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V4 2030
POST-COVID RECOVERY

V4 2030: EMERGING SUSTAINABLE INNOVATION PATHWAYS TOWARDS A POST-COVID-19 RECOVERY

15 June 2022

About the project

Analyzed trends
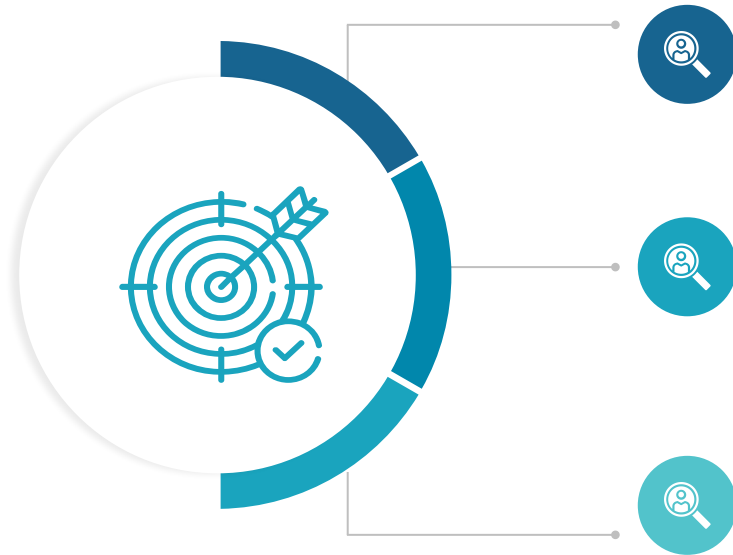
Delphi results

EU scenarios

About the V4:

The Visegrad Group is a regional platform for political and people-to-people cooperation that includes Poland, the Czech Republic, Hungary and Slovakia.

It came to be in 1991, at the Visegrad Castle (outside of Budapest, on the Danube in Hungary).

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About the project

1. Identification of trends

Method: Desk research, PESTLE+ /completed/

Deliverable: Presentation "Overview of trends shaping the future of the V4 region"

2. In-depth analysis of key trends

Method: Delphi survey /completed/

Deliverable: Report from a Delphi survey "V4 2030 Sustainable Innovation Pathways towards post-COVID recovery"

3. Identification of sustainable innovation pathways towards a Post-COVID-19 recovery

Method: Discussion panel/workshop /in-progress/

Deliverable: Policy brief "Lessons from the Pandemic: Potentials for Radical and Sustainable Change in V4 region", Scientific paper "Identification of innovation opportunities for V4 region until 2030: methodology and results"

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Trend Selection for the Delphi Survey

Desk research report: https://4cf.pl/overview-of-trends-shaping-the-future-of-the-visegrad-region/

Desk research: **Phase 1**	Desk research: **Phase 2**	Desk research: **Phase 3**	Questionnaire: **Phase 4**
Trend search	**Trend identification**	**Trend analysis and key trend identification**	**Trend selection for the Delphi survey**
Identification of information sources and collection of data on trends Data cleaning and processing	Building database of trends along 8 categories (geopolitical, economic, sociocultural, educational, environmental, technological, health-related, other)	Determining influence of a trend on sustainability (positive/negative) Determining V4 influence on a given trend (y/n)	Selecting two key trends per category: ✓ trends which to a large extent, can be influenced by the V4 region (acting collectively) ✓ trends which to a very limited extent, can be influenced by the V4 region alone
Output:	112 trends	30 trends	14 trends 28 enablers & blockers

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List of trends, enablers and blockers for the Delphi Survey

Positive trends

Category	List of positive trends	List of trend enablers (E) and blockers (B)	
Geopolitics	**Trend 1:** Strengthening emphasis on the future in the European Union's governance and policy	E	Increased number of futures studies training programs
		B	Populism (implying that politicians focus on short-term gains)
Economy	**Trend 3:** Rising popularity of remote or hybrid work	E	High emphasis on the work-life balance
		B	High emphasis on issues related to data protection
	Trend 4: Increasing demand for product and company transparency	E	Increased awareness concerning health and nutrition
		B	Economic crises and rising inflation
Environment	**Trend 7:** Emerging energy sector transitions	E	Increased political pressure around the world concerning climate change mitigation
		B	Social anxiety over energy transformation
Education	**Trend 12:** Increasing emphasis on sustainability-oriented competences in educational programmes on all levels	E	Budgetary support (on the state and EU level) for sustainability oriented programmes
		B	Anti-green movements organizing disinformation campaigns (concerning climate change)
Health	**Trend 13:** Growth of artificial intelligence (AI) use in the healthcare industry	E	Cost savings (and improved efficiency) thanks to AI
		B	Lack of social acceptance of AI technology

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List of trends, enablers and blockers for the Delphi Survey

Negative trends

Category	List of negative trends	List of trend enablers (E) and blockers (B)	
Geopolitics	**Trend 2:** Deterioration of the rule of law	E	Geopolitical conflicts in the neighbourhood of the given country
		B	Financial pressure from the EU, in reaction to the violations of the rule of law
Technology	**Trend 5:** Persisting gap in innovation performance between the V4 countries and better performing EU states	E	Limited autonomy of the research activities
		B	Return migration and brain gain (remigration of highly educated workforce to their countries of origin, reversing the brain drain into a significant brain gain)
	Trend 6: Rising popularity of cyberattacks	E	High interconnectivity of devices relying on a WiFi connection
		B	Efficient (technological, economic, legal) defence system against cyberattacks
Environment	**Trend 8:** Rising need for food security and self-sufficiency	E	Transition towards circular economy in the food system
			Climate change leading to unfavourable farming conditions in numerous regions
Society	**Trend 9:** Increasing polarization of societies	E	Targeted disinformation campaigns
		B	Introduction of the Universal Basic Income scheme
	Trend 10: Increasing disinformation, misinformation and circulating conspiracy theories	E	Lack of adequate regulations to address spreading disinformation
		B	Highly developed civil society
Education	**Trend 11:** Persisting gap in quality of education between the V4 countries and better performing EU states	E	Online education and learning (e.g. due to pandemics)
		B	High levels of funding for the education sector
Health	**Trend 14:** Growing number of people suffering from mental health issues	E	Extensive time spent online
		B	Rebuilding local communities

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Delphi Survey questions

Question 1
Assessment of trends (0-6)

Experts were asked to assess the influence of a given trend on sustainable development of the V4 countries.
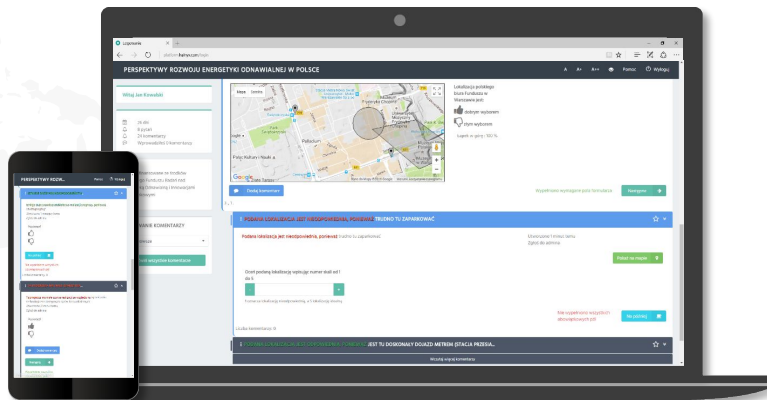
Question 2
Assessment of trend enabler (0-10)

Experts were asked to assess the impact of an enabler on a given trend and the timeframe within which this impact would be the strongest.

Question 3
Assessment of trend blocker (0-10)

Experts were asked to assess the impact of an blocker on a given trend and the timeframe within which this impact would be the strongest.
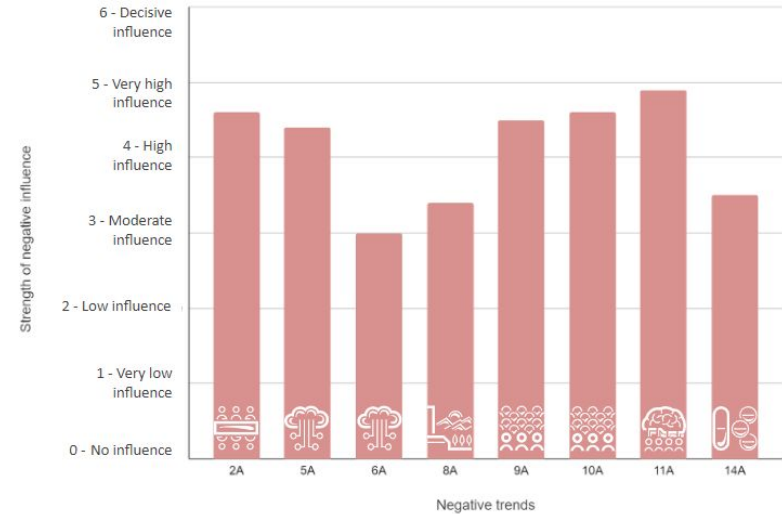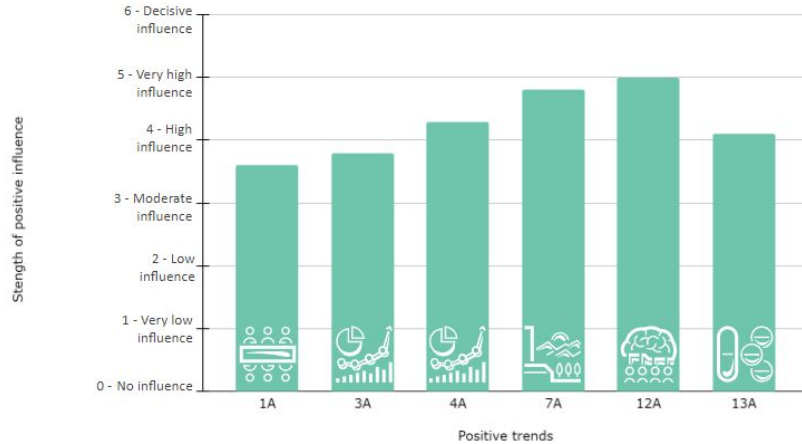

https://4cf.pl/en/halnyx/

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Delphi Survey results (Question 1)

Positive and negative trends

List of positive trends

1A. Strengthening emphasis on the future in the European Union's governance and policy

3A. Rising popularity of remote or hybrid work

4A. Increasing demand for product and company transparency

7A. Emerging energy sector transitions

12A. Increasing emphasis on sustainability-oriented competences in educational programmes on all levels

13A. Growth of artificial intelligence (AI) use in the healthcare industry

List of negative trends

2A. Deterioration of the rule of law

5A. Persisting gap in innovation performance between the V4 countries and better performing EU states

6A. Rising popularity of cyberattacks

8A. Rising need for food security and self-sufficiency

9A. Increasing polarization of societies

10A. Increasing disinformation, misinformation and circulating conspiracy theories

11A. Persisting gap in quality of education between the V4 countries and better performing EU states

14A. Growing number of people suffering from mental health issues

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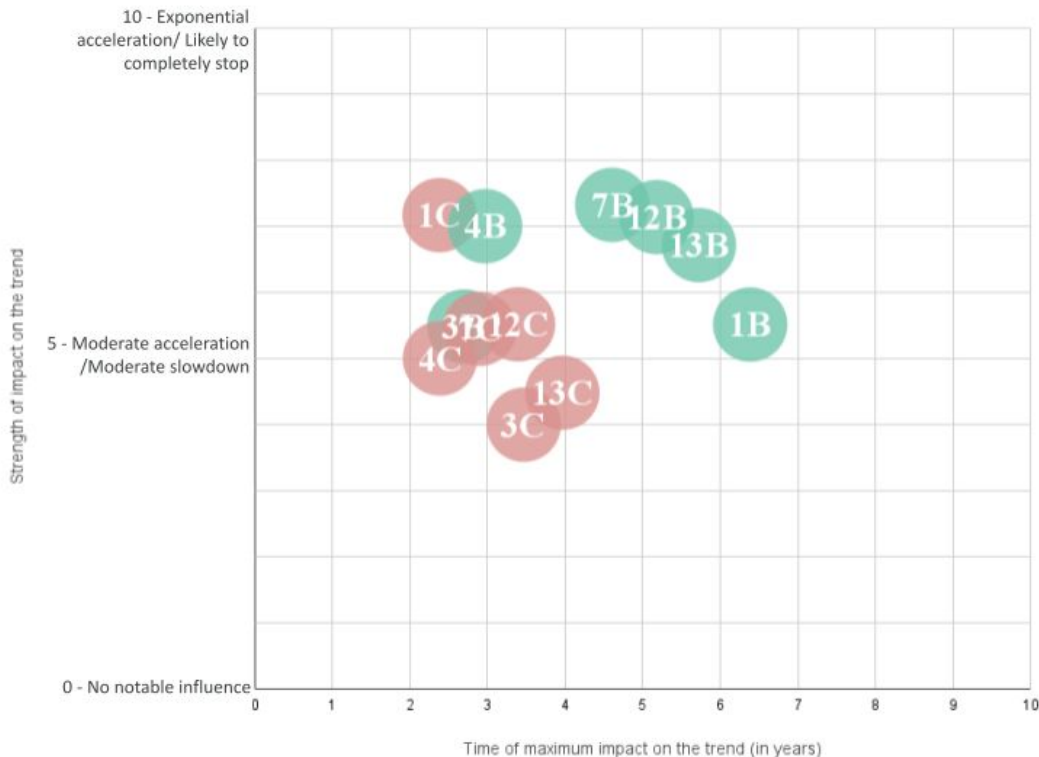# Delphi Survey results (Question 2)

Enablers and blockers for positive trends

Enablers (B)

1B. Increased number of futures studies training programs

3B. High emphasis on the work-life balance

4B. Increased awareness concerning health and nutrition

7B. Increased political pressure around the world concerning climate change mitigation

12B. Budgetary support (on the state and EU level) for sustainability oriented programmes

13B. Cost savings (and improved efficiency) thanks to AI

Blockers (C)

1C. Populism (implying that politicians focus on short-term gains)

3C. High emphasis on issues related to data protection

4C. Economic crises and rising inflation

7C. Social anxiety over energy transformation (lack of acceptance of the transformation e.g. due to fear of losing jobs in coal-industry, etc.)

12C. Anti-green movements organizing disinformation campaigns (concerning climate change)

13C. Lack of social acceptance of AI technology (concern over AIs modes of operation and data gathering)

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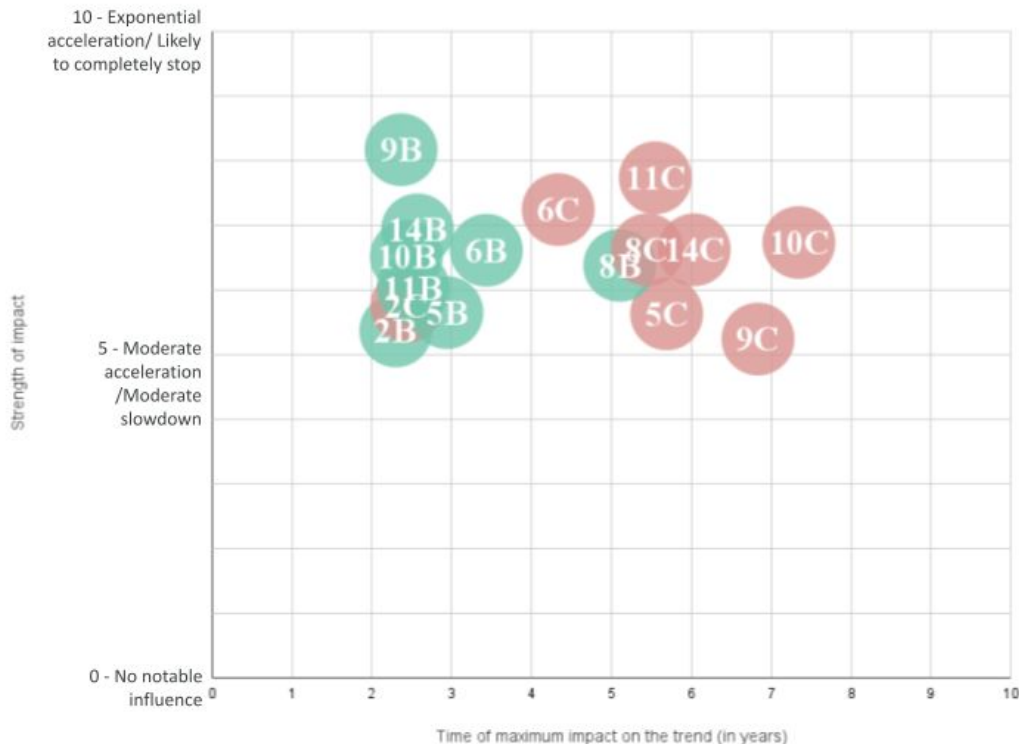POST-COVID RECOVERY

Delphi Survey results (Question 3)

Enablers and blockers for negative trends

Enablers (B)

2B. Geopolitical conflicts in the neighbourhood of the given country

5B. Limited autonomy of the research activities

6B. High interconnectivity of devices relying on a WiFi connection (including Internet of Things in companies, private homes, etc.)

8B. Transition towards circular economy in the food system (increased demand for sustainable practices and measures to address the efficient resource use, food distribution, food waste and surplus management)

9B. Targeted disinformation campaigns

10B. Lack of adequate regulations to address spreading disinformation

11B. Online education and learning (e.g. due to pandemics)

14B. Extensive time spent online (resulting in i.a. social media pressure and reduced face-to-face interactions)

Blockers (C)

2C. Financial pressure from the European Union, in reaction to the violations of the rule of law

5C. Return migration and brain gain (remigration of highly educated workforce to their countries of origin, reversing the brain drain into a significant brain gain)

6C. Efficient (technological, economic, legal) defence system against cyberattacks

8C. Climate change leading to unfavorable farming conditions in numerous regions

9C. Introduction of the Universal Basic Income scheme

10C. Highly developed civil society

11C. High levels of funding for the education sector

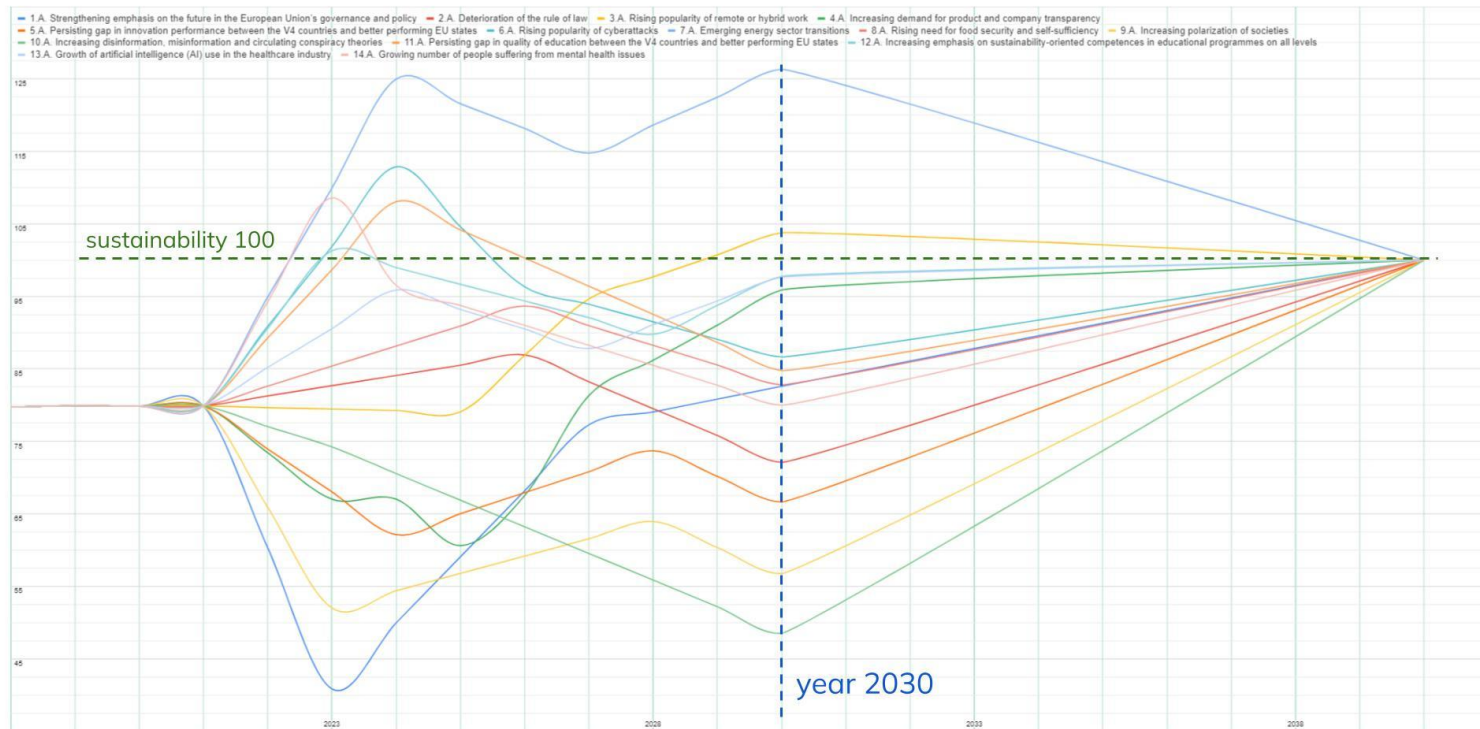14C. Rebuilding local communities (e.g. communities of neighbours, local youth, seniors, etc.)

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Delphi Survey results - imagining the pathways

The three EU 2050 scenarios

Foresight for Chemicals - DIRECTORATE-GENERAL FOR INTERNAL MARKET, INDUSTRY, ENTREPRENEURSHIP AND SMES

Somewhat satisfied

The first scenario describes a future, in which most of the EU's long term strategic plans went relatively well.

Gritting our teeth

The second scenario describes the effects of the growing crisis caused by climate change.

Watching the dawn

The third scenario focuses on the outcome of tightened cooperation between democracies around the globe.

Scenario 1 - *"Somewhat satisfied"*

Most of the EU's long term strategic plans went well. In 2050, fossil fuels are no longer used in the EU, climate change has been successfully stopped at 1.5℃ and the EU is strong and democratic. However, the world is still full of political tensions and intense competition between the superpowers. There have been no fundamental technological breakthroughs in the world, although automation is, not surprisingly, considerably higher than ever before.

Geopolitics

● China is the biggest economy in the world, competing with the USA and EU.
● World of 2050 is full of political tensions, despite that there were no major active military conflicts in the last 25 years.
● There are almost 10 bn people in the world, with almost 650 m living in Europe.
● Africa is a site of intensive political and economic competition between China, EU and USA.

Economy

● The EU cautiously continues its strategic economic partnership with China.
● The supply of critical resources is secured within the EU as a result of the Union's common resource policy, diversification of supply chains, transformation to the circular economy model as well as increased technological innovation.
● The EU's GDP growth is stable, but slow (2% on average).

Technology

● The EU's collaborative R&D ecosystem is amongst the world's strongest, only slightly behind China and the USA.
● Quantum computers are becoming mainstream in the EU, which is the main global provider of quantum computer services and solutions.
● The EU has fully transformed its governance to digital.
● Advanced Artificial Intelligence and automation are commonly applied. However, despite the fact that a significant number of jobs has been automated (mostly customer services) no General Artificial Intelligence has been developed.

Environment

● The climate change has stopped at 1.5℃ above the average global temperature before the industrial era. The results of the climate warming are severe (major heat waves at least a few times every 5 years, draughts in the Mediterranean, sea levels 0.1m higher) though not as catastrophic as prognosed in the 2020s.
● The EU's biodiversity is slowly growing. There are intense biodiversity reclaim programmes in the whole EU and in Africa.
● The EU has reached net-zero GHG emissions.

Energy

● Fossil fuels are no longer used in Europe for energy purposes.
● Energy needs are covered by the mix of hydrogen, bioenergy, solar, wind and nuclear.
● There are no economically competitive alternatives of energy production to those already developed in the 2020s.

Society

● The EU is strong and democratic.
● Almost every society of the EU is an aging one.

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Scenario 2 - *"Gritting our teeth"*

Despite the EU's best efforts, global warming has not been stopped. Annual global temperatures in 2050 are 2℃ higher than in the pre-industrial era and are still rising. The EU is fatigued by a prolonged economic crisis and dependence on external suppliers. The society feels disillusioned by decades of sacrifices, which have not led to stopping climate change. Internal political quarrels in the EU and frequent violent weather events make things even more problematic.

Geopolitics

● The EU is plagued by internal quarrels and lack of unanimity; its integrity is extremely brittle, with multiple countries on the verge of leaving the union.
● China's influence around the world is very high; most of Africa is inseparably tied with China through loans and investments.
● Climate-induced migrations put additional pressure on already struggling democracies worldwide. The EU has been one of the largest recipients of immigrants over the years.
● There's a small, but slowly increasing support for China's socio-political model; opposition parties throughout the EU progressively integrate its elements (such as strengthening the role of central government and higher digital control of the citizens) in their political agendas.

Economy

● The EU is highly dependent on external suppliers.
● Prices of imported resources are high due to the relatively low bargaining power of the EU, further weakened by dwindling cooperation between EU countries.
● The EU is fatigued by a few years of a prolonged economic crisis (economy shrinking on average by 2% annually across the EU).

Technology

● The EU's R&D ecosystem lags far behind China and the USA, similarly to the levels of automation in the industry (even though automation in the EU is quite widespread).
● The EU is highly dependent on external suppliers when it comes to advanced microelectronics and digital infrastructure.
● Digital administration is working relatively well, but its capabilities are smaller than they could be due to fears related to external infrastructure suppliers.

Environment

● Failure to halt global warming; in 2050, average annual global temperatures have risen to almost 2℃ compared to pre-industrial era; too slow efforts to curb climate, failure of energy transition, lack of global cooperation in curbing climate change.
● Maximum temperatures in the EU temperate countries (Ireland, Poland, Germany, northern France, Benelux) exceed 45℃, straining infrastructure unprepared for such extremes.
● Formerly agricultural areas are becoming steppe-like.
Summer droughts lasting up to 3 months are a permanent feature of the northern EU countries. Occurrence of violent weather events has increased harshly.

Energy

● The EU has partially succeeded in transformation to clean energy. However, energy prices are very high, seriously limiting economic growth and causing financial difficulties to many Europeans.
● Problems with energy supply lead to feverish investments in search for new, innovative solutions.

Society

● The EU (states and the EC) is trying to preserve the old values of the democratic rule of law, to remain democratic and stop disintegration. Despite the unfavorable circumstances it succeeds so far, thanks to, amongst others, enormous efforts of both civil society and some politicians.
● Growing support for auto-technocrats advocating the creation of a digital dictatorship in the Chinese model.
● Population pyramid of the EU became wide at the younger ages, mostly due to the large influx of immigrants over the years.

Scenario 3 - *"Watching the dawn"*

"Dawn of techno-democracies" is the term used to describe the increasingly widespread use of AGI for supporting democratic governance in 2050. A so-called "Global NATO" encompasses democracies around the world, enjoying the benefits of unprecedently close economic cooperation as well as being largely independent from external suppliers. Global warming is in reversal and nuclear energy dominates the grid, with fusion energy seemingly just around the corner. Societal trust in AGI-supported decision making is surprisingly high and continuously enforced by its tangible benefits.

Geopolitics

● Democracies around the globe have tightened cooperation.

After an amendment of Article 10 of the North Atlantic Treaty many new countries have joined the pact, leading to a new, "Global NATO", facilitating both military and unprecedently close economic cooperation. New members include Sweden, Finland, Australia, India, Brazil, Japan, New Zealand, South Korea and South Africa.

● Non-democracies (including China as a leader) outside "Global NATO" struggle with civil unrest and fragile economies, further weakened by strong trade restrictions imposed by the pact's members.

"Dawn of techno-democracies" is the term used to describe the increasingly widespread use of AI for supporting democratic governance.

● SVCs are totally transparent, thanks to digitalisation and new regulations.

Economy

● The EU is mostly independent from suppliers outside the "Global NATO". Most resources are available within the "Global NATO" itself, due to a long line of innovations and a consistent policy of limiting dependency on external suppliers.

● GDPs of EU countries are at an all-time high, and economic growth in most EU countries exceeds 5%.

● Unprecedented levels of automation have allowed most of the EU's countries to officially shorten the working week to 4 days, but in practice many people enjoy just 3-day workweeks or shortened working hours throughout the 4 days.

Technology

● Extensive employment of AGI in science and industry leads to an avalanche of breakthroughs and innovations amongst "Global NATO" members.

● Even though the topic remains somewhat controversial, some experts assess that the level of advancement of modern Artificial Intelligence systems running on quantum computers and utilized in both public and private sectors is so high that it can be regarded as AGI (Artificial General Intelligence).

● Most aspects of the EU administration and governance are at the very least strongly supported by AI. All public services are digital. Democratic processes across the EU are also supported by AI, which analyses the needs of the society and suggests optimal courses of action and legislation to the human decision makers, by running complex simulations possible thanks to quantum computing. Countries around the world using such systems are called "Techno-democracies".

Environment

● Global warming has been stopped below 1.5℃ and shows signs of reversal.

● All degraded ecosystems have been successfully restored.

● Water, land and soil cleanliness has returned to acceptable levels across the EU and is gradually being improved.

Energy

● Clean and safe nuclear energy dominates the grid, fusion energy seems to be around the corner.

● Fuel cells dominate in the transportation sector.

● The EU's energy balance is managed by AI

● The chemical industry has been largely electrified.

Society

● Russian influence in Europe considerably fades and there has been a significant EU enlargement (new members include Ukraine, Albania, Bosnia and Herzegovina, North Macedonia and Montenegro).

● There is a very high social trust in AGI's suggestions within "Global NATO" countries.

● Huge AGI-enabled advancements in medicine result in life expectancy nearing 100 in some EU countries.

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Imagining V4 futures against EU 2050 scenarios

Group 1, 2
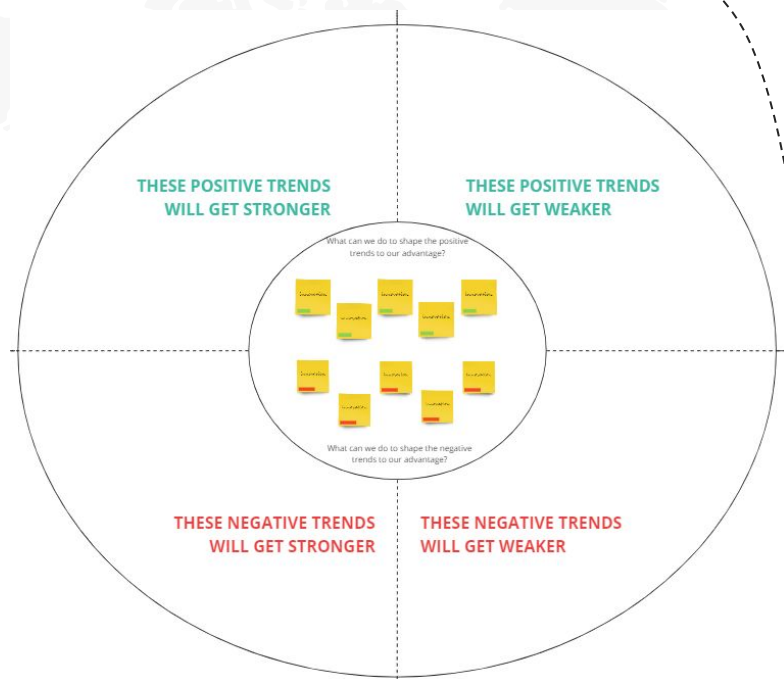Scenario 1

Group 3, 4
Scenario 2

Group 5, 6
Scenario 3

POSITIVE TRENDS

1A. Strengthening emphasis on the future in the European Union's governance and policy

3A. Rising popularity of remote or hybrid work

4A. Increasing demand for product and company transparency

7A. Emerging energy sector transitions

12A. Increasing emphasis on sustainability-oriented competences in educational programmes on all levels

13A. Growth of artificial intelligence (AI) use in the healthcare industry

NEGATIVE TRENDS

2A. Deterioration of the rule of law

5A. Persisting gap in innovation performance between the V4 countries and better performing EU states

9A. Increasing polarization of societies

10A. Increasing disinformation, misinformation and circulating conspiracy theories

6A. Rising popularity of cyberattacks

8A. Rising need for food security and self sufficiency

11A. Persisting gap in quality of education between the V4 countries and better performing EU states

14A. Growing number of people suffering from mental health issues

THESE POSITIVE TRENDS WILL GET STRONGER

THESE POSITIVE TRENDS WILL GET WEAKER

What can we do to shape the positive trends to our advantage?

What can we do to shape the negative trends to our advantage?

THESE NEGATIVE TRENDS WILL GET STRONGER

THESE NEGATIVE TRENDS WILL GET WEAKER

Group exercise in Miro collaboration platform

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