the entrenched inequality, the system still allows for limited upward mobility. Success and loyalty to the dominant structures may offer a path from the margins to the elite, though such opportunities are rare and often come at the cost of personal autonomy or ethical compromise.

Vulnerable groups are pushed further into extreme marginalization, often confined to environmentally degraded and unhealthy living conditions. As more people fall into precarious circumstances, the size and severity of vulnerable populations grows, intensifying social fragmentation. Without robust and universally accessible social protection systems, such as minimum income schemes or comprehensive welfare

programs, many individuals are forced to rely on family networks or charitable organizations for basic survival.

While strategic public spending is essential to promote shared prosperity, there is a strong decline in meaningful public investment, particularly in welfare and infrastructure.

Instead of serving the broader public interest, public resources are often redirected by powerful lobbying groups, turning investment into a tool for advancing private agendas. With non-existent democratic institutions, the very notion of a "public" sphere - a space for collective decision-making and shared benefit – is lacking and hence public investment as such also loses its original purpose.

This lack of institutional support risks creating a near-feudal dynamic, where the most disadvantaged are reduced to conditions resembling modern slavery—exploited, excluded, and stripped of autonomy. Labour laws and regulations favour profit maximization, without any attention on environment degradation or worker conditions, and allow wealth accumulation without enforcing any fair redistribution.

Work is becoming extractivist, not only in its disregard for ecological sustainability but also in its treatment of human labour. Many jobs are being replaced by artificial intelligence, while those that remain are either degraded to low-value monitoring roles—such as physicians overseeing AI-generated diagnoses—or reduced to rudimentary manual labour. The rise of "bullshit jobs"—positions that lack meaningful social or environmental value—is contrasted by the increasing precarity of work that does contribute positively to society, such as caregiving and community support. These essential roles are often unpaid or underpaid, left to struggling communities, and disproportionately carried out by women in patriarchal structures, who suffer from care poverty. Men from lower-income groups may also engage in care work, but often only when unavoidable, while non-binary and other marginalized genders are sidelined, frequently forced into sex work to survive. Overall, labour is becoming a mechanism of control. The elite does not participate in labour but instead "provides" work as a gatekeeping tool to maintain dominance over the rest of society.

This disintegration of the social fabric is compounded by demographic and health challenges. Fertility rates are declining, life expectancy is stagnating or falling, and mental health is deteriorating across many regions. Violence is on the rise, both within societies and in the form of regional conflicts. Environmental, industrial, and infrastructure-related disasters are becoming more frequent and severe, adding further strain to already fragile communities.

Instead of fostering human happiness, dignity, or resilience, societies suffer mental health challenges, existential distress, and escapist behaviours such as drug abuse—affecting individuals across all age groups. Access to healthcare becomes conditional, often limited to those deemed economically productive. Being "healthy" is reduced to being able to work, while broader aspects of wellbeing—mental, emotional, and social—are neglected. Public health systems are underfunded, and policies increasingly favour the needs of the wealthy, widening the divide between those with good health and those

in poor conditions. Even sports, traditionally a space for community and health, are repurposed as tools of entertainment and geopolitical power display, reinforcing global hierarchies rather than promoting wellbeing.

Marginalized groups suffer disproportionately. They are often blamed for their own misfortunes and pushed further to the margins to preserve the illusion of wellbeing among populations more aligned with the ruling class. Life expectancy may continue to rise for the privileged, supported by technological advancements that address health challenges without addressing underlying social or ecological crises.

Access to education and reliable information is severely restricted. Censorship and propaganda dominate public discourse, and the ability to think critically or challenge authority is systematically undermined. While access to information remains technically high, distinguishing truth from manipulation becomes increasingly difficult. Advances in artificial intelligence blur the lines between reality and fabrication—images, videos, and audio recordings can no longer be trusted as evidence of actual events. AI-generated content floods communication channels, serving the interests of powerful actors who possess the technological and financial means to shape public perception.

To pacify the masses - especially the poor and large segments of the middle class - entertainment becomes increasingly immersive and addictive. Technologies such as virtual reality and brain-computer interfaces offer hyper-personalized experiences that distract from deteriorating living conditions. These tools serve as a modern form of social control, keeping disadvantaged groups quiet and disengaged.

Corporations and elites use AI tools and social media platforms to maintain control, distract the population, and suppress dissent. Traditional media outlets, under immense economic and political pressure, fail to remain relevant or independent. Instead, they pivot toward entertainment and content that aligns with elite interests, abandoning high-quality journalism. Hence, access to information also becomes highly unequal. The ruling class benefits from exclusive knowledge and digital infrastructure, reinforcing their dominance and comfort. Meanwhile, the general population is left in widespread "information blind spots," with limited access to reliable or timely data. This disparity also deepens social divides and weakens democratic engagement.

The widespread use of AI in education, workplaces, and leisure activities further erodes critical thinking. Many individuals no longer develop the skills needed to question or analyze the information they receive. As a result, society becomes more susceptible to manipulation, and the ability to engage in informed civic discourse further declines.

Along income and wealth inequalities, the digital divide makes the wealthy better positioned to utilize digital tools for personal and professional gain, while vulnerable populations often lack the infrastructure, skills, or trust to engage meaningfully with digital solutions. Despite the potential of AI to support marginalized communities, many still prefer face-to-face services, which feel more accessible and trustworthy.

Some individuals pursue low-tech, often illegal alternatives that reflect a desire for autonomy and resistance. These solutions, while driven by ethical and practical

motivations, are frequently unsafe due to lack of oversight. Low-tech, human-centred approaches gain appeal for their perceived transparency and ethical foundation.

The concentration of ownership and influence over technological innovation leads to the prioritization of tools that reinforce elite control and perpetuate capital accumulation. AI systems are increasingly used to manipulate public discourse, surveil populations, and replace human labour - especially among formerly high-skilled workers - resulting in rising unemployment and further income inequality.

The physical and environmental costs of AI are also substantial. The growing demand for raw materials, energy, water, and cooling systems, along with the reliance on low-paid or even forced labour for tasks like content moderation, exposes the unsustainable nature of this type of technological progress. The expansion of AI also raises concerns about land use and resource allocation, such as land grabs for data centre construction, which benefit a technocratic elite. These pressures are likely to eventually reach their limits, challenging the myth of endless innovation and necessitating democratic reforms. While AI may offer some opportunities for cross-cultural understanding and empowerment, these benefits are often unevenly distributed, favouring those with existing privileges.

While a well-educated population is essential for innovation, multicultural communication, and digital literacy, education is being systematically undermined. Public investment in education is drastically reduced, and universities are transformed into elitist institutions accessible only to a small, privileged minority. These institutions promote conservative ideologies, while public education is left underfunded and staffed by underqualified teachers, further widening educational inequality.

The privatization of education accelerates, with corporate actors dictating curricula and qualifications. Students are increasingly unable to distinguish fact from fiction, and teachers who advocate for marginalized perspectives or alternative viewpoints are silenced. There is a tendency for AI systems to replace human educators, delivering standardized content without transparency about its origins or biases.

In this context, education ceases to be a space for empowerment and alternative thinking. Instead, it becomes a tool for social control, reinforcing authoritarian power structures and suppressing dissent. The potential for brain drain increases, as individuals seek educational opportunities elsewhere, further weakening intellectual and civic life within the autocratic regimes.

In the context of accelerating technological advancement - particularly artificial intelligence (AI) - demographic dynamics are increasingly shaped by political, economic, and cultural forces. Contrary to assumptions that elites might favour population growth to boost consumption, there is growing concern that a larger population could pose a threat to social stability, especially if rising unemployment leads to unrest. This dynamic contributes to a broader trend of population control, often embedded in policy incentives that reflect cultural and ethnic biases. These measures risk undermining reproductive autonomy, further reinforcing authoritarian control over private life.

However, even without much intervention, lifestyles centred around consumption and technological engagement contribute to long-term declines in fertility rates, particularly in the European Union. As digital literacy demands higher education and higher education overlaps with prime reproductive years, time for family formation is limited. Child-rearing is also increasingly seen as incompatible with consumption-driven lifestyles. Even if some pro-natalist policies exist from time to time, they largely failed to reverse these trends. In a confrontational and unequal society, such policies are ineffective or irrelevant, and their outcomes remain uncertain.

Globally, demographic shifts are uneven, leading to imbalances in resource consumption, migration, and socio-economic disparities. These changes may exacerbate shortages of food, water, and energy, increase pollution and deforestation, and accelerate biodiversity loss.

Neo-colonial dynamics are intensifying, driven by militarily and economically powerful nations seeking to secure resources essential for sustaining their systems. These efforts are often cloaked in civilizing or liberatory narratives, echoing historical colonialism, but now adapted to modern geopolitical and economic realities. Global trade and production systems, dominated by monopolies and oligopolies, reinforce this trend. Multinational corporations and financial institutions—often under the guise of "green" investment—consolidate power, absorb smaller competitors, and shape markets to serve elite interests all over the world. This results in continued resource extraction, including deforestation, overfishing, and pollution from the Global South. As supply chains remain globalized, local actors are marginalized, and economic power becomes increasingly concentrated. Trade imbalances and persistent deficits fuel tensions between nations, while autocratic regimes exploit trade and military intervention to expand influence, suppress dissent, and exclude migrants—many of whom flee climate disasters and conflict. Families are separated based on nationality and police round up migrants and 'deviants' to make them disappear.

The gap between the Global North and Global South widens, with the former extracting resources and labour from the latter, while denying mobility and opportunity. Even within regions like the EU, internal colonialism emerges, with peripheral zones—such as mining areas in Serbia—sacrificed for the benefit of urban cores and technocratic elites. Land grabbing for infrastructure like AI data centres exemplifies this shift.

Colonialism's foundational elements—military power, economic greed, and ideological justification—remain intact, now repurposed for a globalized, digitized world. Europe, despite its historical reckoning with colonialism, feels compelled to re-enter the colonial competition as other global powers also pursue aggressive expansionist strategies. Ultimately, the system remains rooted in exploitation and control, with militarily powerful nations acting swiftly to secure dominance in a collapsing world order. The result is a deeply unequal global landscape, where neo-colonialism becomes entrenched, and the promise of equitable justice is increasingly out of reach.

4. Annex 4: Long version of the Elitist Green Bubble scenario

In this scenario, humanity has reached a level of consciousness where business practices are ostensibly aligned with collective social and ecological goals. Ethical considerations in business reflect these aims, particularly within privileged regions that showcase green infrastructure, renewable energy, and carbon-neutral technologies. However, this surface-level sustainability masks deeper systemic issues.

Respect for human and non-human diversity remains low. The interests of a privileged human elite dominate, while less privileged regions are exploited to sustain green technologies—such as through intensive mining for rare earth minerals or biofuel plantations. This dynamic reflects a form of greenwashed extractivism, where resource use is justified by sustainability narratives but driven by elite consumption patterns.

The scenario unfolds as an overshoot and collapse trajectory, exacerbated by environmental degradation and forced migration. As livable areas shrink, human life—particularly that of the elite—is prioritized over the well-being of other species. Non-human life and biodiversity are devalued, and planetary health is treated as secondary to human-centric concerns.Despite technological advancements and efficiency gains in green products, the Jevons paradox prevails: increased efficiency leads to greater overall consumption, undermining ecological benefits. Sustainability is narrowly interpreted through the lens of elite interests, focusing on localized human challenges while ignoring broader ecological crises such as species extinction and biodiversity loss.

Ultimately, this ecomodernist but non-authoritarian scenario fails to deliver meaningful climate impact. Elites enjoy clean air and climate-resilient environments, while marginalized populations face worsening climate extremes, resource depletion, and habitat destruction. The global sustainability narrative is skewed, privileging a select few and sidelining the interconnectedness of all life on Earth.

In this scenario, social inequality intensifies as the gap between elites and the general population widens. A small, privileged minority—referred to as the "green elites"—controls access to information and sustainability narratives, fostering public discontent and polarization. These elites are perceived as using ecological discourses to mask power dynamics, sometimes fueling conspiracy theories among excluded groups.

Within elite green bubbles, residents live in psychological comfort, shielded from the external consequences of their lifestyles. This ignorance is not necessarily malicious but stems from a survival instinct to maintain well-being, resulting in denial and narrow awareness of the broader social and environmental costs.

The bubbles are characterized by transparency and abundance of information—internally. However, this openness does not extend beyond their borders. Externally, these zones are fortified and disguised by natural landscapes, with advanced security systems preventing migration, rebellion, and information exchange. This separation sustains inequality not through overt oppression but through systemic ignorance and controlled narratives of democracy and superficial environmental progress.

The scenario reflects localized conservationism, where nature is preserved for the enjoyment of the privileged, while the ecological and social consequences of this lifestyle are outsourced to marginalized regions. The elite lifestyle is marked by health-centric habits—yoga, matcha lattes, sourdough bread, and superfoods imported from the tropics—while local populations in those regions survive on basic staples like corn and potatoes. Access to health, nutrition, and wellness becomes a marker of wealth.

Technology reinforces this divide: AI-powered health monitoring devices rank individuals by fitness, creating a Spartan-like dystopia where poor people are assumed to be unhealthy. This assumption is partly true, as they endure harsh labor conditions in agriculture, industry, and waste management, with limited access to nutritious food or wellness infrastructure.

Overall, this scenario portrays a deeply unequal world masked by sustainability rhetoric, where elite comfort is maintained through systemic exclusion and ecological exploitation. The environmental and social costs are externalized, and the sustainability efforts of the privileged remain largely inconsequential in addressing global challenges.

Economic prosperity is concentrated within elite "green bubbles," where public investment is strategically aligned with the interests of privileged social groups. Governments channel resources into green infrastructure, digital technologies, and localized environmental improvements—but only within secure, affluent zones. These investments are framed as public goods but function primarily as mechanisms of exclusion, enhancing the quality of life for the elite while neglecting basic services in less privileged areas.

Despite the appearance of sustainability, the energy transition is not guided by planetary ethics or a genuine commitment to a low-carbon economy. Instead, it serves local pollution reduction and elite comfort. Tensions arise between collective needs—such as public transport—and prevailing ideologies of individualism, which dominate both policy and practice.

Business ethics in this scenario are deeply bifurcated. Within elite zones, businesses appear socially and ecologically responsible, supporting local green initiatives and community well-being. However, these practices are underpinned by exploitative global production systems. The full lifecycle of "green" products often involves destructive resource extraction and harsh labor conditions in marginalized regions. Sustainability labels mask these realities, and instrumental profit motives override intrinsic social and environmental values.

Ultimately, business remains focused on short-term profit maximization, reinforced by legal frameworks that prioritize economic growth over ethical transformation. The prosperity within elite bubbles is built on systemic inequality and global exploitation, making the sustainability narrative both selective and superficial.

Profit remains the dominant objective of the economy, even as green products and sustainability narratives gain prominence. A subset of ethical businesses exists, aiming to contribute socially and ecologically to their communities. These businesses embed

sustainability goals into their statutes, allocating profits toward environmental and social well-being. However, they face systemic disadvantages: the legal framework does not support them with concessions or competitive advantages, leaving them overshadowed by larger, profit-driven corporations that lack community-oriented objectives.

Environmental and social externalities are neither prohibited nor heavily taxed, allowing exploitative practices to persist. While green products generate profit and uphold certain environmental standards, this is driven by monetary incentives, not genuine ecological values. Business ethics are instrumental, serving elite interests by extracting profit from ecological consumption without necessarily delivering real environmental benefits.

Wealth becomes increasingly concentrated among a privileged elite, whose prosperity is sustained by "socially oriented and locally green" businesses operating within protected bubbles. These bubbles benefit from innovation and technological advancement, particularly in green technologies. However, the impact of innovation is limited to elite zones, reinforcing inequality. Techno-optimism fuels the development of net-zero environments and high-end green products—such as bio-fuelled private jets—but these innovations rely on unethical resource extraction and labor exploitation in external regions.

The concept of innovation remains largely unchanged: companies focus on increasing product quantity and value, occasionally shifting toward quality improvements. Yet, these shifts are driven by market demands, not by a desire to enhance worker well-being or ecological integrity. The result is a highly unequal and selectively sustainable economy, where elite comfort and technological progress are built on systemic exclusion and global exploitation.

This scenario depicts an anti-utopia where excessive faith is placed in technology as a solution to environmental and social challenges. While green technologies improve conditions within elite "green bubbles," they fail to address global problems. The production zones and supplier countries—often in the Global South—become increasingly polluted and stressed. The reality is "green where bought, grey where produced," as products labeled sustainable often conceal exploitative and environmentally destructive production cycles.

Technological advancement deepens inequality. The wealthy elite benefit from cutting-edge digital tools and AI, which optimize their businesses, automate decision-making, and concentrate power and wealth. AI is also weaponized for surveillance, controlling the movements of migrants and marginalized groups, reinforcing isolationist and segregationist policies. These developments erode democratic participation and civil liberties, often under the guise of environmental protection or national security.

The elite maintain a façade of democracy while using media and AI-driven propaganda to shape public opinion and suppress dissent. Laws and regulations are crafted to serve elite interests, further entrenching their dominance. Selective green bubbles form around powerful corporations and interest groups, creating clean, adaptive zones designed to serve business needs. Access to these bubbles is restricted based on

economic value and specialized knowledge, deliberately limiting populations to maintain control and efficiency.

Outside these bubbles, marginalized communities face worsening conditions. Peripheral zones are exploited for resource extraction, waste disposal, and cheap labor. Climate impacts disproportionately affect these areas, while the bubbles remain buffered through targeted adaptation strategies. These enclaves—whether urban or rural— prioritize capital interests over community well-being, exacerbating social and environmental divides.

Techno-optimism delays systemic responses to climate change, fostering complacency within privileged regions. While local green technologies may benefit nature inside the bubble, the broader economic model drives widespread environmental degradation. Biodiversity loss becomes a secondary concern. Green innovations such as electric vehicles, biofuels, and clean energy depend on vast quantities of rare earth minerals and critical materials, often sourced through exploitative supply chains in vulnerable regions.

The global economic system remains nationally focused yet internationally exploitative, leading to severe ecological degradation and deepening environmental injustice. While elite zones may experience localized environmental improvements, the global ecosystem continues to deteriorate due to outsourced pollution, habitat destruction, and the unchecked crossing of ecological tipping points. Surface-level mitigation efforts fail to address the root causes of climate change, allowing systemic harm to persist.

Workers and ecosystems are excluded as relevant stakeholders, with environmental and social costs concealed through manipulated or opaque data. Although climate impacts eventually reach elite zones, their continued external resource extraction delays these effects, preserving a rigid, class-based society where roles are tightly defined and mobility is limited.

Green technologies become speculative assets, used by financial and real estate markets to justify returns for wealthy clients in the Global North. Meanwhile, the Global South suffers from capital flight, currency speculation, and exploitative trade practices. These dynamics force Southern economies to mimic Northern models, promoting tech-sector poster children while engaging in harmful practices like dumping and price wars. The result is widening inequality—both within and between countries—with no meaningful global cooperation.

As global supply chains become increasingly fragile and raw materials scarce, production is partially relocated to Europe, raising costs and limiting product availability. Companies prioritize high-margin goods for elite consumers. Labor shortages, driven by demographic aging, are partially offset by automation. Export-oriented industries face structural decline due to international tensions, reducing Europe's global trade footprint.

The global waste trade exemplifies these dynamics. While Europe properly recycles some electronic waste, much is exported to the Global South, where it supports

livelihoods but also causes environmental degradation, health risks, and exploitative labor—especially among vulnerable groups like women, youth, and the unemployed.

Climate change and biodiversity loss disrupt global supply chains, turning commodities like coffee, cocoa, and fish into luxury items. These remain available in Europe but at extreme prices, inaccessible to average consumers. Recurring food crises—caused by poor harvests of staples like wheat, maize, and rice—lead to price spikes that disproportionately affect lower-income Europeans. In response, Europe prioritizes its own economic security, even resorting to military interventions to secure critical materials, commodities, and transport routes. This militarization drives up defense spending and reinforces a geopolitical order rooted in resource competition rather than cooperation.

This scenario deepens into a form of "green colonialism," where global elites compete for access to critical raw materials in the Global South. The green transition is narrowly framed around carbon emissions, obscuring the exploitative dependence on land, labor, and resources from marginalized regions. A lack of public education and transparency perpetuates this tunnel vision, enabling systemic environmental and social harm.

Media controlled by wealthy elites highlights carbon reduction successes in the Global North while concealing the ecological degradation, social deprivation, and civil unrest in exploited regions. This reinforces modern colonialist models—not overtly, but through pervasive, systemic acceptance among privileged groups. The contradiction is stark: a world where "Make America Green Again" becomes plausible, blending nationalist isolationism with superficial environmentalism.

Elitism reshapes demographic processes, leading to isolationist societies that close borders to migrants and refugees, especially those displaced by environmental crises. Gentrification intensifies urban class divides, pushing lower-income populations to peripheral, hazardous zones. Life expectancy diverges sharply: the privileged live longer in clean, controlled environments, while the less privileged suffer from pollution, poor nutrition, and inadequate healthcare.

The green bubble enforces exclusion through seemingly open borders that are, in practice, inaccessible to non-elite populations. This reduces diversity and multicultural integration. Within the bubble, demographic stability is maintained through selective immigration of highly skilled individuals, controlled reproduction, and robotic or AI-assisted care systems. Meanwhile, care work is outsourced to migrant labor under exploitative conditions or replaced by automation.

Carbon footprints diverge: elites reduce theirs through access to green goods and technologies, while the masses maintain low footprints due to poverty. However, the environmental burden on the poor is disproportionately high. Green gentrification displaces vulnerable populations, exposing them to environmental hazards and reducing their life expectancy.

Income inequality and wealth concentration escalate, justified by the rhetoric of environmental innovation and progress. The society ossifies into a rigid structure of

green elites, whose values and interests become increasingly detached from the rest of the population. Sustaining this political and economic order requires coercion, both subtle and overt.

Ultimately, this scenario portrays a world where green capitalism and techno-optimism mask deep systemic injustices. Environmental progress is localized and selective, while global degradation and inequality intensify. The privileged live in sanitized bubbles of sustainability, built on the exploitation of ecosystems and communities elsewhere. The illusion of progress is maintained through control, exclusion, and the strategic manipulation of environmental narratives.

The legal system favors local elites, reinforcing existing inequalities and offering limited protection to vulnerable groups such as migrants, refugees, and informal workers. While the legal framework may resemble current systems, its inadequacies become increasingly apparent, eventually triggering crises. Rights are unequally distributed, and vulnerable populations remain trapped in precarity, unable to mitigate their misfortunes in a system that is openly elitist.

Although some redistributive mechanisms exist—often rooted in historical precedents or designed to alleviate social tensions—they are minimal and market-driven. Support for marginalized groups (e.g., people with disabilities, the unemployed, or those in precarious housing) is framed through market solutions rather than robust social policies. Health and wellbeing become commodified, accessible primarily to the elite who equate ecological living with personal wellness. For the poor, ecological concerns are secondary to survival.

Wellbeing and health are stratified along socio-economic and geographic lines. Privileged populations in green enclaves enjoy clean air, nutritious food, advanced healthcare, and life-extending technologies. Meanwhile, migrants, informal workers, and residents of polluted production zones suffer from deteriorating mental and physical health due to environmental degradation and lack of access to care. Even non-human species and ecosystems are deprioritized, undermining broader ecological wellbeing.

Over time, the false promise of elite sustainability becomes evident. Despite temporary health benefits, the sustainability class eventually faces the consequences of climate change and biodiversity loss, as their lifestyle fails to respect planetary boundaries. The illusion of ecological security within the bubble collapses under global environmental pressures.

Labour structures become rigid and hierarchical. The elite dominate tech and corporate management; the middle class occupies public institutions and low-tech industries; and the rest—primarily from the Global South—fill low-status service roles. The size of the middle class varies by national wealth, virtually disappearing in poorer economies. International trade regimes reflect these disparities, with redistribution occurring only within ethnic or national boundaries. Labour is greenwashed but exploitative. Migrants and care workers are overworked, underpaid, and unprotected, while their roles are symbolically framed as part of the green economy. Working conditions in green companies remain poor for most, except for upper management. Care work is either

outsourced to migrants under harsh conditions or replaced by AI and robotic systems. This reinforces green colonialism, where elites in the Global North benefit from clean jobs and automation, while the Global South bears the environmental and social costs.

Intersectional injustices are normalized. Green colonialism becomes the default, rarely named except by activists whose efforts are limited and often suppressed. Small-scale solidarity protests in the Global North are controlled or banned by law. However, this repression may catalyze stronger alliances among colonized Global South countries.

Political power is concentrated among wealthy elites who fund and control elections, shaping national legislation to serve their interests under the guise of environmental protection. Local governments are disempowered, with meaningful change occurring only through grassroots mutual-aid efforts—often outside the legal system. Yet, even these are constrained, as laws increasingly prohibit community-led energy, housing, and local provisioning.

The irresponsible outsourcing of ecological damage, combined with techno-optimism and unchecked consumption, leads to planetary-scale harm. Overshooting planetary boundaries—especially biodiversity—triggers cascading effects. Mass migration and disrupted food supply chains eventually pressure high-income countries, whose border controls can no longer shield them from crisis and unrest.

Migration intensifies, both from the Global South and within Europe. European nations respond with fortified borders, costly deals with authoritarian regimes, and increased surveillance—all aimed at preventing the rise of populist movements. Despite these efforts, migrants continue to arrive, tolerated only because aging societies require their labor. Climate-related migration within Europe also grows, especially from southern to northern regions. Migration becomes the dominant political issue in rich countries, with migrants forming a distinct, exploited labor class in industries that rely on intensive manual work.

Deeply, this scenario explores the tensions surrounding the development and deployment of AI, education, and technology within an increasingly elitist framework. The central question is whether these tensions represent a transitional phase toward a more inclusive future, or a blind alley reinforcing systemic exclusion.

Currently, AI, research, and technological innovation are shaped by elite institutions and actors. International collaboration at the policy level is similarly elitist, even when national representatives are formally elected. Education systems increasingly prioritize technology-driven solutions, sidelining critical disciplines such as environmental studies, local knowledge, history, geography, philosophy, logic, and grammar. This narrowing of educational focus undermines the capacity for critical thinking and holistic understanding of sustainability.

Despite this, there remains potential for transformation. Conditions for AI development and use could be restructured to promote broader access, inclusive educational practices, and technological innovation that supports sustainability in everyday life. This would require not only high-level expertise and financial investment—still largely

elitist—but also cultural shifts and changes in daily practices, such as household recycling and language training.

The paradox of this scenario lies in the dual nature of progress: while sustainable tools and technologies demand elite resources and coordination, their meaningful impact depends on grassroots adoption and cultural change. The key question becomes: Can an elitist trajectory be reframed as a social transition toward inclusivity and ecological integrity?

This tension highlights the need to critically assess whether current developments in AI and education are laying the groundwork for a more equitable and sustainable future—or entrenching a system where access, knowledge, and power remain concentrated in the hands of a few.

5. Annex 5: Expert characteristics

Education Levels of Experts

Gender Breakdown of Experts
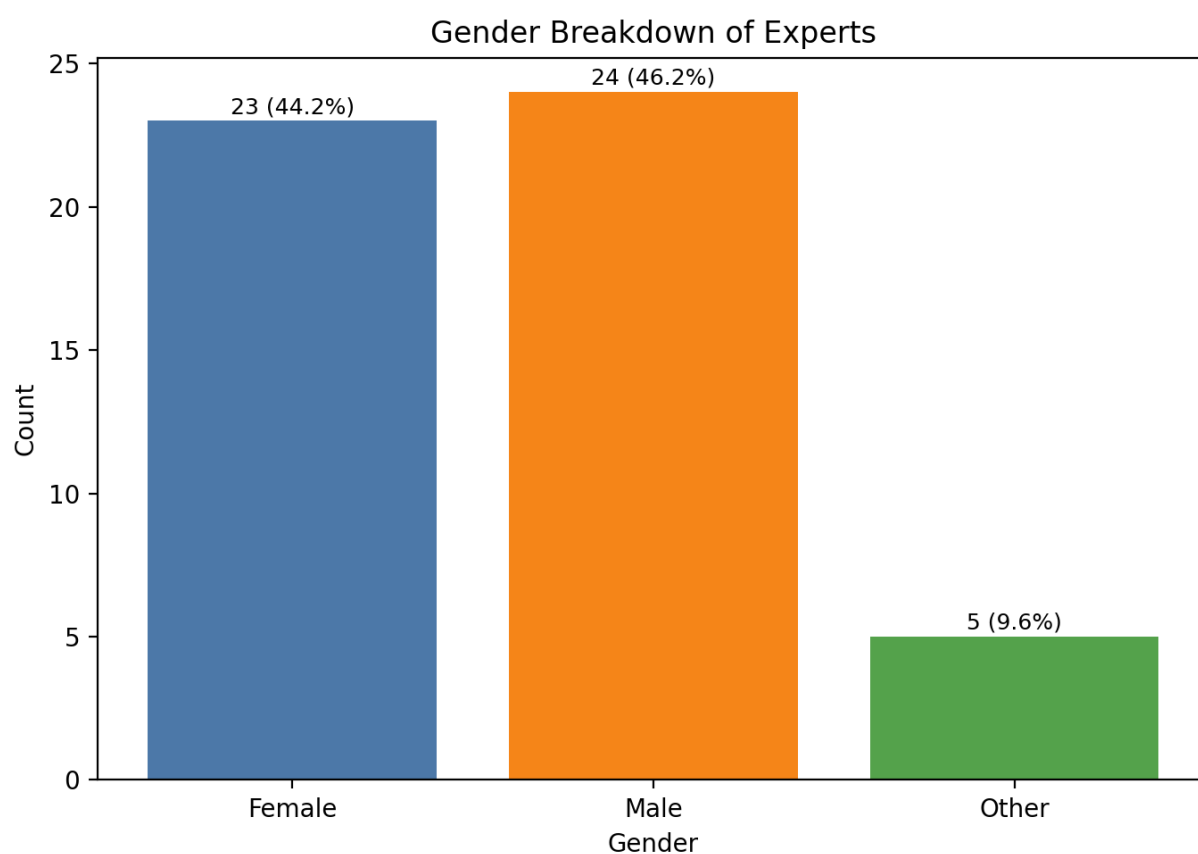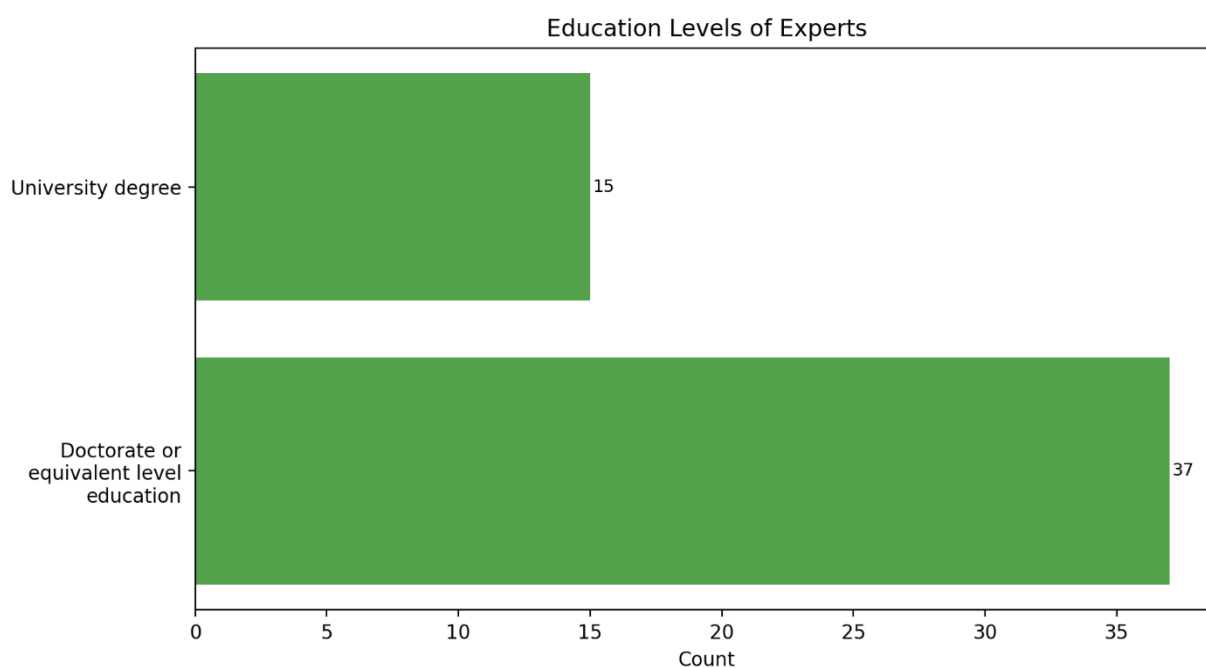
Please note: 'Other' refer to 'prefer not to say' (3 experts), 'gender not listed here'(1 expert), and 1 missing data.

Years of Expertise Distribution

Age Distribution of Experts
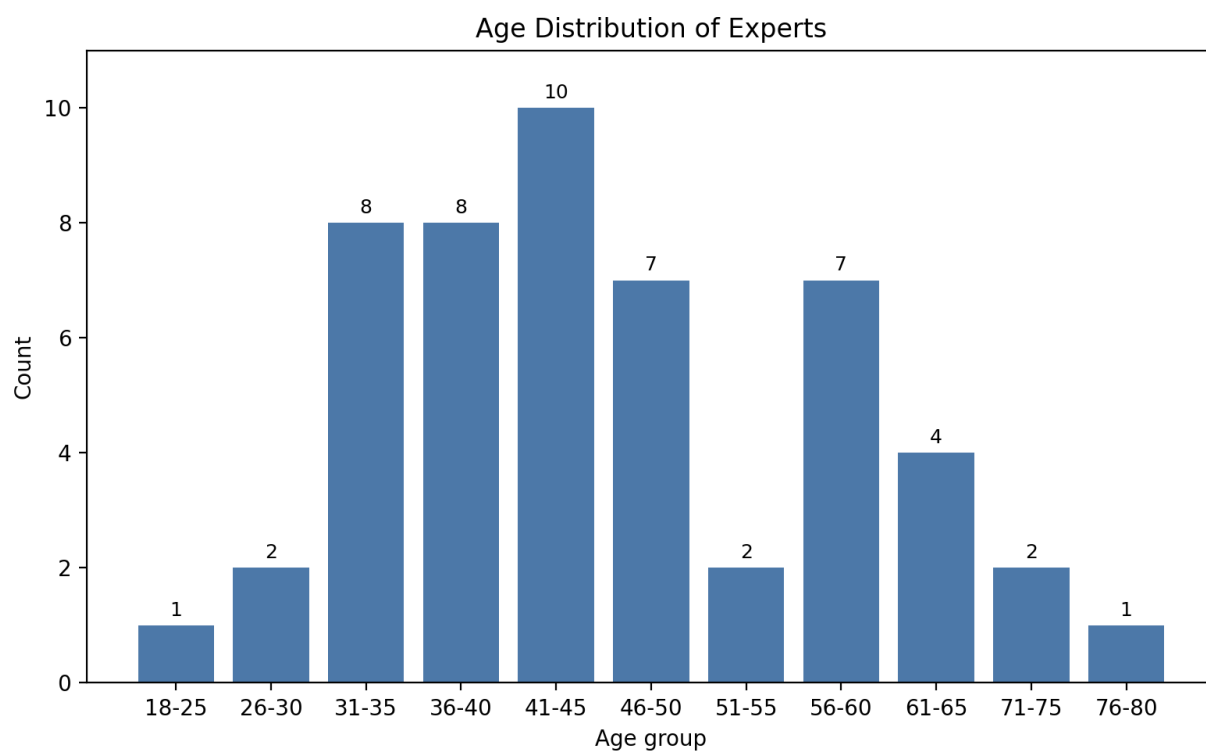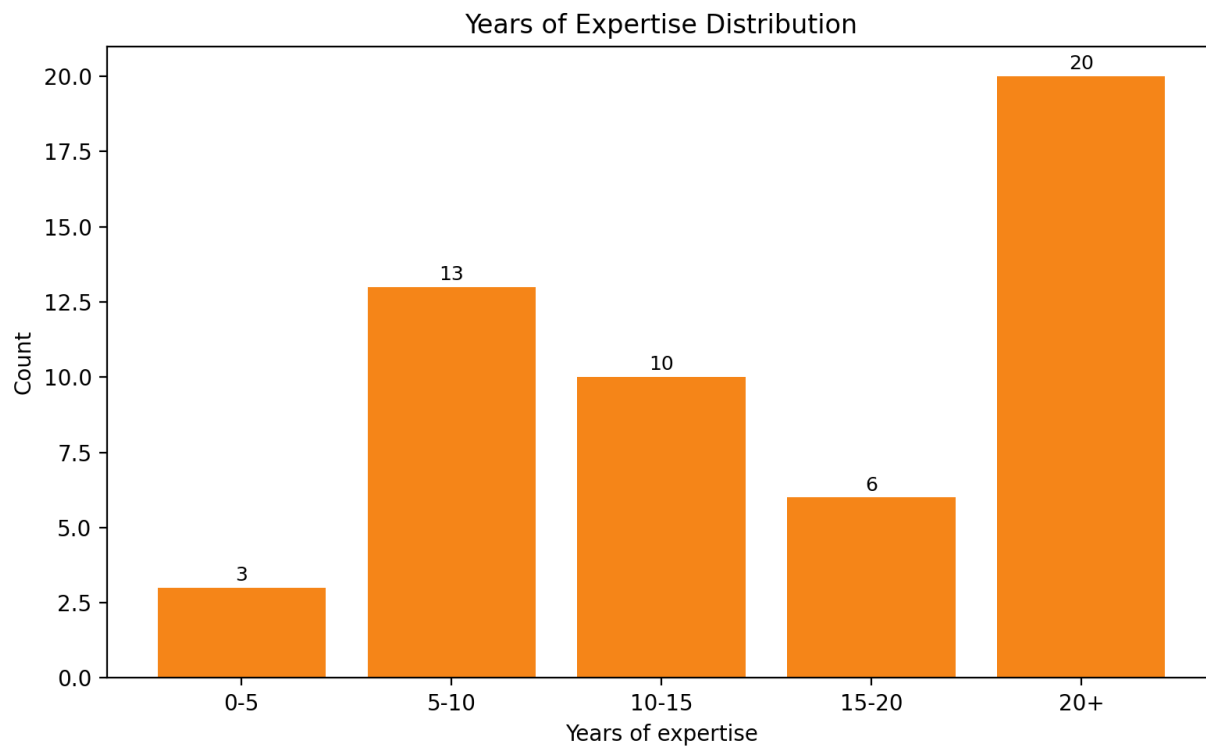
Top 50 keywords of expertises given by 52 experts and their frequencies, using copilot.

6. Annex 6: Invitation emails

Email 1:

Dear Colleague,

You have personally been suggested as an invaluable expert in your field **to participate in a Delphi study**. Your role is to support building possible post-growth future scenarios for Europe as part of the Horizon Europe project [MAPS: Models, Assessment, and Policies for Sustainability](#).

As a respected expert in your field, your insights are especially valuable to our initiative. Together with 50 other leading professionals from academia, government, business, and civil society, you will help assess four distinct future scenarios for Europe: 'elitist green bubble', 'autocratic collapse', 'ecological autocracy', or 'democratic caring for nature'. We invite you to evaluate these potential futures and the policy pathways that could lead us there.

The process involves **two short rounds of online questionnaires via the e-Delphi platform**, designed to encourage both reflection and dialogue. Each round will take approximately 30–60 minutes of your time, and you'll have the opportunity to review and comment on other experts' responses. All responses will remain anonymous and will be used solely for research purposes, in full compliance with EU data protection regulations.

You will soon receive an invitation email sent from the e-Delphi platform. The invitation includes your personal link to access the survey.

This is a unique opportunity to contribute directly to one of Europe's most forward-looking sustainability initiatives. We sincerely hope you will accept the invitation!

1st round	May 23 – June 20	Gather expert insight on feasibility, desirability, drivers, and intervention points of scenarios.
2nd round	Sep 1-Sep 30	Gather expert insight on policy instruments. Provide outputs from the 1st round to participants.
Final feedback	October	Provide overall results to the participants.

Should you have any questions, please do not hesitate to contact us.

Facing the turbulence and uncertainty in the world, we believe in the collective power of scientific endeavor to shape the present and the future. We are eager to do so, and we sincerely hope you will join us. Your insights will make a difference!

Thank you in advance for your cooperation.

Kind regards,

Tuuli Hirvilammi, University Lecturer, Tampere University (Finland)
tuuli.hirvilammi@tuni.fi

Jing Ding, PhD Researcher, Tampere University (Finland) jing.ding@tuni.fi

Judit Gáspár, Associate Professor, Corvinus University of Budapest (Hungary)
judit.gaspar@uni-corvinus.hu

Attila Szathmári, Assistant Professor, Corvinus University of Budapest (Hungary)
attila.szathmari@uni-corvinus.hu

Email 2:

Dear MAPS e-Delphi experts,

We can't thank you enough for taking part in the first round of the MAPS e-Delphi study! Now we are able to announce that, in total, we successfully involved **52** of you - coming from a wide range of backgrounds and expertise across 29 countries.

We have collected and synthesised your valuable inputs, resulting in four extremely rich descriptions of each scenario. We are excited to share this collective effort with you and invite you to further explore policy solutions together:

The second round of our data collection is now open with interesting insights and intriguing questions - join us, and join the conversation with other experts!

As previously, you will soon receive an invitation email sent from the e-Delphi platform. The invitation includes your personal link to access the survey. We kindly ask you to work on 1-4 scenarios (whichever you prefer) by **30 September at the latest**. Completing the survey will take you appr. 20-40 minutes.

We truly appreciate your interest and time in developing alternative futures.

Warm regards,

Tuuli Hirvilammi, University Lecturer, Tampere University (Finland)
tuuli.hirvilammi@tuni.fi

Jing Ding, PhD Researcher, Tampere University (Finland) jing.ding@tuni.fi

Judit Gáspár, Associate Professor, Corvinus University of Budapest (Hungary)
judit.gaspar@uni-corvinus.hu

Attila Szathmári, Assistant Professor, Corvinus University of Budapest (Hungary)
attila.szathmari@uni-corvinus.hu

Gabriella Kiss, Associate Professor, Corvinus University of Budapest (Hungary)
gabriella.kiss@uni-corvinus.hu

Alexandra Köves, Associate Professor, Corvinus University of Budapest (Hungary)
alexandra.koves@uni-corvinus.hu

Zsombor Csuport, Corvinus University of Budapest (Hungary)
zsombor.csuport@stud.uni-corvinus.hu

7. Annex 7: If-Then matrixes

How many connections does a theme have with another theme?	How many 'if-then' relationships are in a cell?
0 connections	0 'if-then' relationship
1 to 4 connections	1 or 2 'if-then' relationships
5 to 9 connections	3 or more 'if-then' relationships
10 to 14 connections	
15 to 20 connections	

If-then frequency by topics in the 'Autocratic collapse' scenario

If-then frequency by topics in the 'Democratic caring' scenario

If-then frequency by topics in the 'Elitist bubble' scenario

If-then frequency by topics in the 'Ecocracy' scenario

maps

Models, Assessment, and Policies for Sustainability
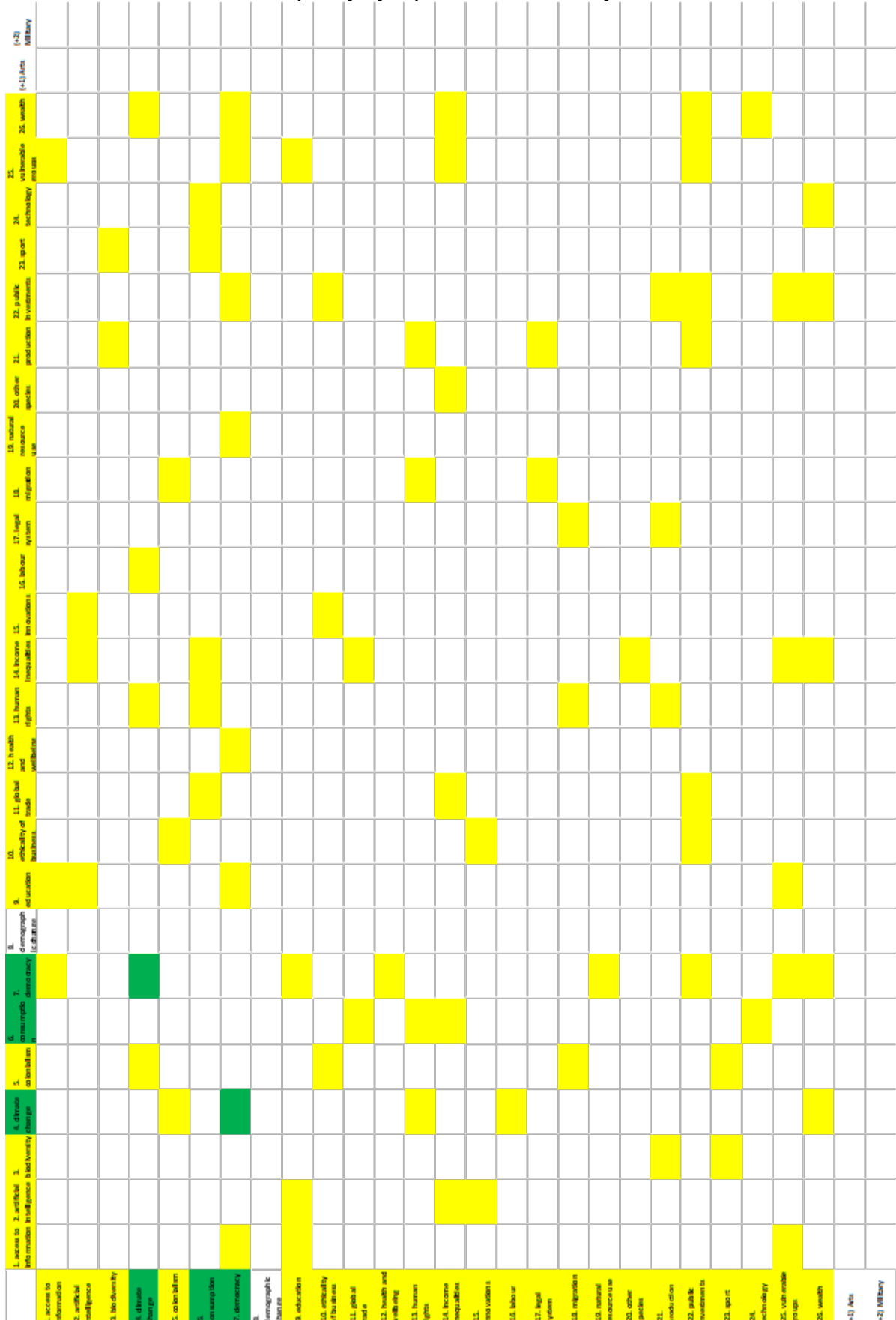
mapsresearch.eu →

LinkedIn→