

DELPHI STUDY REPORT

V4 2030 Sustainable Innovation Pathways
towards post-COVID recovery

V4 2030

POST-COVID RECOVERY

Delphi Study Report "V4 2030 Sustainable Innovation Pathways towards post-COVID recovery"

Study on the development of key trends within Geopolitics,
Economy, Education, Environment, Society, Technology and Health

4CF The Futures Literacy Company
May 2022

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Table of Contents

Executive summary	3
Authorship	4
Lead authors	4
Lead contributors	4
Delphi experts	4
Introduction	5
The purpose of trend analysis in the Visegrad region	5
The objective and design of the Delphi study	5
Purpose and methodology	9
Delphi method: the rationale	9
Methodology	10
Composition of the Delphi expert panel	10
How to read the Delphi study results	12
Overall results	14
The impact of trends on sustainable development	14
The impact of enablers and blockers on trends	15
Additional enablers and blockers	17
Geopolitics – results	19
Economy - results	27
Technology - results	34
Environment – results	41
Society – results	50
Education – results	59
Health - results	67
Sustainable innovation pathways towards post-COVID recovery	74
Map of Innovation Pathways	74
Analysis of the Map of Innovation pathways	76
Top 5 most important trends	77
About the project	80
References	81
List of graphs	82
List of tables	82

Executive summary

This report summarizes the research undertaken at a regional level in an effort to collectively envision an array of potential emergent futures and to discover opportunities that can guide the post-COVID transformation toward desirable sustainable futures, and away from undesirable, unsustainable development trajectories.

The main aim of the study was to assess enablers and blockers of trends, which can influence future sustainable development within the Visegrad region consisting of Czechia, Hungary, Poland and Slovakia.

In total, fourteen trends were analyzed by the panel of international experts in the online Delphi study, which took place in April 2022.

The results are organized under the seven thematic categories: Geopolitics, Economy, Technology, Environment, Society, Education and Health.

It is understood that the future post-COVID is filled with challenges when it comes to sustainability performance. Therefore, most of the identified trends on their own - even the positive ones - are unlikely to provide an impact big enough to determine the path of unfolding transformations to sustainability of the V4 region. However, it is possible to identify the trends that require special attention from policy makers due to their highest overall influence on sustainability prospects of the V4 region.

The top 5 most important trends were found to be:

- Increasing disinformation and circulating conspiracy theories,
- Increasing polarization of societies,
- Persisting gap in quality of education between the V4 countries and better performing EU states,
- Deterioration of the rule of law,
- Emerging energy sector transitions.

According to experts' knowledge and assessment, the impact of trends with negative influence on the

V4 group sustainability is much stronger than the one of positive ones. Secondly, experts opined that blockers with positive impact on trends have much higher influence on sustainability than blockers with negative impact.

This leads to a conclusion, that the most effective strategy for reaching the desired level of sustainability in the V4 region should focus on the policies built around the blockers, which neutralize or slow down negative trends, rather than around those blockers that weaken positive trends.

Some of the most efficient policy pathways indicated in the course of the Delphi study, that would effectively address the challenging trends in an effort to reach the desired level of sustainability, would be to:

- Develop civil society capacities,
- Revitalise education - both by higher financing and innovations,
- Monitor the infosphere to limit the spreading of conspiracy theories and targeted disinformation campaigns, and to improve access to varied sources of information,
- Introduce effective socio-economic and policy innovations - Universal Basic Income as an example to test,
- Secure peace and democracy in the neighbouring countries,
- Increase the dependency of the availability of the EU funding on the beneficiary country compliance with the rule of law,
- Increase the political pressure around the world concerning climate change mitigation and adaptation,
- Find ways to effectively deal with the social anxiety over the energy market transformation i.e. through local community building strategies and development of key skills (such as: entrepreneurial skills, critical thinking, systems thinking, future-orientation).

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The development of the study was supported by the research team of the V4 2030 project and 41 external experts who participated in the real-time Delphi survey, whom we would like to thank for participation in our research. Experts who have expressed a wish to be recognised as contributors are mentioned below.

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Introduction

The purpose of trend analysis in the Visegrad region

There is a growing body of research toward understanding how transformations toward sustainability happen and what can be done to guide and accelerate them (Köhler et al. 2019). In the V4 countries¹ and the wider Central and Eastern Europe region social and sustainable innovations are gaining more saliency, too (Ashoka 2019). However, no matter how innovative or effective humanity's responses, wild-card events, such as the global pandemic, contribute to profound transformation of a socio-economic environment exposing us to new and unfamiliar circumstances of existence. What had been considered plausible by Futures Studies' researchers (MliR 2019) we have been experiencing for real.

The COVID-19 pandemic has helped us reframe our take on the functioning of the world. It has made us realize that health and education systems, industries, sectors and value-chains of the future will not be like the ones of today. On the other hand, it has also revealed plenty of disruptive potential, and it has created conditions for radical, transformative and sustainable change across the world (Patel 2021, UNDP 2020). But, identifying possible ways the technological and social trends could combine to shape our future post-COVID-19 is still a matter of considerable uncertainty. Therefore, we have undertaken new research at a regional level in an effort to collectively envision an array of potential emergent futures and to discover opportunities that can guide the post-COVID transformation of the Visegrad (V4) region toward desirable sustainable futures, and away from undesirable, unsustainable development trajectories.

The objective and design of the Delphi study

The present Delphi study was designed with the primary objective to assess enablers and blockers of certain trends which can influence the sustainable development within the Visegrad Group in the future. The detailed overview of trends is given in the report from a preceding desk-research².

Stakeholders representing academia, business, NGOs, policy and wider society (university students) from all V4 countries were engaged to filter the results of the trend analysis phase by assessing the most impactful enablers and blockages for the sustainable development of the V4 region in the 3 time frames (short, medium and long term). A broader, outsider's view on the development perspectives of the region was assured by engaging 6 international experts who represented the field of Futures Studies.

¹ V4 is a political and cultural alliance of 4 countries: The Czech Republic, Hungary, Poland and Slovakia.

² <https://4cf.pl/overview-of-trends-shaping-the-future-of-the-visegrad-region/>

In total, fourteen trends were analyzed in the Delphi study. They refer to changes in the following domains of the macro environment of the V4 region: Geopolitics, Economy, Technology, Environment, Society, Education and Health.

In addition to that, the trends are classified into two groups: positive trends (Table 1) and negative trends (Table 2). The division is based upon their impact on sustainable development of the V4 region.






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 Trend 4: Increasing demand for product and company transparency	E High emphasis on the work-life balance B High emphasis on issues related to data protection 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

Table 1. Trends positively impacting sustainable development of the V4 region







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 European Union, 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 Trend 6: Rising popularity of cyberattacks	E Limited autonomy of the research activities B Return migration and brain gain 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 B Climate change leading to unfavourable farming conditions in numerous regions
Society 	Trend 9: Increasing polarization of societies Trend 10: Increasing disinformation, misinformation and circulating conspiracy theories	E Targeted disinformation campaigns B Introduction of the Universal Basic Income scheme 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

Table 2. Trends negatively impacting sustainable development of the V4 region

Overall, 100 experts selected by designers of the study (4CF, EUBA, UP, CUB) were invited to participate in the Delphi survey. More than 35% invitees, corresponding to 41 experts engaged in the study by answering the questionnaire and providing comments to support the rationale behind their responses. The study was conducted as a real-time Delphi survey on the 4CF HalnyX platform³. This allowed respondents to monitor statistics, read and vote for other experts' comments and revise their own answers providing more options for interaction and resulting in more reflective judgements.

This report summarizes the statistical results, provides their general commentary and illustrates the key findings in reference to sustainable innovation pathways towards post-COVID recovery of the V4 region.

³ <https://4cf.pl/en/halnyx/>

Purpose and methodology

Delphi method: the rationale

The Delphi method is a structured group interaction process, in which individuals are requested to give numerical judgments about future developments in science, technology, society, policy etc.

Main objectives of the surveys of the Delphi method are to obtain consensual expert opinions, predict uncertain facts, generate ideas and provide additional information about developments under study. Delphi also serves a communication and awareness raising function among the participants. This function is supported by the anonymity of the process, which ensures that experts can express their opinion (or evaluate the opinions of others) without perceived social pressure from survey participants.

The results of the Delphi method can be used to provide guidelines for policy, to help determine priorities, to advocate for new research or business initiatives or to communicate, raise awareness and inform the general public.

Methodology

The present Delphi study was conducted on the 4CF HalnyX online platform. A total of 111 selected experts were invited to join the online Delphi study. 41 experts (37%) took active part in the survey which lasted from 8 April to 30 April 2022.

4CF HalnyX Delphi platform allowed each participant to see the aggregated overall responses of the entire panel and to read the comments made by other experts, anonymously and in a real-time fashion. Participants were encouraged to revisit their answers during the survey for re-evaluation based on the shifting consensus and comments from their peers. As full anonymity was provided, the process was not influenced by the position or dominance of individual experts. The continuous monitoring results and exchange of viewpoints through free-text commenting created a dynamic process during which expert opinions could converge towards a consensus on a given topic.

Measurement scale	Consensus measure	Group stability measure
6-and 10-point scale	Arithmetic mean	Standard deviation

Table 3. Quality indicators of the Delphi study

Two measurement scales were used throughout the survey. 6-point scale for the measurement of trend impact on sustainability and 10-point scale for the measurement of impact of the enabler or blocker on the trend. The consensus measure was calculated as the arithmetic mean of all the responses to a specific question. Group stability (i.e. the strength of the consensus) was measured as the standard deviation, that is the dispersion of a dataset relative to its mean (Tab. 3). The research team had not set

the consensus threshold for the questions. However, each trend's fiche provides specific commentary to the questions where the distribution of answers varied the most (that is where standard deviation reached 2 or above).

Composition of the Delphi expert panel

The results of a Delphi survey depend to a large extent on the appropriate selection of experts. In this study, knowledge was provided by independent experts representing different sectors, disciplines and countries. Comparing their opinions brings out a unique and in-depth view of the future of the Visegrad countries.

The group of experts was diversified by country of origin. Each Visegrad country was represented in the study (85% of experts), and a wider perspective was provided by a group of international foresight experts from Finland, Germany, Greece, Romania, Slovenia and the United States (15%). From the Visegrad group, the most significant group of respondents came from Poland, followed by the Czech Republic, Slovakia and Hungary (Fig. 1).

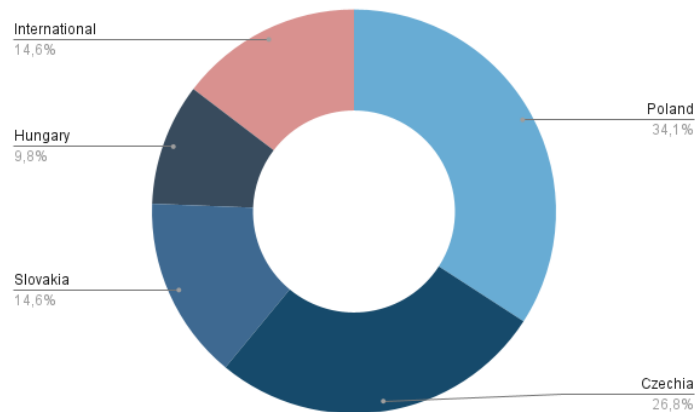


Figure 1. Experts by nationality

A varied range of stakeholders, including specialists, the wider public and foresight experts were invited to the discussion (Fig. 2). This selection made it possible to perceive the diverse perspectives in which the future of the Visegrad countries is seen. The main target groups of the study were:

- Academic and research networks especially representatives of Faculties of Arts, Science and Futures Studies professionals,
- Non-profit organizations which focus on sustainability, Industry 4.0 and just transitions topics,
- University students, representatives of students associations and/or foreign Erasmus+ mobility scholarships holders of V4 nationality,
- Business and/ or industry associations especially the representatives of small and medium sized enterprises,
- Representatives of public administration dealing with the issues of regional development, smart specialization and EU funding.

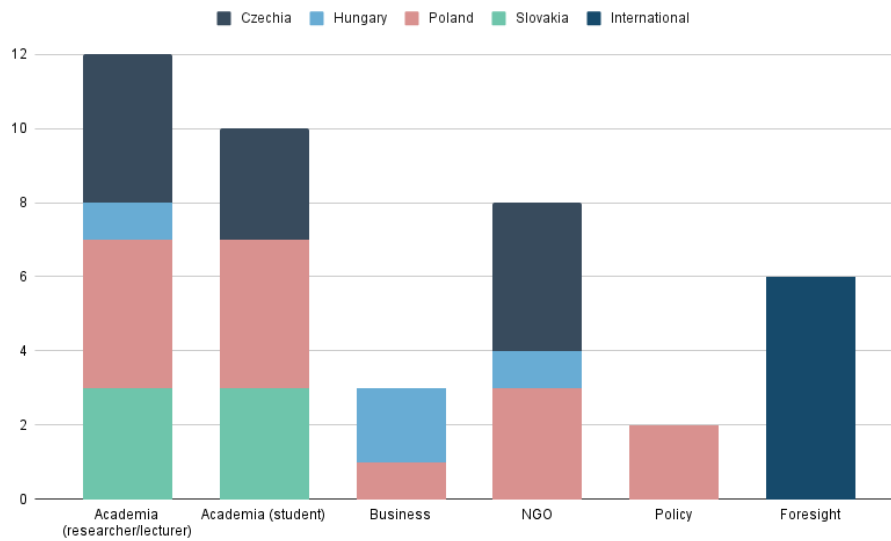


Figure 2. Number of experts by sector and country represented

The expert panel of the Delphi study was mainly composed of: university representatives i.e. researcher/lecturer (29%) and students (24%), non-profit organizations, and international foresight experts who accounted for 20% and 15% of the responses respectively. The least represented groups in the survey were: business (7%) and policy (5%). In total, representatives of 32 institutions completed the questionnaire (Fig. 3).



Figure 3. Examples of organizations represented in the Delphi panel

- supported by
- Visegrad Fund
-
-

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How to read the Delphi study results

The aim of the study was to assess enablers and blockers of trends which can influence future sustainable development within the Visegrad Group (consisting of Czechia, Hungary, Poland and Slovakia).

Delphi results are organized under the seven thematic categories (Geopolitics, Economy, Technology, Environment, Society, Education, Health). The study covered 14 trends that could have major influence (positive or negative) on sustainable development within the Visegrad Group, that were selected via desk research. There were 2 trends for each of the thematic categories and there were 3 questions concerning each trend.

In the first question, experts were asked to assess the influence of a given trend on sustainable development of the V4 countries (which was predefined by desk research results as either negative or positive - and explained in the survey questions). In the comment section experts were asked to add change factors, i.e. issues that in their opinion could influence the given trend. Numerical assessments were obligatory, while comments were optional.

The second and third questions concerned “enablers” and “blockers”, i.e. issues or phenomena that could either accelerate (enabler) or slow down (blocker) the given trend. Experts were asked to assess their impact on a given trend and the timeframe within which this impact would be the strongest. In the comment section experts were able to provide rationale behind their assessment. Numerical assessments were obligatory, while comments were optional.

For each trend, the so-called “trend fiche” provides an overview of the quantitative survey responses, which are presented in summary graphs, supplemented with the text fields that summarize the perspective of the 4CF research team and interpretations of findings. The trend fiche presents the Delphi responses via two graphs:

- 1) First graph illustrates the aggregated numerical assessment of the impact of the trend on sustainable development of the Visegrad region on a 0 - 6 scale (Fig. 4)
- 2) Second graph illustrates the following aggregated numerical assessments (Fig. 5):
 - Impact of the enabler on the trend (0 - 10 scale)
 - Time of the maximum impact of the enabler on the trend in years (0 - 10 scale)
 - Impact of the blocker on the trend (0 - 10 scale)
 - Time of the maximum impact of the blocker on the trend in years (0 - 10 scale)

In addition to that, selected free-text comments from the respondents are quoted in the bottom section of the trend fiche. Given the large number of comments received in this Delphi study (114 in total), the quotes were chosen based on the number of votes they received from respondents and with the intention to highlight opposing viewpoints or underline important information provided by the experts, which helped to explain the overall result.

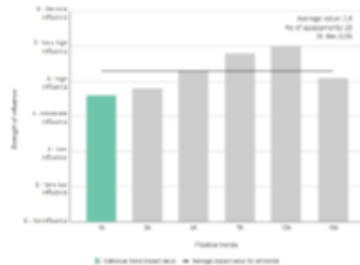
Description of trend results

The graph shows the strength of the impact of the trend on sustainable development. Trends with a positive impact are marked in green, trends with a negative impact are marked as red.

Trend 1 performance results fiche:

Trend 1: Strengthening emphasis on the future in the European Union's governance and policy

Trend definition: Strengthening the role of foresight as a policy-making tool by launching the strategic foresight agenda and the Ministries of the Future network to inform the Commission's multi-annual programming and strengthen cooperation among Member States on forward-looking issues relevant to open's future.



Our perspective on the results

According to the experts, strengthening emphasis on the future and relying on foresight in European Union's governance and policy will have the lowest positive impact on sustainable development of the V4 countries. However, this trend is not neutral - experts expect it to have moderate to high influence on sustainable development (average influence value: 3.6). Change of experts' opinions was relatively low, with standard deviation of 0.66.

Experts suggested that change factors which could influence this trend include e.g. rising awareness and understanding of futures studies and foresight. However, they emphasized the need to engage foresight advisors in policymaking, so they could help improve understanding of various long-term policies and their potential outcomes by applying quantitative and qualitative foresight tools. Furthermore,

respondents highlighted the importance of explaining foresight tools to the policymakers and wider population - foresight tools and activities should not be perceived as forecasts, but rather means of exploring alternative futures. Finally, experts suggested that forward-looking assessments and projects within the EU could in the future be required to include the aspect of green transformation.

On the other hand, respondents pointed out that a change factor which could hinder this trend stems mainly from economic issues. Thus far, sustainability has been largely perceived as a luxury, rather than necessity, within the Visegrad countries. An economic crisis could slow down sustainable development in these states, as they would possibly opt for the cheapest solutions that would be the most effective in the short term. In such conditions, the V4 countries could rebel against the European Union's policies concerning sustainable transformation. Furthermore, experts noted that decay of democracy and rule of law within the Visegrad states would likely limit application of foresight, favouring instead only those visions of the future which support the stance of the ruling parties. Moreover, populist governments are more likely to base their policymaking on polls rather than exploring scientific methods of dealing with the future.

Quotes from survey

A change factor that could accelerate this trend is...



"To strengthen this trend, a wider population of policymakers and elected officials need to become aware of how prominently their imagined futures are influencing their choices and actions. Without this common-level understanding of how imagined futures are already present in their works, they will gain little benefit from using any specific set of steps or mechanistic tools to produce foresight. If foresight is done in an instrumental way, it will have limited effects."

"The 'Ministries of the Future' need training in foresight and completed futurist advisors, to understand how quantitative and qualitative futures research tools could help improve understanding of alternative and potential long-term outcomes of various policies."

A change factor that could slow down this trend is...



"Economic crisis in V4, the majority of people see sustainable development and related environmental policies as kind of luxurious stuff. V4 can easily become a group of rebellious countries within the EU regarding this topic."

"The more authoritarian and nationalistic governments within the EU are going to become, the less strategic foresight will be understood and needed - unless it supports the agenda of those governments."

Overview of selected expert comments relating to factors accelerating or slowing down the trend.

Summary and interpretation of the trend results by the authors of the report.

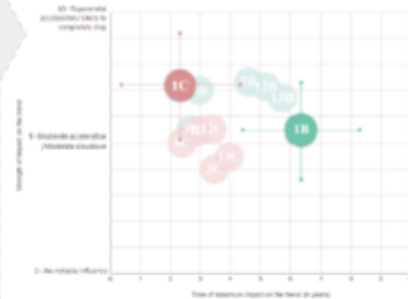
Figure 4. How to read the Delphi results: a trend fiche (graph 1)

Description of results for trend enabler and blocker

The graph shows the strength and time of the impact on trend for the relevant enabler (green bubble) and blocker (red bubble). In addition, the value of the standard deviation for each enabler and blocker is illustrated with two lines intersecting at right angles. The longer the line is, the higher the standard deviation.

Performance results for enabler and blocker of Trend 1

- Green bubble:** Increased number of futures studies training programs
- Red bubble:** Population (implying that politicians focus on short-term gains)



Our perspective on the results

Experts expect the trend blocker - population - to have a strong impact on the trend of strengthening emphasis on the future in the European Union's governance and policy. They assumed that this blocker could lead to a significant slowdown of the trend, in a short period (the expected time within which the blocker would achieve maximum influence on the trend is c. 2 years). The blocker assumes that population would lead to politicians focusing on short-term gains and guiding their decisions with polls, rather than scientific research methods. However, respondents noted that even if politicians plan for the short-term, they still need to apply future planning. The short-term outcomes of their policies would be informed by their ideas regarding the future. Populists are more likely to develop grand visions of the future (often guided by nationalist interests). Thus, even if population would influence the way in which foresight is used, some experts argued that it is not necessarily mutually exclusive with emphasis on the future.

Enabler of the trend, i.e. an increased number of futures studies training programs, received lower assessments in terms of strength of its influence on the trend. Experts estimated that it would moderately accelerate the trend, while the time needed to influence the trend at maximum is significantly higher than in the case of the blocker (i. 6 years). This implies that the blocker is a more robust factor which could shape the trend of futures-orientation in the European Union's governance and policy. Regarding the enabler, experts noted that additional fundamental research and higher education programs in futures studies would strengthen the field by developing the scientific aspect of futures studies, as well as educating a higher number of foresight professionals. However, experts emphasized that establishment and completion of futures studies programs would take many years. Moreover, they assumed that the futures studies cannot be perceived as a science about the shape of the future, but rather a tool of thinking about the future.

Quotes from survey

I think that this enabler will not significantly influence the trend, because...



"Futures studies as a field is still underdeveloped concerning its theoretical contributions, ways of knowing, and focus of inquiry. Too often, the students are recruited with promises they can be 'experts about the future' while the main practice, ought would be an becoming knowledgeable about how people and orgs engage future'. If FS doesn't mobilize, the outcomes concerning governance and policy-making could actually be dangerous. Moreover, there are very few futures studies departments and zero futures studies faculties in European universities. It would take at least a few years to launch several new programs and a couple rounds of student graduates from those programs before policy and governance processes would benefit from people with futures studies education."

I think that this blocker will not significantly influence the trend, because...



"Even a short-term future is a future. Populists do often attempt to produce short-term outcomes, yet these are informed by their normative ideas regarding the future. Historically, populist-oriented dictators have mobilized their nation states based on grand visions of the future. Therefore, you could have an EU strengthen its emphasis on the future in governance, but the future being emphasized is populist in nature, and likely to inspire highly unethical actions."

Overview of selected expert comments relating to influence of enabler or blocker on trend.

Summary and interpretation of the results concerning the impact of the enabler and blocker on the trend by the authors of the report.

Figure 5. How to read the Delphi results: a trend fiche (graph 2)

Overall results

The impact of trends on sustainable development

Overall, results indicate that respondents believed negative trends (Fig. 7) will have a higher influence on the development of the Visegrad region than the positive ones (Fig. 6). Aggregated results demonstrate that experts assessed the impact of negative trends at a high- and very high- level (4,6 on a 6- point scale). Whereas the influence of positive trends was rated as a moderate- and high- (3,6 out of 6 point scale). Group consensus was relatively high with standard deviation amounting to 0,9 on average for all the assessed trends.

- 1.A. Strengthening emphasis on the future in the European Union's governance and policy
- 3.A. Rising popularity of remote or hybrid work
- 4.A. Increasing demand for product and company transparency
- 7.A. Emerging energy sector transitions
- 12.A. Increasing emphasis on sustainability-oriented competencies in educational programmes on all levels
- 13.A. Growth of artificial intelligence (AI) use in the healthcare industry

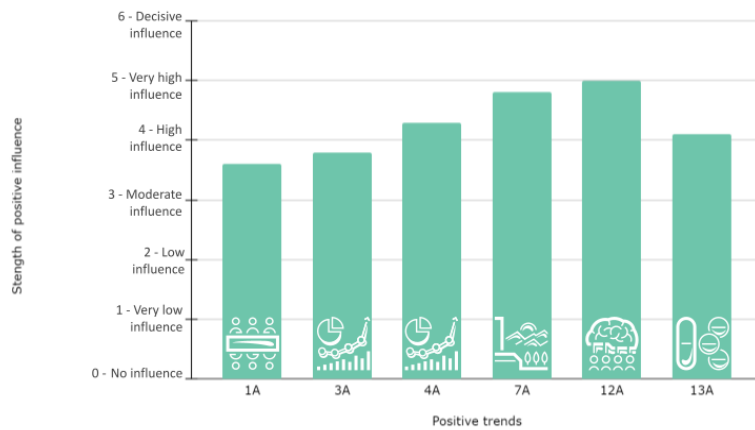


Figure 6. The impact of positive trends on sustainability: overall results

Positive trends, which were rated the highest were those related to: the increasing role of sustainability-oriented competencies in educational programs at all levels (Education), the emerging energy sector transitions (Environment) and the growth of AI use in the healthcare industry (Health). On the other hand, panellists did not believe that strengthening forward-looking approaches and foresight in policy-making at the EU level (Geopolitics) will have a pivotal role in orienting the V4 region towards sustainable development. Arguments supporting the overall assessment of this trend referred to short-termism and populist tactics of decision-makers in the region. In addition to the very high level of consensus regarding the highest ranked trend (No. 12), the experts reached a highly comparable level of agreement on the role of the increasing demand for product and company transparency. In both cases the value of standard deviation was approx. 0,6.

- 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.

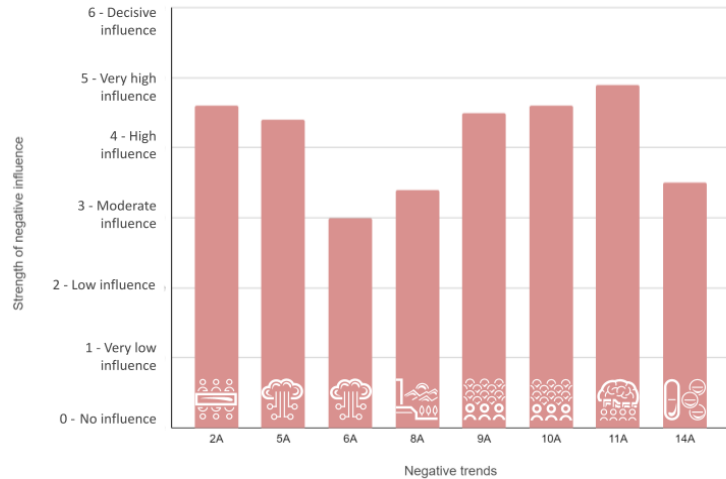


Figure 7. The impact of negative trends on sustainability: overall results

Negative trends, which were rated above 4 (high influence) and therefore assessed as the key blockers of sustainable development of the V4 region were the following: the persisting gap in quality of education compared to better performing EU Member States (Education); deterioration of the judicial system (Geopolitics); increasing disinformation, misinformation and circulating conspiracy theories, and polarization of societies (Society). Finally, the persisting gap in innovation performance between the V4 group and better performing EU states (Technology) was rated equally high in its negative influence on sustainable development. On the other hand, respondents opined that rising popularity of cyberattacks (Technology) will have rather moderate negative influence. The reasoning behind this assessment included the growing societal awareness of the need for adequate cybersecurity measures in the era of hyperconnectivity. When it comes to the level of consensus, the experts were relatively less agreeable when assessing the impact of negative trends with the value of standard deviation exceeding 1,2 in the case of three trends (No. 6, 8 and 14).

The impact of enablers and blockers on trends

The overall results of the enablers and blockers of the positive trends (Fig. 8) demonstrate that experts believed that blockers, that is, factors responsible for the slowing down of these trends would occur within the short- timeframe of 2-4 years. Whereas the time of occurrence of the phenomena that would be instrumental in strengthening the positive trends was assessed to take place in a medium timeframe of 5-7 years.

On average the impact of enablers on trends that positively impact sustainable development was rated higher than the impact of blockers. Two factors that are believed to have the highest impact and envisaged to occur at the earliest time are: populism (blocker of the trend 1: strengthening the emphasis on the future in the EU governance and policy) and awareness of health and nutrition (enabler of trend 4: increasing demand for product and company transparency).

The level of consensus regarding the average assessment of the impact of enablers of positive trends was slightly higher (st. dev. 1,7) than in case of blockers (st. dev. 1,9). Whereas, the standard deviation

regarding the assessment of the average time of occurrence of both enablers and blockers of positive trends was at the same level (1,9).

- 1B. Increased number of futures studies training programs
- 1C. Populism (implying that politicians focus on short-term gains)
- 3B. High emphasis on the work-life balance
- 3C. High emphasis on issues related to data protection
- 4B. Increased awareness concerning health and nutrition
- 4C. Economic crises and rising inflation
- 7B. Increased political pressure around the world concerning climate change mitigation
- 7C. Social anxiety over energy transformation
- 12B. Budgetary support (on the state and EU level) for sustainability oriented programmes
- 12C. Anti-green movements organizing disinformation campaigns (concerning climate change)
- 13B. Cost savings (and improved efficiency) thanks to AI
- 13C. Lack of social acceptance of AI techn.

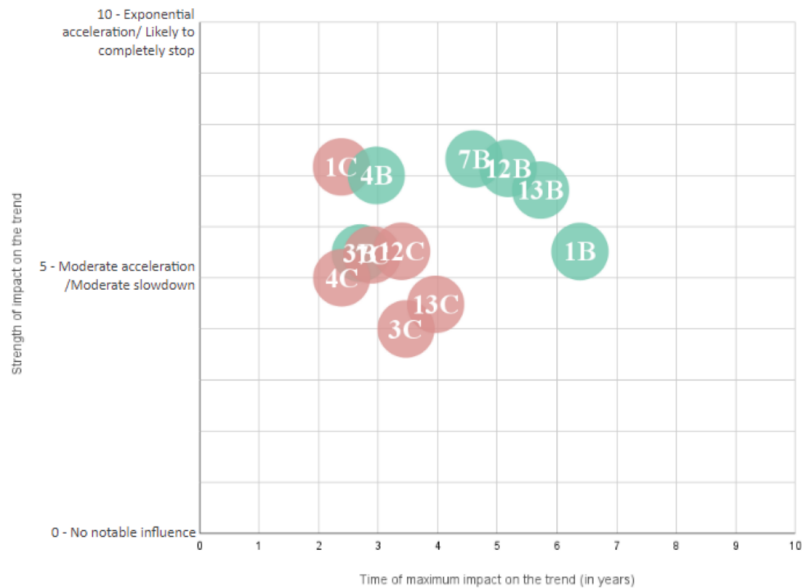


Figure 8. The impact of enablers and blockers on positive trends: overall results

Similarly, when assessing blockers of the trends that negatively impact sustainable development of the V4 region (Fig. 9), experts believed that factors responsible for the slowing down of these trends would occur within the longer- timeframe of 4-8 years. Whereas the time of occurrence of the enablers, that is the phenomena that would be instrumental in the acceleration of the negative trends, was assessed to take place in a short time frame of 2-4 years.

There were two exceptions to this assessment pattern. The financial pressure from the European Union, in reaction to the violations of the rule of law (blocker of negative trend No. 2: deterioration of the rule of law) was anticipated to reach the highest influence on the trend already in two years (ahead of the remaining blockers). Transition towards a circular economy in the food system (enabler of negative trend No. 8: rising need for food security and self sufficiency) was believed to reach its peak of influence no sooner than in 5 years (behind other enablers that strengthen negative trends).

On average the impact of enablers and blockers on trends slowing down sustainability was rated at comparable levels. Of all factors that deepen negative trends, targeted disinformation campaigns (enabler of the negative trend No. 9: increasing polarization of societies) is believed to have the highest negative influence. Whereas, of all factors that counteract negative trends, high levels of funding for the education sector (blocker of the negative trend No. 11: persisting gap in quality of education between the V4 countries and better performing EU states) is opined to have the biggest positive influence.

The level of consensus regarding the average assessment of the impact of enablers that strengthen negative trends was only slightly higher (st. dev. 1,7) than in case of blockers’ assessment (st. dev. 1,8). On the other hand, the experts were more agreeable when assessing the average time of occurrence of blockers of negative trends (st. dev. 1,8) than enablers (st. dev. 2,0).

- 2B. Geopolitical conflicts in the neighbourhood of the given country
- 2C. Financial pressure from the European Union, in reaction to the violations of the rule of law
- 5B. Limited autonomy of the research activities
- 5C. Return migration and brain gain
- 6B. High interconnectivity of devices relying on a WiFi connection
- 6C. Efficient (technological, economic, legal) defence system against cyberattacks
- 8B. Transition towards circular economy in the food system
- 8C. Climate change leading to unfavourable farming conditions in numerous regions
- 9B. Targeted disinformation campaigns
- 9C. Introduction of the Universal Basic Income scheme
- 10B. Lack of adequate regulations to address spreading disinformation
- 10C. Highly developed civil society
- 11B. Online education and learning (e.g. due to pandemics)
- 11C. High levels of funding for the education sector
- 14B. Extensive time spent online
- 14C. Rebuilding local communities

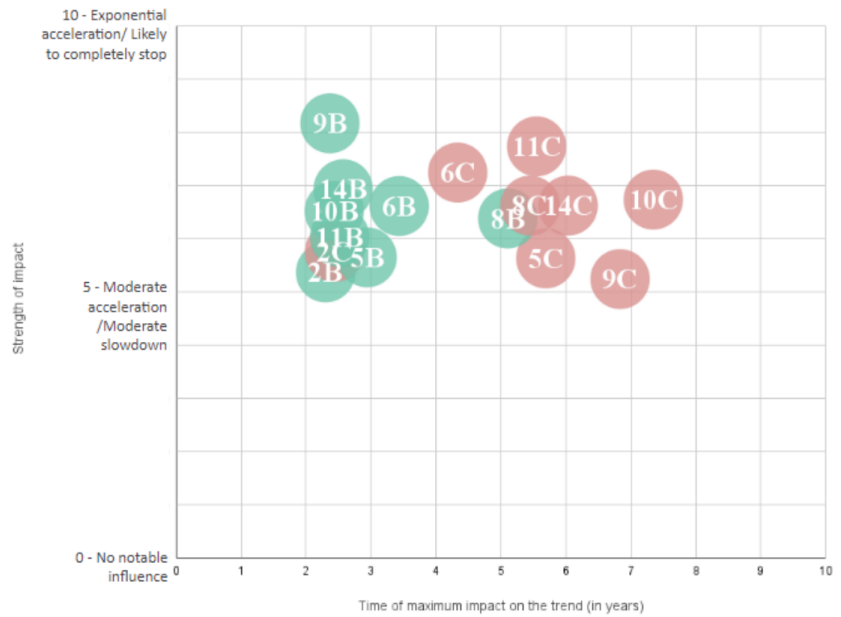


Figure 9. The impact of enablers and blockers on negative trends: overall results

Additional enablers and blockers

In addition to the list of enablers and blockers proposed by the research team and assessed in the study, the experts suggested additional driving factors, which might accelerate or slow down the analysed trends.

In general, experts pointed to regulatory factors indicating the importance of the role of governance structures, policy measures or good practice standards, which provide adequate conditions for ideation and implementation of social, technological and policy innovations for sustainability of the region.

In addition to these factors, experts indicated the role of responsible, educated civil society equipped with entrepreneurial, future-orientated and critical thinking competences as key to transformational change in the region.

Last but not least, experts considered Russia's war in Ukraine as a wild card event, which could either accelerate or weaken some of the analysed trends (e.g. restoring/weakening the rule of law or accelerating/ slowing down the emerging energy sector transitions, food security and self-sufficiency).

Selected enablers and blockers proposed by experts are grouped in two categories, and include those that exhibit favourable (Tab. 4) and unfavourable (Tab. 5) impact on both positive and negative trends.

Additional enablers strengthening positive trends	Additional blockers weakening negative trends
<ul style="list-style-type: none"> • War in Ukraine reducing the fear of social and economic transformation • Strong political will facilitating the transition process • Promotion of sustainability at the government level • Increase in research funding for interdisciplinary teams connecting throughout the EU to advancing transformation in the energy sector • Pro-environmental behaviour of society and employees • Rising awareness about social consequences of consumption among generations Y and Z; growing awareness of the "dark side" of consumption • More direct involvement of the EU in education (e.g. more Erasmus and international education even in high school) • New possibilities of education caused by the online learning • Rising the attractiveness of a career in the education sector • Rising awareness and understanding of futures studies and foresight • The need to engage foresight advisors in policymaking and in explaining foresight tools to the policymakers and wider population 	<ul style="list-style-type: none"> • Diminishing the "double-class status" of EU countries • Greater respect for democratic values by governments • Impartial and supporting public trust media • Modern judiciary ensuring implementation of climate-related regulations and protection of the environment • Increasing technology transfer across the EU • Increasing financial support for social and technological innovation • Systemic solutions strengthening entrepreneurship, supporting talent and initiative, furthermore reducing bureaucracy and academic requirements • Civic education, development of NGOs and citizens engagement on the local level of democracy • Increasing the role of education in the enhancement of critical thinking competencies and higher levels of social awareness

Table 4. Enablers and blockers with positive impact on trends

Additional enablers strengthening negative trends	Additional blockers weakening positive trends
<ul style="list-style-type: none"> • War in Ukraine constitutes a potential opportunity to pass restrictive regulations (e.g. in terms of freedom of speech or mobility). Regulations introduced in times of a conflict or another danger often linger for years following the threat. • Inappropriate framework conditions for innovation • Shift towards regional and local food production (not necessarily beneficial economically or environmentally) • Lack of emphasis on critical thinking and the devaluation of democratic values • Low level of education, thus the lack of emphasis on learning critical thinking • Lack of awareness in policy-making and shame-focused attitudes toward mental health problems 	<ul style="list-style-type: none"> • Fear of change in the wider society • Trade unions in the energy sector • Policy making putting the cost of transformation on the consumers • Populism • Reform of education systems trending to old conservative methods and ideas that oppose innovation

Table 5. Enablers and blockers with negative impact on trends

Geopolitics – results

Geopolitics - trends and driving factors under assessment

Trend 1: Strengthening emphasis on the future in the European Union's governance and policy

Trend definition: Strengthening the role of foresight as a policy-making tool by launching the strategic foresight agenda and the Ministries of the Future network to inform the Commission's multi-annual programming and strengthen cooperation among Member States on forward-looking issues relevant to Europe's future.

Trend enabler: Increased number of futures studies training programs

Trend blocker: Populism (implying that politicians focus on short-term gains)

Trend 2: Deterioration of the rule of law

Trend definition: Politicization of the justice system undermines the executive oversight and negatively affects liberal aspects of democracy

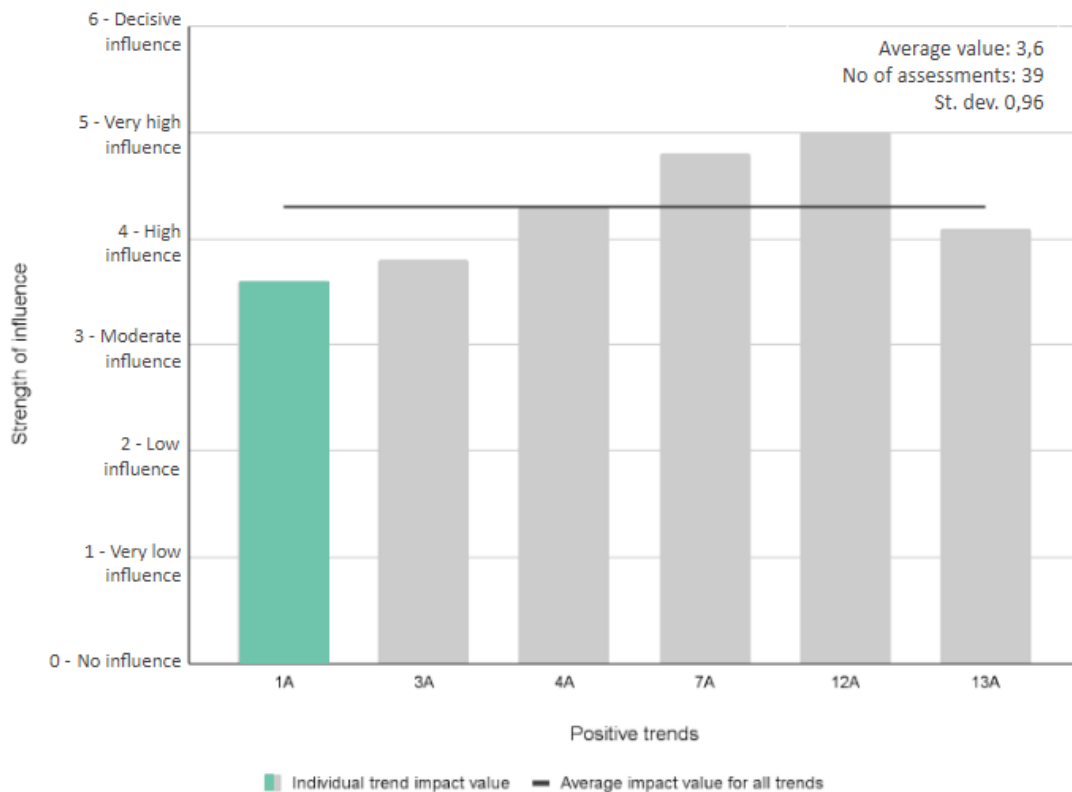
Trend enabler: Geopolitical conflicts in the neighbourhood of the given country

Trend blocker: Financial pressure from the European Union, in reaction to the violations of the rule of law

Trend 1 performance results fiche:

Trend 1: Strengthening emphasis on the future in the European Union's governance and policy

Trend definition: Strengthening the role of foresight as a policy-making tool by launching the strategic foresight agenda and the Ministries of the Future network to inform the Commission's multi-annual programming and strengthen cooperation among Member States on forward-looking issues relevant to Europe's future.



Our perspective on the results

According to the experts, strengthening emphasis on the future and relying on foresight in European Union's governance and policy will have the lowest positive impact on sustainable development of the V4 countries. However, this trend is not neutral - experts expect it to have moderate to high influence on sustainable development (average influence value: 3,6). Divergence of experts' opinions was relatively low, with standard deviation of 0,96.

Experts suggested that change factors which could influence this trend include e.g. rising awareness and understanding of futures studies and foresight. Moreover, they emphasized the need to engage foresight advisors in policymaking, as they could help improve understanding of various long-term policies and their potential outcomes by applying quantitative and qualitative foresight tools. Furthermore,

respondents highlighted the importance of explaining foresight tools to the policymakers and wider population - foresight tools and activities should not be perceived as forecasts, but rather means of exploring alternative futures. Finally, experts suggested that forward-looking assessments and projects within the EU could in the future be required to include the aspect of green transformation.

On the other hand, respondents pointed out that a change factor which could hinder this trend stems mainly from economic issues. Thus far, sustainability has been largely perceived as a luxury, rather than necessity, within the Visegrad countries. An economic crisis could slow down sustainable development in these states, as they would possibly opt for the cheapest solutions that would be the most effective in the short term. In such conditions, the V4 countries could rebel against the European Union’s policies concerning sustainable transformation. Furthermore, experts noted that decay of democracy and rule of law within the Visegrad states would likely limit application of foresight, favoring instead only those visions of the future which support the stance of the ruling parties. Moreover, populist governments are more likely to base their policymaking on polls rather than exploring scientific methods of dealing with the future.

Quotes from survey

A change factor that could accelerate this trend is...



“To strengthen this trend, a wider population of policymakers and elected officials will need to become aware of how prominently their imagined futures are influencing how they frame their choices and actions. Without this context-level understanding of how imagined futures are already present in their works, they will gain little benefit from using any specific set of steps or mechanistic tools to produce foresight. If foresight is done in an instrumental way, it will have limiting effects.”

“The "Ministers of the Future" need training in foresight and competent futurist advisors to understand how quantitative and qualitative futures research tools could help improve understanding of alternatives and potential long-term outcomes of various policies.”

A change factor that could slow down this trend is...



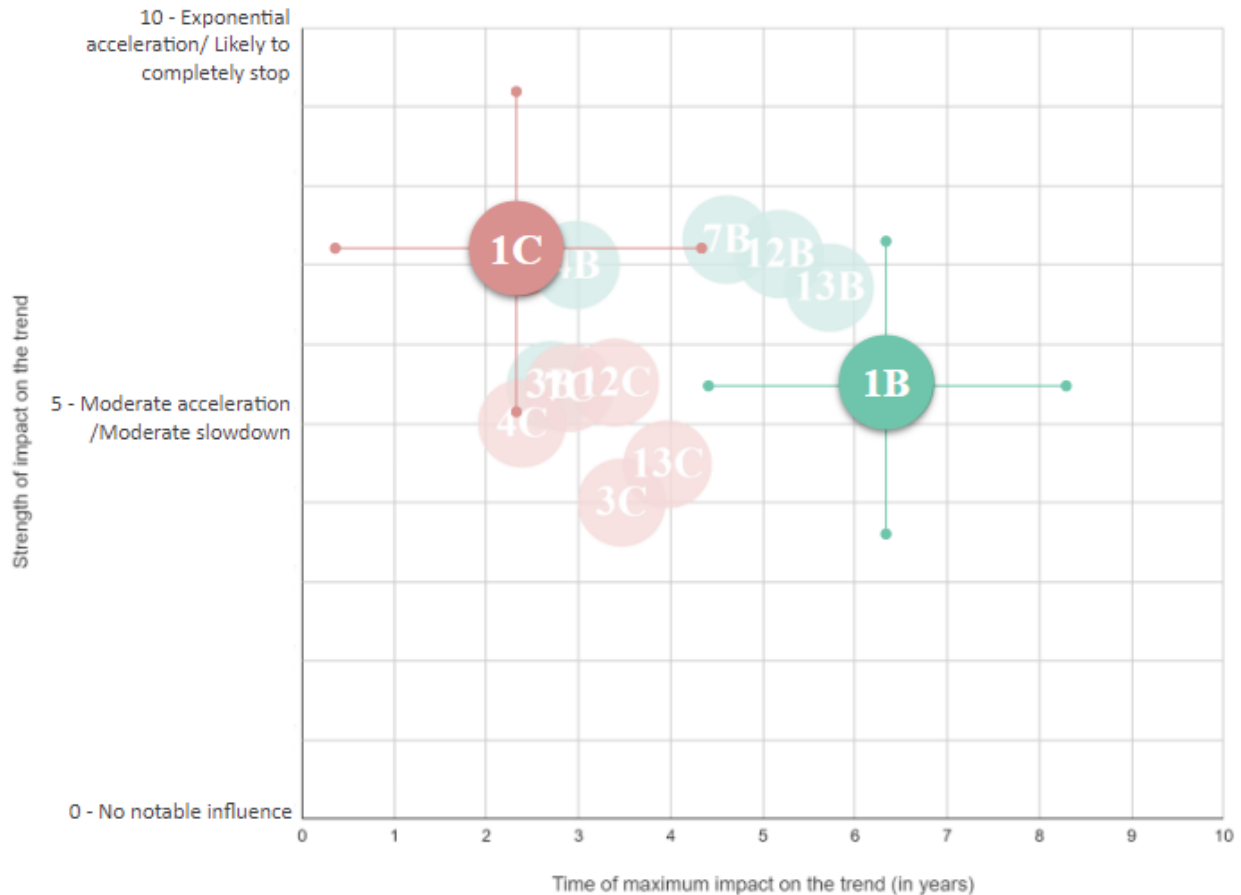
“Economic crisis. In V4, the majority of people see sustainable development and related environmental policies as kind of luxurious stuff. V4 can easily become a group of rebellious countries within the EU regarding this topic.”

“The more authoritarian and nationalistic governments within the EU are going to become, the less strategic foresight will be understood and needed – unless it supports the agenda of those governments.”

Performance results for enabler and blocker of Trend 1

Enabler: Increased number of futures studies training programs

Blocker: Populism (implying that politicians focus on short-term gains)



Our perspective on the results

Experts expect the trend blocker - populism - to have a strong impact on the trend of strengthening emphasis on the future in the European Union's governance and policy. They assessed that this blocker could lead to a significant slowdown of the trend, in a short period (the expected time within which the blocker would achieve maximum influence on the trend is c. 2 years). The blocker assumes that populism would lead to politicians focusing on short-term gains and guiding their decisions with polls, rather than scientific research methods. However, respondents noted that even if politicians plan for the short-term, they still need to apply future planning. The short-term outcomes of their policies would be informed by their ideas regarding the future. Populists are more likely to develop grand visions of the future (often guided by nationalist interests). Thus, even if populism would influence the way in which foresight is used, some experts argued that it is not necessarily mutually exclusive with emphasis on the future.

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Enabler of the trend, i.e. an increased number of futures studies training programs, received lower assessments in terms of strength of its influence on the trend. Experts estimated that it would moderately accelerate the trend, while the time needed to influence the trend at maximum is significantly higher than in the case of the blocker (c. 6 years). This implies that the blocker is a more robust factor which could shape the trend of futures-orientation in the European Union's governance and policy. Regarding the enabler, experts noted that additional fundamental research and higher education programs in futures studies would strengthen the field by developing the scientific aspect of futures studies, as well as educating a higher number of foresight professionals. However, experts emphasized that establishment and completion of futures studies programs would take many years. Moreover, they asserted that the futures studies cannot be perceived as a science about the shape of the future, but rather a tool of thinking about the future.

Quotes from survey

I think that this enabler will not significantly influence the trend, because...



"Futures studies as a field is still underdeveloped concerning its theoretical contributions, ways of knowing, and focus of inquiry. Too often, the students are recruited with promises they can be 'experts about the future' while the more practical angle would be on becoming 'knowledgeable about how people and orgs engage futures'. If FS doesn't recalibrate, the outcomes concerning governance and policy-making could actually be dangerous. Meanwhile, there are very few futures studies departments and zero futures studies faculties in European universities. It would take at least a few years to launch several new programs and a couple rounds of student graduates from those programs before policy and governance processes would benefit from people with futures studies education."

I think that this blocker will not significantly influence the trend, because...

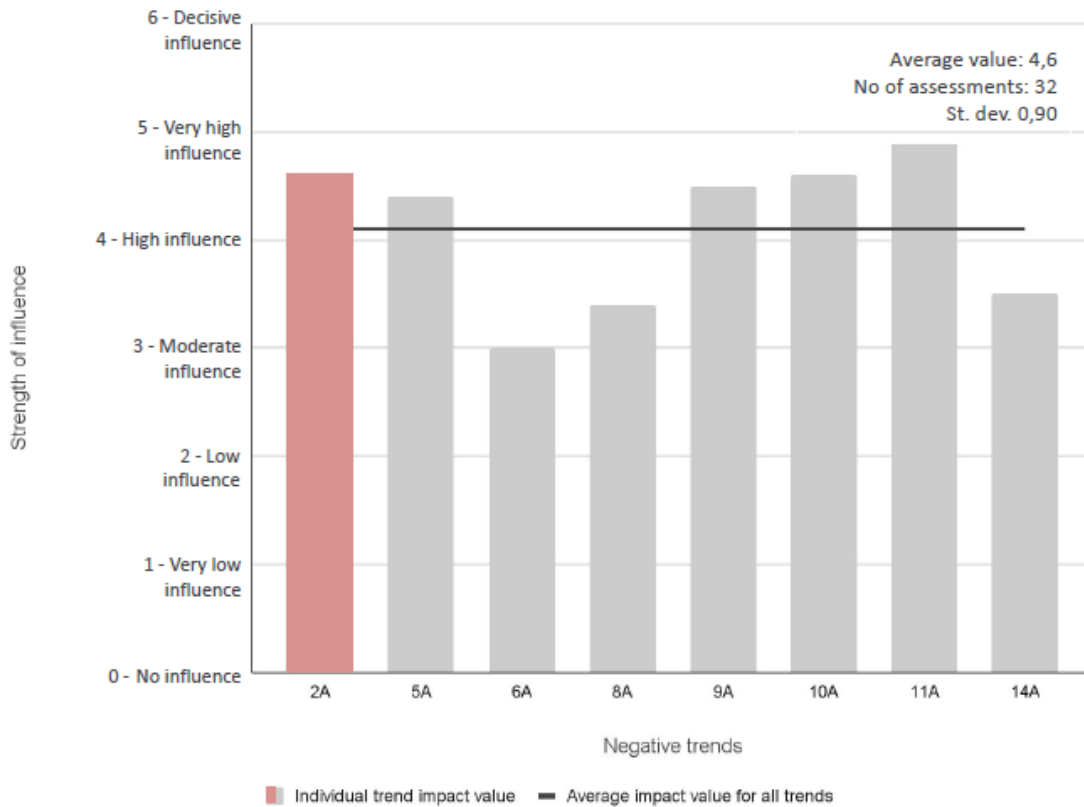


"Even a short-term future is a future. Populists do often attempt to produce short-term outcomes, yet these are informed by their normative ideas regarding the future. Historically, populist-oriented dictators have mobilized their nation states based on grand visions of the future. Therefore, you could have an EU strengthen its emphasis on the future in governance, but the future being emphasized is populist in nature, and likely to inspire highly unethical actions."

Trend 2 performance results fiche:

Trend 2: Deterioration of the rule of law

Trend definition: Politicization of the justice system undermines the executive oversight and negatively affects liberal aspects of democracy.



Our perspective on the results

According to the experts' assessments, deterioration of the rule of law is one of the main trends that could negatively impact sustainable development in the Visegrad Group countries. The trend implies that politicization of the justice system undermines the executive oversight and negatively affects liberal aspects of democracy, which could hinder sustainable development. The trend was rated as having between high to very high negative influence on sustainable development (average: 4,6). A relatively low standard deviation (0,90) implies a high convergence of experts' opinions.

Respondents noted that an independent, efficient and modern judiciary is crucial to ensuring implementation of climate-related regulations and protection of the environment. Moreover, change factors that could counteract the politicization of the justice system included civic education, development of NGOs and citizens engagement on the local level of democracy.

Quotes from survey

A change factor that could slow down this trend is...



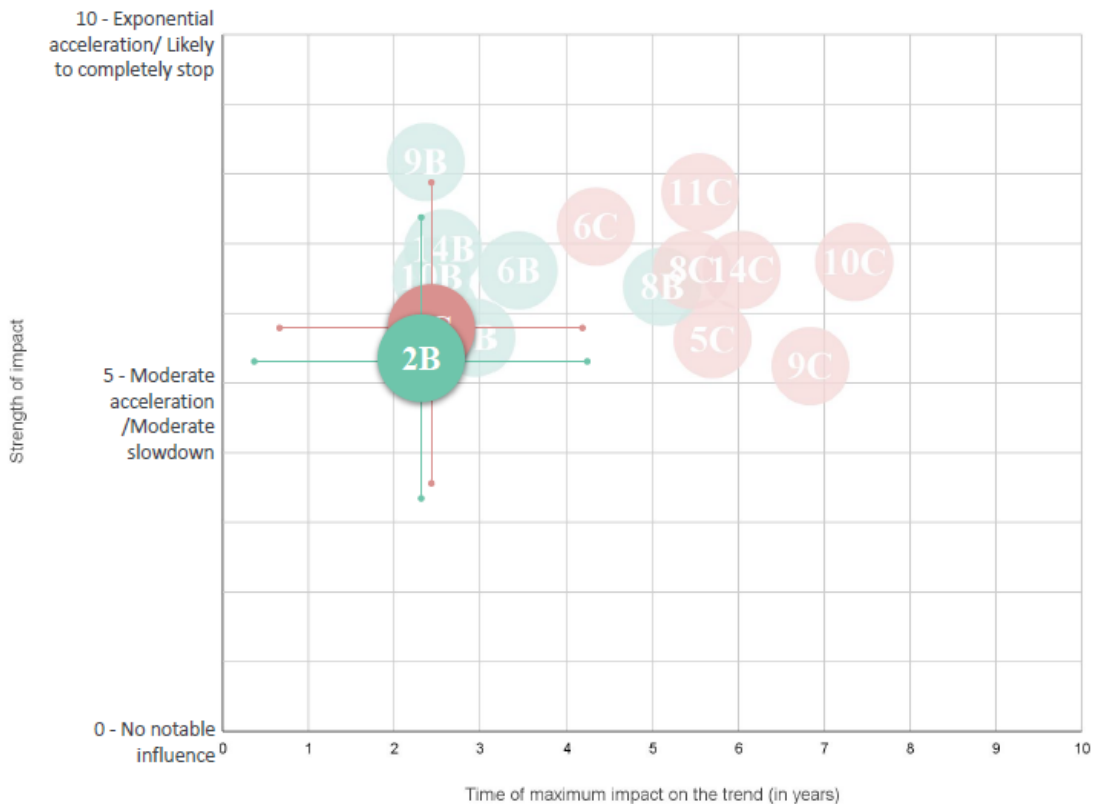
"If the V4 ensures the independence of their judiciary systems in concert with providing modern legal education to its lawyers and judges in training, then it can stem the worst possible version of a politicized judiciary. Regarding sustainable development, to date many environmental victories have been won in courts of law. Courts are a key venue for implementing environmental policy."

"...the development of NGOs and citizen engagement on the local level of democracy."

Performance results for enabler and blocker of Trend 2

Trend enabler: Geopolitical conflicts in the neighbourhood of the given country

Trend blocker: Financial pressure from the European Union, in reaction to the violations of the rule of law



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Our perspective on the results

Enabler and blocker of the deterioration of the rule of law were assessed similarly, as having moderate influence on the trend and a short time of achieving the maximum impact on the trend (c. 2-3 years).

The enabler, i.e. geopolitical conflicts in the neighbourhood of the given country, relied on the assumption that geopolitical conflicts deteriorate attention from internal affairs and allow the governments to introduce emergency policies that could restrict some freedoms or accord more power to the government. Experts noted that e.g. the war in Ukraine indeed shifts focus to military actions and constitutes a potential opportunity to pass restrictive regulations (e.g. in terms of freedom of speech or mobility). Experts added that regulations introduced in times of a conflict or another danger often linger for years following the threat. On the other hand, experts emphasized that geopolitical conflicts reinforce the need for strategic foresight to understand possible future scenarios. Moreover, respondents noted that deterioration of the rule of law can also unfold without any geopolitical threats in the neighbourhood.

Concerning the blocker of the trend, i.e. financial pressure from the European Union (in reaction to the violations of the rule of law), experts emphasized that as there is a number of underdeveloped regions within the Visegrad Group countries, restricted access to the EU funding could endanger their development. Some experts noted that financial pressure mechanisms could backfire, having affected states turn elsewhere in search of the funds. Yet, experts' opinions highly diverged, many assuming that it would not be the case within the V4 states.

Quotes from survey

I think that this enabler will significantly influence the trend, because...



“War in Ukraine puts focus on military actions, which includes opening up Marshall Law as an option to elected leaders. This produces situations wherein normal rules can be paused and things such as media freedoms or freedom of mobility can be reduced. There are examples from history of short term policy regimes lingering for long term, e.g. the Patriot Act in the U.S. after 9/11 still is in force.”

I think that this blocker will significantly influence the trend, because...



“There is a great number of underdeveloped regions within the V4 countries. Restriction of access to EU funds might endanger their existence and development.”

Economy - results

Economy - trends and driving factors under assessment

Trend 3: Rising popularity of remote or hybrid work

Trend definition: Changing work patterns in favor of remote and hybrid office work reinforced by the COVID-19 pandemic, as well as technological and social drivers.

Trend enabler: High emphasis on the work-life balance

Trend blocker: High emphasis on issues related to data protection

Trend 4: Increasing demand for product and company transparency

Trend definition: Across industries, the importance of supply-chain transparency grows. A growing segment of consumers seeks information on product ingredients and materials, their origin, and the conditions in which they were produced.

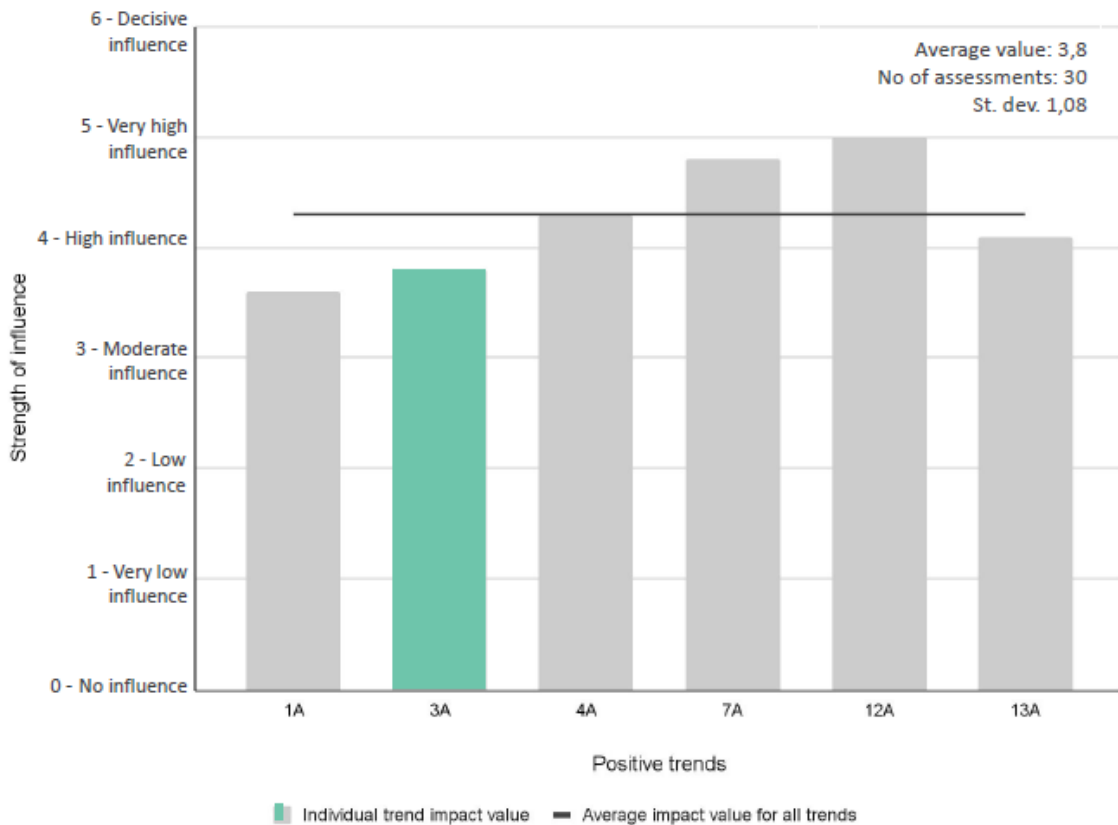
Trend enabler: Increased awareness concerning health and nutrition

Trend blocker: Economic crises and rising inflation

Trend 3 performance results fiche:

Trend 3: Rising popularity of remote or hybrid work

Trend definition: Changing work patterns in favor of remote and hybrid office work reinforced by the COVID-19 pandemic, as well as technological and social drivers.



Our perspective on the results

Rising popularity of remote or hybrid working is a trend with a moderate impact on sustainable development in the Visegrad countries. The opinion of experts on this factor converges, which is reflected in the relatively low standard deviation of 1.08.

Experts point out that the trend may be influenced by issues related to pro-environmental behaviour of society and employees. The further prevalence of virtual meetings and conferences, which has been widely implemented due to the pandemic, will help to reduce the emissions associated with business travel. Another important aspect popularising remote working may be the increase in mobility costs caused by the current energy crisis.

Quotes from survey

A change factor that could accelerate this trend is...



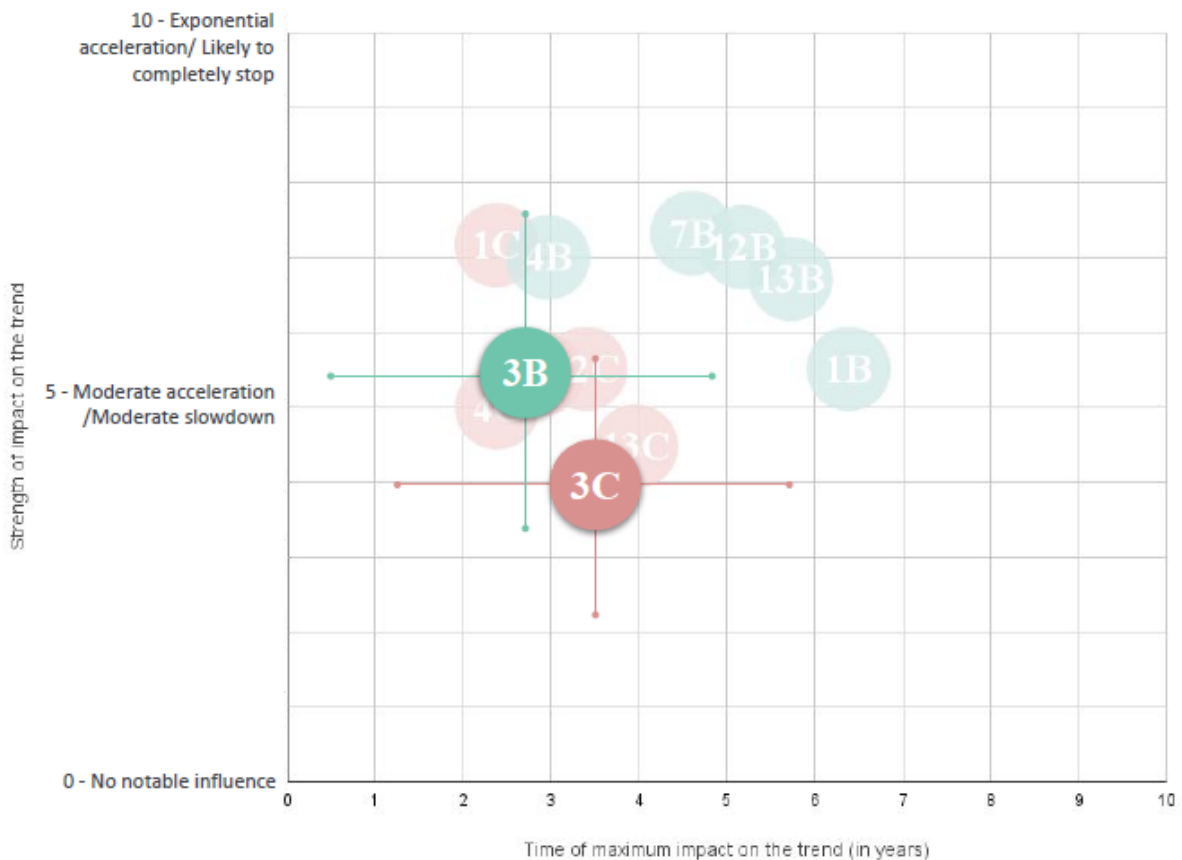
"Employer interest in 'being green' could lead to post-covid pandemic use of virtual conferences and meetings, which will reduce emissions caused by travel."

"The current energy crisis and rising price of mobility will reinforce the trend of remote working."

Performance results for enabler and blocker of Trend 3

Trend enabler: High emphasis on the work-life balance

Trend blocker: High emphasis on issues related to data protection



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Our perspective on the results

Enabler of the trend - High emphasis on the work-life balance has a moderate impact on accelerating the rising popularity of remote or hybrid work. Experts estimate that expected time within the enabler would achieve maximum influence on the trend is c. 3 years.

Among the drivers that may confirm enabler's influence on the trend, experts mention social changes, including shifts in attitudes towards life: greater concern for mental health and dedicating more time to private life (abandoning travel to work), especially in the case of younger generations.

According to experts, a high emphasis on issues related to data protection may moderately slow down the trend. The average time needed for a blocker to have an impact on the trend is about 3.5 years, slightly later than an enabler.

In the coming years, the expansion of the trend may be hampered by the high emphasis on issues related to data protection. Experts confirm that cyber security will be a challenge when working remotely, while also pointing to the need to develop security systems and local data centres.

Quotes from survey

I think that this enabler will significantly influence the trend, because...



"Physically traveling to and from a workplace reduces the amount of time one has to do non-work things, such as spending time with family and friends, or taking up hobbies. Now that many have gotten a taste of 'working from home', few will want to 'only work at an office'."

I think that this blocker will significantly influence the trend, because...

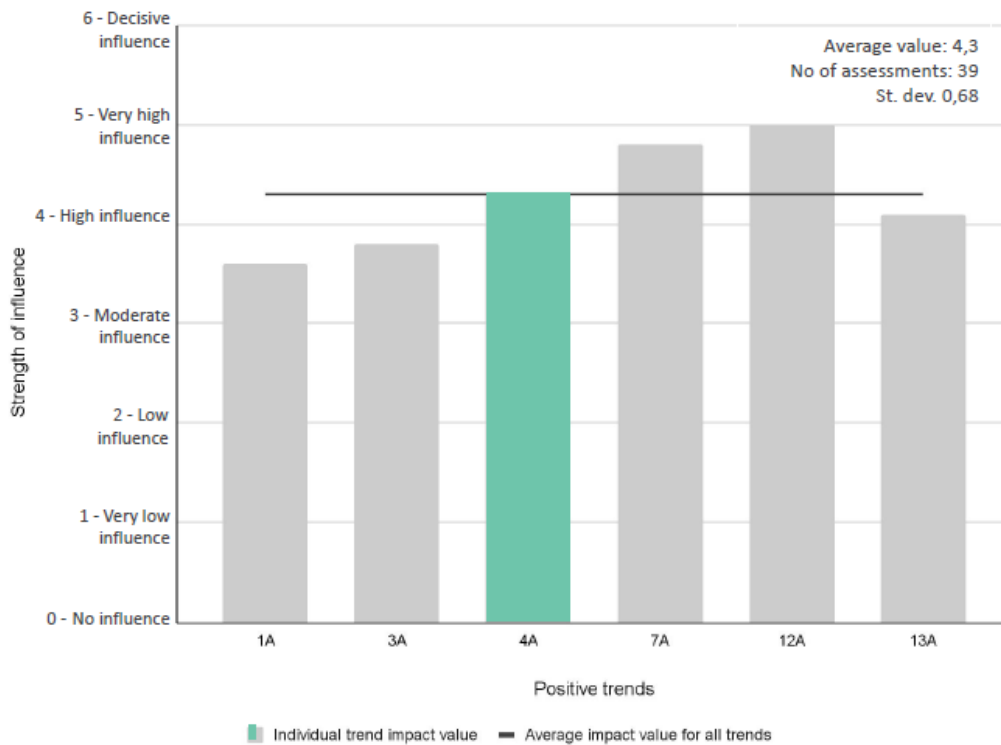


"Cybersecurity is and will remain a challenge. However, continuously improved security systems will reduce its significance if work is done at the office or remotely."

Trend 4 performance results fiche:

Trend 4: Increasing demand for product and company transparency

Trend definition: Across industries, the importance of supply-chain transparency grows. A growing segment of consumers seeks information on product ingredients and materials, their origin, and the conditions in which they were produced.



Our perspective on the results

Experts assume that the trend of increasing demand for product and company transparency will have a high impact on sustainable development. In fact, this is one of the most significant positive trends for the Visegrad countries until 2030. The standard deviation shows a value of 0.68, which indicates a consensus of experts' opinions.

Experts mention several factors that are able to accelerate this trend. They point to the emergence of a requirement for greater transparency regarding the production of goods in the future. Product information will include more than country of origin, i.e. environmental issues, corporate social responsibility rating, virtual water, sustainability of resource, etc. Furthermore, respondents highlight the increased awareness about social consequences of consumption among generations Y and Z, which puts pressure on sustainable consumption also on the part of producers.

Quotes from survey

A change factor that could accelerate this trend is...



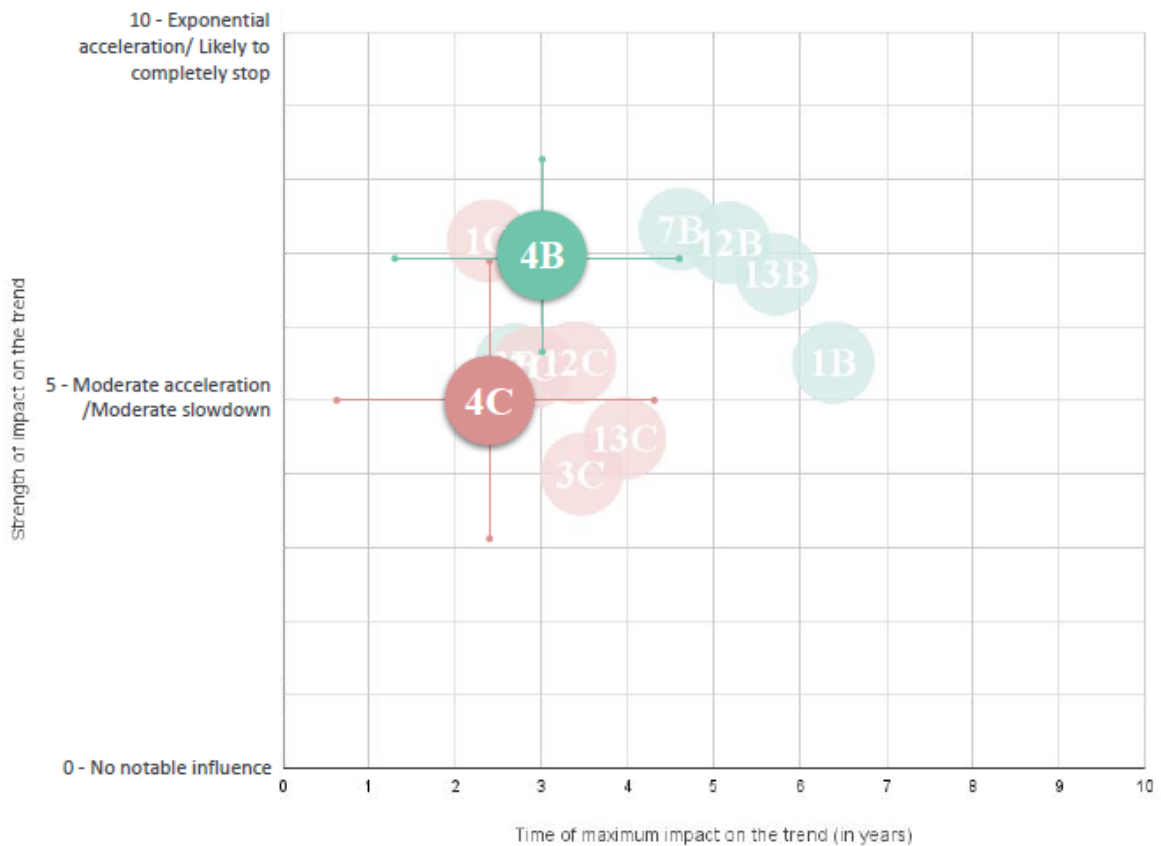
"Labels with information on corporate social responsibility rating, virtual water, sustainability of resources, etc., might soon be required for most products, as are now for the place of origin."

"A change factor that could accelerate this trend is the rising awareness in Y and Z generations about social implications of consumption."

Performance results for enabler and blocker of Trend 4

Trend enabler: Increased awareness concerning health and nutrition

Trend blocker: Economic crises and rising inflation



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Our perspective on the results

The enabler, which is increased awareness concerning health and nutrition, has a high influence on the trend and can significantly strengthen its impact. Experts assess that the time of maximum impact on the trend could be relatively soon, i.e. in about 3 years.

Some respondents indicate that awareness-raising campaigns about the connection between the consumption patterns, health and nutrition with sustainable development would contribute to positively shaping behaviours and mindsets and would result in strengthening the trend.

According to expert assessments, the blocker, i.e. economic crises and rising inflation may to a moderate extent slow down the trend of increasing demand for product and company transparency. However, the opinion of respondents on this is relatively divergent and ranges between low and high influence (3.2 and 6.8). The impact time of this blocker is slightly faster than that of the enabler (about 2.5 years).

Experts point out that certain factors can impair the effectiveness of the blocker. There is a change in behaviour due to the public's perception of the negative effects of increasing consumption, which contributes to greater carefulness and choice of sustainably made products. On the other hand, some experts emphasise the positive impact of economic crises on product and company transparency. They believe that crises create more social pressure on companies regarding the cost efficiency, transparency or the employment conditions. The shift towards the importance of the place of origin of products in times of crisis is also of particular importance - a potential increase in sales of local products reduces their production costs, this may help the local economy to get through the crisis more smoothly.

Quotes from survey

I think that this blocker will not significantly influence the trend, because...



"The awareness of the 'dark side' of consumption grows and the number of people aiming for 'bio' products and 'responsible' consumption grows."

Technology - results

Technology - trends and driving factors under assessment

Trend 5: Persisting gap in innovation performance between the V4 countries and better performing EU states

Trend definition: The innovation performance of the V4 countries has been below the EU average over the last decade (European Innovation Scoreboard). Bridging the persisting Innovation gap between the V4 and better performing EU regions is necessary.

Trend enabler: Limited autonomy of the research activities

Trend blocker: 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

Trend definition: Increase in politically, ideologically or financially motivated cyberattacks from nation-state and non-state adversaries.

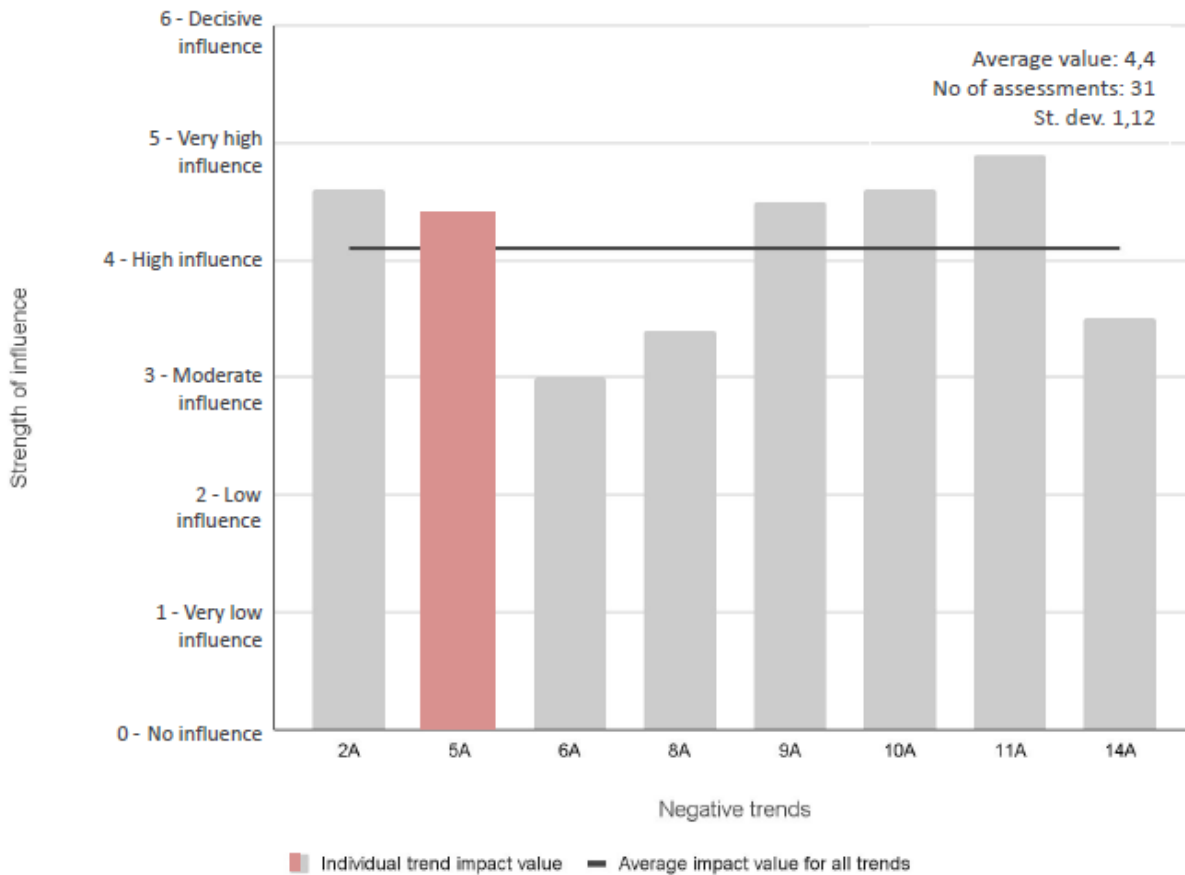
Trend enabler: High interconnectivity of devices relying on a WiFi connection (including Internet of Things in companies, private homes, etc.)

Trend blocker: Efficient (technological, economic, legal) defence system against cyberattacks

Trend 5 performance results fiche:

Trend 5: Persisting gap in innovation performance between the V4 countries and better performing EU states

Trend definition: The innovation performance of the V4 countries has been below the EU average over the last decade (European Innovation Scoreboard). Bridging the persisting Innovation gap between the V4 and better performing EU regions is necessary.



Our perspective on the results

The persisting gap in innovation performance between the V4 countries and better performing EU states hinders the transition towards sustainable development. Respondents identified this as one of the strongest negative trends. Divergence of experts' opinions was relatively low, with standard deviation of 1.12.

Experts emphasize that financial support for social and technological innovation is key to slowing down the negative trend. Furthermore, respondents point to the double-class status of EU countries as a factor causing an innovation performance gap of the different EU regions. This implies differences in financial

and technological support from the EU, which should be reduced. Furthermore, increasing technological exchange across the EU will improve the innovation performance rates of the V4 countries because it may reduce the brain drain.

Quotes from survey

A change factor that could slow down this trend is...

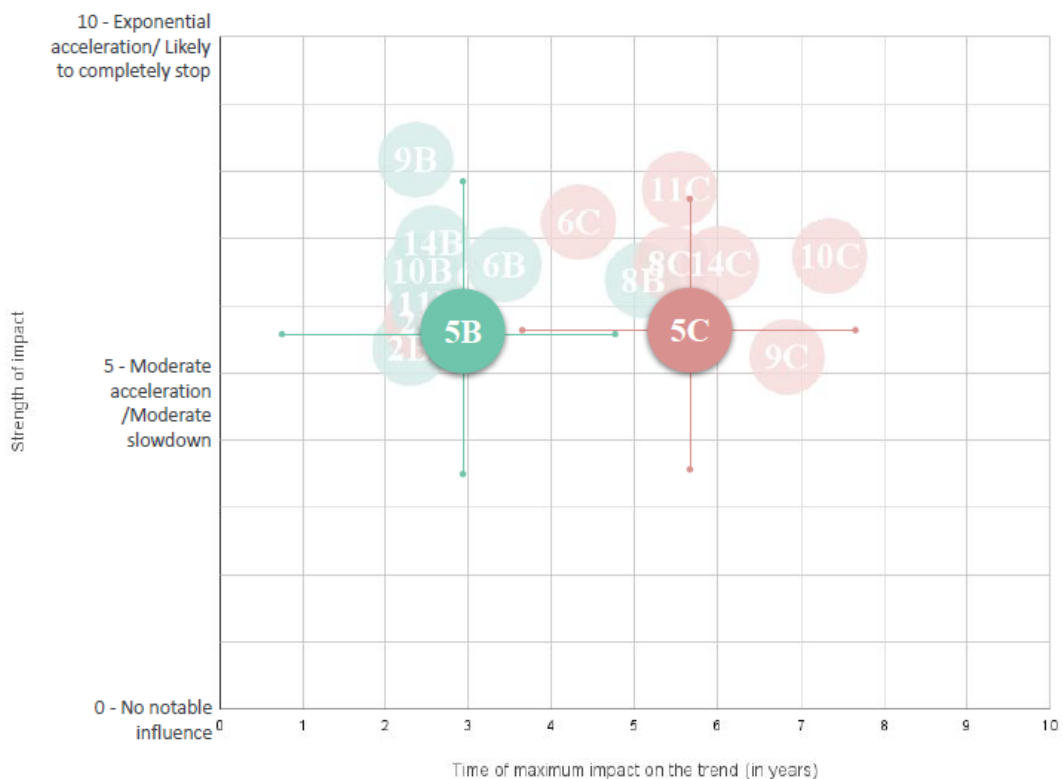


"Increasing financial support for both social and technological innovation is important for sustainable development."

Performance results for enabler and blocker of Trend 5

Trend enabler: Limited autonomy of the research activities

Trend blocker: Return migration and brain gain (remigration of highly educated workforce to their countries of origin, reversing the brain drain into a significant brain gain)



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Our perspective on the results

The trend enabler - limited autonomy of the research activities - could moderately exacerbate the persistent gap in innovation performance. The experts estimate that the expected time within the enabler would achieve maximum influence on the trend is 3 years.

Experts point out the difference in the approach of the academic community between the Western European countries and the Visegrad countries. The lower level of innovation is related to the rewarding of academic degrees, instead of talent and the ability to implement solutions. Limited autonomy of the research activities goes hand in hand with brain drain, which is consequently reflected in differences in remuneration as well as recognition and reward principles.

At the same time, experts highlight the factors by which the enabler will not significantly influence the trend. With the broadening research ecosystems, and availability of funding for international research undertakings, the innovation gap is more likely to be reduced by growing research collaboration at the European level that is coupled with the implementation of transdisciplinary European research agendas.

Return migration and brain gain is a blocker that assumes remigration of highly educated workforce to their countries of origin and reversing the brain drain into a significant brain gain. Experts estimated that the blocker could moderately slow the trend, with a comparable strength of impact to the enabler. The moment when the blocker will have the greatest impact on the trend will occur in about 6 years.

Experts point out that encouraging talented innovators to return needs to be linked to reforms in the Visegrad countries. Systemic solutions should strengthen entrepreneurship, support talent and initiative, furthermore reduce bureaucracy and academic requirements. An open scientific environment can also support the return of high-qualified workers.

Quotes from survey

I think that this enabler will significantly influence the trend, because...



“Limited autonomy of research activities and brain drain are reinforcing each other. Brain drain is set to continue, given the significant remuneration differences among countries, as well as the recognition and reward principles, which in the developed countries are mainly based on talent, not on academic credentials. Innovators seek opportunities to implement their ideas, not to keep collecting degrees.”

I think that this blocker will not significantly influence the trend, because...

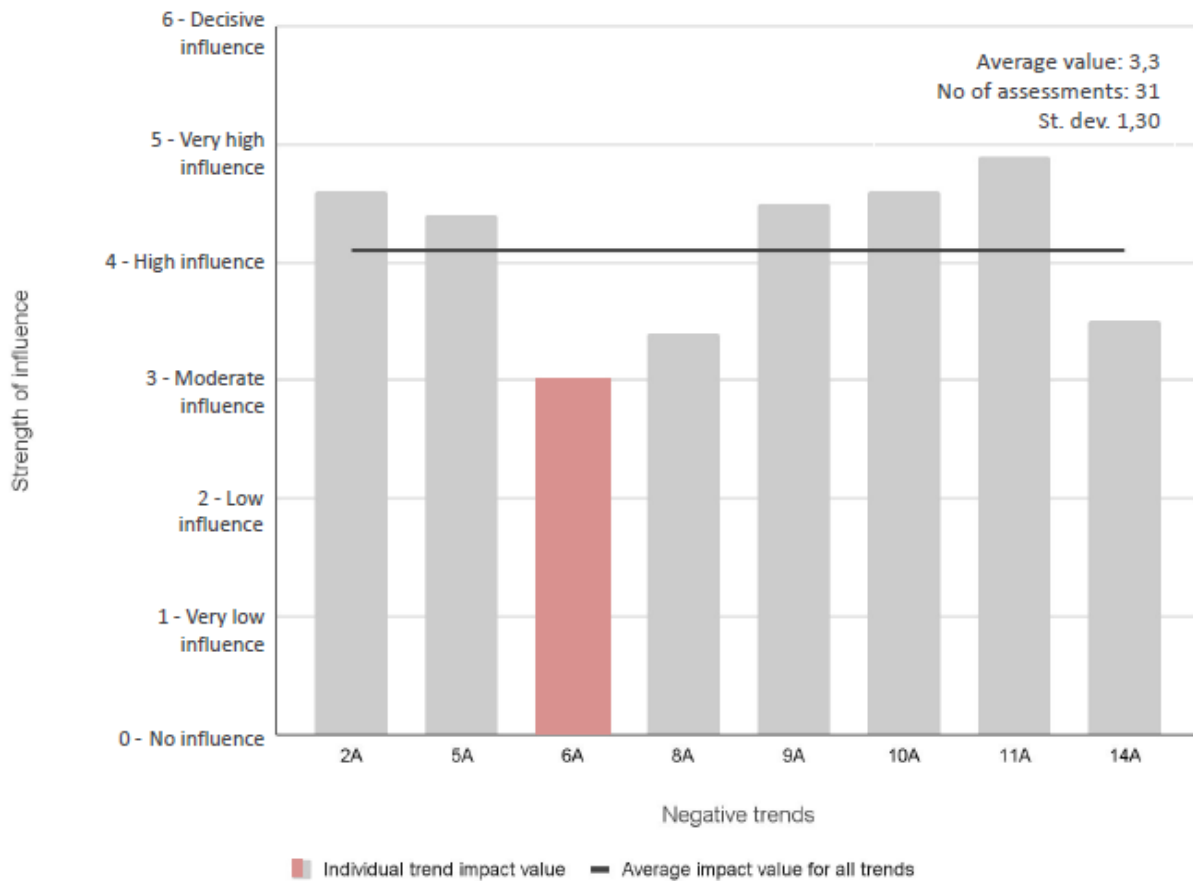


“For motivating real innovators to return, V4 countries should significantly change their systems, to encourage entrepreneurship, support talent and initiative, and reduce bureaucracy and academic requirements.”

Trend 6 performance results fiche:

Trend 6: Rising popularity of cyberattacks

Trend definition: Increase in politically, ideologically or financially motivated cyberattacks from nation-state and non-state adversaries.



Our perspective on the results

Rising popularity of cyberattacks is a trend with negative implications for sustainable development. It assumes an increase in politically, ideologically or financially motivated cyberattacks from nation-state and non-state adversaries. Compared to other negative trends, it has the lowest impact, but is nevertheless not insignificant for sustainable development. The expert assessment points out that it is a trend with moderate strength of influence. The divergence between the opinions of respondents is relatively small (dev. 1.3).

According to some experts, the trend can be slowed down by taking care of the social side of sustainable development. Special attention should be paid to the role of education in the enhancement

of critical thinking competencies and higher levels of social awareness, as well as to the strengthening of democratic society.

Quotes from survey

A change factor that could slow down this trend is....

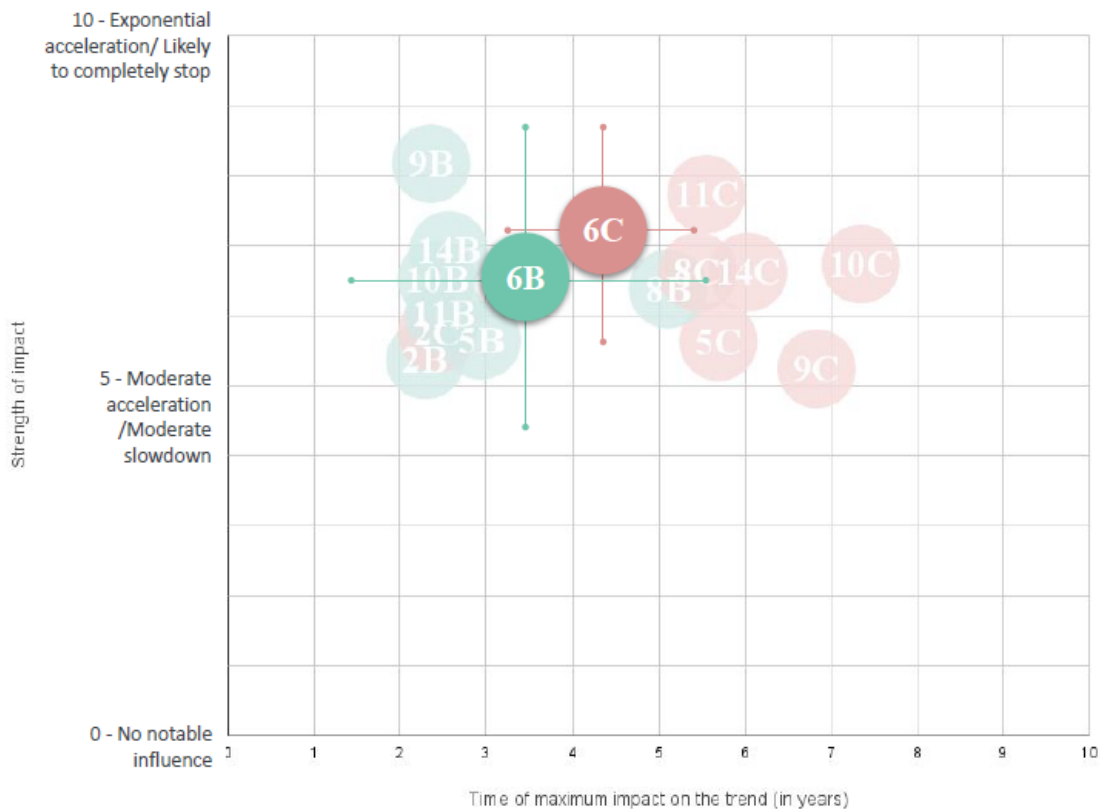


“...the social aspect of sustainable development: education, democracy development, higher level of awareness, critical thinking competencies.”

Performance results for enabler and blocker of Trend 6

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

Trend blocker: Efficient (technological, economic, legal) defence system against cyberattacks



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Our perspective on the results

High interconnectivity of devices relying on a WiFi connection (including Internet of Things in companies, private homes, etc.) is an enabler that may accelerate the negative impact of rising popularity of cyberattacks on sustainable development. There is a wide divergence in experts' assessment of this factor. The impact on the acceleration of the trend is estimated by respondents on average as high. The time in which the impact of enabler on the trend will become visible is between 1.5 and 5 years. Experts point out that due to the growing hyperconnectivity, the societal awareness and need of adequate cyber security measures is increasing, too. This contributes to slowing down a negative trend that threatens sustainability.

The trend blocker, i.e. an efficient (technological, economic, legal) defense system against cyberattacks has a slightly higher impact on future cyber threats than the enabler. This enabler may reach maximum impact on the trend, and thus slow it down significantly, in about 3-5 years.

Quotes from survey

I think that this enabler will not significantly influence the trend, because...



"Interconnectivity demands more security and the awareness of this fact grows."

Environment – results

Environment - trends and driving factors under assessment

Trend 7: Emerging energy sector transitions

Trend definition: Technology changes and rapid reductions in technology costs provide a foundation for emerging energy-sector transitions in many countries. Climate change and political endorsement of the Paris Agreement are expected to accelerate and intensify actions and investments towards a sustainable low carbon future.

Trend enabler: Increased political pressure around the world concerning climate change mitigation

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

Trend 8: Rising need for food security and self-sufficiency

Trend definition: Food self-sufficiency has moved higher on the policy agenda in a number of countries following the instability or shocks of world food markets. Food self-sufficiency means the extent to which a country can satisfy its food needs from its own domestic production.

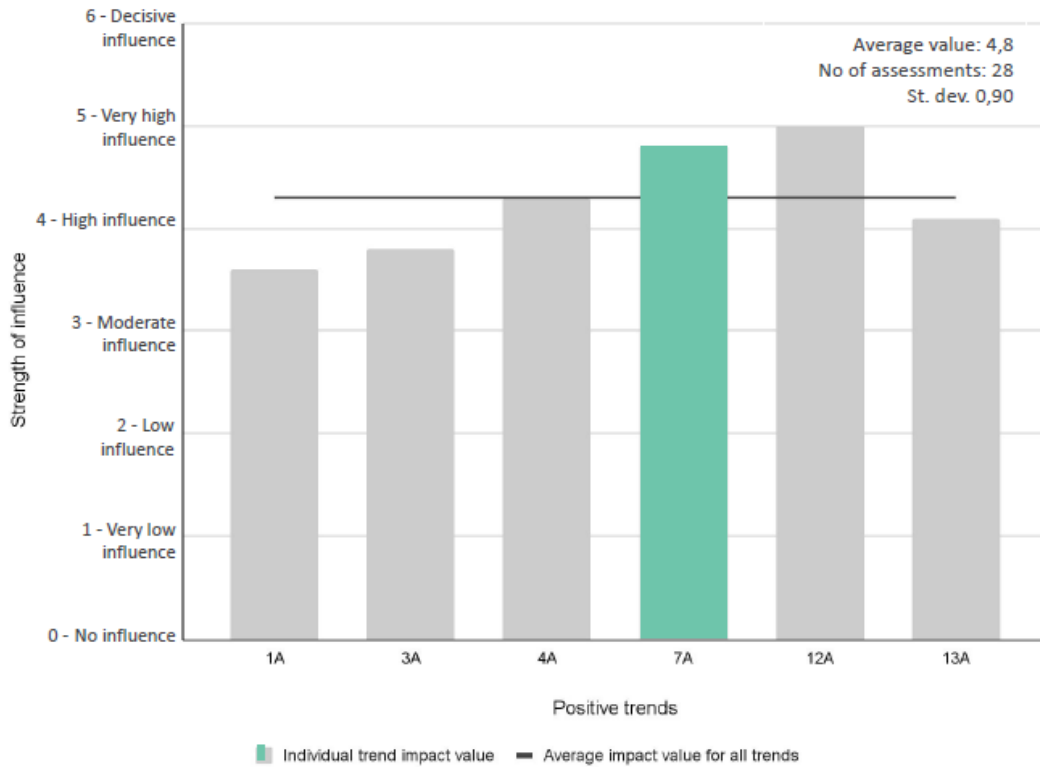
Trend enabler: Transition towards circular economy in the food system (increased demand for sustainable practices and measures to address the efficient resource use, food distribution, food waste and surplus management)

Trend blocker: Climate change leading to unfavorable farming conditions in numerous regions

Trend 7 performance results fiche:

Trend 7: Emerging energy sector transitions

Trend definition: Technology changes and rapid reductions in technology costs provide a foundation for emerging energy-sector transitions in many countries. Climate change and political endorsement of the Paris Agreement are expected to accelerate and intensify actions and investments towards a sustainable low carbon future.



Our perspective on the results

Emerging energy sector transitions is one of the highest rated trends supporting sustainable development. Under this heading are technology changes and rapid reductions in technology costs, which provide a foundation for emerging energy-sector transitions in many countries. Climate change and political endorsement of the Paris Agreement are expected to accelerate and intensify actions and investments towards a sustainable low carbon future. Experts assess the impact of this trend as close to very high. The divergence between the opinions of respondents is relatively small (dev. of 0.9).



According to experts, the trend may be accelerated by R&D-related issues, which may enable breakthroughs in the energy sector. This requires more funds for research and internationalization of research teams within the EU.

At the same time, experts highlight factors that may interrupt the trend, which will have adverse consequences for sustainable development. Constraints to the emerging energy sector transitions are political and social phenomena, such as populist tactics and trade union activities opposing the changes in the energy sector. In addition, experts point to ambiguities regarding the social costs of transition, which intensify the already existing general fear of change.

Quotes from survey

A change factor that could accelerate this trend is...



"...more research funding for interdisciplinary teams connecting throughout the EU to further advances in the energy sector (ex: energy storage for surplus generated with renewable energy etc)."

A change factor that could slow down this trend is...



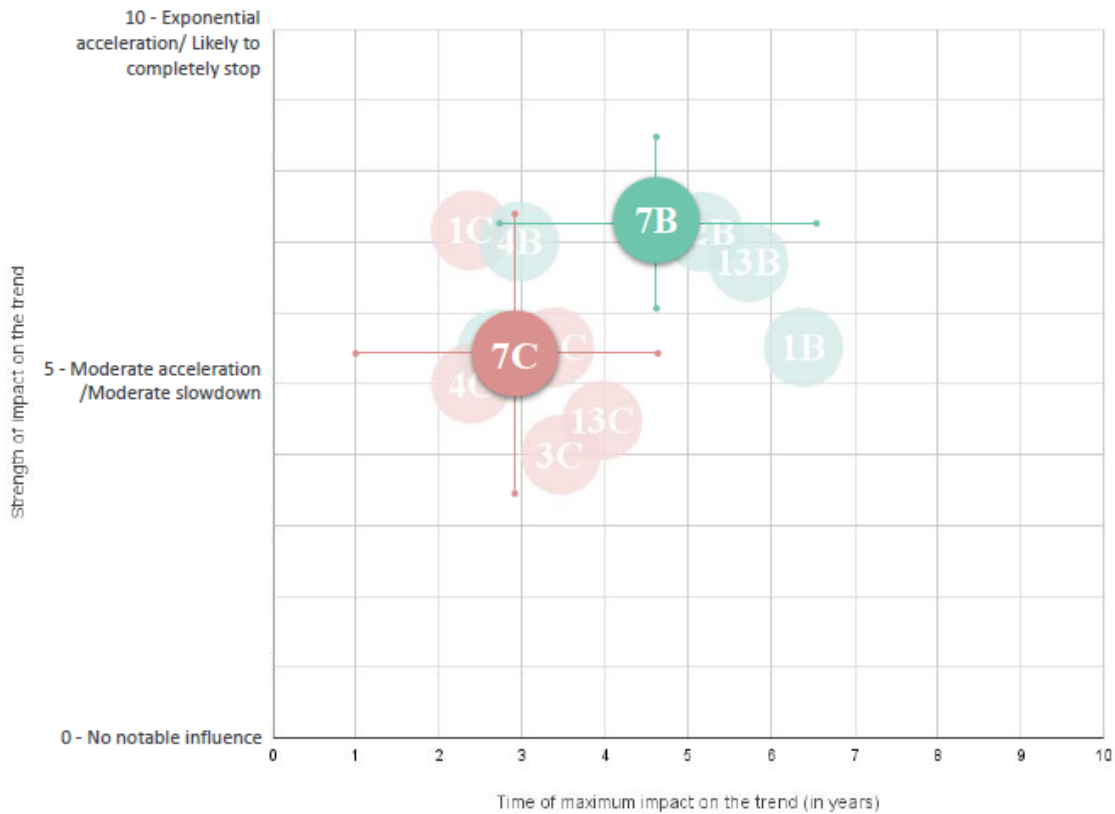
"...policy making that will put the cost of transformation on the consumers."

"...populism, fear of change, trade unions in the energy sector."

Performance results for enabler and blocker of Trend 7

Trend enabler: Increased political pressure around the world concerning climate change mitigation

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



Our perspective on the results

According to experts, the enabler, i.e. increased political pressure around the world concerning climate change mitigation, could accelerate the trend to a high degree. Respondents' assessments regarding the timing of the enabler's impact on the trend are divergent and range from about 3 to 6.5 years.

The promotion of sustainability at the political level should be essential to support the trend. Experts suggest that a sufficiently strong political will facilitates the transition process and helps to gain public acceptance and recognition of the need for change. In addition, the consideration of sustainability and transformation towards a low carbon future in policies will provide the conditions for transformation, e.g. by funding research. Experts also point to the changing attitudes of younger generations, who see the need for urgent change and at the same time are increasingly present in economic life, as a positive factor in the trend.

Social anxiety over energy transformation (lack of acceptance of the transformation e.g. due to fear of losing jobs in coal-industry, etc.) is a blocker that may slow down the trend and thus hinder the sustainable development of the Visegrad countries. Experts are divided in their assessment of the impact of the blocker on the trend and the timing of its appearance. The strength of the impact is between relatively low and high levels. The timescale of the blocker influence is earlier than the enabler and can happen within 1 year to about 5 years.

According to some experts, currently the factor that weakens the impact of the blocker is the war in Ukraine. It reduces the fear of social and economic transformation, *mainly as a consequence of the need to become independent from fossil fuel imports and to secure sustainable deliveries of energy.*

Quotes from survey

I think that this enabler will significantly influence the trend, because...



"The political will is crucial for the transformation towards a low carbon future. Politicians actively promoting sustainability can persuade the majority population to accept and embrace the need for change. Also, the political situation influences the streams for research funding etc."

I think that this blocker will not significantly influence the trend, because...

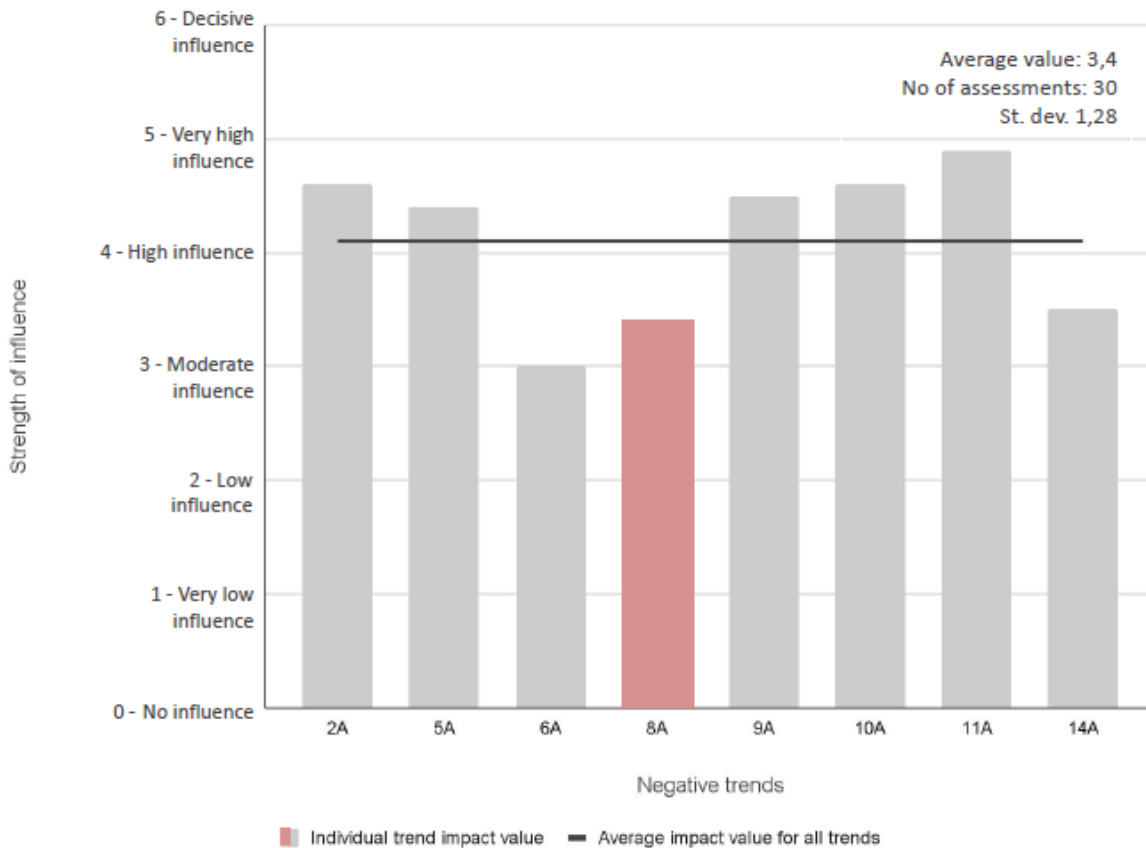


"The current war in Ukraine is a major current enabler that decreases the anxiety [of transition] within society and economy."

Trend 8 performance results fiche:

Trend 8: Rising need for food security and self-sufficiency

Trend definition: Food self-sufficiency has moved higher on the policy agenda in a number of countries following the instability or shocks of world food markets. Food self-sufficiency means the extent to which a country can satisfy its food needs from its own domestic production.



Our perspective on the results

Food self-sufficiency is often presented in policy circles as the direct opposite of international trade in food, and is widely critiqued by economists as a misguided approach to food security that places political priorities ahead of economic efficiency (Clapp 2017). However, in the face of recurring global uncertainties regarding food security and food price volatility, many countries introduce policies to increase domestic food production and lower the reliance on exports regardless of the available land, water, and fertile soil. In this sense, failure to support sustainable agricultural production coupled with limited participation in international food trade may have detrimental consequences for the global environment.

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Surprisingly, Delphi experts considered the impact of this trend on the sustainability of the region to be moderate. Respondents' opinions were mildly divergent, with a standard deviation of 1.28.

According to experts, a shift towards regional and local food production would favour sustainable development of the region, would lower transport-related emissions and would have a positive impact on the local labour market. Therefore, policies enabling further development of the trend should be introduced in the region.

Quotes from survey

A change factor that could accelerate this trend is....

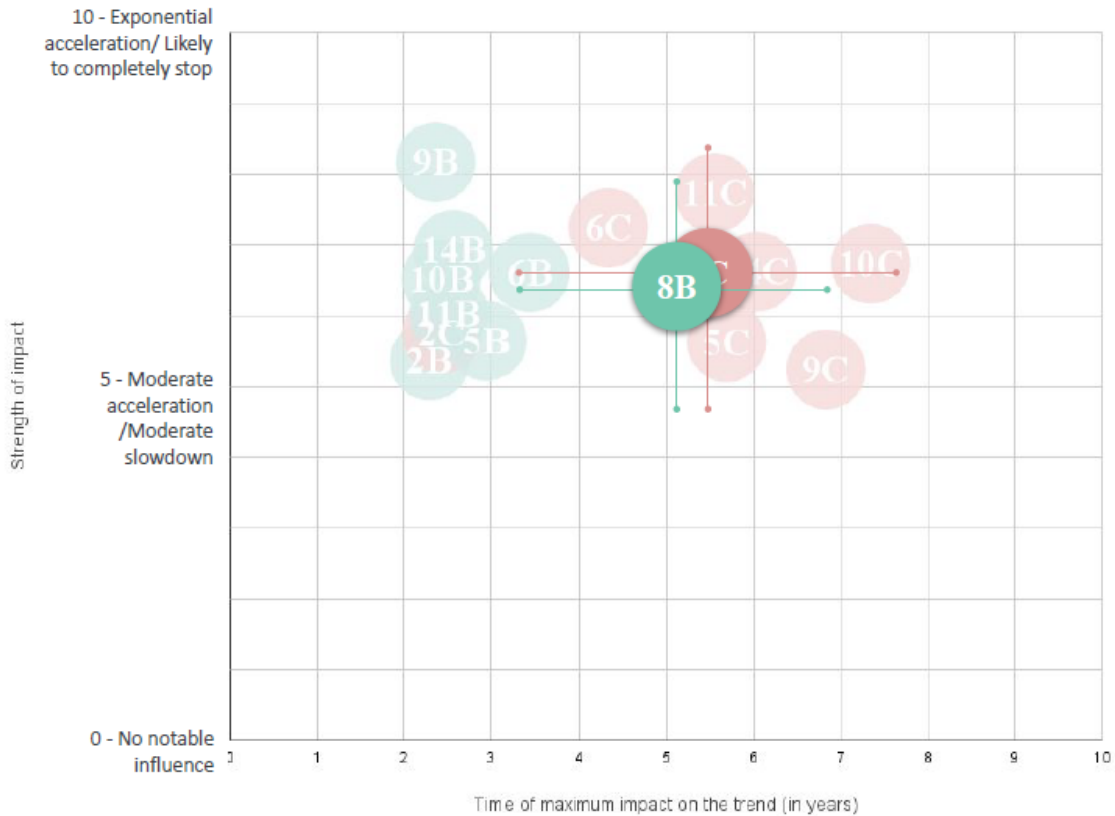


"...an increased understanding in the society that food production within a country's boundaries (i.e., regional) lessens emissions through transportation – moreover, people can find work local work with less commuting time."

Performance results for enabler and blocker of Trend 8

Trend enabler: 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)

Trend blocker: Climate change leading to unfavorable farming conditions in numerous regions



Our perspective on the results

Transition towards a circular economy in the food system may direct the trend towards sustainability due to increased demand for sustainable practices and measures to address the efficient resource use, food distribution, food waste and surplus management. Experts assess the impact of the enabler on the trend as relatively high. Respondents expect the moment of maximum enabler impact on the trend to occur in approximately 5 years.

Experts point to factors that confirm the need to transition towards a circular economy in the food system. Dependence on foreign supplies of basic food raw materials threatens food security. The consequences of such decisions can now be seen in the implications of the invasion of Ukraine, which has had a major impact on global food supplies. Experts also highlight that limiting the world's supply of basic crops will have consequences in raising food prices and as a final result, hunger in some parts of the world.

Climate change leading to unfavorable farming conditions in numerous regions hinders food security. Experts assess the impact of this blocker as slightly higher than the enabler. The time horizon over which the maximum impact of the trend blocker may occur is 5 years on average, but in this case the opinions of respondents are quite divergent, oscillating between 3 and 8 years.

Climate change is a factor that may further exacerbate the problem of the growing need for food security and self-sufficiency. Climate change is creating unfavorable conditions for farming, with a reduction in agricultural production, therefore it implies additional pressure to ensure food security and to responsibly manage a country's or a region's participation in the global food supply chains.

Quotes from survey

I think that this enabler will not significantly influence the trend, because...



"Limiting the world's supply of basic crops such as wheat, maize and sunflower oil would result in a sharp rise in food prices and hunger."

"War in Ukraine has shown the effects of dependence on imports of basic food raw materials. The Russian invasion of Ukraine will have an impact on global food security."

I think that this blocker will not significantly influence the trend, because...



"Climate change contributes to food insecurity, therefore it further increases the need for food security. I would thus say that climate change indirectly increases the need for enhancing food security, not that it slows the trend down."

Society – results

Society- trends and driving factors under assessment

Trend 9: Increasing polarization of societies

Trend definition: Politically, ideologically, economically motivated polarization of societies exacerbated by the COVID-19 pandemic.

Trend enabler: Targeted disinformation campaigns

Trend blocker: Introduction of the Universal Basic Income scheme

Trend 10: Increasing disinformation, misinformation and circulating conspiracy theories

Trend definition: The exponential growth of content that has a primary intention of deception, manipulation or societal polarization.

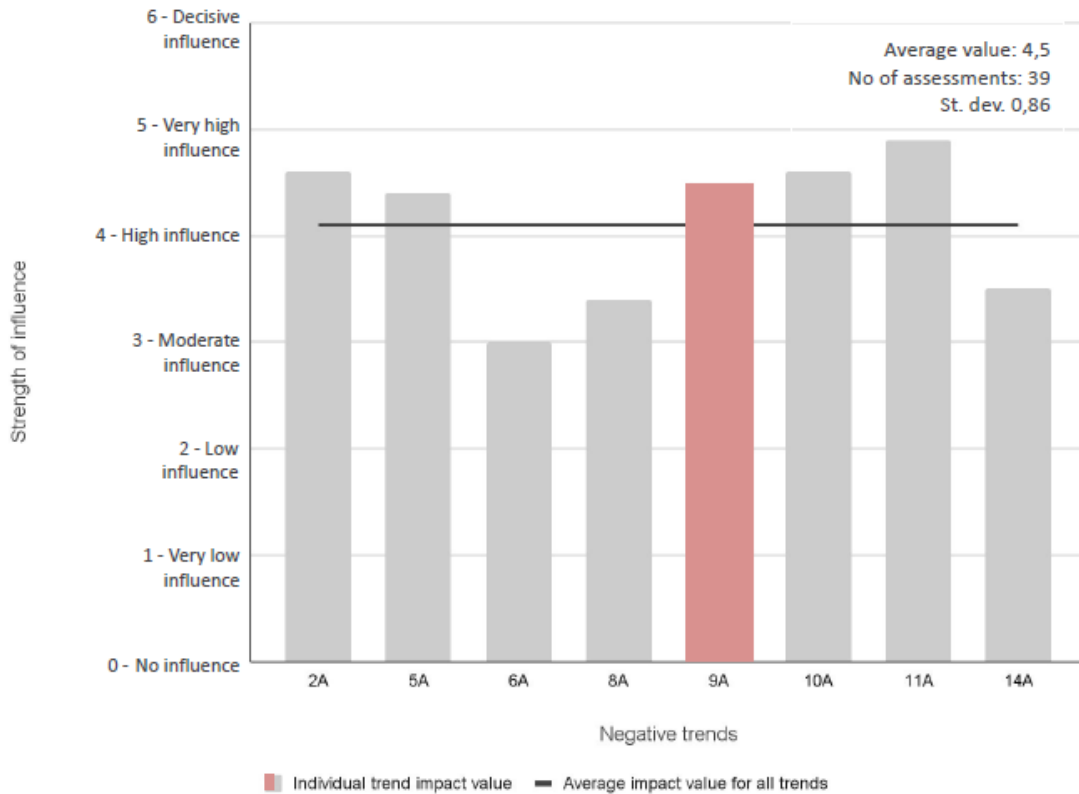
Trend enabler: Lack of adequate regulations to address spreading disinformation

Trend blocker: Highly developed civil society

Trend 9 performance results fiche:

Trend 9: Increasing polarization of societies

Trend definition: Politically, ideologically, economically motivated polarization of societies exacerbated by the COVID-19 pandemic.



Our perspective on the results

Increasing polarization of societies is one of the highest rated trends with a negative impact on the sustainable development of the Visegrad countries. Experts assessed the average impact as relatively very high. Respondents' answers are convergent, with an average standard deviation of 0.86.

Experts point out that politically, ideologically, and economically motivated polarization was exacerbated during the pandemic. Funds to compensate for losses due to the pandemic were distributed unequally in the EU, especially at the national level. According to respondents, issues related to insufficient education, in particular the lack of emphasis on critical thinking and the devaluation of democratic values, may also accelerate the trend.

Quotes from survey

A change factor that could accelerate this trend is....



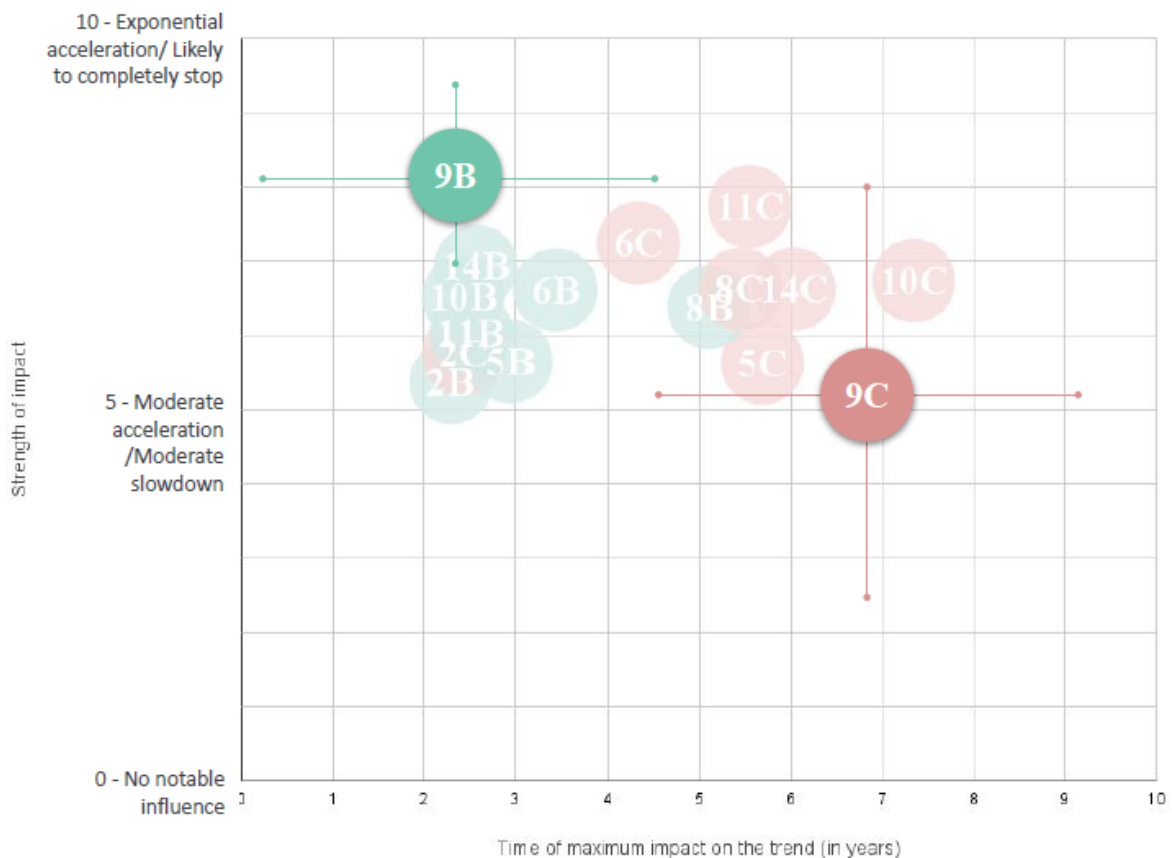
"The unequal allocation of EU funds to compensate for the economic losses due to the COVID-19 pandemic revealed and exacerbated politically, ideologically, and economically motivated polarization across the EU, with significant impact also at a countries' level."

"...the lack of education (critical thinking) and poor understanding of democratic values."

Performance results for enabler and blocker of Trend 9

Trend enabler: Targeted disinformation campaigns

Trend blocker: Introduction of the Universal Basic Income scheme



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Our perspective on the results

Targeted disinformation campaigns are an enabler that can accelerate the negative effects related to the polarization of societies. According to experts, the enabler will occur much earlier than the blocker and will have a much greater impact, which makes it a considerable threat to the stable development of the Visegrad countries. Experts unanimously assess the impact of the enabler as very high. Respondents expect that the effects of the maximum influence on the trend can already be expected in less than a year to about 4 years. Experts indicate that the further impact of the trend may be influenced by the disruption of educational systems during the pandemic, which particularly affected the younger generations.

The assessment of the trend blocker has brought largely varying opinions among experts. The impact of the introduction of the Universal Basic Income scheme is assessed by respondents between very high and relatively low, so the average estimate assumes a medium slowdown of the trend. The experts also have divergent positions regarding the time horizon of the maximum impact of the blocker on the trend. The time horizon is estimated to be between 4.5 and 9 years and this is significantly later than the expected time of occurrence of the enabler.

According to some experts, UBI will help reduce social inequalities, but it will require time to see the positive effects. Respondents warn that in the first stage of introducing this scheme, especially in highly individualized societies where success is measured by the level of income, polarization may increase. On the other hand, some experts argue that in Visegrad countries, social polarization is not mainly based on the economic level, but on political and ideological conflicts.

Quotes from survey

I think that this enabler will significantly influence the trend, because...



“The quality level of education in the younger generations has been strongly impacted by COVID-19.”

I think that this blocker will not significantly influence the trend, because...



“In V4 [countries] the polarization is not essentially based on revenues, but on the antagonism between conservative and liberal mindset.”

I think that this blocker will significantly influence the trend, because...



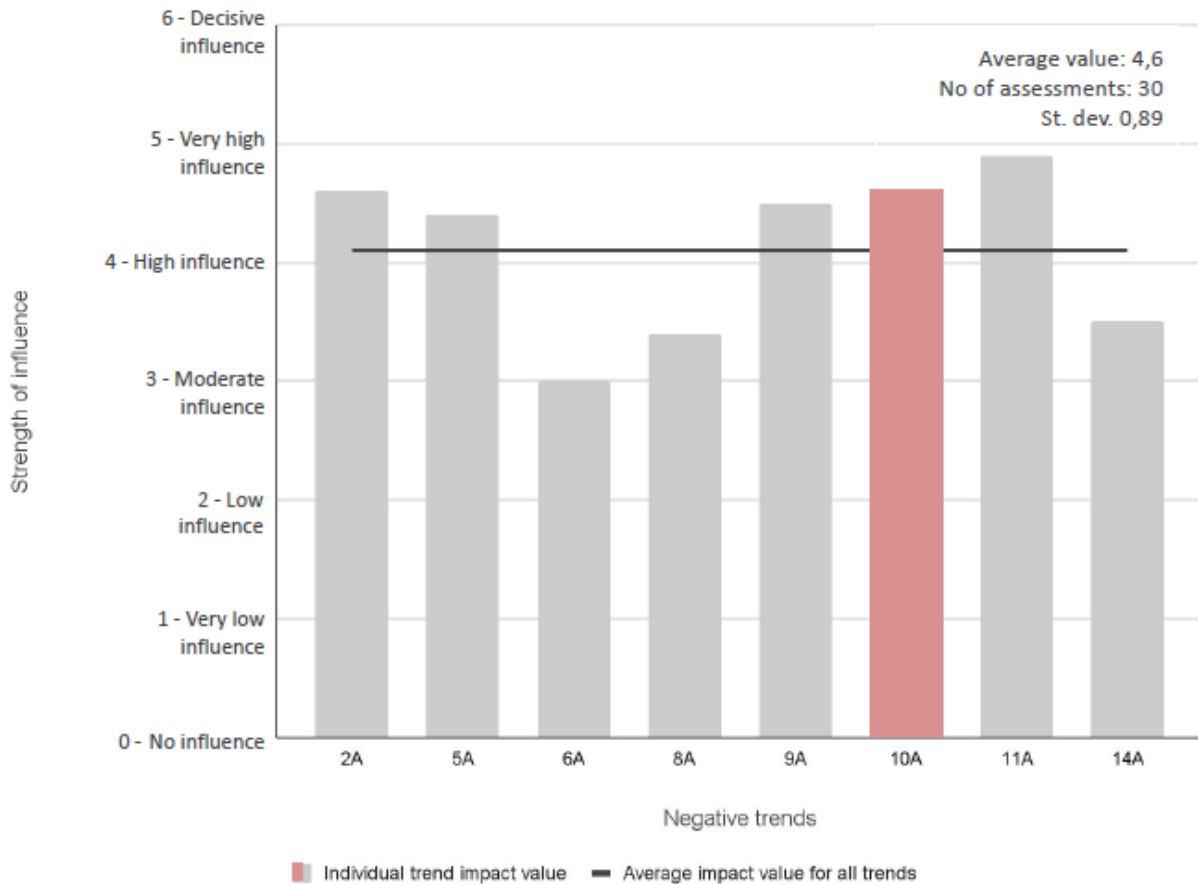
“Although the trend can accelerate the polarization in societies at the first stance (especially in highly individualized societies where success is measured by the level of income), it might eventually help to reduce the gap between the poorer and wealthier groups of society.”

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Trend 10 performance results fiche:

Trend 10: Increasing disinformation, misinformation and circulating conspiracy theories

Trend definition: The exponential growth of content that has a primary intention of deception, manipulation or societal polarization.



Our perspective on the results

According to experts, Increasing disinformation, misinformation and circulating conspiracy theories is a significant threat to sustainable development as it is one of the highest rated negative trends. Respondents expect a relatively very high impact of the trend. The divergence of expert assessments was comparatively low, with a standard deviation of about 0.86.

The acceleration of the trend may be related to the low level of education, thus the lack of emphasis on enhancing critical thinking competences. Changes at the governmental level, combined with greater respect for democratic values, may play a particular role in slowing down the trend. In addition, respondents point out that a large role in reversing negative trends related to disinformation is played by

general media coverage, which should be substantive and impartial, which will contribute to the increase of public trust.

Quotes from survey

A change factor that could accelerate this trend is...



"...lack of education and poor critical thinking."

A change factor that could slow down this trend is...



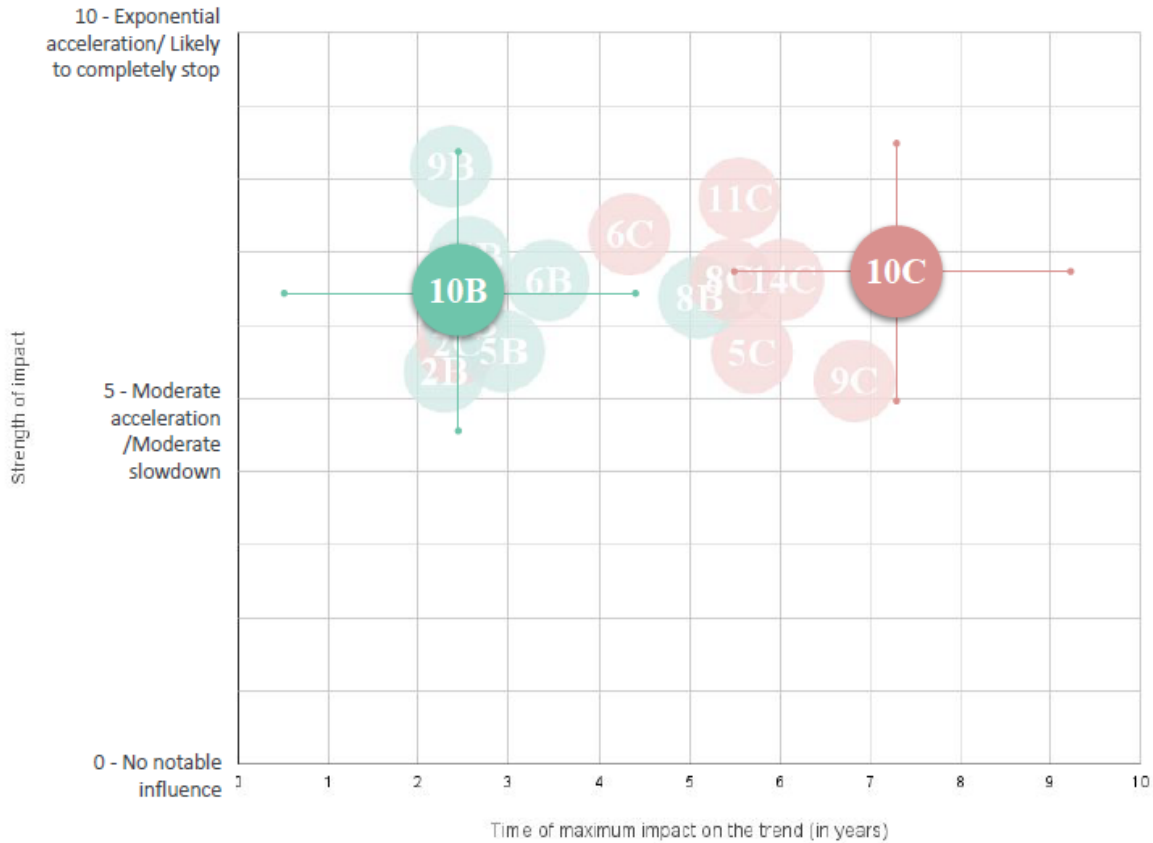
"...media that is less about profit but more about informing to build trust in the public's eye."

"...governments that favour highly democratic values."

Performance results for enabler and blocker of Trend 10

Trend enabler: Lack of adequate regulations to address spreading disinformation

Trend blocker: Highly developed civil society



Our perspective on the results

Lack of adequate regulations to address spreading disinformation is a factor that in the short term (next 5 years at most) may accelerate the negative impact of increasing disinformation. At the same time, experts expect this enabler will have a relatively high impact on the trend, and thus Visegrad countries should pay special attention to this factor.

Several experts recommend caution so that the increase in regulation does not lead to an increase in censorship, reducing the freedom of speech and thought, which would be at least as dangerous as misinformation. Nevertheless, experts put forward the concept of algorithmic accountability and transparency, which requires e.g. social media platforms to be open about the purpose, structure and underlying actions of the algorithms used to search for, process and deliver information. Experts underline the threat of expanding digital dictatorship and recommend, “it is necessary to ensure access to diverse information, increasing peoples' knowledge and power of making better informed choices”. In addition, respondents highlight that regulations may not be able to slow down the trend on their own, so an emphasis on education and general public awareness concerning the means of disinformation is still necessary.

According to experts, the blocker i.e. highly developed civil society is able to slow down the growing disinformation to a relatively high degree, but its maximum impact on the trend will only be visible in the second half of the 2020s, which is much later than the impact of the enabler accelerating this negative trend.

On the one hand, experts emphasize the positive aspects associated with civil society, but nevertheless respondents believe that the achievement of civil society status is comparatively distant in time, and will happen when society realistically places more emphasis on humanistic, rather than economic, values.

Quotes from survey

I think that this enabler will not significantly influence the trend, because...



"The regulations will not replace awareness and education."

I think that this blocker will not significantly influence the trend, because...



"[We need] a society that is based on human values and not economic values – and it seems the latter is what we understand right now as a civil society"

Education - results

Education - trends and driving factors under assessment

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

Trend definition: Although progress has been made in ensuring access to equitable and quality education through all stages of life in V4 countries, on average, they still fall behind better performing EU regions in terms of (Eurostat): achievement in reading, mathematics or science; tertiary educational attainment, adult participation in learning.

Trend enabler: Online education and learning (e.g. due to pandemics)

Trend blocker: High levels of funding for the education sector

Trend 12: Increasing emphasis on sustainability-oriented competences in educational programmes on all levels

Trend definition: The growing need for people to improve and develop the knowledge, skills and attitudes to live, work and act in a sustainable manner has driven the uptake of policy actions (European Green Deal) and development of green competence frameworks for education programmes across the EU.

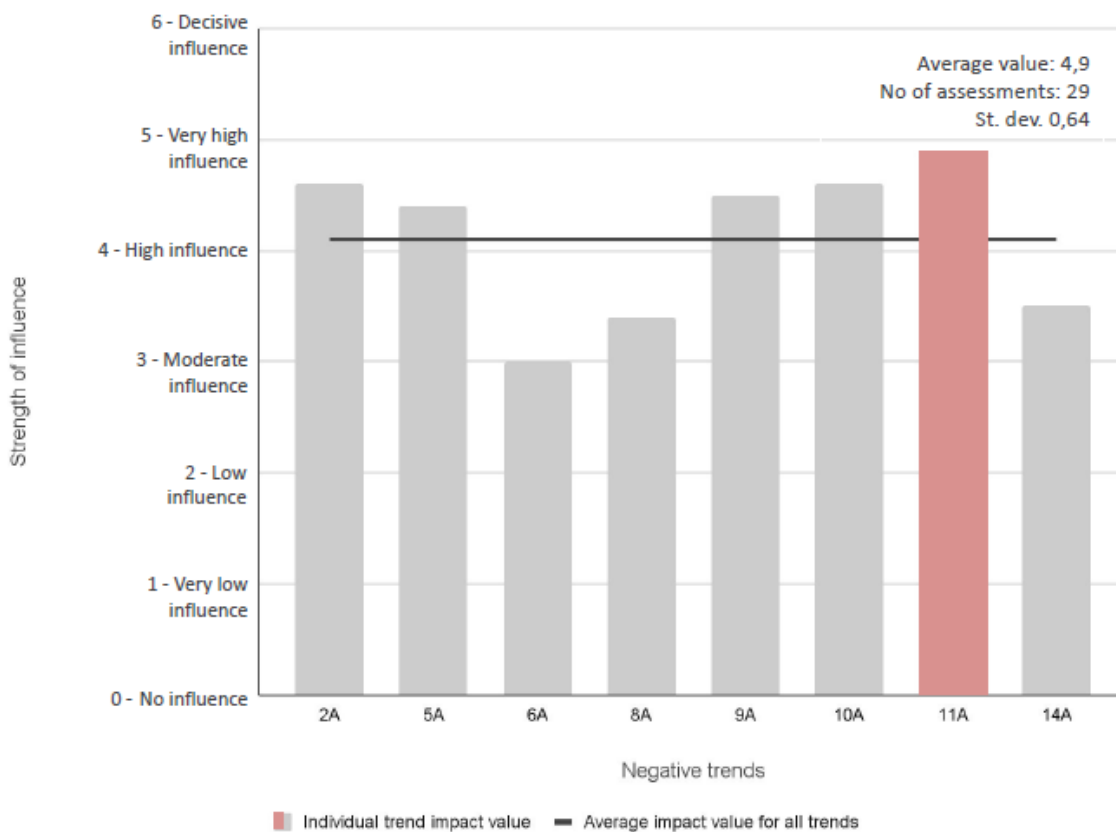
Trend enabler: Budgetary support (on the state and EU level) for sustainability oriented programmes

Trend blocker: Anti-green movements organizing disinformation campaigns (concerning climate change)

Trend 11 performance results fiche:

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

Trend definition: Although progress has been made in ensuring access to equitable and quality education through all stages of life in V4 countries, on average, they still fall behind better performing EU regions in terms of (Eurostat): achievement in reading, mathematics or science; tertiary educational attainment, adult participation in learning.



Our perspective on the results

Among the negative trends, the persisting gap in quality of education between the V4 countries and better performing EU states may have the greatest impact on the sustainable development of the V4 countries. The level of convergence of experts' opinions is high (st. dev. 0.64).

According to the respondents, this negative trend can be reversed by increasing the degree of internationalization of education, starting from secondary school.

Quotes from survey

A change factor that could slow down this trend is...

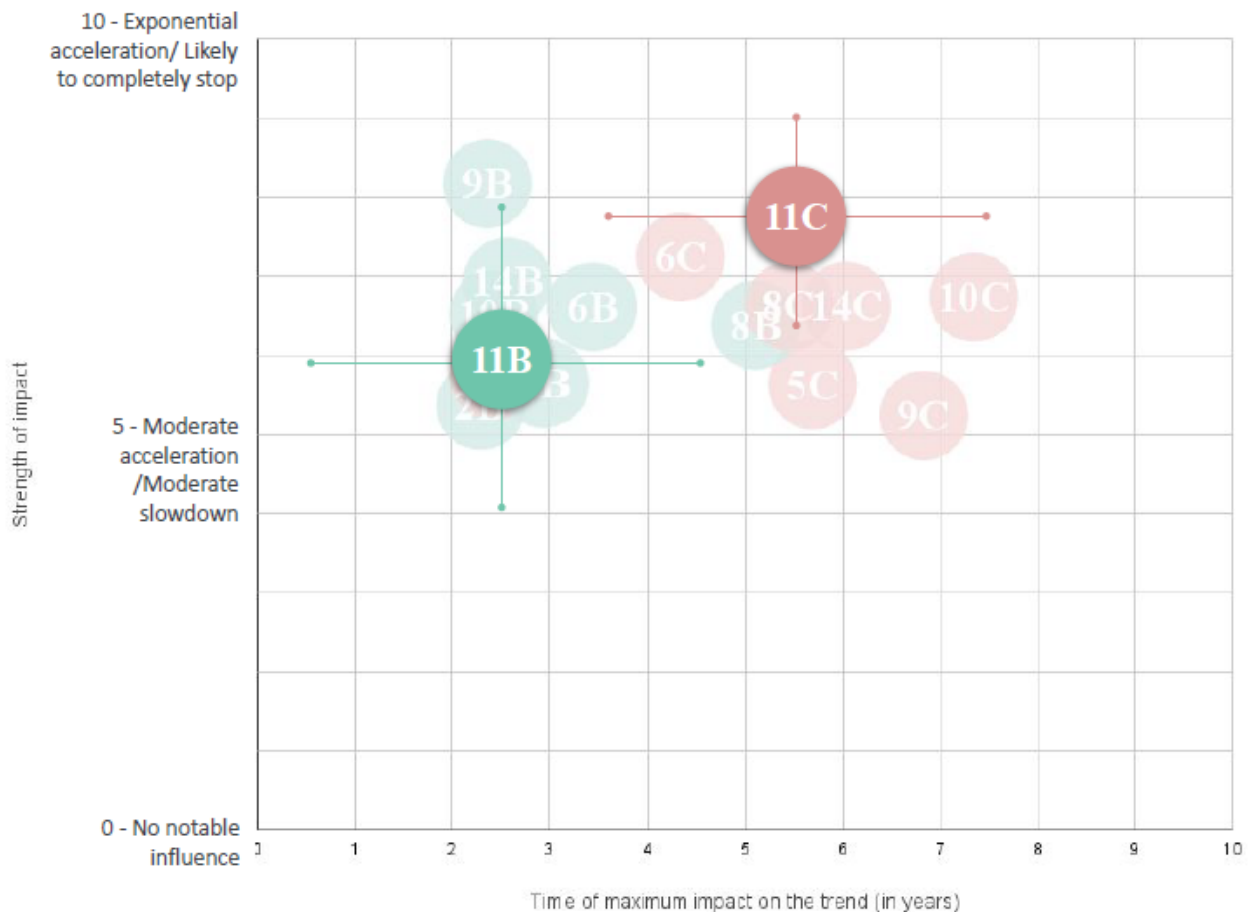


“...more direct involvement of the EU in education (e.g. more Erasmus and international education [programs], even in high school).”

Performance results for enabler and blocker of Trend 11

Trend enabler: Online education and learning (e.g. due to pandemics)

Trend blocker: High levels of funding for the education sector



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Our perspective on the results

Online education and learning (e.g. due to pandemics) may result in a moderate acceleration of the negative trend. Experts expect that the maximum impact of the enabler on the quality of education between the V4 may appear within the next few years (one to five years).

Experts note both opportunities and obstacles related to the impact of the enabler on the trend. On the one hand, the effects related to remote learning have already exacerbated inequalities in access to education. On the other hand, some respondents argue that remote learning opens up new opportunities related to education.

High levels of funding for the education sector have a greater positive impact on the trend than the enabler and could slow it down significantly. According to experts, the time of maximum impact on the trend will be in about 4-7 years.

This blocker of the negative educational trend can successfully counteract it, if the funds are distributed appropriately, highlight the experts. In addition to that, they propose that the authorities in the Visegrad region consider making a career in the education sector more attractive, also in terms of salary. Furthermore, investing in school infrastructure, such buildings, furniture and equipment that contribute to the learning environment. Finally, experts point to the emergence of cascading effects in the long term. High investment in education, which aims to nurture and attract talents, is also a signal for investors and thus can bring many economic benefits for the economy in the longer term.

Quotes from survey

I think that this enabler will not significantly influence the trend, because...



"After the first shock due to the pandemic, online education opens new possibilities of education."

I think that this enabler will significantly influence the trend, because...



"...it deepened already existing inequalities in access to quality education."

I think that this blocker will significantly influence the trend, because...



“Education systems can improve when teaching and research become more elevated and desirable jobs in society. An attractor is higher pay, and higher pay means higher budgets. The quality of educational facilities is also important in terms of attractive and inspiring buildings. Furthermore, a nation that invests in its education system signals to foundations, private grant makers, that they are serious about developing their education systems - which can lead to cascade effects.”

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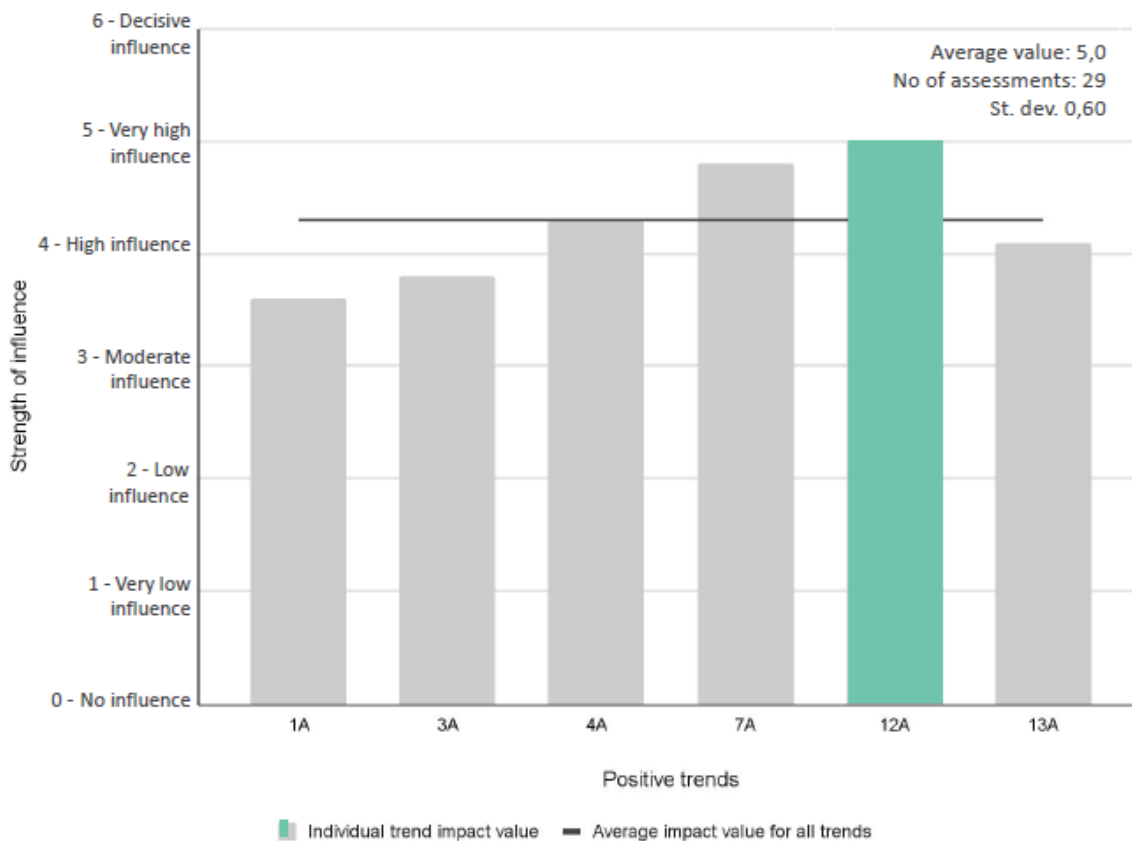
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Trend 12 performance results fiche:

Trend 12: Increasing emphasis on sustainability-oriented competences in educational programmes on all levels

Trend definition: The growing need for people to improve and develop the knowledge, skills and attitudes to live, work and act in a sustainable manner has driven the uptake of policy actions (European Green Deal) and development of green competence frameworks for education programmes across the EU.



Our perspective on the results

Increasing emphasis on sustainability-oriented competences in educational programmes on all levels has a very high impact on the sustainability of the Visegrad countries. It is the highest rated positive trend. A low standard deviation (0.60) implies a high convergence of experts' opinions.

Experts suggested that a slowing down of the trend may be caused by political decisions on the shape of the education systems; they referred in particular to the recurring changes of the teaching curricula, methods and structure of educational institutions as well as the politicization of education.

Quotes from survey

A change factor that could slow down this trend is...

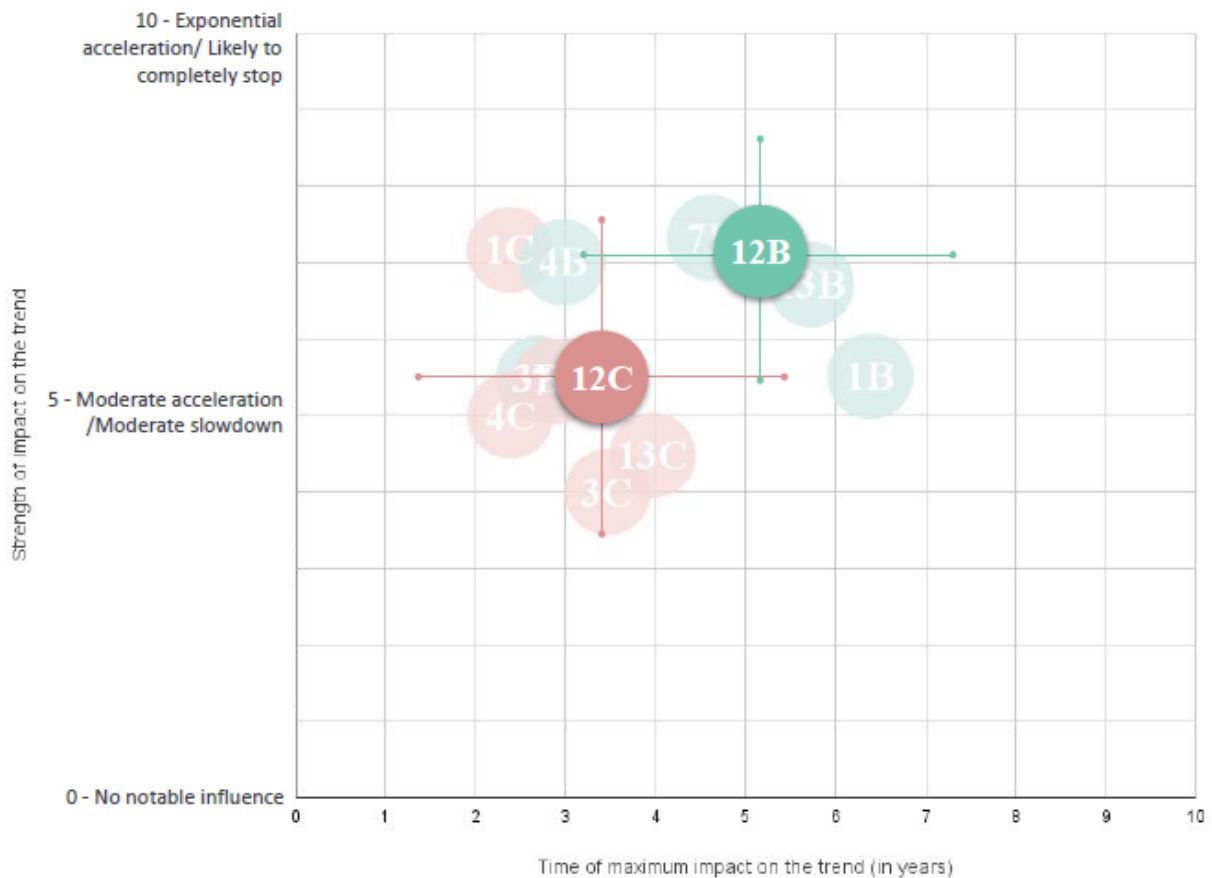


"... reforms of education trending to conservative methods and ideas."

Performance results for enabler and blocker of Trend 12

Trend enabler: Budgetary support (on the state and EU level) for sustainability oriented programmes

Trend blocker: Anti-green movements organizing disinformation campaigns (concerning climate change)



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Our perspective on the results

Experts expect the trend enabler i.e. budgetary support for sustainability oriented programmes to have a strong impact on the trend leading to the enhancement of sustainability-oriented competences in the society. They assess that this enabler could lead to a significant acceleration of the trend, but its time of occurrence is rather delayed (the enabler would achieve maximum influence on the trend in c. 5 years). Experts point out that this enabler will contribute to sustainable development of the region by mitigating the societal opposition to change.

Blocker of the trend - anti-green movements organizing disinformation campaigns - received lower assessments in terms of strength of its influence on the trend. Experts estimated that it would moderately slow down the trend, while the time needed to influence the trend at maximum is slightly lower than in the case of the enabler (c. 3 years).

Experts emphasize the importance of education, but at the same time suggest that before educational programmes are introduced, the population may fall victim to anti-green campaigning due to a lack of knowledge, which exacerbates the fear of change.

Quotes from survey

I think that this enabler will significantly influence the trend, because...



"Education is crucial in mitigating the opposition to change."

I think that this blocker will significantly influence the trend, because...



"In the first years the anti-green campaigns will appeal to an uneducated population that fears change."

Health - results

Health - trends and driving factors under assessment

Trend 13: Growth of artificial intelligence (AI) use in the healthcare industry

Trend definition: The use of AI in the healthcare system continues to grow. It encompasses uses of AI in both operational and clinical settings.

Trend enabler: Cost savings (and improved efficiency) thanks to AI

Trend blocker: Lack of social acceptance of AI technology (concern over AI's modes of operation and data gathering)

Trend 14: Growing number of people suffering from mental health issues

Trend definition: Prevalence of those experiencing symptoms of at least one current mental disorder has been rising. The trend has been reinforced by the COVID-19 pandemic, in which the prevalence of depressive disorder and suicide risk tripled and anxiety disorders doubled.

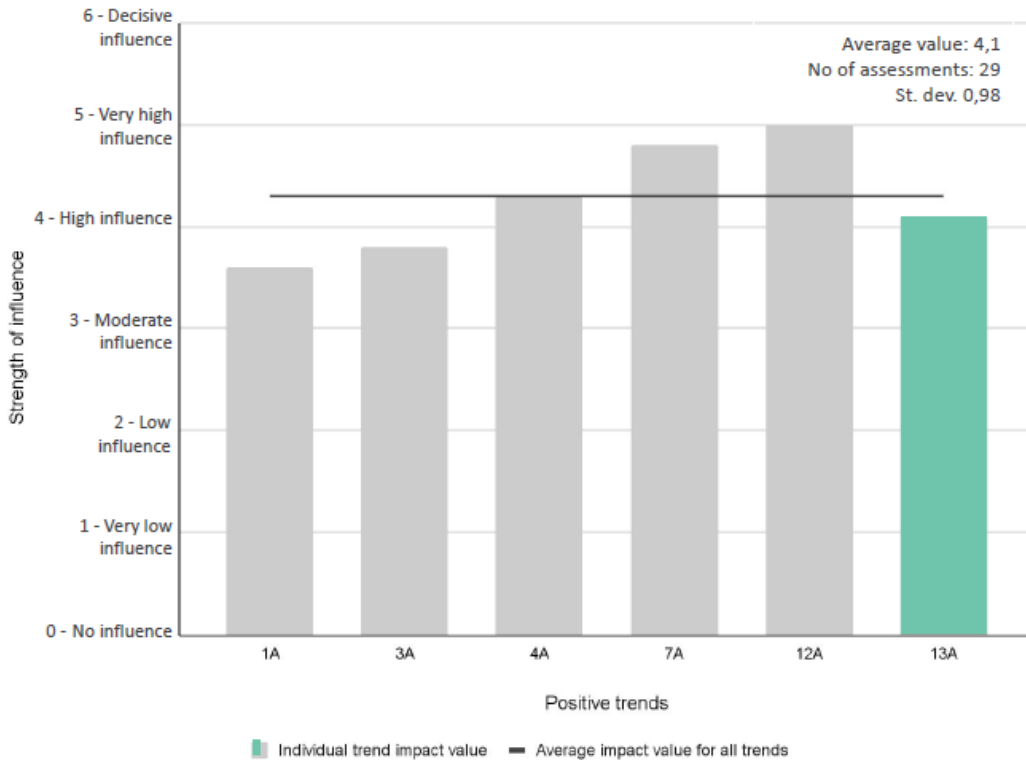
Trend enabler: Extensive time spent online (resulting in i.a. social media pressure and reduced face-to-face interactions)

Trend blocker: Rebuilding local communities (e.g. communities of neighbours, local youth, seniors, etc.)

Trend 13 performance results fiche:

Trend 13: Growth of artificial intelligence (AI) use in the healthcare industry

Trend definition: The use of AI in the healthcare system continues to grow. It encompasses uses of AI in both operational and clinical settings.



Our perspective on the results

Experts expect the growth of artificial intelligence (AI) use in the healthcare industry to have a high positive impact on sustainable development in the Visegrad countries. The trend assumes that the use of AI in the healthcare system continues to grow, that encompasses uses of AI in both operational and clinical settings. Divergence of experts' opinions was relatively low, with standard deviation of 0.98.

Respondents indicate change factors which could influence this trend. Experts emphasize that the use of artificial intelligence in the healthcare industry may be a necessity due to the lack of sufficient medical staff. In addition, the personnel should be educated to cope in tandem with AI solutions.

Quotes from survey

A change factor that could accelerate this trend is....



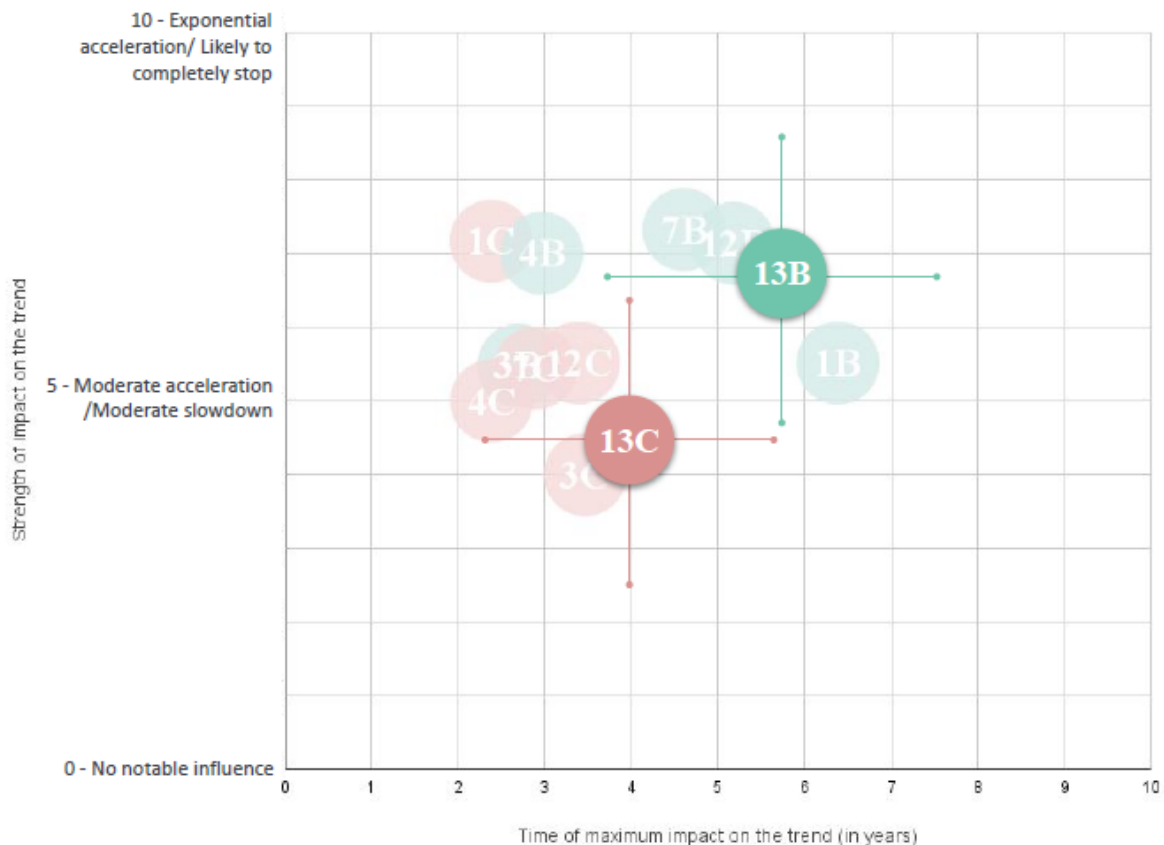
"...education of medical staff working alongside AI."

"...the lack of health service staff."

Performance results for enabler and blocker of Trend 13

Trend enabler: Cost savings (and improved efficiency) thanks to AI

Trend blocker: Lack of social acceptance of AI technology (concern over AI's modes of operation and data gathering)



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Our perspective on the results

Enabler of the trend - cost savings and improved efficiency thanks to AI has a relatively high impact on accelerating the implementation of the use of artificial intelligence in the healthcare industry. Experts estimate that the expected time within the enabler would achieve maximum influence on the trend is c. 6 years.

Experts predict that the decline in the quality of services due to the lack of medical personnel and the cost of education could have an impact on accelerating the trend.

The trend blocker assumes the lack of social acceptance of AI technology, and according to experts, it has a moderate impact on the trend. Respondents estimate that the point at which the blocker can maximally slow the growth of artificial intelligence use in the healthcare industry will occur in about 4 years, so the blocker may come faster but its strength is weaker compared to the enabler.

However, some experts point out that the lack of public acceptance of the use of AI in healthcare may lose its relevance if there are not sufficient medical staff. Therefore, AI-enabled medical service will be a necessity rather than a preference.

Quotes from survey

I think that this enabler will significantly influence the trend, because...

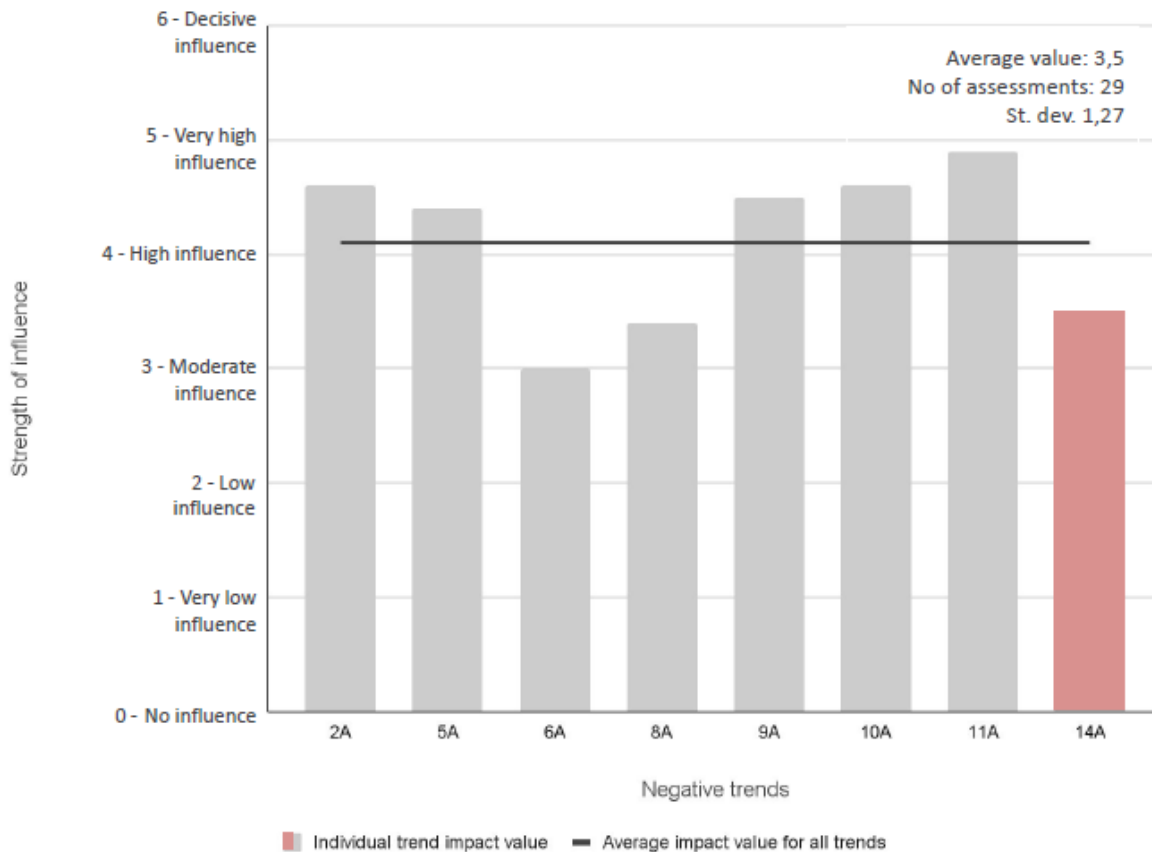


"The lack of staff and the cost of education will impact the quality of service."

Trend 14 performance results fiche:

Trend 14: Growing number of people suffering from mental health issues

Trend definition: Prevalence of those experiencing symptoms of at least one current mental disorder has been rising. The trend has been reinforced by the COVID-19 pandemic, in which the prevalence of depressive disorder and suicide risk tripled and anxiety disorders doubled.



Our perspective on the results

The second trend in the health category assessed by the Delphi experts was the growing number of people suffering from mental health issues. Experts opined that it might have a moderate negative influence on the development of Visegrad countries. The convergence of experts' opinions is reflected in a relatively low standard deviation (1.27).

A factor that may exacerbate this trend is the disregard or neglect of the relevant policy-making response, which may result in limited availability of modern, effective diagnosis and treatment options. In addition, experts point to the social stigma around mental illness and its treatment as being a factor that definitely intensifies the scale of the problem in the region.

Quotes from survey

A change factor that could accelerate this trend is...

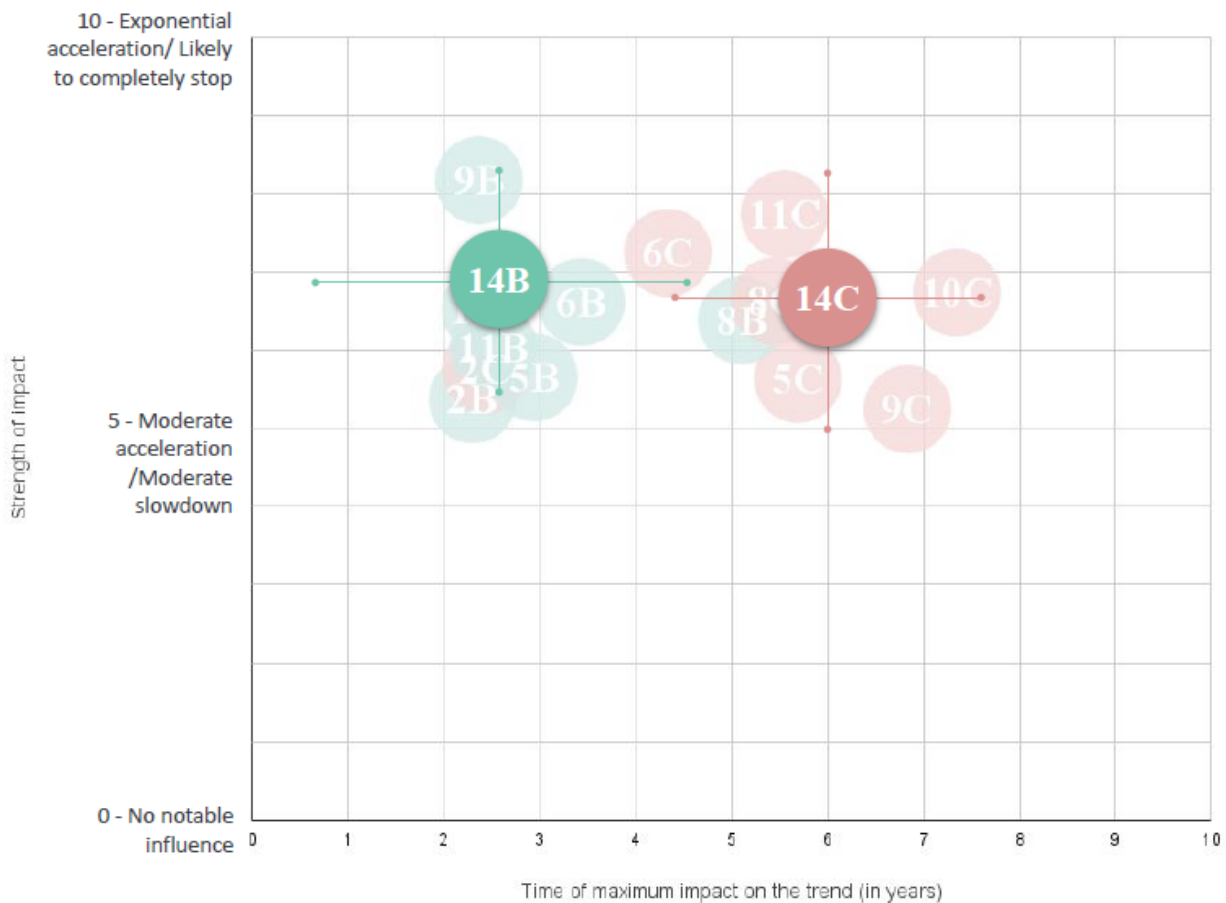


"Lack of awareness in policymaking and a "shaming" approach toward mental health issues."

Performance results for enabler and blocker of Trend 14

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

Trend blocker: Rebuilding local communities (e.g. communities of neighbours, local youth, seniors, etc.)



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Our perspective on the results

Extensive time spent online resulting in social media pressure and reduced face-to-face interactions could have a high impact on accelerating the trend. Experts estimate the time of greatest impact of enabler on further increase in prevalence of social diseases to be about 2.5 years. However, their opinions are slightly divergent, ranging from nearly a year to 5 years.

Experts point to the connection of this phenomenon with growing popularity of remote working, resulting in more time spent online.

When assessing the blocker of this negative trend, namely the rebuilding of local communities, experts suggest that its strength is equally high as the enabling factor; however the time of occurrence will happen much later, in about 6 years.

Several Polish experts point to an increase of citizen participation in local community affairs, which consequently will have a positive impact on the trend. Other experts point to the financial assistance offered by the V4 Group to support democracy in the neighbouring countries (Belarus, Ukraine, Western Balkans) as ways of reinvigorating local values of democracy and laying the groundwork for sustainable socio-economic co-operation opportunities in the future.

Quotes from survey

I think that this enabler will significantly influence the trend, because...



“The pandemic developed a trend of [popularized] remote working and increased time spent online.”

I think that this blocker will significantly influence the trend, because...



“Efforts toward local democracy and involvement in community life are growing”

“By extending the support of V4 countries for democracy abroad, new options for domestic citizen engagement and community building will be created”

Sustainable innovation pathways towards post-COVID recovery

Map of Innovation Pathways

The creation and design of the innovation pathways was conducted under the principle of the easiest way to select and communicate the most important strategies for sustainability in the post-Covid world. This idea is reflected in the rather complex and unlikely chart - Map of the Innovation Pathways.

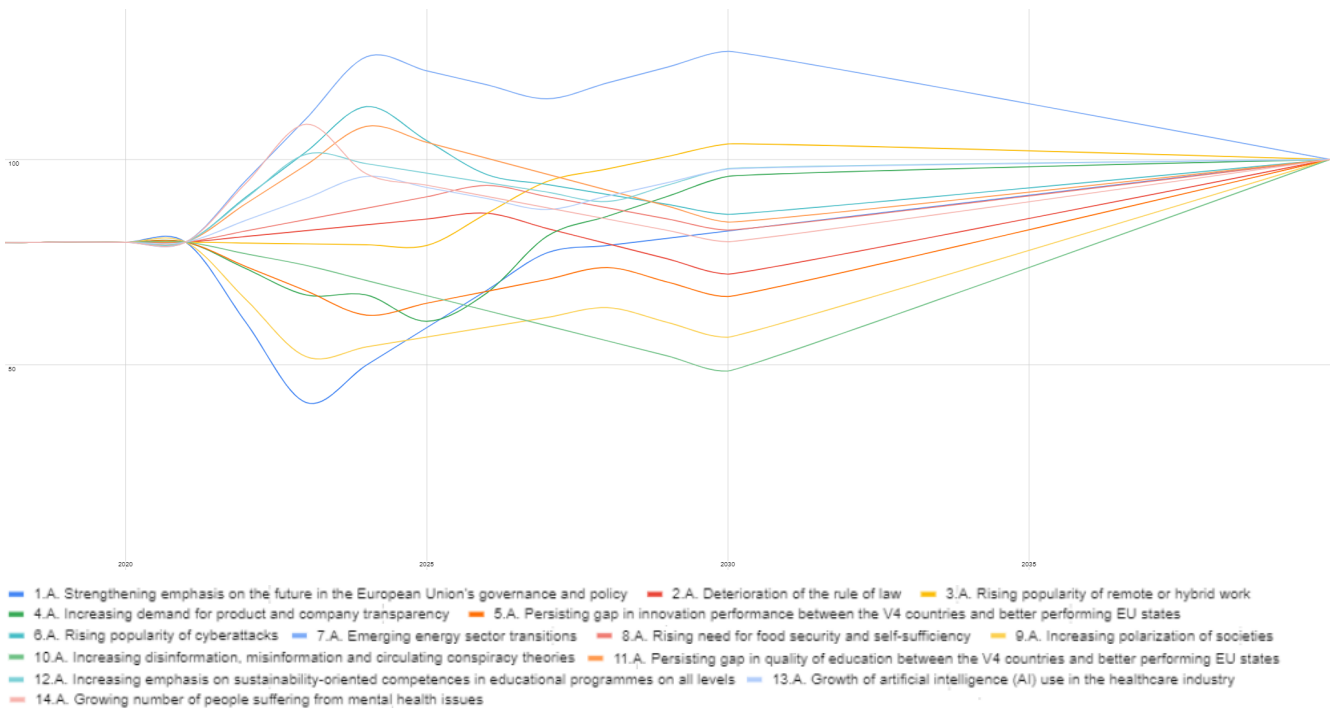


Figure 10. The Map of the Innovation Pathways

The Sustainable Development Goals index was used to assess the entry level of sustainability in the V4 group. Table 6 presents the levels of the SDGIndex in all of the V4 countries according to the Sustainable Development Report 2022 (Sachs et al 2022) in the last 4 years.

Country	2018	2019	2020	2021
Poland	80.32	80.55	80.19	80.22
Czech	81.14	81.23	81.23	81.26
Slovakia	79.07	79.14	79.41	79.43
Hungary	78.43	78.74	78.58	78.65
Average	79.74	79.92	79.85	79.89

Table 6. Levels of the SDG Index in the V4 countries 2018-2021

Each line on the Map of the Innovation Pathways chart represents the development of one of the fourteen most influential trends assessed in the Delphi survey. They are presented as relation of the V4 group's SDG Index level in the years of 2018 to 2040. All of the pathways end in the one and the same point. This is the point for the year 2040 and the SDG index on the level 100 - the maximum possible score. This is because of the assumption that has been made when creating the pathways, that in 2040 - no matter what happens - the V4 group will achieve total sustainability. Though the analysed trends, as well as their enablers and blockers were assessed in the time horizon of 10 years, the innovation pathways were meant to show the path necessary for the V4 countries to take if they want to achieve the desirable level of sustainability in the year 2040 - and this is exactly why that assumption was made.

For example, Figure 11 illustrates the development of the “Increasing demand for product and company transparency” trend. It is the sum of three variables assessed in the Delphi survey:

- The level of influence of the analysed trend on the V4's sustainability (What is the influence of Increasing demand for product and company transparency on the V4's sustainability?)
- The level of influence of the trend's enabler on the V4's sustainability (What is the influence of the Increased awareness concerning health and nutrition on the V4's sustainability?)
- The level of influence of the trend's blocker on the V4's sustainability (What is the influence of the Economic crises and rising inflation on the V4's sustainability?)

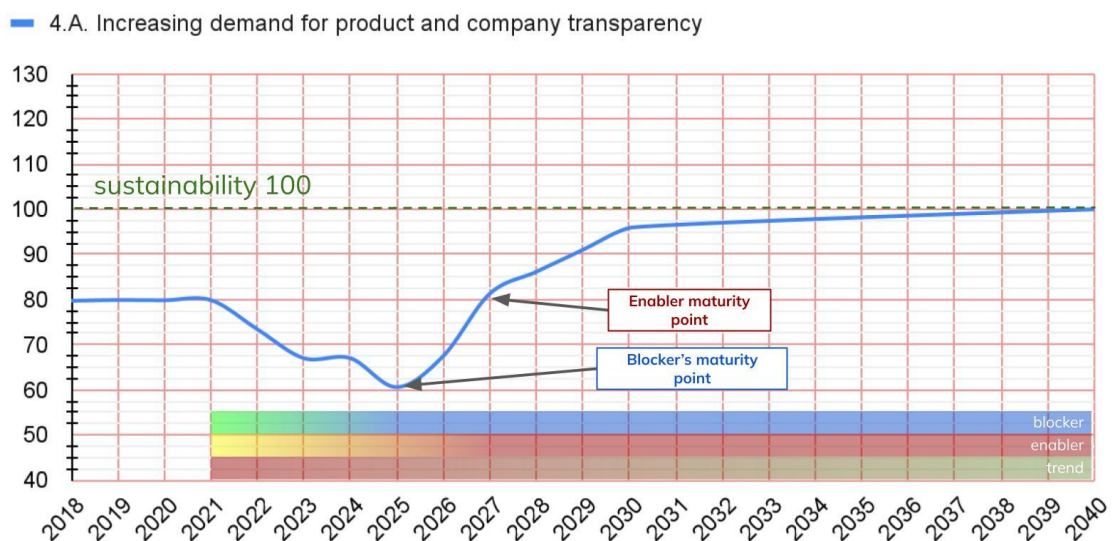


Figure 11. Development of the “Increasing demand for product and company transparency” trend 2018-2040

The input of the amount of influence on the overall sustainability from each of the three interdependent variables changes in time depending on the type of the variable and its assessment in the Delphi survey. The boxes “Enabler maturity point” and “Blocker’s maturity point” are highlighting the data points on the chart, in which each of the sub-trends (enabler and blocker) reach maturity. The placement of these points closely resemble the assessments made by experts during the Delphi survey. The influence on the overall sustainability of the trend was modelled as the linear function, thus in each case it reaches its

maturity in 2040. The three gradient color strips at the bottom of Figure 11 represent times of maturation.

In the case of some trends, the level of overall sustainability reaches the SDG Index level of over 100 points, as it is for example the case with Emerging energy sectors transitions trend shown in Figure 12. This is not meant to signify that the level of total sustainability can exceed 100 and it should not be interpreted this way. It is rather to show the strength of potential influence of specific enablers and blockers.

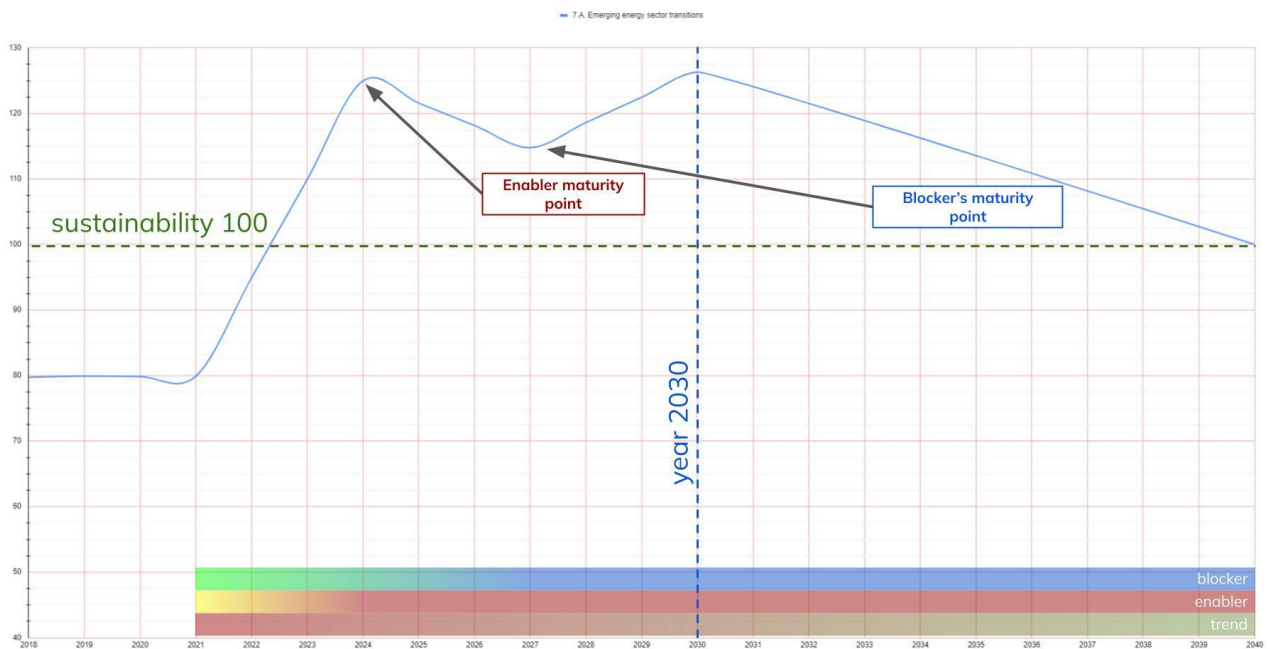


Figure 12. Influence on sustainability of the trend “Emerging energy sectors transitions”

Figure 12 illustrates clearly that the combined influence of the enabler and the trend itself is much stronger than the negative impact of the blocker. This points to the conclusion that attempts supporting the trend’s enabler are much more effective than attempts to neutralise the blocker.

Analysis of the Map of Innovation pathways

The map presented in Figure 10 includes a complex set of different information, making it dense and hard to understand at first glance. By simplifying the chart, some of the information becomes more visible. The first conclusion that comes from analysis of the simplified Map is the overall influence of trends, blockers and enablers, as shown in Figure 13.

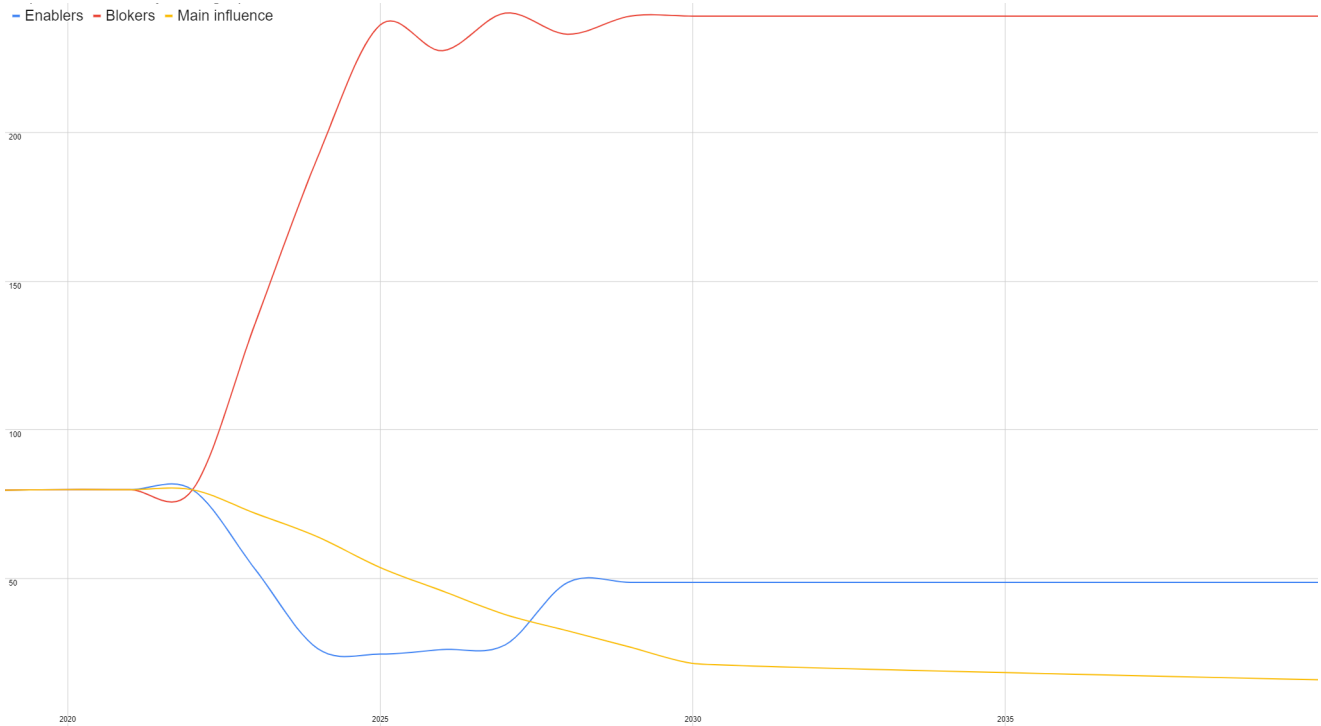


Figure 13. Simplified Map of Innovation pathways - overall influence of trends, blockers and enablers on sustainable development in the V4 countries 2018-2030.

What is shown in this chart is that according to experts’ knowledge and assessment **the blockers with positive impact have much higher influence on sustainability than blockers with negative impact**. The second fact is that **the influence of trends with negative influence on V4’s sustainability is much stronger than the one of positive ones**. This leads to a conclusion that the most effective **strategy for reaching the desired level of sustainability should focus on the policies built around the blockers, which neutralize or slow down negative trends**.

Top 5 most important trends

It is understood that the future post-COVID is filled with challenges when it comes to sustainability performance. Therefore, most of the identified trends on their own - even the positive ones - are unlikely to provide an impact big enough to determine the path of unfolding transformations to sustainability of the V4 region.

However, it is possible to identify the trends of the highest overall influence in 2030 as these are the ones that require special attention from policy makers. The complex Map of Innovation pathways presented in Figure 14 allows to quickly identify the trends that, according to experts’ opinions, are the most influential for sustainable development.

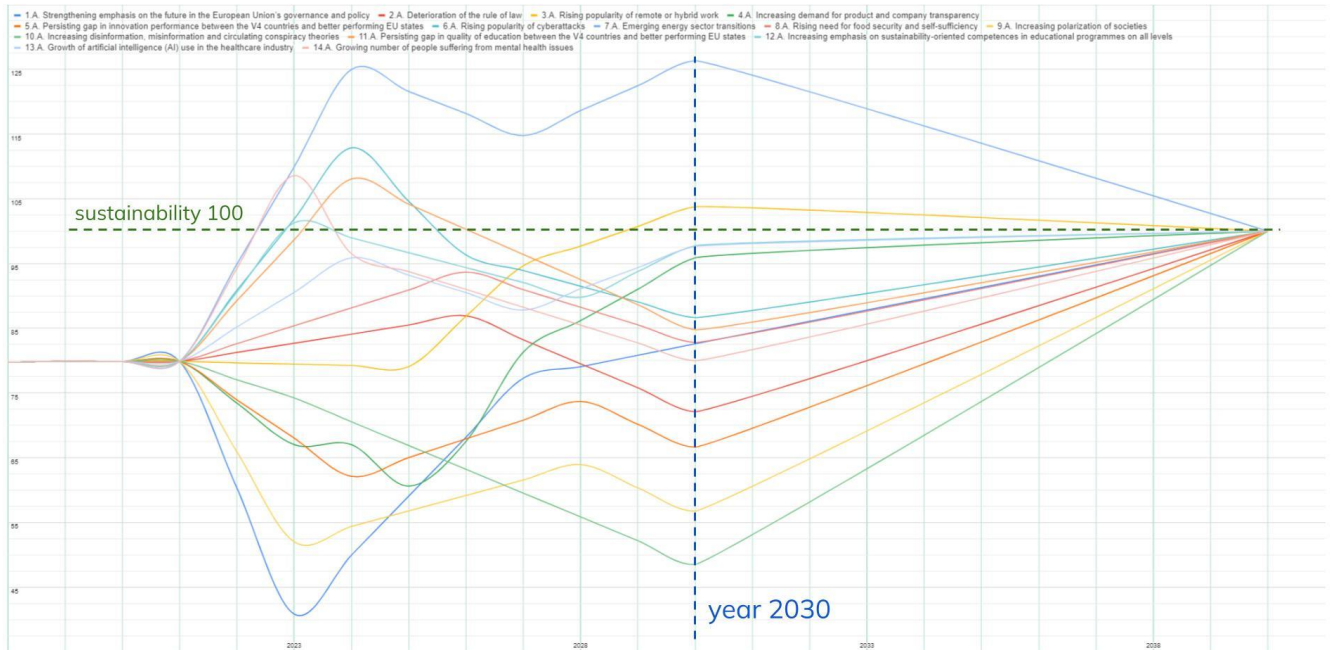


Figure 14. Map of Innovation pathways - influence of individual trends on sustainable development in the V4 countries 2018-2030.

The top 5 most important trends from the perspective of the desired sustainability performance of the V4 region are:

- Increasing disinformation and circulating conspiracy theories
- Increasing polarization of societies
- Persisting gap in quality of education between the V4 countries and better performing EU states
- Deterioration of the rule of law
- Emerging energy sector transitions

Some of the most efficient policy pathways indicated in the course of the Delphi study, that would effectively address the challenging trends in an effort to reach the desired level of sustainability, would be to:

- Develop civil society capacities,
- Revitalise education - both by higher financing and innovations (hybrid learning),
- Monitor the infosphere to limit the spreading of conspiracy theories and targeted disinformation campaigns, and to improve access to varied sources of information,
- Introduce effective socio-economic and policy innovations - Universal Basic Income as an example to test,
- Secure peace and democracy in the neighbouring countries,
- Increase the dependency of the availability of the EU funding on the beneficiary country compliance with the rule of law,
- Increase the political pressure around the world concerning climate change mitigation and adaptation,

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- Find ways to effectively deal with the social anxiety over the energy market transformation i.e. through local community building strategies, development of key skills (such as: entrepreneurial skills, critical thinking, systems thinking, future-orientation).

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About the project

Project idea and objectives

In 2021, the European Commission set an objective to bring together intelligence and foresight expertise from all Member States for cooperation on forward-looking issues relevant to Europe. It has two levels: a high-level network of “Ministers for the Future” and a citizen-based year-long debate on the future of Europe. The project is a response to this call.

The idea behind the project is to identify priorities for post-COVID-19 recovery of the V4 region, build a sense of solidarity within the region and competently contribute to the ongoing debate in the EU on the future of the region. The project is funded by the Visegrad Fund and led by 4CF The Futures Literacy Company from Poland, as well as 3 universities: from the Czech Republic (Palacky University Olomouc), Hungary (Corvinus University of Budapest), and Slovakia (University of Economics in Bratislava).

The project takes on a pan-regional outlook on enablers and blockers of the V4 region’s transformation. Discovering “unique” enablers or hidden blockers will be possible by stress-testing regional visions of the V4 against wider development scenarios of Europe and the world.

Outcomes

Our contribution to identify pathways towards sustainability of the V4 region takes place:

- ✓ **On an individual level** By exposing stakeholders of the V4 region to futures concepts and thus developing their Futures Literacy competences

- ✓ **On a regional level** By launching an online moderated Delphi collective debate on the socio-economic future of Visegrad region

- ✓ **On the EU level** By stress-testing the identified enablers of V4 sustainable future with the alternative scenarios of Europe during an online webinar.

The list of recommendations of V4 region adaptation pathways – opportunities for society, economy and policy – that will enable sustainable social and economic recovery of the V4 region and will help to neutralize negative effects of the COVID-19 pandemic, will include the shared aims towards which V4 stakeholders could navigate to when planning their sustainable futures. These findings will be communicated via a policy brief “Lessons from the Pandemic: Potentials for Radical and Sustainable Change in V4 region” and a scientific paper “Identification of innovation opportunities for V4 region until 2030: methodology and results”.

The project can be followed at: <https://4cf.pl/en/visegrad2030/>



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List of graphs

Figure 1. Experts by nationality	10
Figure 2. Number of experts by sector and country represented	11
Figure 3. Examples of organizations represented in the Delphi panel	11
Figure 4. How to read the Delphi results: a trend fiche (graph 1)	13
Figure 5. How to read the Delphi results: a trend fiche (graph 2)	13
Figure 6. The impact of positive trends on sustainability: overall results	14
Figure 7. The impact of negative trends on sustainability: overall results	15
Figure 8. The impact of enablers and blockers on positive trends: overall results	16
Figure 9. The impact of enablers and blockers on negative trends: overall results	17
Figure 10. The Map of the Innovation Pathways	74
Figure 11. Development of the “Increasing demand for product and company transparency” trend 2018-2040	75
Figure 12. Influence on sustainability of the trend “Emerging energy sectors transitions”	76
Figure 13. Simplified Map of Innovation pathways - overall influence of trends, blockers and enablers on sustainable development in the V4 countries 2018-2030	77
Figure 14. Map of Innovation pathways - influence of individual trends on sustainable development in the V4 countries 2018-2030	78

List of tables

Table 1. Trends positively impacting sustainable development of the V4 region	6
Table 2. Trends negatively impacting sustainable development of the V4 region	7
Table 3. Quality indicators of the Delphi study	9
Table 4. Enablers and blockers with positive impact on trends	18
Table 5. Enablers and blockers with negative impact on trends	18
Table 6. Levels of the SDG Index in the V4 countries 2018-2021	74

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