

FUTURES LITERACY IN TRANSFORMATIVE INNOVATION POLICY

REPORT OF THE FUTURES LITERACY LABORATORY 2021

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Introduction

This brief summarises the main reflections and images which emerged from a Futures Literacy Laboratory (FLL) on “Futures Literacy and Transformative Innovation Policy”, held online during 1-2 November 2021.

The aim for the Lab was to mobilise the collective intelligence of a diverse group of experts, researchers and practitioners with an interest in Transformative Innovation Policy and to explore their different stories about the future of innovation. In the Lab the participants made use of these stories to reflect on their preconceptions, social, economic, environmental and technological drivers, paying attention to innovation priorities in society in 2050.

The Lab was organised as Part II of the TIPC Nordic Learning event and with support of the UNESCO Futures Literacy Unit, the Research Council of Norway and the Nordic Institute for Studies in Innovation, Research and Education (NIFU). The Lab brought together around 30 persons from across the Nordic countries, the United Kingdom and Spain.

Why Futures Literacy?

The coronavirus pandemic, along with the reorientation of research and innovation policy towards societal challenges, has prompted a need for anticipatory thinking and practices in policy development. Policymakers are struggling to find ways to meet this reorientation with appropriate measures and instruments. Prognoses and forecasting are useful tools, but they are not good at predicting the unpredictable, and do not necessarily give rise to the creativity and innovation required to find new ways of addressing the future.

The Futures Literacy philosophy and methodology can enrich this third-generation reorientation of innovation policy learning, leadership and development by encouraging us to question our implicit ideas about what the future will look like and should look like.

Policy is about transforming society in a more sustainable and just way, and increasing future quality of life for all citizens. Futures Literacy helps us reflect on what that means, by reframing our ideas about what this future might look like and identifying threats and opportunities that stand in the way.

We start to experience ourselves as part of the problem, implicated in (re)producing unsustainable sociotechnical systems and the belief systems that support them. In this way, Futures Literacy encourages deep learning (or Second-Order Learning), helping us to question our underlying assumptions, critically assess our own preferences and experiment with alternatives.

All of this means that Futures Literacy is not about predicting the future. It is rather about imagining different futures in order to analyse and understand the preconceptions and prejudices underpinning our *present* understanding of the past, present and future. By freeing us from at least some limiting preconceptions, theories and narratives we open up new venues, possibilities and roads to take.

About Futures Literacy Labs

Futures Literacy Laboratories (FLL) are innovative learning-by-doing processes, with a proven track record from around the world, for achieving three outcomes:

First, participants start a learning voyage, becoming acquainted with the different reasons and methods for imagining the future. As such, they become more futures literate.

Second, by exposing the assumptions that shape images of the future, participants in a Lab are able to ask new questions about an important topic, like the future of wellbeing. Such new questions - rethinking the nature of the problems and discovering the boundaries that define inside-the-box thinking from outside-the-box - have direct implications for policy, strategy and decision-makers.

Third, running FLLs provides detailed insights into the sources of what people imagine and why, thereby enabling a better understanding of the origins of people's fears and hopes. Designing, facilitating and implementing FLLs also provides the organizers – called designers - facilitators, and participants with an experience of designing and engaging in a collective intelligence process that uses the future in different ways.

In practical terms, FLLs invite people to share what they know. Since no one knows the future, everyone is equally ignorant. We all depend on our imaginations to invent images of tomorrow. The lab involves plenary sessions and working together in smaller breakout groups with peer facilitators who guide participants through the collective intelligence knowledge creation process. Breakout sessions provide the opportunity to fully make use of our ability to negotiate shared meaning. Building awareness of the sources of the futures we imagine and the power of what we imagine for what we see and do. There are no right or wrong answers. There is no one future, or one reason for imagining the future. FLLs are action-learning experiences that invite participants to play with their images of the future. By inventing, expressing, and testing their imaginations participants become better able to use the future.

Structure

In this Lab the organisers used an adapted version of the UNESCO approach, arranging a six-hours exercise spread over two days, as opposed to a 10-hours or more Lab stretching over two or three days. Given the time limitations of a six-hour workshop (as opposed to longer once) it was not possible to create coherent, unified scenarios from the workshop. Nevertheless, the time spent was enough to bring forward several ideas, observations and narratives about social, economic, environmental and cultural processes, and to identify unexpected challenges and opportunities.

The 30 participants were invited based on their connection to the TIPC network. They were researchers, experts, practitioners and Research Fellows from a large variety of organisations: the Swedish Social Insurance Agency, the Centre for Digital Life Norway, NIFU, the Research Council of Norway, SPRU, Vinnova, Lund University, the Norwegian University of Science and Technology, Ingenio, UGlobe, Expo 2020, Business Finland, the University of Stavanger and UNESCO.

In the workshop participants talked openly and anonymously about possible futures within the framework of innovation priorities in 2050, in small breakout groups. In keeping with the general design principles of FLL, the Lab was carried out in three main sessions, proceeding with an introduction to the FLL approach followed by a plenary debate. Each session lasted for approximately one hour each.

- *Session 1: desirable scenarios:* the participants were asked to think about and present the future they desire/dream about, freeing themselves from the boundaries set by realism. The aim was to reveal their visions for the future, their dreams and ideals.
- *Session 2: probable scenario.* The participants were asked to describe what they realistically believed would be the situation in the future. The aim was to map the participants' preconceptions and mental barriers.
- *Session 3: Reframing scenario.* The facilitators present an unexpected "counter-scenario" that forced the participants to imagine an unexpected future. The aim was to make the participants develop unexpected narratives which could help them identify possibilities and challenges that are not normally seen in current debates. The reframing was also to help them critically approach their given understanding of the current social, political and cultural systems.

In each session, participants were divided into smaller groups of 5-6 people (including the facilitator) and asked to describe the future in 2050 on Post-its (in Miro boards). The participants were asked to bring out their own, personal reflections and not those representing their respective organisations. The descriptions were given in the form of citations, newspaper headlines, quotes, short stories, etc. The facilitator asked each of the participants to present their reflections to the other group participants. which led to discussions and reflections within the groups.

The peer-facilitators and selected rapporteurs from the groups brought up some critical points for debate in the final plenary session.

The reframing scenario

The reframing scenario presented by Riel Miller contained the following main elements:

We wake up in 2050 or further and imagine a world that is thick with innovation but no nation state, no universities, very few firms, no UN type multilateral organization, no nation state of Earth bureaucracy, very little mass production, ideas are global, production is local, monumentalism is over, lightness is legacy.

Unique creation – beyond supply and demand – assume that there has been a highly transformative change in accounting systems to include human capital and NC – with a massive change in power relationships. We have been moving from material and physical capital to intangible capital and learning as value creation. There has been a change in the ownership of the means of production.

Also worth noting that this means inheritance takes on a very different character – since if human capital is the primary asset, it dies when you die, since it is your personal capacity as a relational/social element of the community able to generate value. This alters the conditions for entry, exit, birth, death – fluidity that can be impeded by fixed assets that are so critical to the reproduction of power structures in current monumentalist, immortality-fixated social orders.

Now – let's push the virtual. This is not new but it is NOT about the tech – think of what you were able to imagine about telepresence prior to the pandemic and now – think about the difference between social orders where people bowed to nobles and today's

follow on Twitter or LinkedIn as a 'nod'/handshake... it isn't the tools, it is the expectations, norms and rituals that create the relationships.

Pre-defined hierarchical social status is marginal – we see heterarchical equality.

Conflict isn't gone but the manner in which values/ethics are operational changes – with a shift to an experiential, learning-by-doing, wisdom society – this is one of the components of the murmuration – which requires some major common/underlying conditions to work... like the eyes and wings and reflexes of swallows in a murmuration.

The past is not used to justify the reproduction of the past. The future is not used to justify the reproduction or continuity of the past. Difference and novelty fuel constant transitional and diversification type perceptions/choices.

Change in the conditions of change alter the relationship between perception and choice, between the capacity to seek, articulate and experiment with preferences enabling difference to be something we take advantage of.

(In the following video Riel Miller presents the context of this part of the exercise as well as the scenario itself: <https://www.youtube.com/watch?v=WgvTfR7TLI>)

Discussions from the breakout groups

Session 1: Desirable futures

Session 1 aims at revealing the participant's existing dreams and values. This makes it easier for them to relate possible future events and strategies up against what they really want. Moreover, it also makes it easier to discuss possible changes in dreams and objectives.

The discussions taking place in the groups did, as should be expected, reflect contemporary issues, ideas, and challenges. Since much of the current discussions are about societal and environmental challenges, the participants often presented futures where these problems had been addressed and solved. Moreover, the solutions were often presented as technical in nature, not social or cultural. This is also quite common given that contemporary innovation policy discussions remain dominated by "technology fix" approaches.

Many of the future snapshots presented were about nature and the environment.

Participants imagined worlds where the ocean health has been restored and is sustainable. Unsustainable agriculture has been replaced by renewable agriculture. The air is clean. Oceans are free of plastic.

"The Global North has shared sustainable solutions with the Global South rather than building empires on top of them," one participant added. The Nordics has become "one county of innovators, diverse and united."

These images from the future were enriched by developments that are relevant to both nature and social settings. One envisaged a future where "Meal replacement products

reach \$800 billion annual sales". Others saw the end of the privately owned automobile. Moreover, we have been able to transform whole systems, as in having a sustainable food system. As one put it: "circularity as mandatory/dominating principle in society".

The environmental perspectives were often connected to the problems associated with a carbon-based economy and the use of fossil fuels. So renewable energy is the "dominating source of energy, for heat and power".

This also means that many imagined a world where the related governance challenge has been solved. So, "Major political powers in the world are cooperating for the common good/global challenges". "We now know how to handle climate change; the world has embarked on a global plan for action".

The participants did not always discuss how this political change had taken place, but – then again – they had not been asked to.

Some did address social, cultural and political challenges beyond the environmental crises.

Some saw a world where democracy had been strengthened in the face of new technological realities, and where inequality had been addressed. People were encouraged to think about what kind of life they wanted to live. Humans have, for instance, changed their preferences in production and consumption. Indeed, the 25th annual Living with Less Award winner has been announced. Some went even further: "There is a revolution of the self. Open minds, open hearts, open will have synchronised to generate just futures."

Others put innovation into a social system's context, as in involving users and citizens. As one put it: "Research shows that the transition towards demand-led innovation is the reality." Another imagined a world where pensioners are actively engaged in "social solutions". Some envisaged a decentralized future with an "amoeba" or "agile development". Not all measures have to be organized as traditional projects. Vouchers can be given to citizens based on certain criteria. Crowdsourcing and participatory innovation may play an important role.

The new approach to innovation is captured nicely on this Post-it note: "Human focused innovation is now the dominant idea: meaning that innovation is focused first on human skills, second on social relations and third on artifacts. We build new selves and new communities as a priority!"

The new kind of innovation allows us to recognize diversity in ways of living, making it more evident, one noted. Innovations are valued in relation to three dimensions: economy, nature, society. Indeed, one argued that quality of life had replaced economic growth as the main policy objective. Another dreamed about a world where innovation takes into account both nature and humans.

One described the existence of a collaborative innovation program: "if you are doing things collaboratively, trying to think of mechanisms that can follow over time, scaling up things, how can you do it transparently, reporting on the development of the story, development of the investment and transformation journeys."

“Innovation captures the societal changes and future needs, rather than capturing present problems,” one suggested. The concept of futures literacy is integrated in basic as well as advanced education/training, said one. “Research(ers) are to a great extent integrated in societal innovation,” the third suggested.

This broader, holistic, approach to innovation and the economy can also be reflected in new ways of measuring innovation, one noted: “GDP includes, besides euros, also the welfare of people and nature. This means that the measures of innovation are also sustainable.”

It was interesting to note how the different groups ended up on different trajectories. One group was dominated by ideas regarding how to fix environmental problems. Another was more oriented towards ways of changing policies.

Session 2: Probable futures

When asked about what future they expected, the suggestions often became darker, but not all of them. There is also a lot of optimism in this space of “realistic expectations”.

Some point to the role of social mobilisation for change.

Some believe transnational organisations have advanced on reconfiguring global priorities, even if a stronger commitment from the leading nations is needed. “NGOs collaborate on innovations that address all UN SDG goals 2070”.

Others even see a future where the nation state no longer plays the leading role, or where political changes make action difficult (as in the loss of democracy in the US).

Indeed, some find salvation in technologies and the market: “Steady improvements of clean energy production leads to fall in petroleum prices, which finally moves investors out of that sector.” So clean energy is nearly free.

More people are becoming entrepreneurs, creating start-ups based on sustainable business models.

Yet, there is also pessimism. One sees “Panic efforts to reduce GHGs including geo-engineering”.

There are also tales about new ways of approaching the world. The circular economy rules, one says. More than half of the world’s citizens adopt vegetarianism, another explains. “Mass surveillance is broadly acceptable worldwide, democracy has a new meaning (accepting ruling group rather than participating)”.

That being said, some notes also speak of a world where we have not managed to stop the destruction of the existing ecosystems: “20th century simulators so everyone can experience earth as it used to be.” Extinction is advancing at a mass scale harming the most vulnerable, some argue.

Others report that “big capital is still fostering an unfair economic system”, and that the largest tech companies grow even bigger. Indeed, according to some participants tech companies have replaced universities as main actors in research and in knowledge

production and distribution. As one put it: “Corporations will make their role so important to support innovation, becoming untouchable because so much depends on them. Very strong corporations that will work to secure that advantage, no one can go against them.” There are even those who think tech companies have replaced universities as main actors in research and in knowledge production and distribution.

Still, there is always going to be a need for a national innovation funder/agency, one adds, pointing to the need for regional actors. Another one adds that a “new role for local governments is to facilitate and give the citizen a place in innovation.”

Agencies will present broader portfolios of smaller, experimental investments – “leading into larger-scale investments more the norm”.

Policymaking is also governed by old power structures, as in the “hegemony of neoclassical economists” stopping the implementation of a coordinated and future oriented global innovation policy.

As for expected technological innovations, we find, for instance, “wwTN (worldwide Television News in 3D) brought to you via holographic media.” Others are targeting global challenges, as innovations that combat food and water scarcity, personalized medicine and genomics, replacements for plastics, renewable and safe energy sources, micro housing, safe synthetic food, human-enhancing medical centers. “Marginal cost of sustainable energy is close to zero.”

Some innovations have had unintended consequences, as in driverless cars leading to an increase in private car use.

Others look at the interaction between technology innovation and social change. “If negative transformations happen, people will become more worried, especially in countries that have experienced wellbeing in the past,” one participant writes. This will change public opinion in wealthier countries.

“Universities and knowledge generation institutions are critical for the advance of the 2080 global agenda,” pointing to the role of science and technology when addressing global challenges. “Innovation priorities are based on current needs and opportunities of those who can afford them.” But this is not an uncomplicated process. Ethics is included as a mandatory field to address in all R&I&D, another says.

Session 3: Reframed futures

Having listened to Riel Miller present his vision of a different world, called the knowledge intensive society, the participants tried to imagine living in a world like he described.

This is a world for 'smart' people since they are the ones that can do more than brute force solutions, one noted. The ability to play out and simulate possible consequences of actions leads to a more calm and serene society (including a 'gap year', one added).

People are attuned to other people and nature in this world. Social exclusion is no longer an issue, said some, as all are seen and valued. Gender equality is ensured. There is colearning across generations. Empathy-training has become a key part of learning for life. Everyone carries a responsibility of leadership and change making agency.

Indeed, some argued that there are no global challenges anymore, as they have all been solved.

Some argued that we will now choose our families. We do not inherit them, as we will choose communities that mirror our values and our way of living.

Development has moved into the cloud, in cyber form, and all experiment with 'digital twins' and avatars. This will lead to parallel forms of leadership - those that emerge/are selected in cyber groups and those that emerge/are selected in the physical world. Your passport displays the name of your cyber guild or tribes, not the name of a nation state. Some see automatic translations as a solution to the language barriers, others the global adoption of Esperanto.

Food production is now sustainable. Everyone has started to grow their own food in shared gardens, suggested one, and there is no industrialized food production. The only weapons left are used for hunting.

Education is now a personal de-institutional journey framed around innovation. The open source metaverse is the global university, publishing house and the main research hub. Kids learn through online video games. Shared knowledge facilities are spread and funded internationally. Open science is mainstream. Some imagine a world where knowledge is uploaded into our brains.

Health is so integrated into everything we do that we do not even think about healthcare anymore: "Few people/cyborgs even remember how the world was back in 2021 since it has changed so much," one explained.

Aesthetic is more important than ethics, one suggested. "We want to create ever more beautiful things and activities." Dance becomes an important metaphor for improvisation and openness.

Intellectual property rights have been abolished. Everything is owned by the crowd.

Others pointed out, though, that those who were not able to adapt to a fluid and flexible learning society might feel excluded. We need some direction, one pointed out, we need some process of collective agreement. If everything "becomes a flash mob", where do we stand?

Some argued that social dominance will not go away, and that self-defence remains an important community function.

With the power of the state waning, companies might fill the vacuum, and that might lead to some kind of oligarchy, one suggested. It was clear they did not see this as a positive development.

In other words: Some felt that there are certain aspects of human nature that will not go away and which may make even this kind of society oppressive in some ways. The key would be to ensure that people feel safe, so that they could embrace such an open society without fear. However, given this kind of openness, colearning and cocreation, this kind of "benevolent anarchy" might lead to a creative and compassionate society.

Reflections

Takeaways

“Thinking from a position of the future helps us to interrogate the underlying assumptions driving what we do in the present”.

“Innovation is about inclusive processes and mindsets - enabling as many as possible making a difference - not products”.

“Issues of who has agency to shape the future are central and darker imaginations about the future reflect current scepticism about coherence of international cooperation”

“If the world is going to be more equal, who/whom will give up something they have today, like physical possessions, mindsets, earnings, power etc. What might be the value or fear that would really drive this transition worldwide?”

“As for explaining the immediate practical needs. I find that many find that the practical need for Futures Literacy becomes more obvious in a time of crisis, where the very crisis proves that the existing paradigm and practices are not able to solve the problems we are facing. So it is easier to explain the need for FL in innovation policy now, when we are facing existential threats like climate change and fascism”

“This is a challenge, and we are trying to address some of this through developing a new master’s degree looking at strategic design and leadership, where FL and FLL will play an essential part.”

“It has been two valuable days in terms of understanding the complexity researchers and innovators face in terms of creating a good future. Eye-opening for me”.

“I also noticed that focusing on anticipation pushes through a block that I normally employ (without realising)”

“I liked to think about the future, not departing from the past, but from a generative thinking that can lead to action to move forward in desired directions. In a sense that mobilises energy at an individual level (you have to engage to move towards that desirable future) and a feeling of community that is also seeking that direction (and therefore decreases fear and anxiety)”

Comment: “That kind of cooperation and sense of community are key, I agree. But that sense of community is also often the biggest barrier towards transformation and change, because people identify with the past and seek comfort in the seeming predictability of the past. So how do we give them that sense of comfort, while at the same time encouraging them to think about a future where that community has changed dramatically.”

Answer: “I see where you are coming from. It is tricky, indeed. A first thought would be for me, that there are many ways to move towards desirable futures, but if we have general agreements on direction and underlying values, we can converge as a community...not in comfortable and smooth way, after all we are navigating uncertainty and we will be changed through the process, and we humans don't really like that, but history has shown that we can move towards desired directions, just like the starling swarm...”

“I think also the feeling of ‘vulnerability’ in imagining the future was made clear when we were first assigned new, unfamiliar groups earlier today. To me, it showed the need for safe spaces for these kind of mental exercises - but also how fast such a safe space can be formed 😊”

“Agree, we need more of this. It is a very good session, I have learnt a lot”

Annex 1. Agenda

Time	Where	Activity	Comments
Day 1			
10.00 CEST	Plenary	Warm-up	Warm-up exercise, introduction to the Lab context and aims, and to the FL work at UNESCO
10.20 CEST	Breakout groups	Introductions	Round table introduction with breakout group participants and discussion of rapporteur roles
10.30 CEST	Breakout groups	Session 1 Hope/ Preferable	Imagining we are in 2050! We invite participants to imagine hopes and dreams for the future . What are the desirable innovation priorities in 2050 - for us, for our close community, for society?
11.30 CEST	Lunch break		
12.00 CEST	Breakout groups	Session 2 Probable	Back in 2050, we invite participants to reflect on probable innovation priorities in 2050. What do we think will be the most probable and likely innovation priorities in 2050?
13.00 CEST	Plenary		Returning to 2021, we will wrap up Day 1 and introduce the programme for Day 2.
Day 2			
10.00 CEST	Plenary	Reporting from the breakout groups	Welcome back to the future! Rapporteurs will present from the group discussions in Sessions 1 and 2 on Day 1.
10.20 CEST	Plenary	Session 3 Scenario intro	Returning to 2050, we will introduce the reframing scenario . Not probable nor desirable, it is a scenario intended to challenge our anticipatory assumptions. For the next phase of the Lab, we will stay in this scenario and imagine societies, lives, traditions, based in this new reality.
10.40 CEST	Breakout groups	Session 3	We will recap the reframing and discuss ideas around how innovation is organised within this scenario, addressing questions such as: What strikes us most about this scenario? What surprises us?
11.30 CEST	Lunch break		
11.50 CEST	Plenary	Sessions 4	Plenary dedicated to reporting back from the groups on the reframing scenario, with responses to the group discussions. We will also reflect on the event, considering the step-by-step methodology of the Futures Literacy Lab, and how it has impacted on our own way of understanding the future.

			We will end with the way ahead, considering the role of Futures Literacy in Transformative Innovation Policy and addressing system change.
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Annex 2. Points made in the discussions in breakout groups

Here are some of the ideas presented by the participants of this workshop. They are from the notes they made in Miro. Think of these as virtual post it notes presenting snapshots from the year 2050.

Group 1

A. *Desirable futures:*

- Ocean health is restored and sustainable
- 23% of arable land certified as 'renewable agriculture'
- We are breathing clean air
- Breakthrough in carbon capture
- Breakthrough in understanding role of soil biology allowing big improvements in carbon sequestration
- Meal replacement products reach \$800 billion annual sales
- Carbon coin redistributes \$1 trillion annually to global South
- We celebrate the 20th anniversary of antimicrobial resistance (AMR) extinction
- We have transformed our agricultural practices to become sustainable
- End of privately owned automobiles
- Children are growing up safely and without anxiety about the future
- Renewable energy is the dominating source of energy, for heat and power
- Rethinking value creation (alternatives to patents etc.)
- 40% of new clothing market made from recycled fibers
- Major political powers in the world are cooperating for the common good/global challenges
- Strengthening democracy in the face of new technological realities + addressing inequality
- Technology and science governance approaches use more careful implementation of new tech to secure beneficial effects and avoid catastrophe
- Securing sustainability, resiliency and stability in our global economy
- We now know how to handle climate change; the world has embarked on a global plan for action
- Massive innovation required to solve the equation: quality of life for earth inhabitants vs. planetary boundaries

B. *Probable futures:*

- Panic efforts to reduce GHGs including geo-engineering
- Climate change adaptation (sometimes dire)
- Securing basics in Maslow hierarchy becomes national priorities in West (food, water, safety)

- More equality/shared resources. How: A revolutionary demand for sharing and a common conception of what is "enough"
- Saving/restoring what is left of biodiversity on the planet. How: Genome editing and biotechnology
- Exploration of possibilities to live in very different environments (even planets). How: New transport technologies, lab-grown food
- Dealing with millions of displaced persons humanely
- Spread of commons and cooperative based arrangements
- Geopolitical tensions running high, democratic institutions failing or failed
- Adaptation and mitigation to warmer planet. Micro-managing and engineering our way out of failing earth systems
- Oil and gas companies still fight for maintaining production while receiving hard opposition from society
- Ec inequalities reflected in boom of personal tech (genome ed, smartwear).
- Multi-polar or regional power world with limited cooperation
- World in serious and continuing crisis
- 50% renewables in the European energy mix
- Cybersecurity as a priority, ML/AI weaponized in arms race
- It's (almost) all DARPA. Defence and military R&D rises in a destabilized world
- Is there a "universal intelligence" or not? Without, we might experience chaos
- Big companies continue their unsustainable practices and do not think about the negative effects of their products/innovation
- Ageing population and lifestyle diseases put a strain on public spending/collapse in public spending

C. Reframed futures:

- This is a world for 'smart' people since they are the ones that can do more than brute force solutions
- Social exclusion ('utenforskap') is no longer an issue - all feel seen and valued
- The idea of time has changed
- The ability to play out and simulate possible consequences of actions leads to a more calm and serene society (including a 'gap year')
- It may be, however, that very practical knowledge skills become more important-- if so the material standard has fallen
- Empathy and the capacity to listen are core abilities
- No more gender inequalities hindering collaboration
- Those who are different will be excluded (constituted authority defends rights)
- Dominance does not go away and self-defence is an important community function
- as this is a society that works, there are no grand challenges to be "fixed"
- The digital space is the new monument -- the only means for collective memory
- Invention for the sake of the individual or the local community or clan
- Experiences across generations and ages are used as a source of inspiration and valued
- Science has undergone a shift away from institutional structures, long gone are tenure tracks, grant applications, journals and publishing scores
- Source for R&D funding for large scale projects? Peer funding?
- Education is now a personal de-institutionalized journey framed around innovation from day one

- New platforms for cocreating knowledge have emerged, the promise of open science have fully materialized
- The open source metaverse is the global university, publishing house and the main research hub

Group 2

A. *Desirable futures:*

- Users are finally leading the innovation process: Research shows that the transition towards demand-led innovation is the reality
- Pensioners are actively engaged in 'social' solutions (it takes a village...)
- the idea of risk is not applicable. People just think this is the way. We think this is the good of innovation
- Combination of actors taking risks together, in forms of cash and form of time
- What is the risk of not changing? Wasting resources?
- Decentralised way, a common practice
- "Amoeba" or agile development
- It is more inclusive, more democratic, it is something that we have to do
- No need of always being project-centered - other forms of being organised, vouchers given to citizens based on certain criteria
- Crowdsourcing, participatory innovation (Kickstarters)
- "When I look back, I cannot believe how much the approach to innovation has changed during my lifetime: it is a true revolution! Now everything starts with thinking about the good life and what is needed to realise different visions of it"
- There are forums for community interaction/ engagement and 'sluss' toward action
- Human focused innovation is now the dominant idea: meaning that innovation is focused first on human skills, second on social relations and third on artifacts. We build new selves and new communities as a priority!
- It has to have some direction, not only bottom up
- A globe, ecology, environment, we have all the seeds for innovation
- GDP includes besides euros also the welfare of people and nature. This means that the measures of innovation are also sustainable.
- Collaborative innovation program, showing that they are putting skin in the game. Track record - if you are doing things collaboratively, trying to think of mechanisms that can follow over time, scaling up things, how can you do it transparently, reporting on the development of the story, development of the investment and transformation journeys
- Innovation based on concrete needs of community, there will be more trust "more skin in the game". Innovation towards human development, people will have different expectations and will have critical development, people's own development, skills and capacities and social networks
- Some principles that show us how the BAU lead us to an undesirable future, so we can show what is good innovation
- Innovation allows us to recognize diversity in ways of living, making it more evident
- Innovations are valued in relation with these three dimensions (economy, nature, society).
- Media showing this way of living and way of acting
- Different understanding of innovation is mainstreamed and has the capacity to influence political decisions
- Every citizen to put in community service time, which is deducted from your tax return. Motivate by getting engaged, someone is recognizing the value that gives. How the government values their citizens time, active asset

- Educate people to think about the kind of life they want to live, what they want to achieve with this life. Understand what they need, and what they need to support, and to realize the life they want to support
- Inspirational stories, examples of citizens and doing things differently
- System around innovation is not only anymore about research and companies, but it is also citizens. More bottom up
- Innovation is showing and promoting way of life which is more inclusive and sustainable on a big scale
- Artificial intelligence can be used to crowdsource, and scale up yourself to participate in different process, AI will disrupt
- Innovation is influencing political decisions to make them more democratic in a deeper sense
- Innovation is helping people to better understand each other despite the differences

B. Probable futures:

- A few larger corporate actors are leading spearhead innovation initiatives
- Tech companies have replaced universities as main actors in research and in knowledge production and distribution.
- Early warning systems for climate events, security issues
- Medical and welfare technologies are now being surpassed by security technology as the main driver of innovation
- Agricultural innovation cannot keep the pace with climatic challenges
- Capital for innovation becomes more and more scarce
- Financial crisis, people's mentality, priorities, ways of thinking of the future. If negative transformations happen, people will become more worried, especially in countries that have experienced wellbeing in the past. Public opinion in wealthier countries, healthy switch in global relations, younger countries will become more prominent
- Climate change: big change will happen, it will be decided whether innovation will go more towards mega projects or whether the success will be of local and regional projects. Where the successes will be, will they shape the innovation landscape?
- Corporations will make their role so important to support innovation, becoming untouchable because so much depends on them. Very strong corporations that will work to secure that advantage, so no one can go against them
- Big political change - on big corporate players, shaping where innovation is driving towards.
- Public sector funders are reliant on private sector investments; new legal arrangements and forms of partnering are in place
- Transnational regulation of large corporations, ensuring that they play a role that is in sync, that there is not just a group control the rest
- Power of the local and regional rather than the national level
- Local and regional players not replacing the national level but becoming more prominent, certain places and new actors - new change agents to emerge, at a lower geographical level
- Change agents will be different in different localities, one cannot decide which role each actor plays

- Corporations can be part of this change, show how private investors can be part of the change "skin in the game"
- BUT there is always going to be a need to have a national funder/agency. There will be quality assurance of the regional agencies
- Things like COVID and Climate Change pushes governments to think in a different way
- A large variety of community-based/bottom-up initiatives at play, but not yet 'in synch' with the large players
- Public action, the ability to change in response to these changes
- Role of national/transnational institutions, would become more facilitators than those that dictate the agenda
- New role for local governments is to facilitate and give the citizen a place in the innovation
- Media are still paying more attention to mainstreamed innovation but networks of citizens have been able to articulate a different narrative about innovation which is gaining attention at the local and global scale
- Some countries and regional and local gov are using different metrics to measure "development/progress" which include welfare of people and nature
- Bottom-up/decentralized innovations are not yet mainstreamed but have gained more acknowledgment and are receiving more economic and political support
- Broader portfolios of smaller, experimental investments - leading into larger-scale investments more the norm
- More attention to leadership/ teams leading these portfolios
- Public sector thinking /acting more like an investor?
- Educational programs have introduced decentralized/bottom-up innovations

C. Reframed futures:

- Communication, self-expression and creativity are going together. People take pleasure and find fulfilment in understanding how they can best contribute to emerging realities.
- Realisation through participation
- People have developed a wholly new ability for attunement with other people and nature. Attention for needs and the pleasure of collective creation are driving innovation
- Acknowledging services such as raising a child
- Directionality? We need some direction, we need some process of collective agreement
- Everything will be a flash mob.
- No more fear of missing out, but pleasure of contributing most creatively
- Service: instead of buying a car, we get a service of transportation
- Leadership selection based on service references (what contributions most recently)
- Development happens in cyber form - all experimentation with 'digital twins' and avatars
- Aesthetic is more important than ethics. We want to create ever more beautiful things and activities
- Dance, improvisation theatre, "yes and", constant openness to reattune ourselves - ability to listen
- Punishment: not being able to fit in

- Parallel forms of leadership - those that emerge/are selected in cyber groupings and those that emerge/are selected in the physical world
- Individuals have their own personal 'life accounting' - all contributions/ services provided and services received (blockchain)
- there are natural process of learning conducive to an awareness of being respectful with diversity/sustainability etc.
- Even if everything is fluid and experiential, people is able to consider the relevance of wellbeing of people and planet and some agreements are made in this experiential places

Group 3

A) Desirable futures:

- The Children's Panel on Climate Change is ranked top three world's most important societal actor
- UN reports there is no more plastic left in the world oceans
- "We have finally ended world hunger"
- We have reached the SDGs
- We have reversed global warming, stopped mass extinction and saved and deepened democracy
- People are no longer eating meat
- "The ocean is plastic free"
- Young people have a lot of hope and aspirations for the future
- Transformed whole systems "We have a sustainable food system, mobility system etc.
- The Nordics is one county of innovators, diverse and united
- The concept of Futures Literacy is integrated in basic as well as advanced education/training
- The Global North has shared sustainable solutions with the Global South rather than building empires on top of them
- Public transport more popular than cars worldwide
- The Nordics serves as a role model in systemic innovation with societal needs in focus. EU, Americas, Asia and Africa has copied and developed the Scandinavian model for systems innovation
- Petro age has ended
- Biomass as resource has taken over for fossil fuels based products and solutions
- Circularity as mandatory/dominating principle in society
- Research indicates that people are happier than ever before
- Arts & sports become main innovation policies
- The concept of less is more has great support
- Policy is driven by transparent, high quality real time data
- People all over the world work less and have more leisure time
- Over optimism in technology in history, innovation is multilayered
- Research(ers) are to a great extent integrated in societal innovation
- Quality of of life is main objective
- Technology is used to educate people all over the world!

B) Probable futures:

- Productive cross-sectoral efforts exist, but so do strong sectoral interests
- Driverless cars have led to an increase in private car use
- Mass surveillance is broadly acceptable worldwide, democracy has a new meaning (accepting ruling group rather than participating)
- More than half of world's citizens now adopt vegetarianism
- There will be a larger gap between North/South in terms of living standard and technological development
- There will be several "internets"
- Largest tech companies grow even bigger
- Legal voting age lowered to 16 in Europe
- Hegemony of neoclassical economists stops the implementation of a coordinated and future oriented global innovation policy
- Steady improvements of clean energy production leads to fall in petroleum prices, which finally moves investors out of that sector
- Large proportion of unemployed people based on a knowledge gap
- Innovative sustainable solutions hindered by polarization
- Increased political extremism causes many influential countries to leave the UN and other international organizations
- Protectionism is on the rise
- New political alliances based on energy use will be formed (ex solar tech/oil & gas)
- Renewable energy is now bigger than fossil energy
- Marginal cost of sustainable energy is close to zero
- Sustainable and non-sustainable solutions still present
- most work places in the Nordic countries has now introduced 6 hour working days
- Revised version of the SDGs is changing the direction
- More people are becoming entrepreneurs, creating start-ups based on sustainable business models
- Loss of democracy in the US makes international efforts hard
- Priority given to unknown shocks
- Though international competition in the work market. Workplaces have an international culture.
- EU program for desalination of water in the Mediterranean
- Some people will have performance enhancing chips in brain
- Political regulations and incentives to reduce emissions and damaging activities
- Oldest person on earth just turned 130 years
- In order to survive, many companies have transformed to a sustainable, and circular business model
- Technological solutions are been innovated and upscaled in a huge scale
- The earth is 1.5C degrees warmer than in 2021 (2.7C degrees warmer than pre-industrialized times)
- In the Global North people will live for 150 years due to personalized medicine
- There is still plastic in the ocean
- New global soil erosion programme aims at solving the problems cause by rain and floods
- Ageing population has shock effect on society
- Micro housing gaining even more popularity

C) Reframed futures:

- Innovation is an ongoing, shared process where contributors add to a process or product as improvement ideas come up
- Innovation
- No one owns what is being innovated, everything is owned by the crowd
- Rules
- If you destroy something or create lock-in effects on purpose you lose your right to contribute for a while
- Is this reality not really based on technology optimism? That technology will solve everything...
- There are very few rules, the only ones protecting the common good (e.g build don't destroy)
- Innovation is based on playing with the future
- No IPR
- Innovation is primarily for local consumption, and mainly for wellbeing and happiness. We will need new ways of relaxing, spending time
- Innovation platforms are used to connect people, collect a complex understanding of needs and drive innovation
- Status depends on the quality and quantity of your contributions
- Questions
- Is flexibility and not directionality going to solve our problems? I do not think so.
- Ethics
- All life is valued: no hierarchies between species
- I wonder what there will be shortage of in 2050.
- Do we work? based on voluntary, non-paid "work"/play?
- Everyone has started to grow their own food in shared gardens (no industrialised food production)
- Action is based on the mindset that we're all equal, and that every life should be protected
- Learning
- Kids learn via online videogames
- Empathy-training is a key part of learning for life
- Learning is an ongoing process throughout life, it's easy to change profession, and create the life you would want for yourself regardless of beginnings and background
- An individual is called a contributor, belonging is based on participation in positive development that helps the earth, humankind and other species
- A common world language is needed for all to collaborate (Esperanto?)
- Your life is online- some have never met their best friends, spouse etc
- Learning is organised through simulation
- Your passport displays the name of your cyber guild or tribes, not the name of a nation state
- Automatic translations online opens up for collaboration
- Much work is done in open online communities
- As learning and a practical approach is learned for you where as for a child, everyone is innovators
- School is based on peer-learning (no teacher)

Group 4

A. *Desirable futures:*

- No innovations made are discriminative, that being age, gender or where you live

- Innovation captures the societal changes and future needs, rather than capturing present problems
- Focus on enabling behaviour: Strategic design and leadership (as the collective pursuit towards delivering on purpose) is shaping education, enabling new ways of defining problems and solutions.
- Mars explorers demand innovation to bring them back
- Climate change mitigation
- Doing better for many rather than for the few
- Ecosystem-based solutions
- Humans have changed their preferences in production and consumption
- Governmental policy and corporate strategy enable and reward initiatives aimed at long-term equality and well-being for the many.
- 25th annual Living with Less Award winner announced
- A global governance system based on radical collaboration
- The world has shifted the economic growth paradigm to human development
- Atom represents the world, and the particles represent the R&I crossing various disciplines. The more heat you expose to the atom, the more energy you produce and particles
- Changing mindsets in support of the UN's SDGs - this includes what 'success' looks like in school and at work.
- The word 'innovation' is no longer used (we all 'own' it)
- Ensuring that UN SDGs continue to be a success
- Focus on common good/internal goods
- The economic system has shifted towards just transitions
- Focus on process rather than 'product'
- Everyone, from Researchers to customers, all understand that they too are responsible for ethical perspectives any innovation brings to the table
- Innovation takes into account both nature and humans
- There is a revolution of the self. Open minds, open hearts, open will have synchronised to generate just futures
- 'See direction as a result of process' IFF
- Innovation of the self as important as innovation of outside world
- Human replaces the last Artificial General Intelligence

B. Probable futures:

- wwTN (worldwide Television News in 3D) brought to you via holographic media
- Communication innovation across and within borders
- Transnational organisations have advanced on reconfiguring global priorities, but a stronger commitment from the leading nations is needed
- Innovation to correct what went wrong?
- Innovation for changing world order?
- Substitutional innovation to combat food scarcity, water scarcity
- Innovation to solve side-effects of synthetic foods
- Personalized medicine and genomics
- Replacement of nation states
- We made it! Plastics have viable replacements
- Human-enhancing medical centers
- Circular economy rules!
- Bottom up innovation for resilience?
- Grassroots and social innovation are the rulling scheme for self-preservation of vulnerable communities

- NGOs collaborate on innovations that address all UN SDG goals 2070
- Renewable, safe and clean energy sources using biobased materials
- Carbon sequestration technologies have contributed towards carbon net zero
- Social mobilisation keeps putting pressure on governments to life preservation
- Sustainable Development Goals: Agenda 2100
- 20th century simulators so everyone can experience earth as it used to be
- Big capitals are still fostering an unfair economic system
- Universities and knowledge generation institutions are critical for the advance of the 2080 global agenda
- Do you remember the time when we did not talk about planetary boundaries?
- Ethics is included as mandatory field to address in all R&I&D
- Extinction is advancing at a mass scale harming the most vulnerable
- Self-sustainable local communities have been successful in shielding themselves from the scarcity of resources
- Innovation priorities are based on current needs and opportunities of those who can afford them

C. Reframed futures:

- Local people come together to decide on important issues
- Addressing murmuration - through individual 'effective perceptive range'
- Development: Community success is measured in terms of well-being. The best communities are those with the highest level of health, education, environmentally-friendly practices
- Smart sustainable communities: Healthy, affordable food is grown locally. Communities consume what they produce, opening trading networks within distances that keep food sustainable
- There are no weapons, only hunting equipment
- Those with knowledge on practical solutions lead and teach those who don't
- Governance: Global values lived differently locally
- Everyone carries a responsibility of leadership and change making agency.
- Quarrelling among communities over scarce resources continue
- Children are taught through practice and theory about health issues, eco-friendly production, self-sustainable innovation
- The seed bank at Svalbard was not destroyed
- What stands out?
- Trade is based on goods, favours, and knowledge
- What surprises you?
- Education: Preschool, primary and secondary education is context-based but with shared cutting-edge knowledge. Education is the sector with highest investment
- Self-selected groups of avatars using open-source platforms which again is identifying other groups with similar interests. Also introduces other avatars with skills/experiences/interests aligned/required.
- Education: Shared knowledge facilities are spread and funded internationally. Open science is mainstream
- Physical and virtual campfire/ community centre events catalysing processes of defining problems/challenges/opportunities.
- A focus on design thinking (including agility) enabling the process of defining problems and solutions; enabling learning.
- The instincts to survive drives cooperation and knowledge-sharing
- Education: Capabilities-based shared centres are distributed locally and globally

- Everything we do adds value to the greater community.
- There is no such thing as individual success.
- Creative failing which we learn from is a success factor.
- Focus on mindsets, purpose, core values, movement...
- Tool innovation is what local society needs
- Innovation starts with what you need

Group 5

A. *Desirable futures:*

- We eat less food since we eat condensed nutrients geared towards our DNA - keeping us healthy. Most of our former diseases are gone.
- Clean environment - clean air to breath, where children will stop dying from pollution
- I live in self-sufficient community(food and energy) where we all contribute one way or another. We have small apt on our own but most areas are shared to keep the land to grow crops and wildlife.
- Equality - more equal societies
- Impossible to imagine child labour in 2021
- Inclusion: that goes beyond the current definitions of "exclusion" in terms disability, gender or race; but to ensure inclusion of the environment, biodiversity, and species
- Food is homegrown and we eat less:)
- No more production of new clothes
- Crazy that people were thinking of innovation as something separate in 2021
- Today it is 10 years anniversary of the global tech hybrid school system
- Innovation systems that are part: food, health, transport,
- Innovation (and R&D) means the goal is for peace and prosperity, not war and oppression
- I am so grateful that innovation helped us make the world a more inclusive, equal and better place
- Inclusion - beyond the usual

B. *Probable futures:*

- Net-zero is not realised; CO², sea levels, plastics, etc continue to rise
- Innovation leads to progress but is not able to deliver on the SDGs, as expected
- The need for environment innovation is bigger than ever. Humans have made more progress than expected but new threats has been added. For example the antibiotic resistant bacterias is a fact. The world did not prepare for this threat even though scientists had been warning about it for decades
- Innovation is an integrated part of society (economy, politics, social). The actors that did not embrace innovation management are no longer relevant
- Environment (e.g. plastics) remain a major global challenge
- The dominant role for innovation remains as economic growth and competition; rather than inclusion, fairer societies or addressing the SDGs
- Marginal progress made on improving equality and reducing inequality; but the world is still most unequally, polarised and still grappling with SDGs-type issues

- Nations are more of a geographical object than ruling its citizens. (Big) companies and communities have taken over some of the functions of states/nations. Everything goes borderless in the way we know it.
- Innovations in the health field has solved a lot of problems but there is still a big inequality to its usage
- Algorithms and virtual worlds still enforce a gap between the ones being exploited and the ones earning/taking control
- Green tech is making huge progress solving the energy crisis
- Techs (4IR, AI...) becomes more embedded in societies but also in humans as wearables
- There are more investments in Green Tech

C. Reframed futures:

- People are living in physical communities that mirrors their values and way of living. Families are therefore not by inheritance but by choice. This makes communities sort of physical, filter-bubbles. On the other hand you can engage in a lot of virtual worlds with totally different values, experiences. There are several ways to make a living, either you live totally self sufficiently and only work to produce what you need in your community, or you work and barter with others. The community takes care of its inhabitants so no social insurance or welfare is organised. You learn what you need to know, the only organised learning is for highly specialized professions. The only thing that is organised is healthcare.
- School: we upload information to our brains by BMI so the humans have more equal qualifications (prerequisites) than we had back in 2021
- There are areas where those who do not want to live with technology don't have to do that. Everyone is accepted to be in the way they want without judgement.
- Less government/state, companies are now quasi-governments and make laws, regulations and policies – back to some form of oligarchy?
- Since we stopped consumption and capitalism we have other values in life which guides policy
- This also goes for healthcare since health is so integrated that we do not even think about it anymore. Few people/cyborgs even remember how the world was back in 2021 since it has changed so much
- Less environmental impacts – the world is greener, wildlife will overgrow?
- Innovation system is not known of since things needed are taken care of by self-organisation.
- Humans are now – part human and part cyborgs (intelligent beings) – requiring less food, more healthy and travel less (due to tech that include teleporting...) but some things will remain: learning and growing, food and eating, entertainment