STRATEGIC FORESIGHT FOR THE FOREIGN AND EUROPEAN POLICY OF THE SLOVAK REPUBLIC

Risks and opportunities for Slovakia in a transforming world

We cannot predict the future, but we can prepare for it.

Ángel Gurría, former OECD Secretary-General

MINISTRY
OF FOREIGN
AND EUROPEAN AFFAIRS
OF THE SLOVAK REPUBLIC

Strategic Foresight for the Foreign and European Policy of the Slovak Republic

Risks and opportunities for Slovakia in a transforming world

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CONTENT

I. INTRODUCTION

We live in a world of uncertainty, growing instability and increasing conflict potential. The return of geopolitical rivalry accompanied by massive technological transformation has produced a highly dynamic and complex situation. In turn, this is presenting policy makers with an extremely challenging environment.

Events such as the COVID-19 pandemic, Russia's aggression against Ukraine and the great challenges of our time, such as climate change, the rise of new technologies, the energy and food crises as well as demographic change indicate that we need to think the unthinkable and be prepared for the coming changes.

It is precisely these events that point to the necessity of strategic foresight. Every day we convince ourselves that we need to paint the most extreme and darkest scenarios, so we know what to avoid. At the same time,if we want to emerge successfully from today's crises, we have to be capable of identifying opportunities – even in the middle of a crisis, for every crisis is also an opportunity for change.

IN TIMES OF RAPID CHANGE, GROWING COMPLEXITY, AND CRITICAL UNCERTAINTY, RESPONSIBLE GOVERNANCE REQUIRES PREPARING FOR THE UNEXPECTED.

OECD STRATEGIC FORESIGHT FOR BETTER POLICIES

Strategic foresight does not aim to predict the future. It is about monitoring trends, ongoing phenomena and weak signals and considering the possible implications of convergence among events observed today. Strategic foresight thus reinforces anticipatory management, so that future scenarios are always taken into account in strategic decision-making and policy-shaping. It thus serves to strengthen policy preparedness, for future success depends on the decisions taken in the here and now.

This is extremely important for Slovakia, as a small but economically, politically, and socially open country. Equally, it is just as important for the EU, of which we are a member, given its ambition to be a global player. We therefore need to keep abreast of global trends and to reduce risks and identify opportunities in a timely fashion.

This is the first time the Ministry has employed strategic foresight in the field of foreign and European policy. This publication sets out the steps involved in the strategic foresight process, from mapping weak signals and identifying the change drivers to envisioning future scenarios and formulating recommendations for policy-makers.

The recommendations are divided into five areas – Resources, Resilience, Sustainability, Consolidation and Connectivity – that form the backbone of the report, which identifies the key challenges and opportunities Slovakia will face in the coming years. The document is not a comprehensive strategy for Slovakia's development. The priority is to identify the intersecting points between Slovakia's interests and the reality of foreign and European policy. Nonetheless, the recommendations cover a number of areas outside the Ministry's primary responsibilities, which merely confirms the ever closer link between foreign and European policy and domestic policies.

Both Slovakia and Europe are facing a complex phase in their development. Strategic foresight does not equip us for the road ahead but provides us with a map indicating the most viable path and the awaiting pitfalls. The Ministry therefore plans to use the outputs of this report to prepare the Medium-Term Strategy for the Foreign and European Policy of the Slovak Republic.

II. EXECUTIVE SUMMARY

The implementation of the first strategic foresight project at the Ministry had the goal of analytically reinforcing the preparation of the Medium-Term Strategy for the Foreign and European Policy of the Slovak Republic.

Strategic foresight does not aim to predict the future. The main intention is to present policymakers with alternatives so that they can take different scenarios into account when making strategic decisions and shaping policies.

The first phase of the project, carried out in cooperation with the OECD, identified nine change drivers seen as key to Slovakia's foreign and European policy up to 2035: *1. Shift of the geopolitical centre of gravity to the Indo-Pacific; 2. Polarization and disunity of the West; 3. Decline of democracy and the growing assertiveness of autocratic regimes; 4. Technological change and the influence of global corporations; 5. Erosion of multilateralism and the move towards multipolarity; 6. Changing nature of global threats; 7. Climate change; 8. Risk of economic and financial crisis; 9. Uneven demographic development.*

The second phase, carried out in a participatory manner by the project team at the Ministry, led to the delineation of four possible future development scenarios, ranging from an emergency scenario, *World on the Edge of the Abyss, and a status quo scenario, New Cold War, to an optimistic scenario, Consolidation of the World Order,* and a transformation scenario, *New Global Consensus.*

In the final phase, recommendations were made in five areas based on the evaluation of the above-mentioned scenarios:

1. Resources; 2. Resilience; 3. Sustainability; 4. Consolidation; 5. Connectivity.

Main findings:

- Global development will be determined by the twin **green and digital transition**, including disruptive energy transformation and the emergence of new technologies. The transition will affect a wide range of relationships from the geopolitical to the local level. The security dimension is gaining prominence alongside their primary environmental, economic and technological significance.
- The geopolitical sphere will be dominated by the **search for a new or revitalised world order** following the Russian aggression in Ukraine that has undermined the foundations of European and global security and the multilateral, rules-based world order. The key features– besides the security dimension – will be the shift in the geopolitical centre of gravity from the Euro-Atlantic to the Indo-Pacific and the growing importance and influence of the Global South, as well as the increasing role of new domains of human activity – cyberspace and outer space.
- To its advantage, Slovakia is **integrated in the European and transatlantic structures,** which provides security guarantees and foreign policy leverage, opening up opportunities for Slovakia in the processes of global transformation. Thanks to its European integration, Slovakia is also receiving unprecedented financial support at a critical moment, enabling it to turn the crisis into a unique generational opportunity for Slovakia's socio-economic transformation.
- In foreign policy terms, **developments in Ukraine** will be decisive for Slovakia, as these will affect European and global dynamics and may lead to the significant redrawing of socio-economic, security and political relations in Central Europe.
- Slovakia **lags behind** in many of the issues key to fully exploiting the opportunities brought by the transformation – from human resources to economic competitiveness and innovation potential to the socio-economic and the infrastructural ecosystem to strengthening the overall resilience of state and society.

The implementation of the strategic foresight project primarily addressed the Slovak Republic's foreign and European policy interests. The aim was not to cover the government agenda in full. Nonetheless, the process inevitably highlighted the extraordinary extent to which many areas of domestic politics are connected to the pursuit of foreign policy interests. The strategic foresight report therefore goes beyond the Ministry's remit in a number of respects.

The complexity of the issues requires a more in-depth strategic foresight to be conducted in each of the areas examined. Ideally, this should carried out at a cross-government level so as to capture the complexity of future developments in inter-ministerial relationships, or to extend it to include sectoral issues not covered by the present strategic foresight.

III. MAIN CONCLUSIONS

RESOURCES

1. The management of water sources and food self-sufficiency will become increasingly important.
2. The era of fossil energy sources is over. Investment and innovation will need to focus on renewable energy sources.
3. The challenge will be to ensure sufficient critical raw materials while avoiding the kind of dependence we saw with fossil energy carriers.

RESILIENCE

4. Preparedness to anticipate and manage crises must be made a cross-cutting agenda in all national policies.
5. It is in Slovakia's interests for the promotion of democracy, rule of law and human rights to remain an integral part of Slovak foreign policy.
6. Cyber-security and protection against hybrid threats must be an integral part of strengthening the state's resilience and defence.

SUSTAINABILITY

7. Closing the innovation performance gap and developing higher value-added industries is essential for success in the era of global economic transformation.
8. The green and digital transitions are irreversible. They represent an investment for the future and an opportunity to modernise Slovakia.
9. Developing domestic human resources and attracting talented human capital from abroad will be key to raising living standards.
10. Multinational corporations will play an increasing role in meeting the needs of society.

CONSOLIDATION

11. Instead of radically rebuilding the world order, it is necessary to promote the revitalisation of the multilateral system on the basis of international law and institutions.
12. The coming period will create opportunities to consolidate the European and Euro-Atlantic area, providing the political unity of the West is maintained.
13. The dynamics of relations in Central Europe will be determined by developments in Ukraine, which have the potential to transform relations in the region and the nature of the various formats of regional cooperation.

CONNECTIVITY

14. Building a reliable and secure digital infrastructure and maintaining Europe's technological competitiveness is key to a successful fourth industrial revolution.
15. The development of North-South interconnections is key to maximising economic potential and strengthening the security of the Slovak Republic.
16. Slovakia's involvement in European cooperation creates opportunities to exploit the potential of promising areas – the Indo-Pacific, space and the Arctic.
17. Slovakia is an open economy so will have to respond to the changes in international trade brought about by the growing digitalisation, regionalisation and realignment of value chains.

IV. STRATEGIC FORESIGHT METHODOLOGY

Strategic foresight is a systematic approach to thinking about the future, where the aim is not to predict the future but to better understand it. The goal is not to come to a single conclusion but to work with several scenarios. The process consists of identifying the trends, risks and opportunities contained in future developments. The practical purpose of the strategic foresight is to help policy makers anticipate alternatives of future development so they can take different scenarios into account when making strategic decisions and shaping policy.

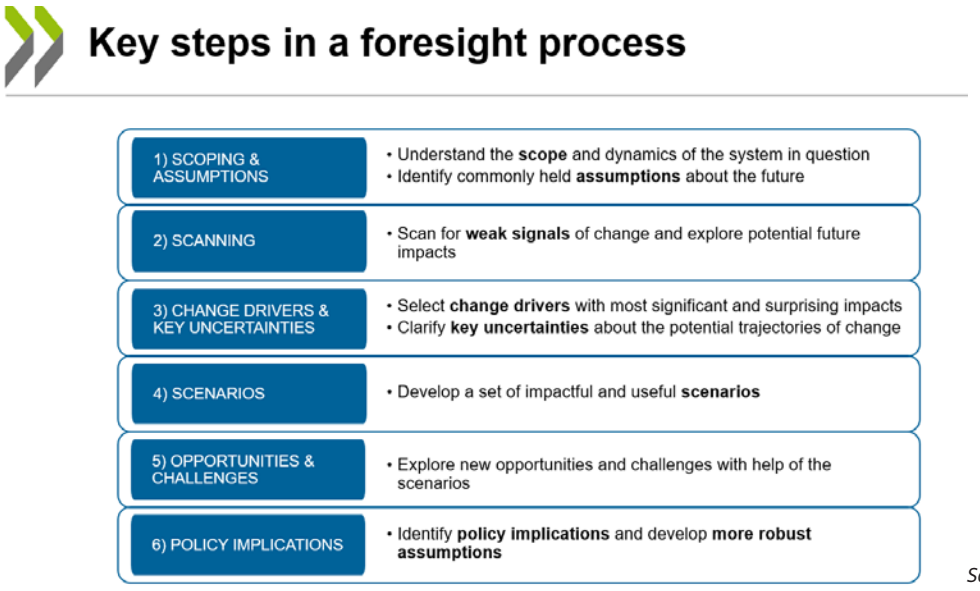
Each of these scenarios is influenced by megatrends, i.e. facts pointing to large-scale and long-term social, economic, environmental, political or technological change that may be slow to emerge but has a significant impact once in place[1]. Megatrends are influenced by accelerators, i.e. events that accelerate them, or by disruptors that slow them down. Crucially, although megatrends will influence the future in a particular direction, the key determinants that ultimately shape the future are the choices people make at a particular point in time. Therefore, strategic foresight is not limited to the analysis of megatrends, but identifies the expected opportunities and risks and makes subsequent recommendations.

Given the considerable uncertainty regarding current global developments, strategic foresight is an effective way of exploring different future development scenarios that can be used in anticipatory management and policy-making.

This is why the Ministry of Foreign and European Affairs decided to use strategic foresight when preparing the Medium-Term Strategy for Foreign and European Policy. Given the OECD's renowned expertise in the field of strategic foresight, the **Ministry** invited the **OECD** expert team to implement a joint project on the **Harnessing Strategic Foresight to Define Mid-term Priorities of the Slovak Foreign and European Policy**. The joint project was implemented during 2021. A series of five VTC seminars was held, focusing on the different stages of the strategic foresight process:

1. searching so-called weak signals (scanning), defining the scope of the research and identifying the main uncertainties (scoping) (2 June 2021);
2. identifying the change drivers (23 June 2021);
3. building future development scenarios (16 July 2021);
4. using future development scenarios (17 September 2021);
5. preparation of a joint Slovakia-OECD workshop (22 September 2021).

An informal **Strategic Foresight Task Force** was set up at the Ministry to implement the project which was then involved in the various stages of the process[2]. A total of eight Task Force meetings were held between June and December 2021.



Source: OECD

1 http://www.cspv.sav.sk/fileadmin/user_upload/Aktuality/Publikacia_GMT/Global_Megatrends_from_Slovak_Point_of_View_06.pdf

2 The Strategic Foresight Task Force members were: Head of Task Force Imrich Marton, Martin Bielik, Adriana Dubeňová, Marek Garbarčík, Peter Holý, Peter Kadvan, Róbert Kirnág, Peter Lizák, Rudolf Michalka, Peter Novák, Lea Preisinger, Juraj Privits, Marek Repovský, Ivan Surkoš, Juraj Tomáš, Lenka Turaz

In cooperation with the OECD, the Strategic Foresight Task Force defined the **scope of the research** (scoping) by examining:

a) the most important areas of uncertainty that could significantly affect Slovakia's foreign policy in the next 10 to 15 years, b) the most important factors with the potential to become geopolitical drivers in the next 10 to 15 years, c) the steps Slovakia should take so it is better prepared for the future, and d) future developments that could significantly disrupt Slovakia's foreign policy.

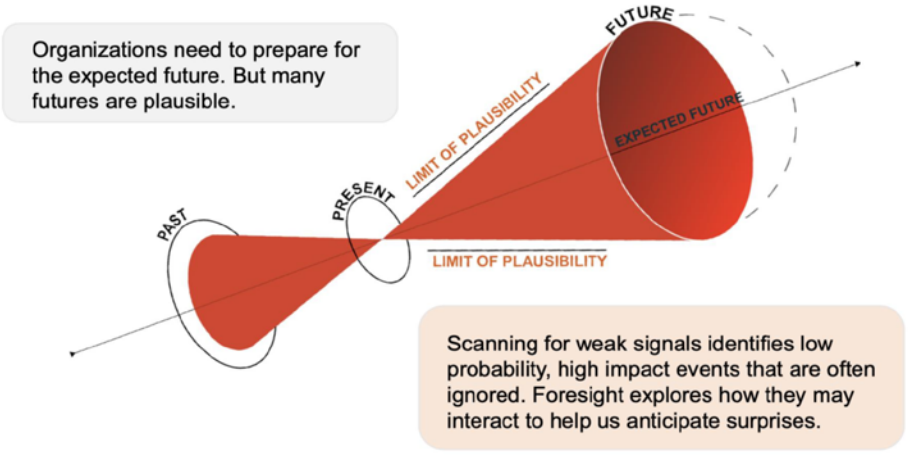
As part of this process, experts from the governmental, non-governmental and academic sectors were approached through a questionnaire, and the external resources were also researched. Ultimately, the Task Force defined 10 areas with the potential to significantly influence foreign policy development: **politics, the environment, economy, energy, social development, security, technology, the law, connectivity and values**.

In these areas the Task Force then **searched for *weak signals* (scanning)** – that is indicators of upcoming events that could significantly impact future developments.

The process resulted in the definition of **nine change drivers**:

1. Shift in the geopolitical centre of gravity to the Indo-Pacific
2. Polarization and disunity of the West
3. Decline of democracy and the growing assertiveness of autocratic regimes
4. Technological change and the influence of global corporations
5. Erosion of multilateralism and the shift towards multipolarity
6. Changing nature of global threats
7. Climate change
8. Risk of economic and financial crisis
9. Uneven demographic development.

These change drivers were presented and discussed at a participatory **workshop on 26 October 2021**, which was open to non-Ministry participants – representatives of other ministries, academia and the non-governmental sector. Speeches were given by State Secretary of the Ministry Martin Klus, representing



Source: Policy Horizons Canada

By linking the weak signals related to a certain area **change drivers** were identified in the next stage. Change drivers are factors that cause major disruption to an analysed system, such that the system changes radically and often irreversibly. The identified change drivers were subjected to two further analyses to confirm and further specify their relevance. The cascade analysis was used to identify additional potential implications of the given change driver in several logically connected sequences. The cross-impact analysis was used to verify the mutual influence between the different change drivers.

the Slovak Republic in the EU strategic foresight network, and Vice-President of the European Commission Maroš Šefčovič, responsible for strategic foresight. The workshop was organised in cooperation with the OECD, represented by Head of the OECD Strategic Foresight Unit Duncan Cass Beggs and OECD expert Dexter Docherty. The workshop also marked the end of the first phase of the project and the cooperation phase with the OECD.

On 27 January 2022, the Ministry approved the creation of the **Strategic Foresight Project Team**[3], which would, in the second phase, build on the previous activities of the

3 The members of the Strategic Foresight Project Team were: Project Team Head Imrich Marton, Martin Bielik, Adriana Dubeňová, Marek Garbarčík, Peter Holý, Peter Kadvan, Róbert Kirnág, Peter Lizák, Juraj Privits and Juraj Tomáš

informal Task Force and the results of the joint project with the OECD. A total of eleven project team meetings were held between February and June 2022, focused on defining future development scenarios and identifying the associated risks and opportunities.

In the first step, the project team defined five basic clusters: **geopolitics, geoeconomics, security, values and the social sphere**. Various aspects of the future development scenarios were discussed along with links to the nine change drivers identified in the previous phase of the project:

Core segment of scenario	Change driver
1. Geopolitics	• Shift in the geopolitical centre of gravity to Asia and the Indo-Pacific • Polarisation and disunity of the West • Decline of democracy • Erosion of multilateralism and fragmentation of standards
2. Geoeconomics	• Shift in the geopolitical centre of gravity to Asia and the Indo-Pacific • Technological change and the influence of global corporations • Changing nature of global threats • Impact of climate change • Risk of economic and financial crisis
3. Values	• Polarisation and disunity of the West • Decline of democracy • Erosion of multilateralism and fragmentation of standards
4. Security	• Polarisation and disunity of the West • Decline of democracy • Technological change and the influence of global corporations • Changing nature of global threats • Impact of climate change
5. Social sphere	• Technological change and the influence of global corporations • Impact of climate change • Uneven demographic development

Within this process, the project team developed **four future development scenarios**: the emergency scenario, *World on the Edge of the Abyss*; the status quo scenario, *New Cold War*; the optimistic scenario, *Consolidation of the World Order*; and the transformation scenario, *New Global Consensus*.

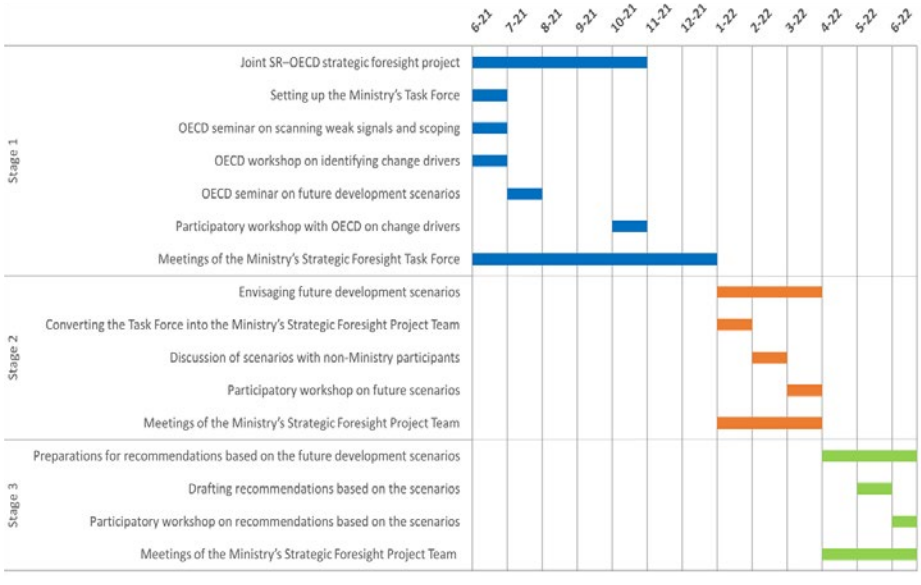
The draft scenarios were discussed during **two online webinars** open to external experts. The first was on geopolitics and security (9 February 2022), and the second one was on geoeconomics, values and the social sphere (23 February 2022). The webinar discussions led to the further specification of the scenarios and brought a Slovak perspective to the global foresight. The scenarios were then presented and discussed with representatives of the other ministries and the non-governmental and academic sectors at the **workshop on 23 March 2022**.

The last step in the strategic foresight process was to identify the main challenges and opportunities for the foreign and European policy of the Slovak Republic up to 2035. These were considered in relation to each of the four scenarios. Then **recommendations** (policy implications) were then made for the five cross-cutting areas:

1. Resources
2. Resilience
3. Sustainability
4. Consolidation
5. Connectivity

On 15 June 2022, the **third and final workshop** was held at the Ministry to discuss **the recommendations** relating to the four world development scenarios up to 2035 and their impact on Slovakia's foreign and European policy. The event was attended by representatives from the expert, academic and non-governmental sectors, as well as representatives from other ministries who helped to consolidate the most relevant recommendations.

The outcome of the Ministry's strategic foresight is the **first report of its kind on Strategic Foresight for the Foreign and European policy of the Slovak Republic**. This will form the basis of the concurrent preparations of the Medium-term Strategy of the Foreign and European Policy of the Slovak Republic.



The process of preparing the Report on Strategic Foresight of Foreign and European Policy of the Slovak Republic

Source: Ministry of Foreign Affairs of the Slovak Republic

V. WEAK SIGNALS

The first step in the strategic foresight process was to scan for weak signals. By weak signals we mean the early indicators of upcoming events that may distort the expected development or bias it in a certain direction[4]. They constitute the building blocks of strategic foresight. The weak signals are usually events of low probability but with high impact. The Task Force identified more than 40 weak signals and grouped them into 10 categories: politics, the environment, economy, energy, social development, security, technology, the law, connectivity and values. In addition to identifying the weak signals, the speed scans process was also used to find weak signals already identified elsewhere (Reddit/ Twitter, websites about the future, websites of world periodicals, newsletters).

The scan identifies the weak signal (the What) and also considers the possible consequences (the What If). **Two examples are given in illustration**:

1. a cyber attack on the oil pipeline infrastructure on the US East Coast
2. the reconstruction of a port and airport in Kiribati for the needs of the Chinese armed forces

(note: these weak signals were assessed in the summer of 2021).

4 https://www.enviroportal.sk/uploads/report/10621.pdf

1. DarkSide hackers shut down US pipeline

What?

A ransomware attack, carried out in May 2021, forced the shutdown of the Colonial Pipeline, which supplies nearly half of the US East Coast with fuel. The Federal Motor Carrier Safety Administration declared a state of emergency in 18 states to help deal with the fuel shortage. It was a week before the Colonial Pipeline was fully operational. The FBI confirmed that the cybercrime group DarkSide was behind the attack. The organised hacking group follows the "ransomware-as-a-service" business model, under which DarkSide hackers develop ransomware hacking tools and then sell them to other criminals who then carry out the attacks. In a statement provided by DarkSide after the attack, the group claimed it had no political goals and just wanted to make money without causing problems to society.

What if?

The interesting thing about this hacker group is that it treats cybercrime as a commercial service and shares its extortion know-how with other potential cyber groups. Were it to target strategic energy, healthcare or national security, it could potentially cause more systematic and widespread disruption. Using the energy parallel, the Slovak Republic presented an example of a potential vulnerability stemming from its high dependence on nuclear energy or highly developed gas/oil supply infrastructure that could potentially be targeted by ransomware hacking groups in the future.

In order to prevent such attacks, the Slovak Republic should engage more in cyber-security cooperation with EU and NATO partner countries.

2. China continues to project its military power in the Pacific

What?

In May 2021 it was announced that China would provide financial assistance to Kiribati to revive a strategically located airport and build a port in Kiribati that could be used by Chinese warships. The new Chinese base will be located a mere three thousand kilometres south west of the Hawaiian Islands, where the US Pacific Fleet headquarters is located and will provide China with a direct foothold in the major sea lanes (commercial and military) between North America and Australia. China's recent move is the latest step in its long-standing efforts to challenge US military superiority in the Pacific, bolstered by China's massive investment in naval capabilities over the past 25 years. During the spring of 2021, several analyses by former US military officers argued that the United States was badly prepared for a potential confrontation with China.

What if?

As China is steadily strengthening its military presence in the Pacific and entering areas around vital sea routes and US military bases, one cannot rule out the potential for conflict between the two powers in the medium term. China's actions alone could well alter the US's strategic threat perception. And that could lead to the US transferring military resources from Europe to the Pacific. For European NATO allies, including Slovakia, it would mean having to take on greater responsibility for defence, including strengthening the military and increasing defence spending. A greater US focus on the Pacific could prompt Russia to be more assertive in Europe. Slovakia should continue to increase defence spending and support US initiatives to counter Chinese interference in Europe (e.g. on 5G) so as to keep the US engaged in Europe.

VI. CHANGE DRIVERS

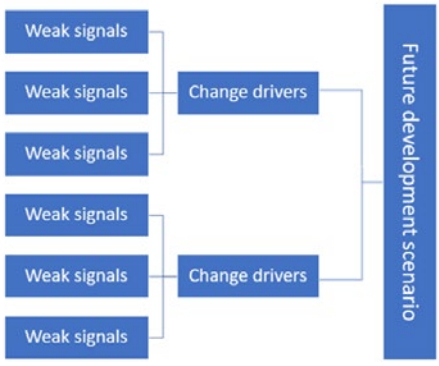
Change drivers are forces that cause significant change within the given system in 10 to 15 years[5]. They indicate the direction of change and are present in all future development scenarios but may have a different impact in each scenario. Examples of change drivers include trends, megatrends and wild cards[6].

The Task Force identified nine key change drivers:

1. Shift in the geopolitical centre of gravity to the Indo-Pacific
2. Polarization and disunity of the West
3. Decline of democracy and the growing assertiveness of autocratic regimes
4. Technological change and the influence of global corporations
5. Erosion of multilateralism and the shift towards multipolarity
6. Changing nature of global threats
7. Climate change
8. Risk of economic and financial crisis
9. Uneven demographic development.

When identifying the change drivers, we also took into account change drivers identified in other foresight documents such as Global Trends 2040: A More Contested World (US)[7]; OECD Global Scenarios 2035[8]; European Commission 2020 Strategic Foresight Report: Charting the Courses Towards a More Resilient Europe[9]; 2021 Strategic Foresight Report: The EU's Capacity and Will to Act10[10]; Driving Forces Cards 2035 (Singapore)[11].

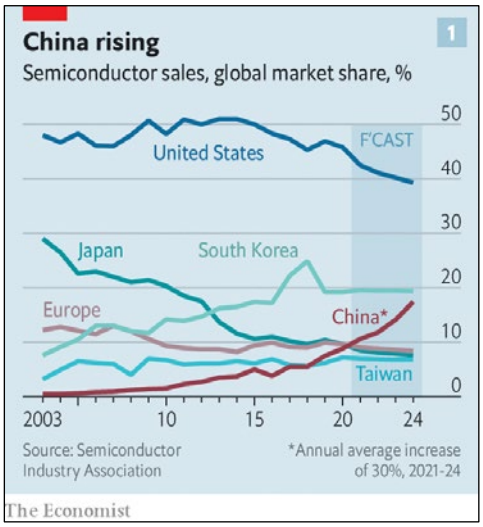
Interconnections between weak signals, change drivers and future development scenarios

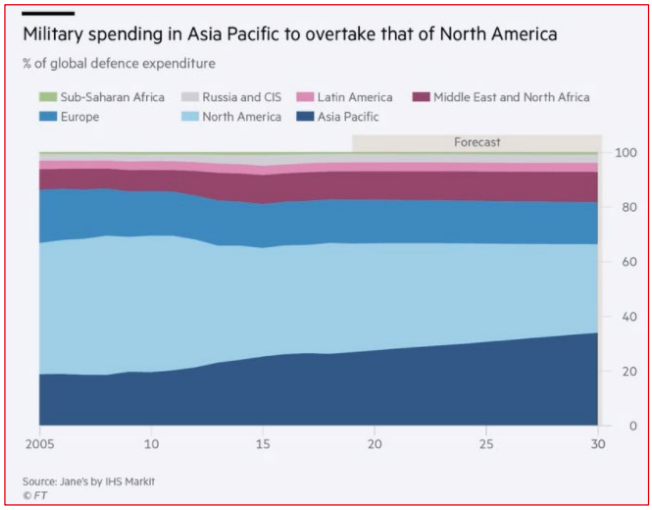


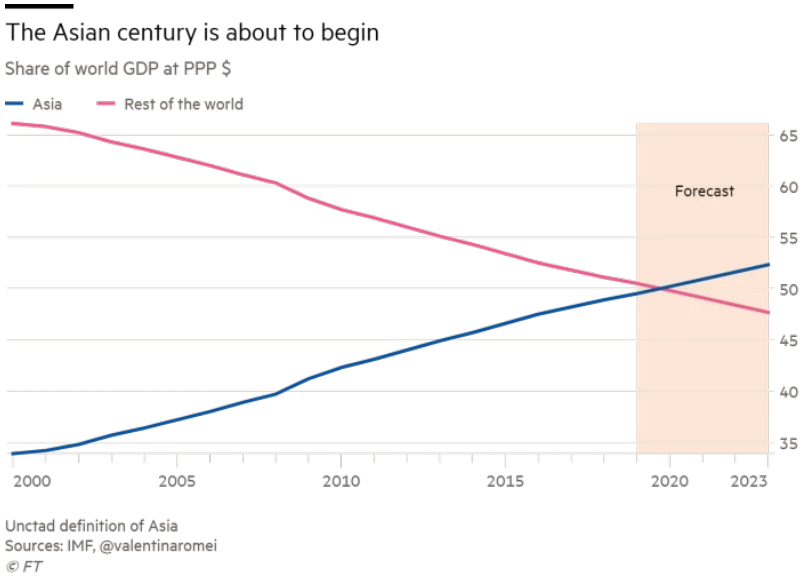
In strategic foresight, the change drivers are the crucial link between scanning for weak signals and building future development scenarios along with recommendations (policy implications).

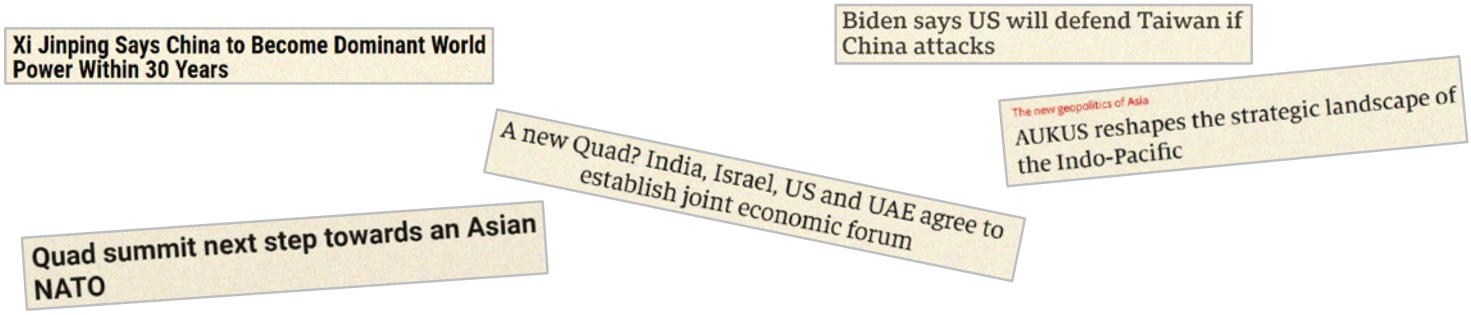
5 Definition from *Policy Horizons*, a renowned Canadian agency dedicated to strategic foresight https://horizons.gc.ca/en/our-work/learning-materials/foresight-training-manual-module-5-change-drivers/
6 https://www.enviroportal.sk/uploads/report/10621.pdf
7 https://www.dni.gov/files/ODNI/documents/assessments/GlobalTrends_2040.pdf
8 https://www.oecd-ilibrary.org/economics/global-scenarios-2035_df7ebc33-en
9 https://ec.europa.eu/info/sites/default/files/strategic_foresight_report_2020_1.pdf
10 https://ec.europa.eu/info/sites/default/files/foresight_report_com750_en.pdf
11 https://www.csf.gov.sg/files/media-centre/publications/csf-df-cards.pdf

1. Shift in the geopolitical centre of gravity to the Indo-Pacific –views may differ on the extent and speed of this megatrend, but economic, demographic, technological and military developments all indicate this geopolitical shift is underway. The region is a focal point in US–China rivalry, and its importance is underlined by its economic and demographic potential – 60% of the world's population (including China) lives here, it accounts for 60% of world GDP, while two-thirds of the world's container transport and a third of its energy passes through it. The region is a leader in digitalisation and new technologies but also produces more than 50% of global emissions[12]. Its growing economic and technological power is matched by the increasing assertiveness of Asia and especially China. Last but not least, Asia is becoming increasingly militarised – by 2030 Asia's arms spending is forecast to overtake that of North America.









12 https://www.eeas.europa.eu/sites/default/files/eu-indo-pacific_factsheet_2022-02_0.pdf

2. Polarization and disunity of the West – a series of crises beginning in 2008 along with disinformation and hybrid actions abroad have led to increasing political disunity in the Euro-Atlantic area[13]. It can be seen in interstate relations as well as citizens' dissatisfaction with governance and has led to the growing social fragmentation and the penetration of elements of illiberal democracy. It has reinforced the connection interdependency of domestic and foreign policy, increased the propensity for unilateral action and exacerbated distrust of international and transatlantic cooperation. The COVID-19 pandemic and Russia's aggression in Ukraine have enhanced the political cohesion of the West, but this unity will be tested in the next decade by the emergence of new economic, energy and security crises. Maintaining European and transatlantic unity and combatting the increasing fragmentation and radicalisation in Western societies will be key.

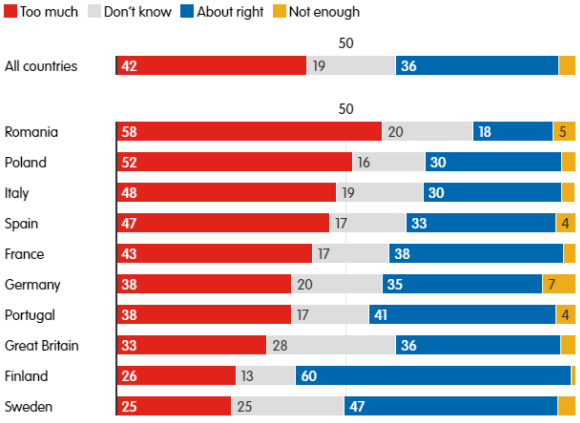
Typical referendum voters

Characteristic	Remain	Leave
Average age	47.3	54.9
Dominant work status, %	Full-time (46)	Retired (36)
Income, £'000	34.3	28.9
Home owner, %	56.3	59.6
University graduate, %	33.8	17.1
2017 general election vote, %	Labour (49)	Conservative (57)
Voting intention now, %	Labour (38)	Brexit Party (28)

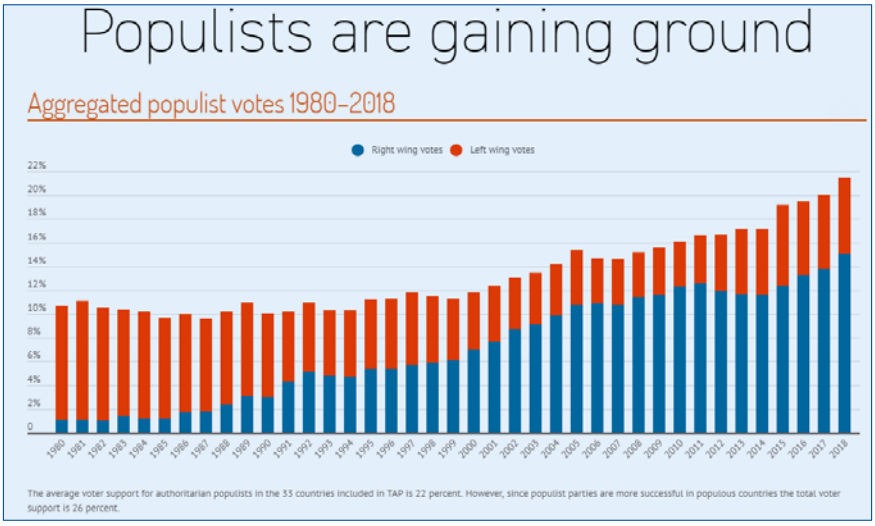
Sources: Chris Hanretty; poll of polls; *The Economist*

The Economist

How much attention does your government dedicate to the war in Ukraine, compared to other problems its own citizens are facing? In per cent



Source: Datapraxis and YouGov, May 2022.
ECFR · ecfr.eu



After Brexit, populists set to outnumber Greens in European Parliament

Turkey to expel U.S. envoy and nine others, Erdogan says

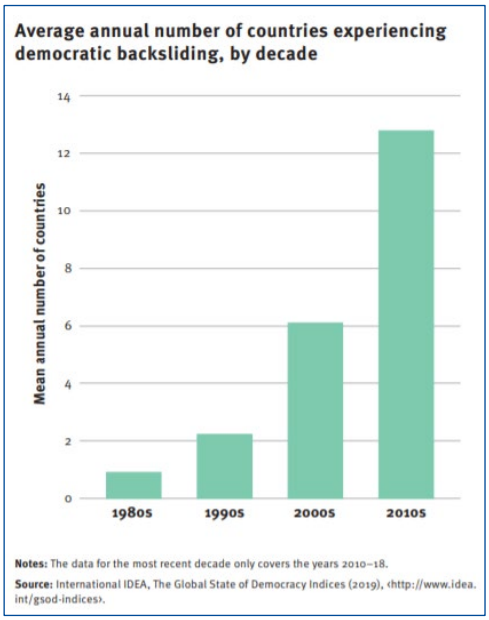
EU disunity on US's anti-Nord Stream 2 push

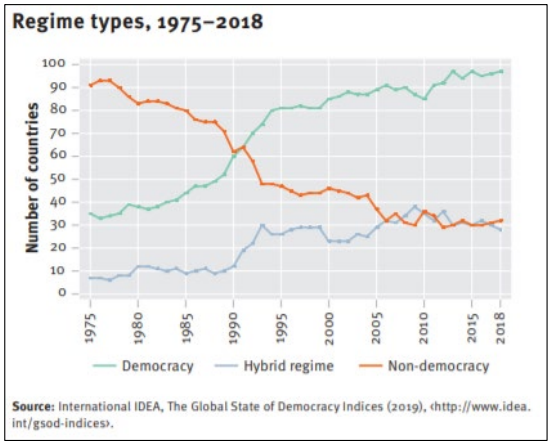
Rising Tensions Between Turkey and Greece Divide E.U. Leaders

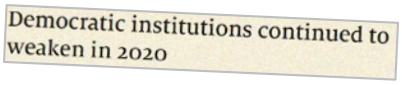
Polexit? Fury in Brussels after Warsaw court rules Polish Constitution overrides EU law

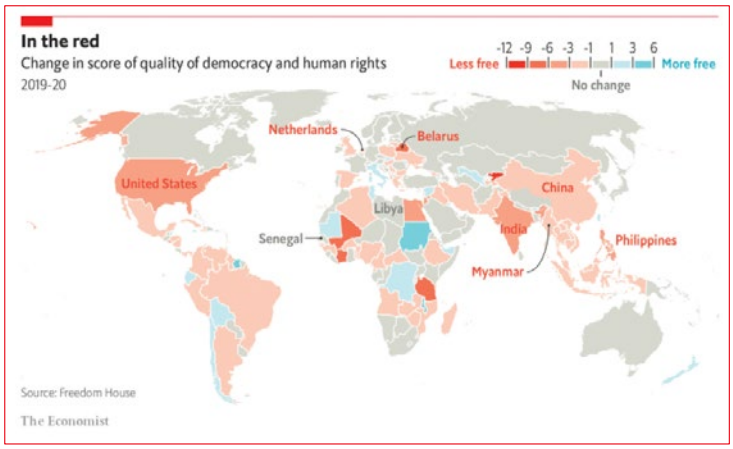
13 https://www.tandfonline.com/doi/pdf/10.1080/13510347.2022.2069751?needAccess=true

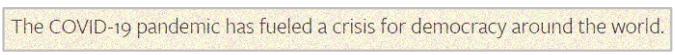
3. Decline of democracy and growing assertiveness of autocratic regimes – democracy's ascent came to a halt in the mid-1990s. The number of non-democratic countries has stopped declining, while the number of hybrid regimes is gradually increasing. Although democracy is still formally the dominant form of governance, its quality is deteriorating – the number of countries in democratic decline has grown exponentially over the past four decades. Since 2014 countries where democracy is deteriorating have continuously outnumbered those in which it is improving. In 2021, the number of democracies was at the 1989 level, while 70% of the world's population lived under an authoritarian or hybrid regime[14]. The continued instability and unpredictability of global developments, along with the worsening socio-economic situation and disappointment with governments is creating a breeding ground for radical and anti-democratic forces, even in advanced democracies.





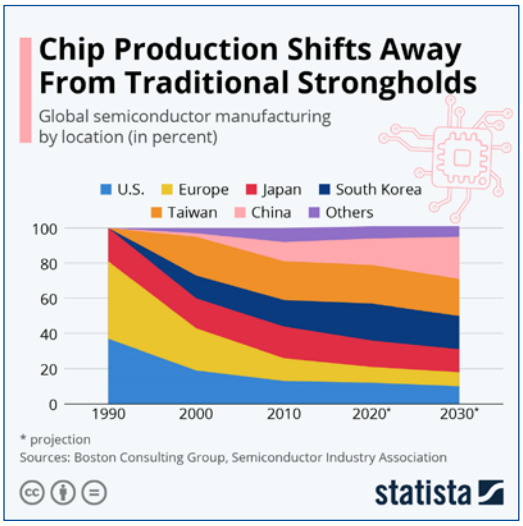


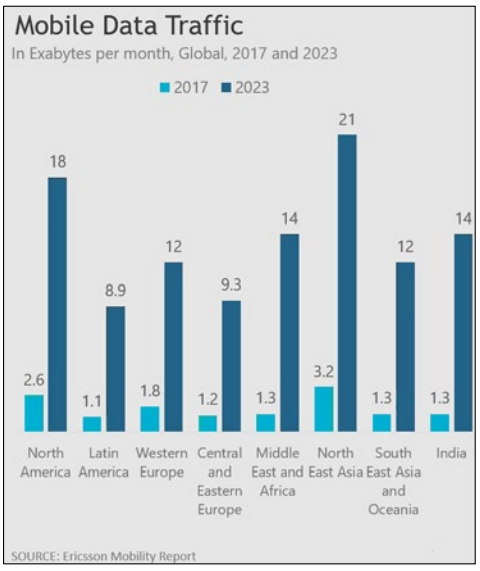


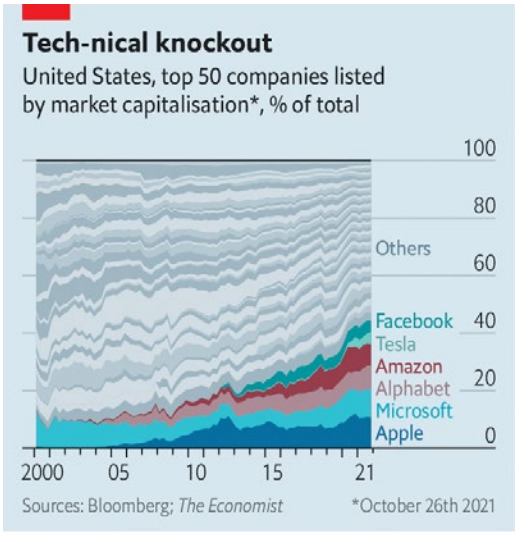


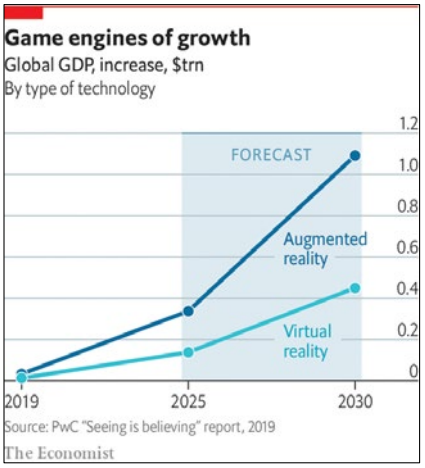
14 https://www.tandfonline.com/doi/pdf/10.1080/13510347.2022.2069751?needAccess=true

4. Technological change and the influence of global corporations – data services have grown exponentially in value since the 1990s and now account for half the services market. There is further potential for growth, with the development of artificial intelligence, virtual reality, quantum technologies and hyperconnectivity. Although automation and the impact on the labour market present a risk for the economic sphere. In the field of security, the capacity to fully exploit the technological change will depend on the reliability of the data infrastructure and, above all, cyber-security. Another challenge is the associated growth in the power and influence of global corporations, which are increasingly dominated by technology companies. Already in 2016, there were 71 companies and just 29 countries in the top one hundred global entities ranked by annual revenue.









The Economist

Google sets up $50M fund to invest in African startups

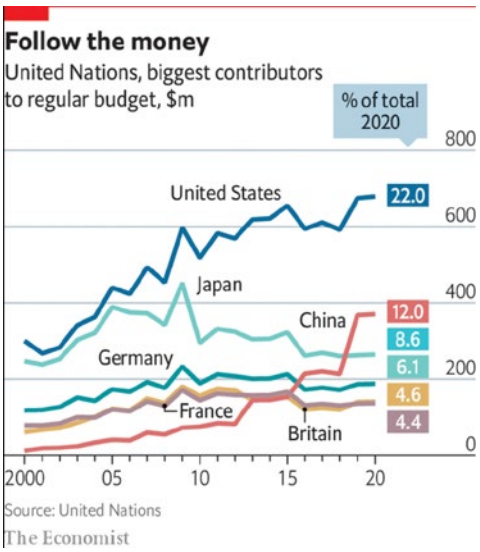
Climate solutions: Technologies to slow climate change

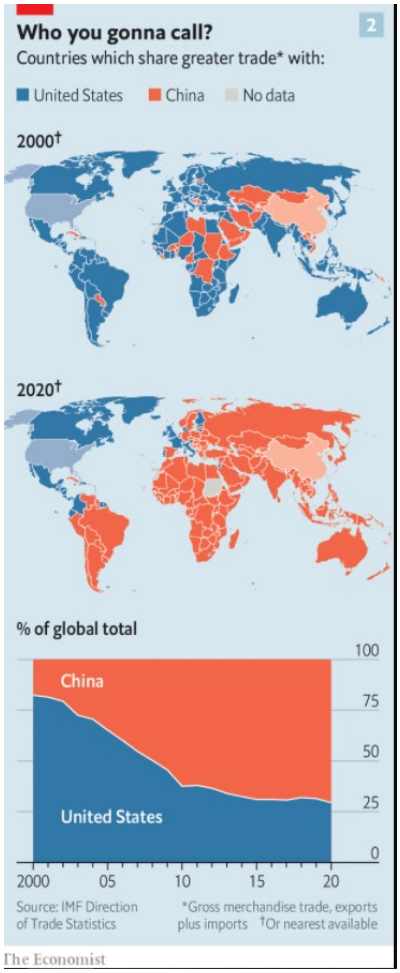
Tech giants and tax havens targeted by historic G7 deal

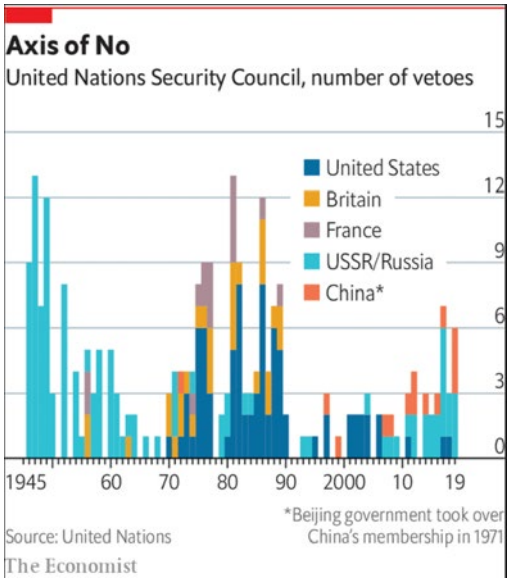
Coronavirus: Will Covid-19 speed up the use of robots to replace human workers?

Speech-To-Speech Machine Translation: The Key To Uplifting Africa's Economy

5. Erosion of multilateralism, the shift towards multipolarity – the multilateral system based on respect for international law, the sovereignty of states and the inviolability of borders is gradually being replaced by a multipolar one in which the assertion of political, economic or military power comes at the expense of rules. Assertive powers who place their own interests above global interests or those of smaller countries are in ascendance. International cooperation is being replaced by the return of spheres of influence. Countries are more likely to act unilaterally, international treaty frameworks are being weakened and international institutions are being marginalised.







Taipei lashes out at China for blocking Taiwan's access to the World Health Organization

U.S. blocks WTO judge reappointment as dispute settlement crisis looms

U.S. Completes INF Treaty Withdrawal

Russia withdraws from Open Skies Treaty after U.S. departure

Russia suspending mission to NATO in response to staff expulsions

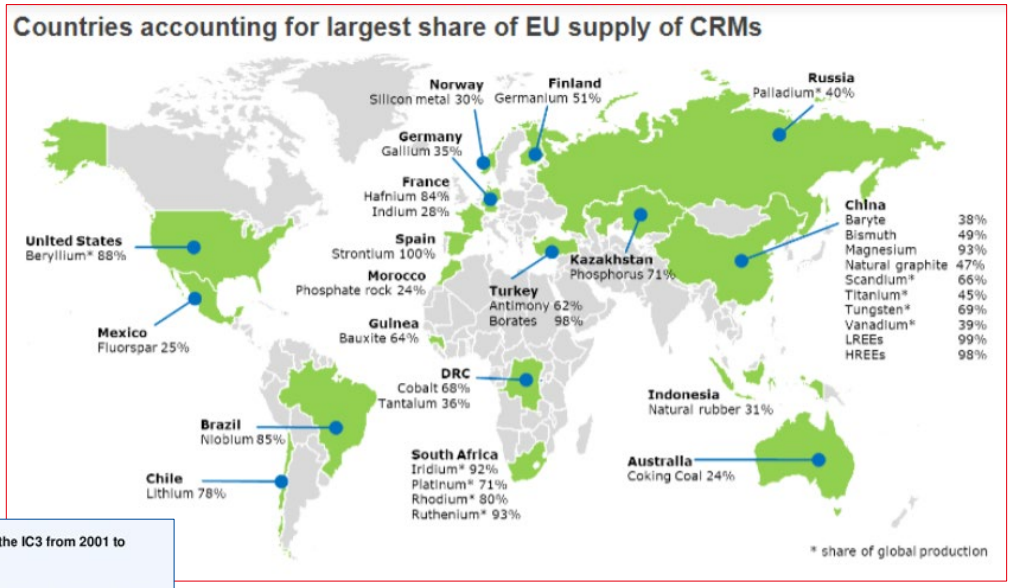
Trump administration begins formal withdrawal from World Health Organization

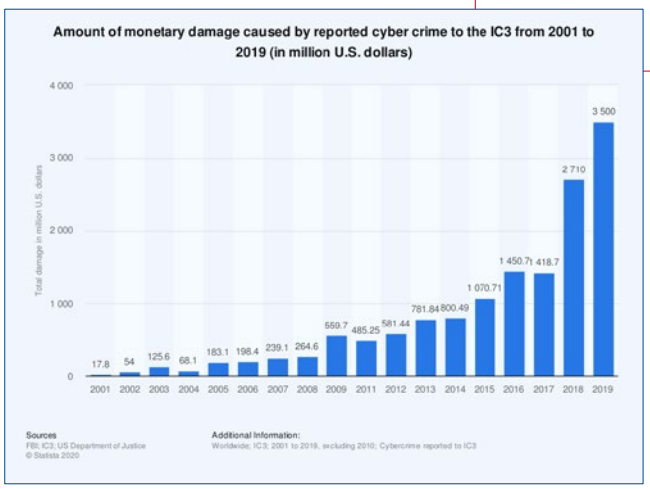
6. Changing nature of global threats – although the threat of conventional conflict will not disappear, one can assume that the attention of state and non-state actors will increasingly shift to hybrid – and especially cyber – threats, as these are less costly, easier to implement, harder to detect and harder to attribute responsibility. Besides the security threats, Europe faces risks associated with the new resource dependency – the shift away from fossil fuels towards the minerals essential for the development of new technologies.

US fuel pipeline 'paid hackers $5m in ransom'

Hackeři zaútočili na nemocnici následné péče v Horažďovicích. Vyřadili její informační systém

US Water Plant Suffers Cyber Attack Through the Front Door



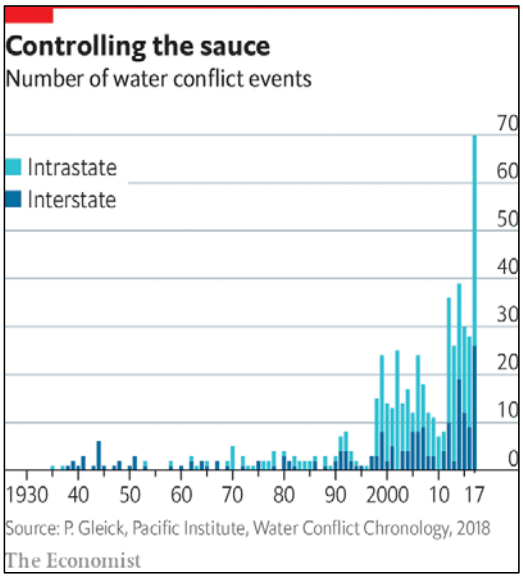


The World Relies on One Chip Maker in Taiwan, Leaving Everyone Vulnerable

Rare earths give China leverage in the trade war, at a cost

China's Rare-Earth Dominance Is a Security Risk for NATO and Western Supply-Chain Resilience

7. Climate change – the increase in the Earth's surface temperatures caused by human activity will have major implications for international relations and geopolitics in the coming decades. In addition to the environmental and economic impacts, climate change will increase the risk of conflict, particularly over resources such as water, arable land and food. Another area where climate change could have a dramatic impact is migration – in three particularly vulnerable areas alone – Latin America, the Indian subcontinent and sub-Saharan Africa – climate change could lead to 140 million people migrating by 2050[15].



Climate Change Could Cut World Economy by $23 Trillion in 2050, Insurance Giant Warns

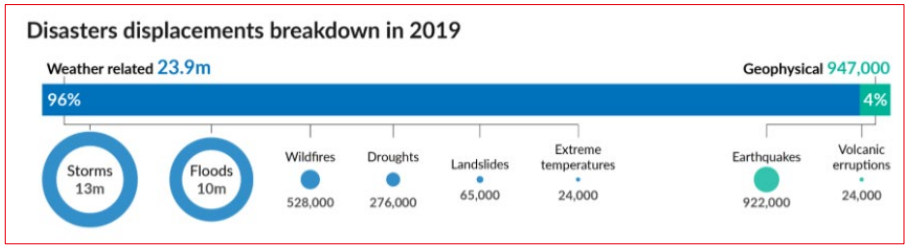
'We are last generation that can stop climate change' - UN summit

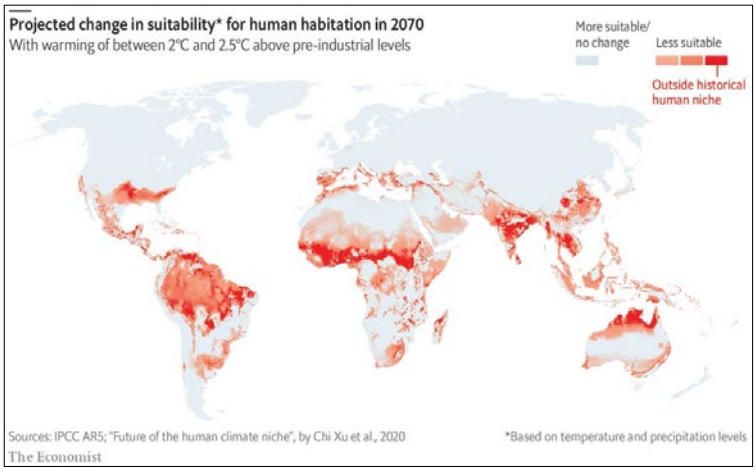
Global temperatures have increased 1.1°C since pre-industrial times and most likely will add 0.4°C to reach 1.5°C around 2030.

"Water is increasingly a trigger, weapon and casualty of conflict—with significant humanitarian consequences."

Government report warns climate migration could lead to political instability

According to figures cited in the report, 3.6 billion people had inadequate access to water at least one month per year in 2018.

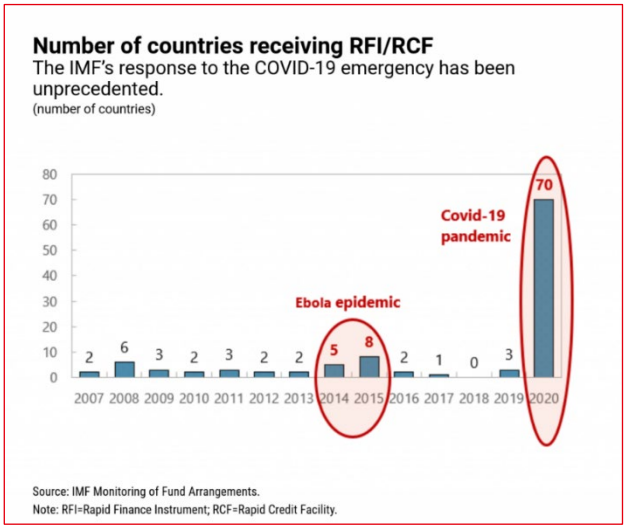


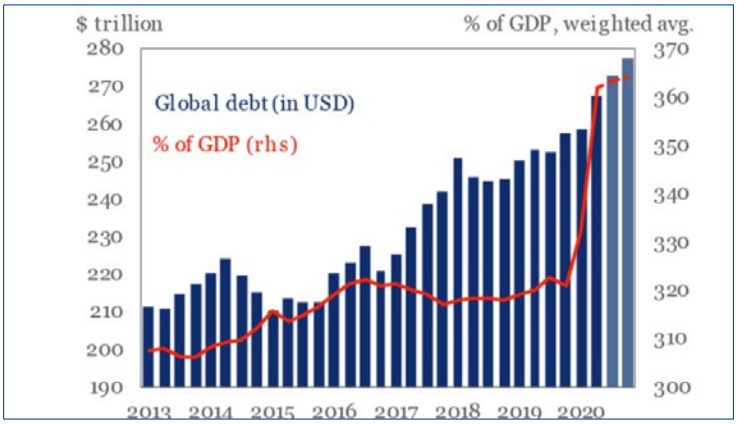


Of the 25 countries deemed most vulnerable to climate change, 14 are mired in conflict

15 https://www.worldbank.org/en/news/press-release/2018/03/19/climate-change-could-force-over-140-million-to-migrate-within-countries-by-2050-world-bank-report

8. Risk of economic and financial crisis – the negative global economic development seen already before 2020 has been exacerbated by the COVID-19 pandemic, Russian aggression in Ukraine and the associated inflationary pressures. Countries are now in record debt[16], and economies face disrupted supply chains. The deepening energy and food crisis is adding to this. The limited prospects for global economic recovery, combined with sharp price rises, are stoking fear of a re-run of the stagflation of the 1970s.





IMF approves 650 billion dollar fund to alleviate pandemic impact

ECB official and OECD warn of rising inflation risks

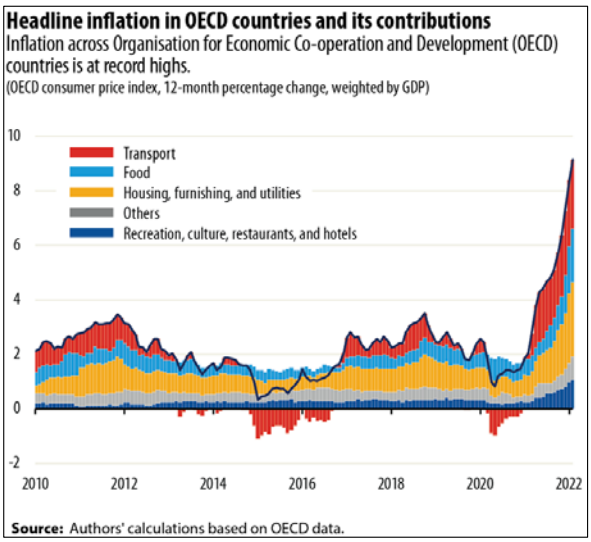
US default would wipe out nearly 6 million jobs, Moody's says

China's Lehman Brothers moment?: Evergrande crisis rattles economy

US Senate averts crisis by voting to extend debt ceiling

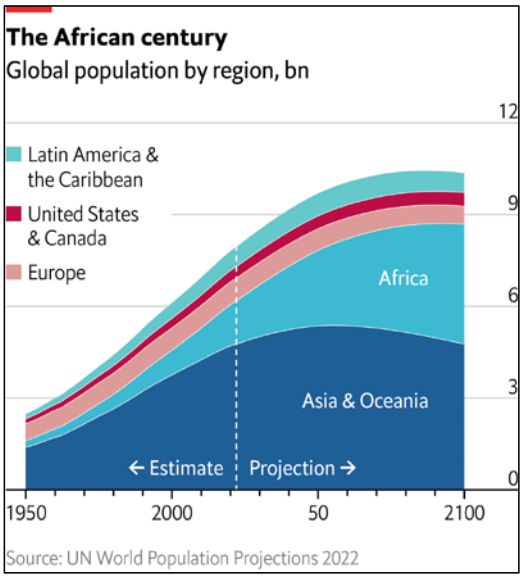
IMF says Covid support has left world open to new financial crisis

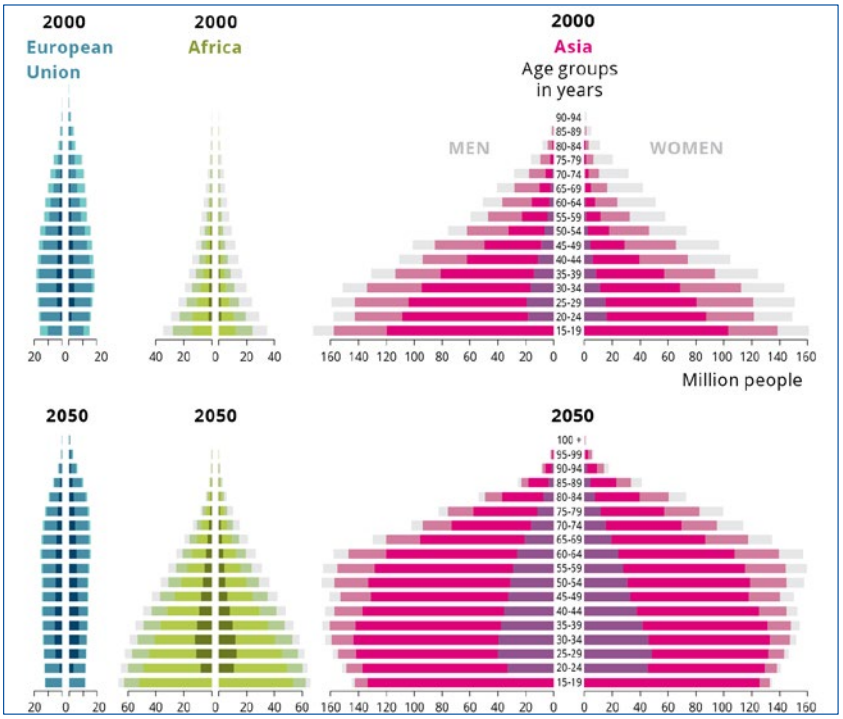
Is this a Bitcoin bubble? The debate is roiling some of Wall Street's most seasoned investors



16 https://blogs.imf.org/2021/12/15/global-debt-reaches-a-record-226-trillion/

9. Uneven demographic development – the trends clearly point to the continued demographic marginalisation of Europe. The EU's share of the world population will fall to 4.3% by 2050 (it was still 5.7% in 2019), while the Western world will have to cope with an ageing population in addition to population stagnation – the median age in the EU will increase by 4.5 years to 48.2 years by 2050[17]. China's unfavourable population structure may also become a barrier to stronger economic growth, while India, which will soon become the world's most populous country, may benefit economically from its relatively young and growing population. By 2030, the total global population is expected to reach 8.5 billion, rising to 10.4 billion by 2100. However, up to half of the expected population growth by 2050 will be concentrated in just eight countries, (Democratic Republic of the Congo, Egypt, Ethiopia, Nigeria, Tanzania, India, Pakistan, Philippines)[18]. The fertility rate in sub-Saharan Africa is three times that than in Europe, and according to the UN 61 countries will lose at least one per cent of their population due to the population decline by 2050[19].

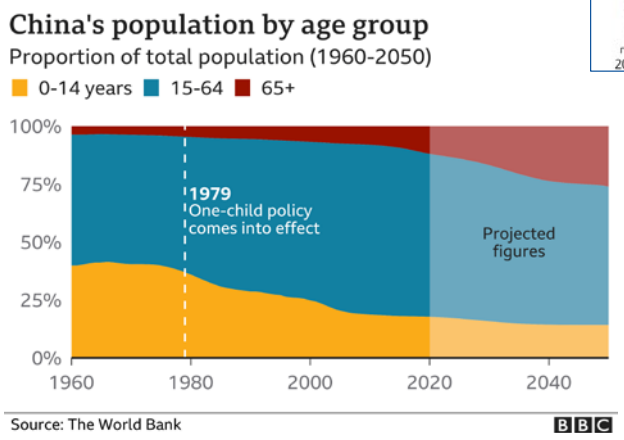




China allows three children in major policy shift

World's population is projected to nearly stop growing by the end of the century

U.S. Population Over Last Decade Grew at Slowest Rate Since 1930s



Africa's population will double by 2050

Southeast Europe faces dramatic population drop, U.N. warns

17 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Ageing_Europe_-_statistics_on_population_developments
18 https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/wpp2022_summary_of_results.pdf
19 Ibid

VII. FUTURE DEVELOPMENT SCENARIOS

The main method used in strategic foresight is to envisage future development scenarios. Scenarios are neither predictions nor forecasts. They are based on interactions between change drivers. Scenarios enable us to combine different trends, factors and policies so we can envisage alternative future developments. They help us clarify and test our assumptions about the future and identify challenges and opportunities.

To create the future development scenarios, the Project Team drew on the strategic foresight method developed by Policy Horizons Canada, which is designed explicitly for public policy. The Horizons method uses four scenarios: 1. status quo scenario – muddling through (the scenario continually responds to change, with no substantial decline or improvement); 2. gradual decline scenario – incremental decline (in this scenario the status quo gradually deteriorates but does not collapse completely), 3. gradual progress scenario – incremental progress (the situation improves slightly), 4. transformation scenario (there is a fundamental shift in approach often reflecting the post-crisis situation).

Given the current situation of highly disruptive elements of global development, the Project Team modified the Policy Horizons scenarios and came up with the following four scenarios:

1. ***World on the Edge of the Abyss*** – emergency scenario. A negative scenario that goes beyond the Policy Horizons scenario of gradual decline,

2. ***New Cold War*** – status quo scenario, but with a negative outcome given the reality,

3. ***Consolidation of the World Order*** – optimistic scenario corresponding to the Policy Horizons scenario of moderate progress, and

4. ***New global consensus*** – transformational scenario.

Scenario I: World on the Edge of the Abyss

World events are evolving in a conflictual environment. International cooperation and trade are severely limited. They are taking place amid strategic confrontation and are strongly influenced by actor affiliation with the conflict parties. Military, technological and economic power are the key instruments of influence. The global environment is characterised by the absence of rules and international institutions capable of buffering highly disruptive events with the potential to fundamentally disrupt the structure of international relations. Potential disruptive events that could occur in the coming decade are: 1. the outbreak of global conflict, 2. a massive cyber-attack, 3. long-term stagflation and the potential collapse of some economies, 4. deepening social unrest and polarisation of societies, 5. global ecological disaster, or 6. the outbreak of a new, more lethal pandemic.

The backdrop to such an environment is democratic regression; political fragmentation; the economic and demographic backlogging of the political West; the growing assertiveness of China; continued instability and the unpredictability of Russia's actions; the spiralling instability in Africa and the Middle East triggered by global economic slowdown; the fight against climate change and accelerated energy transition; and latent political and economic instability in Latin America.

Implications for the Slovak Republic: Slovakia's vital interests are under threat and its potential to influence international events through multilateral or regional integration groupings is reduced. Revisionism is increasingly being promoted in Europe, and frozen conflicts are being stirred up. Small and medium-sized states are increasingly spectators of international affairs rather than players. The international

scene is dominated by great powers, whose interests dictate developments. With the collapse of the multilateral system and the weakening of the global security architecture, Slovakia is grappling with high emigration, while negative demographic development (ageing population) is leading to population decline. On the other hand, faced with conflict, environmental disaster and economic decline, refugees from Africa, the Middle East and Eastern Europe are seeking a new home in European countries, including Slovakia.

Emergency scenario triggered by global military or cyber conflict: The rivalry between the powers leads to an arms race and the use of new technologies and potentially even the use of weapons of mass destruction. Like North Korea, Iran is developing nuclear weapons. The arms treaty frameworks is collapsing and there is unregulated militarisation in the Arctic and outer space. Russia's aggression continue beyond Ukraine and it continues to foment conflict and instability across a swathe of its western and southern neighbourhood. With no movement on European integration, some Eastern European and Western Balkan states opt for pragmatic rapprochement with third actors, while making concessions on democratic governance. Societies are dependent on technology and this is exploited through severe cyber-attacks with the potential to cripple civilian as well as security infrastructure. Amidst the weakening of international regulatory frameworks and state structures, both state and non-state actors increasingly engage in such threats.

Emergency scenario caused by the new global economic crisis: The global economy is experiencing significant instability: a combination of low growth and high inflation is exacerbating the disruption of supply chains and trade relations caused by conflict and sanction regimes. A series of crises leads to massive state debts with some economies defaulting. The weakening of the global trade rules hampers world trade. Energy crises occur amidst the urgent need for an energy transition. The declining importance of fossil fuels runs parallel to the increasing importance of the critical minerals required for the energy transition. Their uneven geographical distribution leads to local conflicts that curtail production.

Emergency scenario caused by deepening social unrest: development is affected by the considerable political and social unpredictability, exacerbated by the rise of disintegrative tendencies in international relations among key international organisations and groups, and even at country level, including in influential states in the international system. Global anarchy is on the rise. In democratic societies, the credibility of the old institutions is declining due to internal polarisation.

This reduces their effectiveness and undermines their ability to make crucial decisions and respond effectively to crisis situations and external threats. Sections of the Western population stop supporting their government's security and political orientation and fall for the propaganda and interests of external actors. The state of democracy and human rights is deteriorating. Accessing reliable information is becoming more difficult. Populist and extremist political parties and movements garner high public support. There is ethnic and religious mobilisation. Moreover revisionism is on the rise, challenging the post-war European order.

Emergency scenario triggered by the climate crisis: The international community fails to agree on commitments to combat climate change that could slow the warming of the planet. As warming continues, the risk of unpredictable disruption to the planet's climate system (changes in sea/air currents) increases. Biodiversity targets have not been met. Increasingly, there are severe climatic fluctuations, with large areas between the Tropics becoming uninhabitable. Several densely populated coastal regions are flooded. Water scarcity, high temperatures and land degradation create migratory pressures. In addition to climatic phenomena, other factors, such as volcanic activity, strong earthquakes or a cosmic body falling to Earth could contribute to the sudden disruption.

Emergency scenario triggered by a global pandemic: With global warming and population movements on the rise, diseases spread, and society faces repeated waves of viral pandemics as well as other public health challenges (e.g. antibiotic resistance).

Scenario II: New Cold War

There are long-standing tensions in the international community resulting from the growing ambitions of regional and world powers and competing systems of governance. Tensions analogous to the Cold War are occurring. There is assertive competition between the great powers and civilisational blocs in the multipolar environment. Nonetheless, the balance of power and general interest in maintaining economic stability prevents the rivalry from escalating into a global conflict. Local conflicts occur along the fault lines of geopolitics. The previous system based on universal rules is giving way to ad hoc agreements between power blocs. Influence is wielded through economic and military power and the ability to create alliances.

Implications for the Slovak Republic: Slovakia remains part of the Western world, but in the New Cold War it finds itself on the external border of the West, which third parties exploit in an attempt to undermine the democratic constitutional system and Slovakia's place in it. Slovakia is the target of hybrid and cyber attacks. Society is becoming ever more polarised, and some politicians continue to call for Slovakia to reorient itself towards the East. The economy remains strongly tied to the car industry and traditional manufacturing. The country is failing to make the necessary reforms and adapt to global developments. It lags behind in spending on science, education and digitalisation, and that is having a direct impact on the country's ability to attract new talent, successfully diversify the economy and refocus production on higher value-added goods and services.

The dynamics of geopolitical development are primarily determined by the ongoing rivalry between the US and China. Russia's aggression against Ukraine, or the consequences thereof, represent a long-standing point of conflict in relations with Russia. The Asia and Indo-Pacific region is increasing its geopolitical and geo-economic weight, but the permanent confrontation prevents it from gaining global dominance. In the Indo-Pacific region, both China and the US are strengthening their military presence. Security cooperation based on mini-agreements (e.g. QUAD/AUKUS) is deepening. NATO is maintaining unity in the face of the external threats and strengthening its defence capabilities and capacities. However, after the West's temporary consolidation in response to Russia's aggression against Ukraine, re-polarisation is on the rise, triggered by the mounting economic and social problems. The EU's approach oscillates between supporting the transatlantic partnership and amassing its own sovereignty. EU member states are divided between those that support federalism and those that are in favour of a Europe of nation states. The divisions between the member states prevent significant reforms to the EU's functioning. The EU accession processes of the Western Balkans and some Eastern European countries are stagnating. Russia continues to threaten external expansion, despite the weakness of its conventional military capability.

Relations with Western states remain tense, and there is a constant threat of nuclear and hybrid attacks. Foreign interference in the information sphere, which is how external actors manipulate public opinion and influence electoral processes, has become part of the geopolitical rivalry.

The ideological rivalry between the democracies and autocracies is giving rise to political, economic and security tensions. Nonetheless, none of the geopolitical actors has gained a strategic global advantage. Western countries are less willing to engage in crisis management in the world. The emerging geopolitical vacuum is being filled by other actors. The continued emphasis by the EU and US on human rights and the rule of law is making the Western model appear less attractive to some countries and leaders, given the existence of alternatives. The rule of law is interpreted variously and adherence is stagnating in some countries.

The main powers develop their geo-economic concepts within their own sphere of influence. The World Trade Organisation remains in crisis. Economic relations are regulated through partial bilateral or regional agreements. EU fossil fuel imports are declining as a consequence of the EU's energy transition. EU dependence on raw material is shifting from fossil fuels to critical minerals. New technologies are having an impact on all global issues. The technological rivalry continues, especially between the Atlantic and Indo-Pacific regions.

The EU is striving to maintain its position as leader in setting global standards, but this is offset by the fall in the political West's share of the global population and economy. There is growing potential for the creation of alternative or separate regulatory clusters around the world that do not cooperate with each other. The growing number of international law violations around the world is distorting the UN and the system based on international law, to the point that it is no longer credible, even in the eyes of Western states and their populations. The role of the UN is being marginalised and replaced by coalitions of the willing and formats based on the power status of the actors involved (e.g. the G20). Multilateralism is being replaced by minilateralism.

The objectives of the Paris Climate Treaty are not being met. Environmental degradation, the associated instability and local conflicts are causing significant migration pressures. In addition to disputes along the dividing line between developing and developed countries, there are climate-agenda tensions between hydrocarbon exporters and importers, and national tensions between the urban and rural population, old and young, and high income and low income citizens. Shortages of some basic foods on the world market will become a problem. The population is shrinking rapidly in several regions, causing social and political tensions in these areas.

Scenario III: Consolidation of the World Order

The civilizational clusters are evolving separately, sticking to their own cultural model and social organisation, while cooperating and following the basic rules and principles of international relations. There is no attempt to pursue a unified vision of the direction global society should take. The world is divided into regions in which each seeks its own path to prosperity based on its experience, preferences and culture. The preference is for multiple cultures and polities, while the revisionist ambitions of the great powers have been thwarted and international legal frameworks and institutions strengthened. The international order has been made more predictable and stable. The global system of checks and balances and multilateral diplomacy is capable of maintaining world peace and removing obstacles to economic cooperation. The ability to conduct effective multilateral diplomacy is a crucial means of asserting influence.

Implications for the Slovak Republic: quality of life has risen considerably due to the favourable external economic conditions and stable geopolitical environment. At the same time, Slovakia is having to cope with no longer being a net recipient of the EU budget. However, the country is successfully building on the wider transformation of the European economy and enhancing its global relevance. Its integration into international structures and the predictability of regional development mean it is able to attract substantial investment in promising industrial sectors. The security environment is improving, and the country is moving away from unilateral dependence on energy resources.

The dividing lines between the West and China are giving way to pragmatism in some areas of cooperation. The geopolitical balance in the region is maintained through closer US military cooperation with Asian democracies and greater EU involvement in the Indo-Pacific. The risk of conflict between the US and China is falling rapidly. India is an emerging global actor in the Indo-Pacific region, and Russia is militarily exhausted and economically weakened after the invasion of Ukraine.

It has become inward-looking and is increasingly orienting towards China. The EU is contributing effectively to the transatlantic partnership, including in defence and security, and is using its economic power strategically, especially to assert its global influence. The recently concluded Transatlantic Trade and Investment Partnership is a means of strengthening transatlantic relations in the economic, technological and energy fields. Solutions are being found to some of the long-standing frozen conflicts in Europe's neighbourhood. Thanks to their targeted efforts, EU and NATO member countries are succeeding in strengthening the internal cohesion of their societies, which have become largely immune to disinformation and influence activities.

The EU is fulfilling its economic potential and has successfully implemented reforms and the Recovery Plan. Both the single market and economic and monetary union are now complete. Europe's successful post-pandemic recovery will boost its relevance in technology, research and development. The Eurozone and the EU will be expanded to include the Western Balkan countries and some Eastern European countries. The euro is becoming a stronger world currency.

Global economic relations are growing and consolidating, and the rules-based system of trade relations is respected. Technological progress is having a positive impact on the world economy. This and the revival of global cooperation are facilitating the shift to renewable energy sources. The limits of the EU and the US are in effect dictated by the size and structure of that market compared to China and India. Africa is seeing significant economic growth. In the Global South, technology transfers and massive infrastructure programmes by major powers (BRI, Global Gateway, Blue Dot Network) are contributing to the more equal distribution of wealth across the world, thereby reducing migration pressures and the potential for conflict within societies.

The erosion of the international legal order has been halted. Regulatory clusters are being consolidated and countries are gradually identifying common points when adopting new global regulations (e.g. data storage and transfer, space, artificial intelligence, regulation of social media). The UN is growing in importance and has greater capacity for action. Democracies are being strengthened, enabling the creation of international platforms for cooperation, coordination and the promotion of values. They are able to solve their domestic problems, are more resilient to external influences and can offer real solutions to present-day challenges.

States are able to find common global solutions in the field of technological standards. In privacy and security, a balance will gradually be struck between state interference and protecting state interests. Governments are using technologies to fight corruption, collect taxes and for security purposes, but the robust setting of democratic standards in technology means they can do so without negatively impacting freedom and democracy.

Scenario IV: New Global Consensus

The world's major powers share a common vision of the world's future, based on globalisation, equitable growth, solidarity, tolerance and peace. National interests are giving way to the global good and prosperity. The world is able to coordinate responses to common global challenges and threats. The ability to innovate, deliver solutions to global problems and help improve the quality of life globally are key to exerting influence.

Implications for the Slovak Republic: As a result of the favourable economic development, the Slovak economy is becoming more competitive. The energy transition is successfully underway, and the country is closer to achieving carbon neutrality. The continued growth in technology is reshaping the socio-economics of society – the labour market is changing, new jobs are emerging and both education and public administration are changing, with the latter largely being conducted online. Slovakia is exploiting its potential in industry, transport and the digital economy and will rank among developed economies in the emerging digital age. Slovakia will be among the leaders in the promising areas of cyber-security, electromobility, renewable energy, green solutions and new industries (e.g. the space economy).

The focus of geopolitical and geo-economic development has shifted to Asia and the Indo-Pacific, which is the new engine of global economic and technological development. China is opening up both economically and politically. Transatlantic relations are deeper and have expanded beyond security cooperation in order to ensure the relevance of the transatlantic space in global competition. Successful integration, both in terms of domestic policy settings and the enlargement process, is helping improve the EU's reputation as a global player. The EU, as a fully-fledged global player, has a key influence on important economic and political processes in the world. The EU is actively engaged in both its immediate neighbourhood and in more distant regions (Indo-Pacific, Latin America). It is very active in Africa, benefiting from its engagement both economically (critical raw materials) and politically (effective cooperation on migration and security issues).

Contractual frameworks for strategic stability are being strengthened. China is joining the US–Russia nuclear agreements. The new Russian leadership is interested in pragmatic relations with the West, mainly economically. The EU's Eastern Neighbourhood is gradually stabilising, helped in particular by the massive Western aid provided for Ukraine's reconstruction. The ideological fragmentation of the world into West, East, North and South is becoming less important.

UN reforms are being implemented, and multilateralism is providing effective solutions to global problems. The World Trade Organisation has been revitalised. Clear rules are being set, and unfair commercial practices are being minimised. Global economic powers and multinational corporations complement each other and contribute to equitable economic growth and the overall improvement in the quality of life, reducing global indebtedness and tackling climate change. The Fourth Industrial Revolution, focused on intelligent automated production and targeted at individual consumers, is dramatically changing the economy. The international community is working together in space and the Arctic to secure new sources of economic growth and critical mineral resources. Revolutionary energy resources have been found that are accelerating the transition to a climate-neutral economy.

The democratic regression has been halted. The end of the pandemic has led to economic development and rising living standards, while liberal democracy has regained its appeal. New rules are being introduced in the digital sphere, in the use of space and polar regions etc. Technological progress is contributing to rising living standards. The influence of multinational technology giants and their desire for a stable trade environment is creating pressure to reduce global tensions and conflicts and shape the rules-based order. In authoritarian countries, elites are changing, and pro-reform governments are in ascent.

Globally, a modus vivendi has been found for cooperation in critical areas such as climate change and technological development. The positive correlation between the green and digital transformations is leading to changes in the socio-economic model. The steady rise in living standards is stabilising migration flows and demographics. There have been major breakthroughs in important scientific disciplines (medicine, bioengineering, new energy resources, CO2 capture, solar radiation management). Cooperation between private businesses and governments in space research is strengthening. The economy is being transformed and significant socio-economic technology-driven changes are taking place. The reshaping of the labour market is contributing to more even growth in living standards.

VIII. RECOMMENDATIONS BASED ON FUTURE DEVELOPMENT SCENARIOS

The opportunities and challenges for Slovakia (policy implications) were assessed based on the four future development scenarios. Drawing on that analysis, the project team set out five main areas of recommendations: Resources, Resilience, Sustainability, Consolidation and Connectivity. Themes that could prove critical before 2035 were then identified for each area. The third strategic foresight workshop was held on 15 June 2022, with representatives of the non-governmental and academic sectors participating. The following areas of recommendations were discussed:

I. Resources:

1. Water and food – factors of global stability
2. Affordable, secure and sustainable energy
3. Growing importance of critical raw materials

II. Resilience:

4. Preparedness to anticipate and manage crises
5. Functioning democracy, effective institutions and cohesive society
6. Strengthening state and societal resilience in cyberspace and against hybrid threats and disinformation

III. Sustainability:

7. Competitive economy
8. Green and digital transitions
9. Human capital
10. State-corporate relationship

IV. Consolidation:

11. Effective multilateralism, international legal order and strategic stability
12. Slovakia as part of a strong, united and responsive EU and NATO
13. Effective regional cooperation

V. Connectivity:

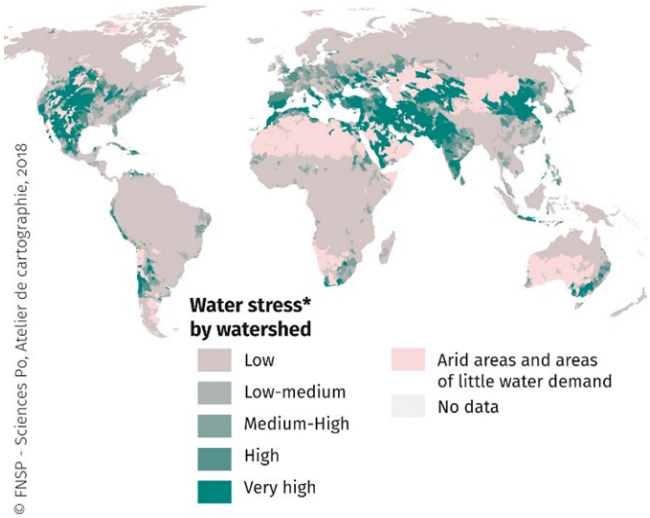
14. Data and technology – future drivers of the modern economy
15. Interconnecting regions and the continent – from North to South
16. Indo-Pacific, Arctic, space – prospective domains of global development
17. International trade and self-sufficiency

I. RESOURCES

1. Water and food – factors of global stability

The world's drinking water resources and food security will increasingly come under pressure. Better water management will be critical to achieving global food security.

According to the World Health Organization (WHO), in 2030 up to 1.6 billion people in the world will not have access to a domestic supply of clean drinking water[20]. More than 3.5 million people a year will die from diseases caused by drinking dirty unfiltered water.



Water availability is not just a socio-economic issue but increasingly a security one. Around the world, water and food shortages will increase the likelihood of conflict, social tensions and mass migration. The areas most likely to experience water wars are border regions with water supplies or large river basins, reservoirs or lakes21[21].

20 https://www.who.int/news/item/01-07-2021-billions-of-people-will-lack-access-to-safe-water-sanitation-and-hygiene-in-2030-unless-progress-quadruples-warn-who-unicef
21 Map source - https://espace-mondial-atlas.sciencespo.fr/en/topic-resources/map-5C33-EN-projected-water-stress-in-2040.html

Countries with largest drinking water resources in the world (source: FAO)					
Country	Average precipitation 1961–1990 (km³/year)	Internal resources: total (km³/year)	External resources: natural (km³/year)	External resources: actual (km³/year)	Total resources: actual (km³/year)
Brazil	15 236	5 418	2 815	2 815	8 233
Russian Federation	7 855	4 313	195	195	4 507
Canada	5 352	2 850	52	52	2 902
Indonesia	5 147	2 838	0	0	2 838
China	5 995	2 812	17	17	2 830
Colombia	2 975	2 112	20	20	2 132
USA	5 800	2 000	71	71	2 071
Peru	1 919	1 616	297	297	1 913
India	3 559	1 261	647	636	1 897

By 2050, up to 1 billion climate migrants could be forced to leave their homes due to climate change and the subsequent water scarcity[22].

According to the World Economic Forum (WEF), the world population will reach 9.8 billion in 2050[23]. At the same time, climate change, urbanisation and land degradation will reduce the availability of agricultural land. Each year, the world's agricultural land decreases by about 12 million hectares[24]. In Slovakia, agricultural land has shrunk by 70 thousand hectares in the last 15 years alone, which represents about 3% of the country's agricultural land[25].

But this does not take into account highly disruptive events such as the ongoing Russian aggression in Ukraine. According to the FAO, the war could lead to a food crisis or famine for up to 181 million people in 41 countries in 2022 alone[26].

Inhabitants of European Union countries are not at risk of acute food shortages; the crisis will be felt mainly through price increases. According to the World Bank[27] because of the war in Ukraine, food and energy prices will remain high until 2025, assuming the war ends in 2022.

After Austria, Slovakia has the second largest per capita supply of drinking water in the world[28]. Žitný ostrov is the largest groundwater reservoir in Central Europe. It contains about 10 billion cubic metres of good quality drinking water and can supply more than 13.5 million inhabitants with drinking water. Slovakia also has almost two thousand mineral springs evenly distributed across the country[29].

The Slovak Republic is in a worse position regarding food self-sufficiency. Other data show that Slovakia is about 40% self-sufficient in food and has to import the remainder[30]. However, Slovakia is around 175% self-sufficient in cereals[31]. Similarly, Slovakia is more than 100% self-sufficient in natural spring and mineral waters[32].

According to the Global Food Security Index 2021[33] in a comparison of food availability, quality and security, natural resources and food system resilience in more than 100 countries across the world, Slovakia ranked second worst among all EU member states (40th overall)[34].

22 https://www.climateforesight.eu/articles/environmental-migrants-up-to-1-billion-by-2050
23 https://www.weforum.org/agenda/2017/08/the-earths-population-is-going-to-reach-9-8-billion-by-2050
24 https://press.un.org/en/2019/sgsm19680.doc.htm
25 https://euractiv.sk/section/ekonomika-a-euro/news/preco-slovensko-prichadza-o-podu
26 https://www.euronews.com/2022/06/19/global-food-crisis-looms-as-ukraine-struggles-to-export-its-grain-after-russian-invasion
27 https://thedocs.worldbank.org/en/doc/5d903e848db1d1b83e0ec8f744e55570-0350012021/related/Implications-of-the-War-in-Ukraine-for-the-Global-Economy.pdf
28 https://www.nasavoda.sk
29 https://sebestacni.sme.sk/c/22674062/sme-vodna-velmoc-a-napriek-tomu-vody-dovazame.html
30 https://www.obilninari.sk/2022/05/30/stanovisko-zpo-k-vyhladu-na-hospodarsky-rok-2022-23/
31 https://www.vuepp.sk/dokumenty/komodity/2021/Obilniny_2021_11.pdf
32 https://sebestacni.sme.sk/c/22674062/sme-vodna-velmoc-a-napriek-tomu-vody-dovazame.html
33 https://euractiv.sk/section/ekonomika-a-euro/news/v-potravinovej-bezpecnosti-je-slovensko-na-chvoste-unie
34 Slovakia performed well in food security and relatively low food loss but underperformed in healthy eating policies and monitoring of diseases related to unhealthy diets, volatility of agricultural production, political commitment to food security and access to food.

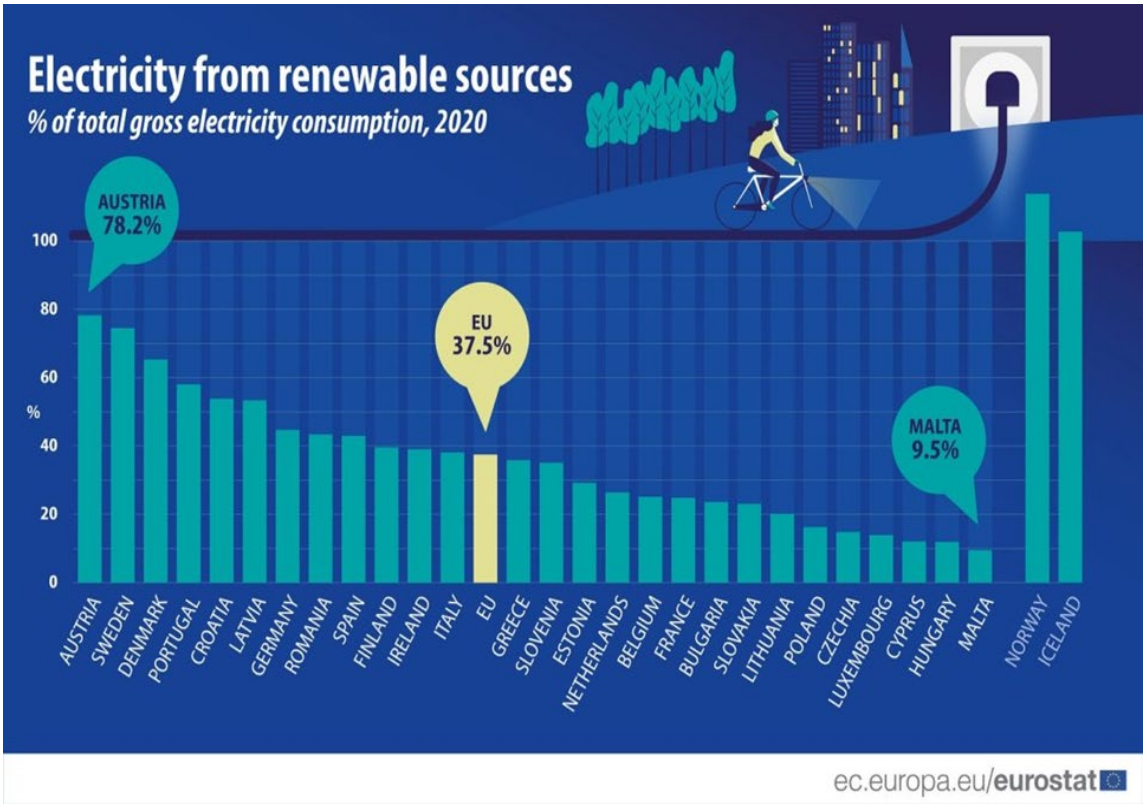
Protecting water resources and improving food self-sufficiency will be of increasing strategic importance. Slovakia has a comparative advantage in the availability of water resources, but in the face of climate change requires a strategic approach to their use. Slovakia should also continue to provide development assistance and advice to partner countries on building institutional capacities and share experience in water management, given its expertise in this area. It is also in Slovakia's interest for the EU to continue leading in implementing the Paris Agreement on climate change. These activities, alongside the fulfilment of climate and development goals, could help prevent conflict and migration in the world. Russia's aggression in Ukraine has highlighted the strategic importance of the Ukrainian agricultural sector to global food security. For Slovakia, as a neighbouring country, it will be important to create opportunities to develop bilateral cooperation in this area. Improving transport corridors and removing bottlenecks in the transport of agricultural products between Slovakia and Ukraine are particularly desirable.

2. Affordable, secure and sustainable energy

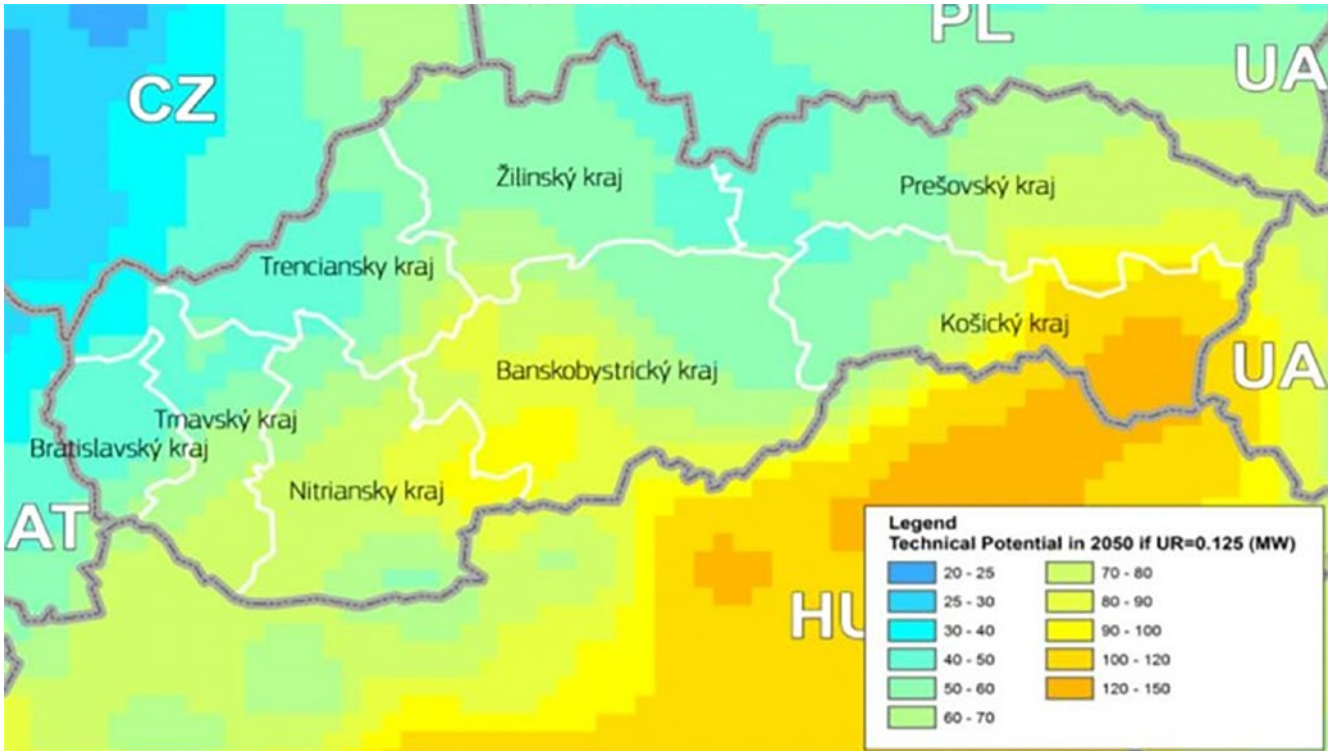
Russia's aggression in Ukraine and the misuse of energy resources for geopolitical purposes underlines the importance of securing reliable and sustainable energy sources. At the same time, the situation is accelerating the ongoing energy transition.

Renewable energy sources (RES) are becoming particularly relevant. These are important not just environmentally and economically but for security as well. Increasing their share is key to improving energy self-sufficiency and thereby energy security. Slovakia lags behind in RES use. In 2020, RES accounted for 22.1% of the EU's total energy consumption[35]. Whereas, in 2021, RES made up 13.44% of Slovakia's national energy mix (water accounted for 6.60%, biomass 3.81%, solar 2.61%, wind 0.04% and geothermal resources 0.00%)[36]. According to Eurostat, in Slovakia the RES share of total electricity consumption in 2020 was 23%, while the EU average was 37.5%. In the EU, the main RES sources of electricity were wind (36%) and hydropower (33%). The remaining share was made up of solar energy (14%), biofuels (8%) and other RES (8%). Solar energy is the fastest growing RES[37].

Greater attention should be paid to geothermal energy in the Slovak Republic as it has huge potential, despite being technologically, financially and time consuming. Unlike other types of RES, geothermal energy can be continuously converted into electricity, although it is not inexhaustible as is the case with wind or solar energy[38].



35 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Renewable_energy_statistics
36 https://www.okte.sk/sk/zaruky-povodu/statistiky/narodny-energeticky-mix/
37 https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20220126-1
38 https://www.enviroportal.sk/geotermalna-energia



Geothermal potential of Slovakia (JRC/ThermoGIS 2018)[39]

In 2020, **geothermal energy** was used in electricity generation and heating in 88 countries[40]. Its use will increase globally and in the EU, especially if ambitious climate change mitigation policies are implemented. Slovakia has suitable conditions for the use of geothermal power, and surveys indicate that 31% of the land is viable for such purposes. In practice though, use is minimal[41]. Increasing the use of geothermal energy is difficult because of the complicated legislation and the difficulty of financing it[42].

Hydrogen is expected to play a key role in the future climate-neutral economy, emission-free transport, heating, manufacturing and energy storage. According to the EU's hydrogen strategy, hydrogen currently accounts for less than 2% of the EU's total energy consumption[43], but by 2050 it could represent 13–14% of the EU energy mix and up to 24% of global energy demand. Annual sales could be around €630 billion. In the EU, hydrogen consumption and use is expected to grow rapidly in industrial technologies, power and gas. The aim of the National Hydrogen Strategy of the Slovak Republic, adopted by the Slovak Government in June 2021, is to increase the competitiveness of the Slovak economy while contributing to a carbon-neutral society in line with the Paris Climate Agreement[44].

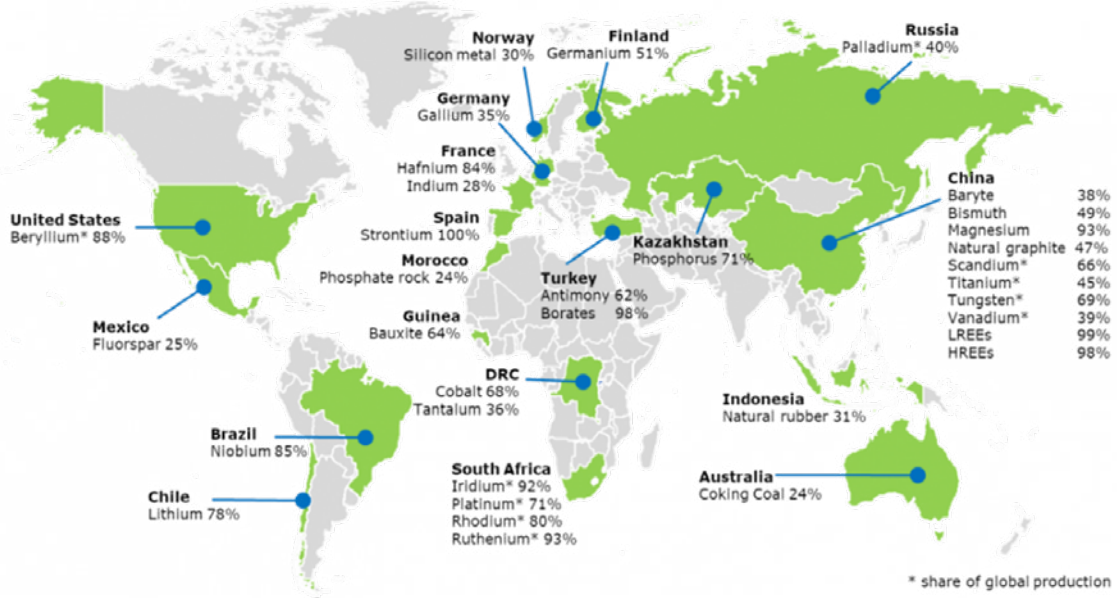
Nuclear energy will remain an important element of energy security for the Slovak Republic. In July 2022, the EU approved the inclusion of nuclear and gas energy as interim sustainable energy sources[45]. The completion and commissioning of Units 3 and 4 of Mochovce Nuclear Power Plant will contribute significantly to fulfilling Slovakia's and the EU's commitments to achieving carbon neutrality by 2050[46]. Compared to fossil fuel power plants, the two new Mochovce units will save at least 5.2 million tonnes of CO2 emissions annually. Once both units are commissioned, Slovakia will once again be self-sufficient in electricity and ready to absorb the increase in electricity consumption brought about by digitalisation and electromobility.

39 https://vedanadosah.cvtisr.sk/priroda/zivotne-prostredie/ak-slovensko-nahradi-uhlie-geotermalnou-energiou-usetri-2-7-miliardy-eur/
40 https://www.geothermal-energy.org/pdf/IGAstandard/WGC/2020/01018.pdf
41 https://euractiv.sk/section/energetika/interview/hydrogeolog-s-geotermiou-sme-na-tom-fantasticky-zdroje-vsak-nesmieme-vystavit/
42 https://euractiv.sk/section/energetika/news/rozvoj-geotermalnej-energie-na-slovensku-brzdi-legislativa-pomoct-ma-novy-zakon
43 https:// ec.europa.eu/energy/sites/ener/files/hydrogen_strategy.pdf
44 https://www.mhsr.sk/nvs?fbclid=IwAR3-tEmpvAEpEGRAs6fHpI9Tb8GqQ75Kaq2tyRXpqb59FtquuXckGHLU8IE
45 https://www.reuters.com/business/sustainable-business/eu-parliament-vote-green-gas-nuclear-rules-2022-07-06/
46 https://www.seas.sk/o-nas/nase-elektrarne/atomove-elektrarne/mochovce-34-vo-vystavbe

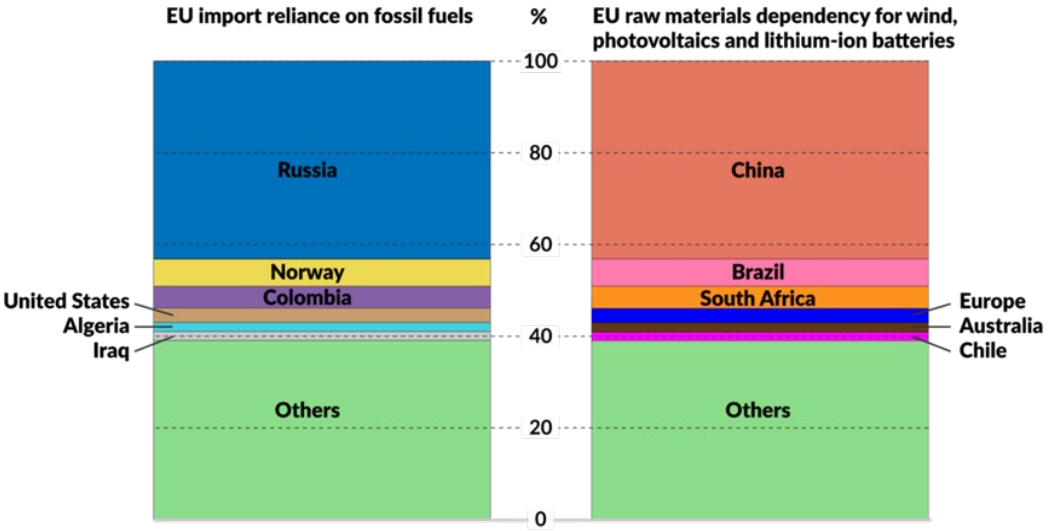
The strategic challenge for the Slovak Republic is to accelerate decarbonisation and end dependency on fossil energy sources. It is clear that the fossil fuel age is coming to an end. Investment and innovation will need to focus on RES, which offers new economic opportunities and security guarantees. The costs of RES and fossil fuel energy production are gradually evening out[47]. In addition to increasing the use of RES in Slovakia, greater energy savings should be promoted, as Slovakia is one of the most energy intensive economies in the EU[48]. Given Slovakia's situation, particular attention should be paid to geothermal energy, an overlooked resource, and hydrogen, a promising clean energy carrier[49], The Slovak Republic has the second highest share of nuclear generated electricity in the EU[50], EU50so it is important to fully exploit the potential of nuclear in the green transition process. Particular attention should also be paid to nuclear fuel diversification[51], nuclear waste repositories and technological advances.

3. Critical raw materials

The growing need for new technologies and the planned transition to carbon neutrality will increase demand for the **critical raw materials** *(CRM)* needed to produce items such as batteries, fuel cells, chips, and components for the defence and digital industries[52]. The available analyses point to a significant increase in demand for these products in the coming decades - the share of wind and solar power in total electricity generation is expected to rise from 9% in 2020 to 70% in 2050[53], while 40% of new cars sold around the world in 2030 are expected to be electric[54], The global demand for batteries (15 times higher than in 2021)[55], and green hydrogen (10 million tonnes produced in the EU in 2030)[56] is also expected to increase. A European Commission analysis points out that by 2030 the EU will consume up to 18 times more lithium and 5 times more cobalt in the electric mobility and energy storage sectors than it did in 2020[57]. At the same time, the EU is highly dependent on imports of these raw materials. At the moment, CRMs are unevenly distributed around the world and their extraction is costly and energy intensive. China is the main producer of these raw materials, accounting for 80% of so-called rare earths and controls 90% of the processing capacity. China also controls 80% of cobalt producing companies, 60% of the world's Li-ion cell production capacity[58], 70% of the world's solar panel production and 40% of wind turbine production[59]. Similarly, Brazil, the US, Russia, Turkey and South Africa are monopoly producers of some of these materials. European production is currently very low - only 1% of the materials needed to produce batteries is mined in the EU, 2% of the materials used in the production of robots and 8% of the components for traction motors, while 9% of the materials needed for 3D printers[60] are of European origin.



47 https://euractiv.sk/section/zivotne-prostredie/news/klimaticky-sef-komisie-za-rekordnymi-cenami-energii-je-aj-zavislost-europy-na-fosilnych-palivach/
48 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_statistics_-_an_overview#Energy_intensity
49 https://www.engineering.sk/clanky2/veltrhy/27098-vodik-ako-nosic-cistej-energie
50 https://mzconsultinginc.com/the-road-to-a-low-carbon-europe-is-nuclear-power/
51 https://ekonomika.pravda.sk/energetika/clanok/633875-zatial-ziadna-nahrada-slovenske-reaktory-mozu-mat-palivo-len-z-ruska/
52 https://openknowledge.worldbank.org/bitstream/handle/10986/28312/117581-WP-P159838-PUBLIC-ClimateSmartMiningJuly.pdf?sequence=1 & isAllowed=y
53 https://www.economist.com/finance-and-economics/2022/03/26/the-transition-to-clean-energy-will-mint-new-commodity-superpowers
54 https://www.virta.global/blog/ev-charging-infrastructure-development-statistics
55 https://www.rystadenergy.com/newsevents/news/press-releases/powering-up-global-battery-demand-to-surge-by-2030-supply-headaches-on-the-horizon/
56 https://ec.europa.eu/energy/sites/ener/files/hydrogen_strategy.pdf
57 https://eur-lex.europa.eu/legal-content/SK/TXT/PDF/?uri=CELEX:52020DC0474 & from=EN
58 https://www.gisreportsonline.com/r/critical-raw-materials/
59 https://www.belfercenter.org/sites/default/files/GreatTechRivalry_ChinavsUS_211207.pdf
60 https://ec.europa.eu/docsroom/documents/42881



Source: https://www.gisreportsonline.com/r/critical-raw-materials

One of the main challenges is ensuring we have sufficient CRMs for technological development without becoming dependent on them in the way Slovakia and the EU are reliant on fossil fuels. Most importantly we need to identify potential opportunities for CRM extraction in the EU, including Slovakia[61], or look for alternative sources of CRM that can be diversified[62]. In addition, cooperation with alternative CRM producers in partner countries will need to be strengthened at the EU level. Another option is to scale up the recycling of raw materials and thereby reduce dependency on external sources. For example, one tonne of electrical waste contains 30 to 40 times more copper and 40 to 800 times more gold than one tonne of ore[63].

II. RESILIENCE

4. Preparedness to anticipate and manage crises

Effective crisis management by the state and a comprehensive approach to security are among the Slovak Republic's strategic security interests[64]. A growing number of factors in the global environment are affecting security and their interconnectedness. Even distant events can affect Slovakia and its security, even over a relatively short period of time, owing to the interconnectedness, highly mobile population and modern technologies. Non-military risks and threats are also increasing in scope and importance and could have an equally significant impact on our security interests. Climate, cyber and pandemic threats could cause significant damage through the disruption or impairment of essential services required for the normal functioning of state and society.

The state must therefore have the capacity to anticipate crises of various kinds that could have an impact on the security and interests of the state or its citizens. This requires effective links between information flows across different parts of government and effective situational overviews. At the same time, there is a need to strengthen capabilities to deal with such crises, while coordination between the different branches of government is of particular importance. Cooperation with both the private sector, given that many critical infrastructure components are in private ownership, and the public are key to creating resilience to information manipulation and avoiding panic. Within the state apparatus, coordination between military and non-military actors and measures is important given the complexity of the risks and threats.

The capacity to handle crises is closely linked to social cohesion and trust in institutions. Up to two thirds of European citizens see EU membership as a good thing, while 52% have positive views of the EU (12% negative)[65]. By contrast the survey data for Slovakia[66] shows that a sizeable part of the population has strongly ambivalent attitudes towards the EU – up to 50% of respondents consider EU membership to be "neither good nor bad" and 49% of citizens have a neutral attitude towards the EU (33% positive and 18% negative).

Social cohesion is being substantially weakened by the polarisation and shift in public opinion towards the extremes.

61 https://eur-lex.europa.eu/legal-content/SK/TXT/PDF/?uri=CELEX:52020DC0474 & from=EN
62 https://op.europa.eu/en/publication-detail/-/publication/d1be1b43-e18f-11e8-b690-01aa75ed71a1
63 https://www.cjdecycling.com/e-waste-recycling/
64 https://www.mosr.sk/data/files/4263_210128-bezpecnostna-strategia-sr-2021.pdf
65 https://europa.eu/eurobarometer/surveys/detail/2792
66 https://europa.eu/eurobarometer/api/deliverable/download/file?deliverableId=82419

Analyses of elections in Europe dispel the myth that support for nationalist and populist and radical left parties comes largely from the older generations. In Sweden, France, Italy and Germany, young people are more likely to vote for extremist parties than older ones.

As the EU continues to integrate, citizens' expectations of security will shift away from national governments towards the European institutions. Even today, 77% of Europeans support the common defence and security policy[67], and 77% of EU citizens approve of strengthening the EU's competence to manage crisis events such as the COVID-19 pandemic[68].

It is highly likely that in the coming years Slovakia and Europe will again face a major crisis event.

We have to be able to anticipate economic, energy, public health and defence challenges, as well as cyberspace, digital infrastructure, climate and environmental emergencies.

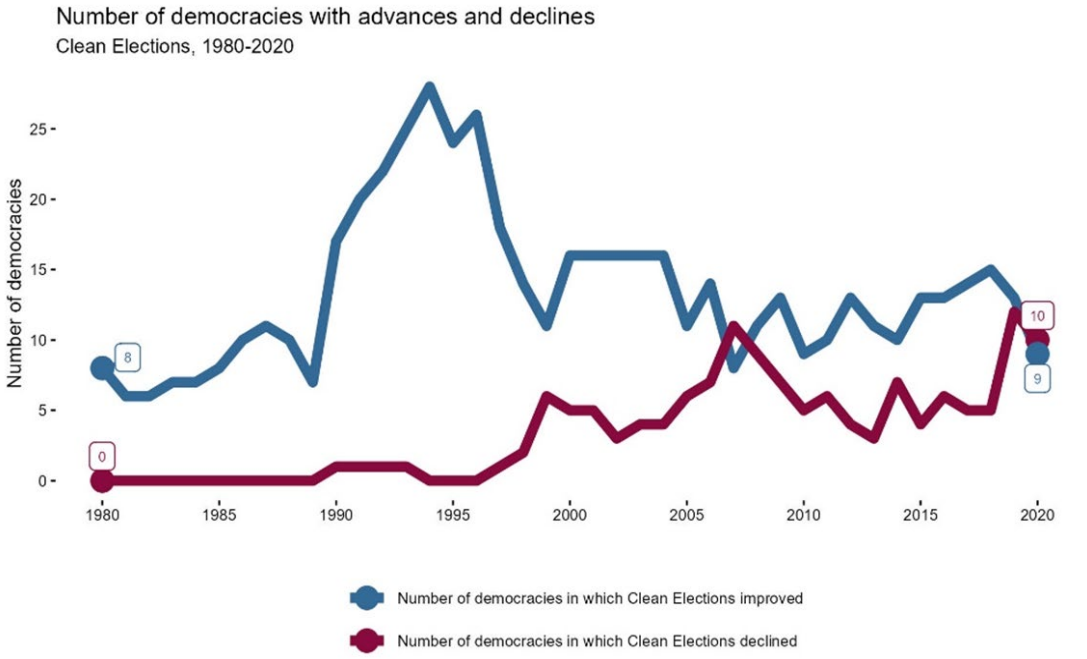
The EU Resilience Dashboards analyse preparedness to face and cope with crises by assessing EU countries' vulnerabilities and capacities in four dimensions: the socio-economic, green, digital and geopolitical dimensions[69]. Slovakia performs below average in areas such as health sector resilience, energy dependence on external suppliers, high concentration of trade and investment partners and increased rates of land degradation.

Slovakia also scores below average in the European Sovereignty Index compiled by the ECFR think-tank[70]. The ranking reveals that Slovakia's contribution to strengthening European sovereignty in areas such as defence and technological capacities is insufficient. Slovakia also ranks below average in indicators such as health care or economic strength.

We can expect emergency events with cross-border implications to increase. That will require high quality monitoring and assessments of the external security environment. Preparedness to anticipate and manage crises will need to become a cross-cutting agenda in all state policies, including those not traditionally perceived as belonging to security. In this context, Slovakia will need to comprehensively assess its crisis management performance in recent years (the COVID-19 pandemic, Afghanistan, Russia's aggression in Ukraine) and ensure that it is reflected in the new security system. Public crisis communication should focus on building citizens' trust in state institutions over the long term and ensuring citizens are sufficiently prepared for crisis. Public preparedness has a positive impact on ensuring a rapid and effective response and minimises the negative secondary effects of an emergency event. The state will therefore need to improve public awareness of potential crises and the recommended procedures.

67 Standard Eurobarometer 96 - Winter 2021-2022
68 https://www.europarl.europa.eu/at-your-service/files/be-heard/eurobarometer/2021/future-of-europe-2021/en-foe-special-eb-report.pdf
69 https://ec.europa.eu/info/sites/default/files/dashboard_report_20211129_en.pdf
70 https://ecfr.eu/special/sovereignty-index/

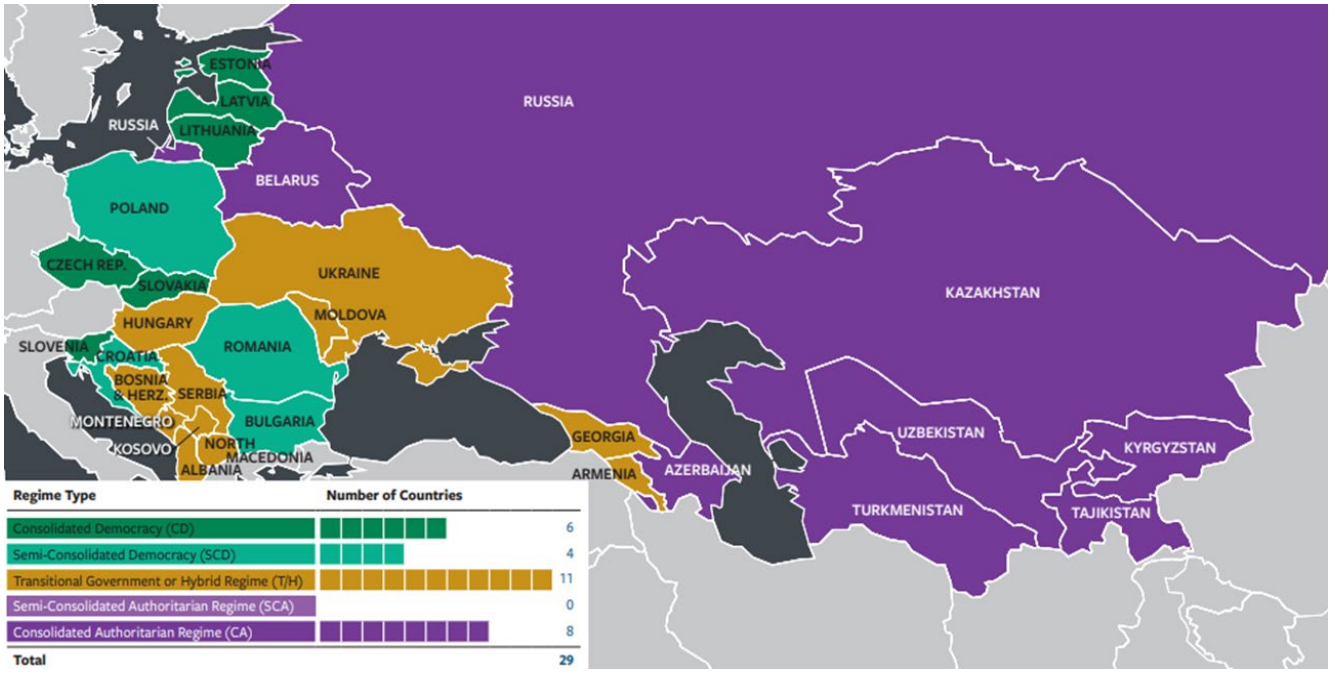
5. Functioning democracy, effective institutions and cohesive societies



Source: International IDEA, The Global State of Democracy Indices v. 5.1, 2021, <https://www.idea.int/gsod-indices/>

The viability and resilience of a democratic system depends on the institutions within it, as well as on an active public and oversight mechanisms (courts, legislature, media). Recent developments around the world show that concentrated efforts are being made to undermine public confidence in power-sharing, human rights, fundamental freedoms and the electoral process[71].

An analysis of the global state of democracy in the world[72] reveals that, in a large number of countries, the state of democracy is deteriorating more than it is improving. Up to 70% of the world's population lives in countries that are either authoritarian or where the quality of democracy is deteriorating; by contrast, only 9% of the world's population lives in fully developed democracies.



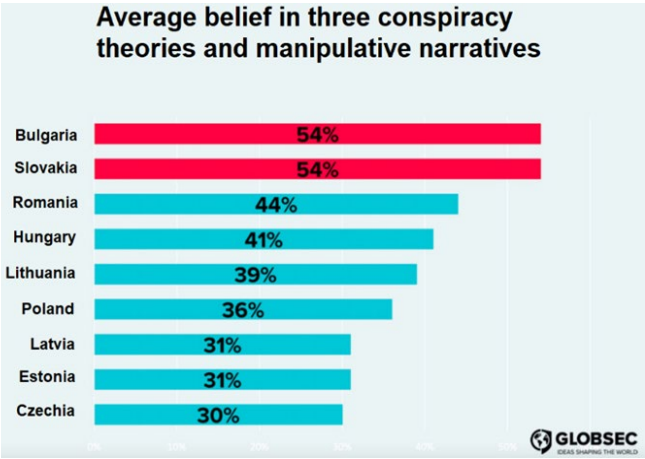
71 https://www.idea.int/blog/democratic-backsliding-different-causes-divergent-trajectories
72 https://www.idea.int/gsod/sites/default/files/2021-11/the-global-state-of-democracy-2021_1.pdf

According to a Freedom House report, the level of democracy in Central and Eastern Europe, the Western Balkans and Central Asia has been steadily declining since 2004. In 2021, for the first time in the 21st century, hybrid regimes became the predominant form of government. There are currently 11 hybrid regimes in the region (7 more than in 2004). Only six countries belong to the category of consolidated democracies – including Slovakia. However, according to the report, 63% of Slovak citizens are dissatisfied with the functioning of democracy[73]. A recently study published by the Brookings think-tank[74] recommends that states should significantly strengthen global cooperation between democracies, especially in multilateral bodies. It also recommends improving the credibility of electoral processes, strengthening the independence of the judiciary, the media and civil society, as well as improving anti-corruption instruments.

According to the Brookings study, technology poses a major challenge for democracy and public institutions, which will increasingly influence citizen's lives and decision-making. The social media phenomenon represents another major challenge – up to 57% of European citizens were active on social media in 2020[75]. Research suggests that social media amplifies citizen insecurity through misinformation and accelerates the fragmentation of society[76]. New technologies and their impact on citizen privacy and the functioning of the state will be a growing challenge.

In the interests of protecting the democratic order of the Slovak Republic, the promotion of both democracy and the rule of law and defending human rights and fundamental freedoms should remain an integral part of Slovak foreign policy. The Slovak Republic will need to continue participating in joint international initiatives aimed at promoting democracy, good governance, strengthening the separation of powers, public sector transparency, and protecting the independence of the judiciary and supporting an independent media.

6. Strengthening state and societal resilience in cyberspace and against hybrid threats and disinformation



The security of the Slovak Republic is increasingly affected by a continual growth[77] of hybrid activities by foreign states and their domestic subjects. Their aim is political destabilisation, to incapacitate state decision, and ultimately weaken citizens' willingness to defend their homeland or allies if necessary. The growing number of actors in the information sphere, the lack of social resilience stemming from political polarisation and the relative ease of spreading information leaves societies open to the erosion of social cohesion.

Cyberspace is particularly vulnerable. It has become essential for all human activity, including the provision of national infrastructure, trade and business. Given the digital interconnections between systems and devices, cyber-attacks can cause disproportionate damage relative to entry costs, especially where critical infrastructure is concerned. The extent of the damage is comparable to that caused by a direct military attack. While in 2015 cyber attacks caused damage to private companies amounting to US$3 trillion, by 2025 this figure is expected to rise to US$10.5 trillion.[78] Slovakia, as a member of the EU and NATO, is an attractive target for a wide range of malicious actors operating in cyberspace and seeking to advance their own political, power, economic, and intelligence interests. Cyberspace has become a natural environment for the targeted spread of disinformation. It is likely that the number of major crises involving technology and cyberspace events will rise in the future, affecting sensitive public and private sectors – hospitals, government servers, power plants, transport systems, etc. The growing state and private sector dependence on technology and digital solutions will further exacerbate this.

73 NIT_2022_final_digital.pdf (freedomhouse.org)
74 Democracy Playbook 2021: 10 Commitments for Advancing Democracy (brookings.edu)
75 https://ec.europa.eu/eurostat/web/products-eurostat-news/-/edn-20210630-1
76 https://www.eurofound.europa.eu/publications/report/2022/fifth-round-of-the-living-working-and-covid-19-e-survey-living-in-a-new-era-of-uncertainty#tab-01
77 Report on the Activities of Slovak Information Service in 2021 (www.sis.gov.sk/pre-vas/sprava-o-cinnosti-2021.html), as well as the Report on the Activities of Military Intelligence in 2021 (https://vs.mosr.sk/sprava_o_cinnosti_vs_2021_svk.pdf)
78 https://www.embroker.com/blog/cyber-attack-statistics/

The spread of disinformation has long been a major problem for Slovakia. Surveys show that Slovak society is among those most vulnerable to the effects of disinformation and, among neighbouring countries, is most susceptible to conspiracies. Comparisons with other EU countries and NATO show that societies most resilient to the spread of disinformation are found in states where citizen trust in state institutions is high and where there is high awareness of the threat of subversion by foreign actors.

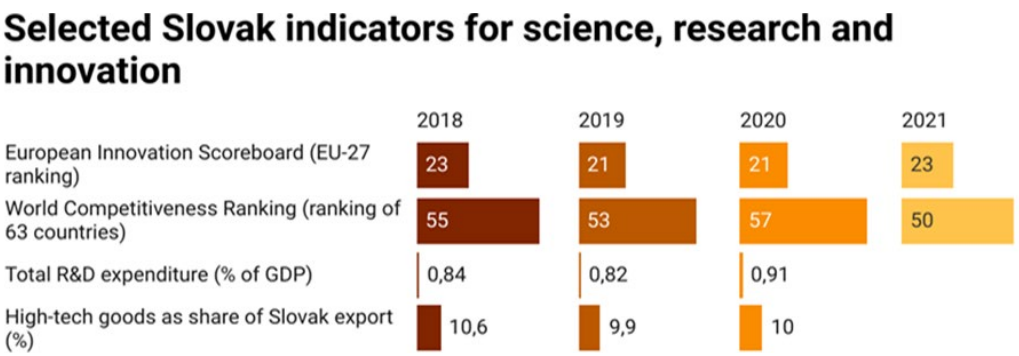
As hybrid and cyber threats are largely a cross-border phenomenon, Slovakia should actively support EU and NATO initiatives aimed at strengthening resilience and defence against foreign manipulation, interference in the information sphere and hybrid activities. Cyber-security and protection against hybrid threats should be an integral part of strengthening resilience and protecting the state against foreign interference in its internal affairs. Public resilience to hybrid action and the effects of disinformation also need to be strengthened. In addition to strengthening the state's strategic communication, it will be necessary to foster the public's critical thinking and digital literacy[79]. Where critical infrastructure is concerned, both price and security considerations should be taken into account when upgrading the technology, i.e. priority should be given to sourcing equipment from companies in reliable countries where there is no risk of misuse. The cyberspace domain is largely unregulated by international law. Slovakia should therefore push for countries to adopt cyberspace rules that are based on responsible behaviour and respect for international law, including fundamental human rights and freedoms in cyberspace.

III. SUSTAINABILITY

7. Competitive economy

The coming decades will be marked by the increasing redistribution of global power and shift in the geo-economic centre of gravity towards the Indo-Pacific. The G7 share of gross domestic product in global GDP has declined from 60% in 1975 to 40% today. The EU's share of global GDP is projected to decline from 18.3% in 2019 to 11.3% in 2050[80]. The disruption of global value chains caused by the COVID-19 pandemic and Russia's aggression in Ukraine has prompted calls for greater self-sufficiency and diversification of resources. Under the green and digital transitions, the dominance of economic sectors such as fossil fuel extraction and energy production is declining, while the renewable energy sector, ICT, services etc. are becoming more important. In order to withstand today's global economic, environmental and pandemic challenges, the modern innovative global economy will need to use resources efficiently and respect environmental principles.

According to the International Monetary Fund, the world needs to invest US$3.3 trillion in energy every year for the rest of the decade if it is to achieve zero carbon emissions by 2050[81]. The pressure to increase productivity coupled with the growing digitalisation and robotisation will affect the structure of employment and require a skilled workforce. Moving people from declining sectors (coal mining, fossil fuel based electricity, climate change industries, etc.) to growing sectors (IT, construction, health care, personal services, etc.) will be a major challenge, since regional mobility and skills are limiting factors. This may affect between 75 million to 375 million jobs globally in the coming decade[82]. Uneven demographic development presents another problem. Many advanced economies will stagnate, with the EU population falling to around 420 million by 2050, representing 4.3% of the global population. Moreover, this is taking place at a time when world debt is reaching record levels: US$226 trillion in 2020 (public and private debt), or 256% of global GDP. The year-on-year increase in global debt was 28%, the highest since the Second World War[83].



79 Specific short-term goals are given in the Action Plan for the Coordination of the Fight against Hybrid Threats for 2022 to 2024, adopted by the Slovak Government on 30 March 2022; https://rokovania.gov.sk/RVL/Material/27021/1

80 https://ec.europa.eu/info/strategy/strategic-planning/strategic-foresight/2021-strategic-foresight-report_sk

81 https://www.teraz.sk/ekonomika/mmf-svet-potrebuje-33-biliona-usd-ro/638102-clanok.html

82 https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM%3A2021%3A750%3AFIN

83 https://blogs.imf.org/2021/12/15/global-debt-reaches-a-record-226-trillion/

In this context, Slovakia's low competitiveness is a problem. It ranked 49th place in the World Competitiveness Ranking 2022[84]. Slovakia has long had a weak innovation environment and science and research receive little support. According to the European Innovation Scoreboard (EIS)[85], Slovakia was one of the "early innovators" in 2021, ranking 23rd among EU member states. Support for science and research has long been below the EU average (0.91% of GDP is spent on science, research and innovation compared to the EU average of 2.2%[86]). "High-tech" goods account for only 10% of total exports on average (compared to the EU average of 16%)[87]. . Unlike in some other countries, few companies innovate in Slovakia, while research is generally of poor quality and underfunded. Strong public-private collaboration is lacking.

According to Eurostat's assessment of the performance of EU member state economies as a percentage of the EU average in 2021 (GDP per capita in purchasing power parity), Slovakia was the third poorest country in the EU. Slovakia's economic performance was 68% of the EU average, despite having been 76% of the EU average in 2010. That represents a fall of eight percentage points over eleven years[88]. In contrast, between 2004 and 2010, the Slovak economy increased from 57% to 76% of the EU average in purchasing power parity terms and recorded the strongest convergence to the EU average among the V4[89] countries.

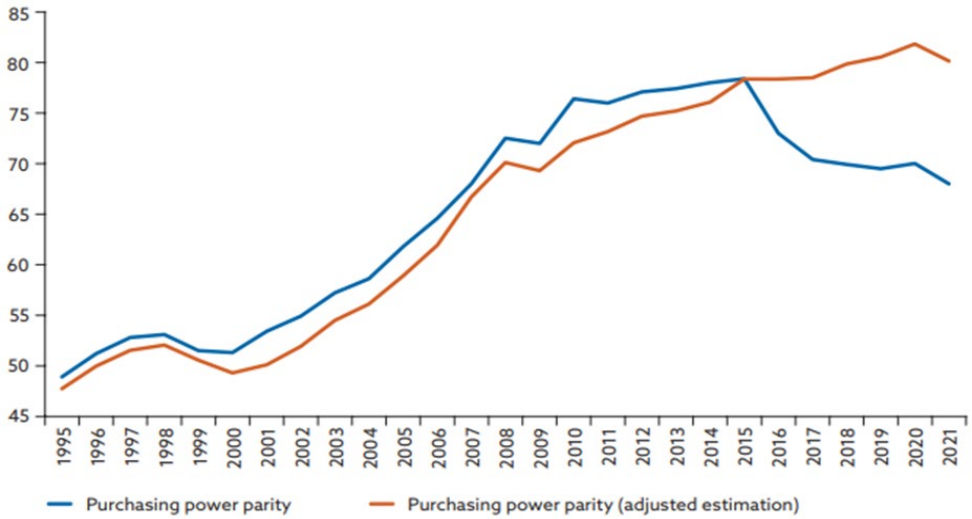
The Slovak economy consumes more resources than its natural capacity[90]. Despite progress in waste recycling (42.2% in 2020 compared to 10.3% in 2011[91]) Slovakia is below the EU average (47.8%).

Moreover, the statistics show that Slovakia has a problem with talented STEM sector workers[92] leaving to study abroad and settling there largely for economic reasons[93].

According to the OECD, Slovakia is highly vulnerable to the fourth industrial revolution and automation, with 34.6% of jobs at risk[94]. Even the most optimistic demographic forecasts show that the number of jobs in the Slovak Republic will decrease by 199,000 in 2030 compared to 2020[95].

To improve the competitiveness of the Slovak economy, it will be necessary to strengthen its innovative capacity and concentrate on sectors with higher added value. Particular attention must be paid to ensuring that businesses and

Evolution of Slovakia's GDP per capita at purchasing power parity (index: EU27 = 100)



Source: NBS

84 https://www.imd.org/centers/world-competitiveness-center/rankings/world-competitiveness
85 https://ec.europa.eu/growth/industry/policy/innovation/scoreboards_en
86 https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm
87 https://databank.worldbank.org/reports.aspx?source=2 & series=TX.VAL.TECH.MF.ZS & country=
88 https://www.trend.sk/ekonomika/neprijemna-statistika-eurostatu-slovensko-je-tretou-najchudobnejsou-krajinou-europskej-unii?itm_brand=trend & itm_template=hp & itm_modul=trend_topbox & itm_poson=1
89 https://www.tsk.sk/buxus/docs/dokumenty_tsk/europska_unia_nam_dokazala_ze_je_pre_slovensko_prinosom/10_rokov_EU.pdf
90 https://www.minzp.sk/files/iep/03_vlastny_material_envirostrategia2030_def.pdf
91 https://www.enviroportal.sk/indicator/detail?id=3501
92 STEM - Science, Technology, Engineering, Mathematics
93 For more information see recommendation 9: Human capital, population development, migration
94 https://www.oecd.org/future-of-work/reports-and-data/what-happened-to-jobs-at-high-risk-of-automation-2021.pdf
95 https://ekonomika.pravda.sk/firmy-a-trhy/clanok/610382-slovensko-do-konca-dekady-strati-200-tisic-pracovnych-miest-najviac-to-pocitia-muzi/

workers are adequately prepared to deal with the job losses caused by automation through the creation of new job opportunities. Slovak stakeholders (primarily small and medium-sized businesses) need to become more involved in science and innovation as well as EU-funded projects to improve scientific performance. Slovak businesses and scientific research entities should be encouraged to form connections with innovation and scientific entities abroad. State coordination and private sector participation in science, research and innovation should also be improved.

8. Green and digital transitions

The European Union has made the green and digital transitions a key priority and has decided to exploit the potential synergies between the two. The Recovery and Resilience Facility stipulates that EU member states must allocate at least 37% of funding to investment and reforms that will contribute to the climate objectives and spend at least 20% of funding on digital solutions[96]. The interconnection between the green and digital transitions cuts both ways: while digital technologies can help reduce the carbon footprint, they also account for 8–10% of energy consumption and 2–4% of greenhouse gas emissions[97]. The European Commission's 2022 Strategic Foresight Report *Twinning the Green and Digital Transitions in the New Geopolitical Context* analyses the interconnection between the twin transitions, taking into account the role of new and emerging technologies as well as key geopolitical, social, economic and regulatory factors. It found that the use of new technologies in the EU's largest greenhouse gas emitting sectors, i.e. energy, transport, industry, construction and agriculture, will prove key to successful twinning[98].

The green transition presents a number of challenges and opportunities. Industry is responsible for around 50% of global greenhouse gas emissions[99] and 1.2 billion jobs worldwide are directly dependent on natural processes, e.g. in agriculture, fishing or forestry[100]. Climate change is also affecting food self-sufficiency: more than 40% of EU agricultural imports could be affected by water scarcity by 2050[101]. But the transition to a green economy will also bring new job opportunities. The International Labour Organisation (ILO) estimates that measures on energy production and use will lead to a net increase of 18 million jobs worldwide[102].

Russia's aggression in Ukraine moves the issue of green transition from the environmental and economic also to the security dimension. In 2021, the EU imported more than 40% of its gas, 27% of its oil and 46% of its coal from Russia[103]. Even before the invasion, it was predicted that the EU could reduce its total energy dependence on foreign countries from 60% to 15% by achieving climate neutrality by 2050[104]. Current events are accelerating these trends.

However, the shift away from fossil fuels could heighten the vulnerability of some economies, as major fossil fuel exporters, who currently account for around 8% of world GDP and have a combined population of almost 900 million, would face large revenue losses in the event of aggressive decarbonisation[105]. Moreover, the shift to renewable sources could lead to a new dependence on the critical raw materials used in green technologies[106].

Similarly, geo-economic relations could be transformed by the digital transition. Digital business models are generating new types of value creation, innovative ways of delivering products and services with the help of supporting technologies such as artificial intelligence, 5G and cloud services. The massive growth of the digital economy is reflected in global GDP, accounting for 15.5% in 2016 and estimated to reach 25% by 2025[107]. In the EU, it is expected that the cumulative additional contribution of new digital technologies to GDP could reach €2.2 trillion by 2030, an increase of 14.1% compared to 2017[108].

Like the green transition, the digital transition has a growing security dimension besides the economic one. The COVID-19 pandemic has highlighted the importance of the online world in relation to the resilience of modern society in a time of disruptive events. Besides the existence of digital infrastructure, the issues of quality and security are becoming increasingly important. In the future, digital infrastructure will play a crucial role in e.g. access to healthcare, education, banking services, as well as in building resilience to climate change[109]. The effective implementation of new digital technologies (e.g. cloud computing) will depend on narrowing the investment gap in the basic digital infrastructure, which amounts to €65 billion per year in the EU.[110].

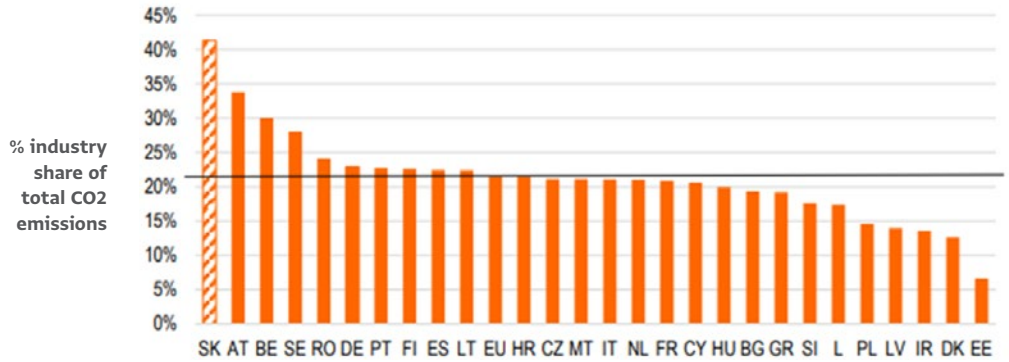
96 The EU's 2021-2027 long-term budget and NextGenerationEU - Publications Office of the EU (europa.eu).
The Recovery and Resilience Facility represents €723.8 billion of the total Recovery Plan – NGEU (€806.9 billion)
97 https://digital-strategy.ec.europa.eu/en/policies/green-digital
98 https://ec.europa.eu/info/strategy/strategic-planning/strategic-foresight/2022-strategic-foresight-report_sk
99 https://op.europa.eu/en/publication-detail/-/publication/7e1bcf73-06e2-11ec-b5d3-01aa75ed71a1/language-en
100 https://www.ilo.org/global/publications/books/WCMS_628654/lang--en/index.htm
101 https://ec.europa.eu/info/sites/default/files/foresight_report_com750_en.pdf
102 https://www.ilo.org/global/publications/books/WCMS_628654/lang--en/index.htm
103 https://ec.europa.eu/info/news/focus-reducing-eus-dependence-imported-fossil-fuels-2022-apr-20_en
104 https://ec.europa.eu/info/sites/default/files/foresight_report_com750_en.pdf, p.9
105 https://www.dni.gov/files/ODNI/documents/assessments/GlobalTrends_2040.pdf
106 For more information see recommendation 3: Growing importance of critical mineral resources
107 https://www.aiib.org/en/policies-strategies/operational-policies/digital-infrastructure-strategy/.content/_download/Full-DISA-Report_final-with-Appendix-2020-01-10.pdf
108 https://ec.europa.eu/info/sites/default/files/foresight_report_com750_en.pdf
109 https://www.act.is/wp-content/uploads/2022/03/ac-0209-203028-Global-Digital-Infrastructure-Investment-LOW-RES.pdf
110 https://ec.europa.eu/info/sites/default/files/communication-shaping-europes-digital-future-feb2020_en_4.pdf

The pace of the green transition has been slow in Slovakia. Although greenhouse gas emissions have fallen substantially owing to structural changes in the economy, the country is lagging behind in many areas, such as waste management, RES and air quality. According to the WWF, in 2022 Slovakia entered ecological debt on May 3rd, which means that it will use up more natural resources than the planet can replenish in a year[111]. Slovakia has the ninth highest energy intensity of all the EU countries. Industrial production and the use of fossil fuels in industry produces 41% of all emissions in Slovakia, the highest among EU countries.[112] According to the Eco-innovations Index[113] pSlovakia ranked 22nd in the EU-27 in 2021.

Slovakia also lags behind in digitalisation. It is below average in key international comparisons in developing a digital economy. Slovakia ranked 23rd among the EU-27 member states[114]. in the digital economy and society index (DESI) in 2022. In the World Digital Competitiveness Ranking[115] Slovakia came 47th out of 64 countries in 2021.

Slovakia is below the EU average in many areas such as basic digital skills (54% compared to 56% in the EU), digital intensity of small and medium-sized enterprises (52% compared to 60% in the EU), use of e-invoices (16% versus 32% in the EU)[116]. According to a McKinsey analysis, in 2016 Slovakia's digital economy generated €4.8 billion, representing 5.9% of GDP. Under the digital transformation, the share of the digital economy in Slovakia could increase to up to €20.9 billion by 2025, or 16.9% of the country's GDP[117].

Industry (and fossil fuel use in industrial production) share of CO2 emissions in 2018

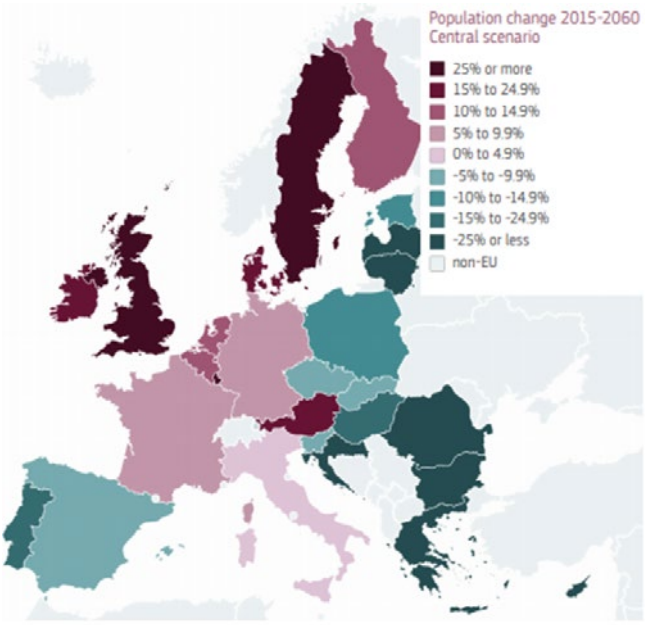


The twin green and digital transitions constitute an irreversible process that will determine the upcoming period. The transitions will be cross-cutting - horizontally covering most sectors and vertically ranging from the international to the local level. Accelerating the green and digital transitions should therefore be seen as an investment in the future and a generational opportunity for Slovakia's socio-economic transformation. In this critical period, effective use of the available resources from the Recovery and Resilience Plan and the new Partnership Agreement 2021-2027 represent a unique opportunity for acceleration. Slovakia plans to spend 45% (€2.85 billion) of its total allocation of €6.33 billion from the Recovery and Resilience Plan on the green transition and 21% (€1.33 billion) on digital transformation[118]. Most of the funds from the Partnership Agreement 2021-2027[119] will go towards green and climate objectives. Slovakia needs to make the most of the available resources to build an ecosystem to support the green and digital transitions, involving both the state and the private sector. Slovakia could also benefit from strengthening cooperation with countries that are green and digital technology leaders through the transfer of know-how.

111 https://slovakia.panda.org/?uNewsID=7204316
112 https://www.minzp.sk/files/iep/03_vlastny_material_envirostrategia2030_def.pdf
113 The eco-innovation index illustrates eco-innovation performance in the EU. It aims to capture different aspects of eco-innovation through 16 indicators grouped into five components – eco-innovation inputs, eco-innovation activities, eco-innovation outputs, environmental outcomes and socio-economic outcomes - https://ec.europa.eu/environment/ecoap/indicators/index_en
114 https://euractiv.sk/section/digitalizacia/news/slovensko-je-v-digitalizacii-piate-najhorsie-v-unii/
115 https://www.imd.org/centers/world-competitiveness-center/rankings/world-digital-competitiveness/
116 Slovakia country report - https://digital-strategy.ec.europa.eu/en/policies/desi
117 https://digitalchallengers.mckinsey.com/files/McKinsey%20CEE%20report_The%20Rise%20of%20Digital%20Challengers.pdf
118 https://ec.europa.eu/economy_finance/recovery-and-resilience-scoreboard/
119 https://www.mirri.gov.sk/sekcie/cko/politika-sudrznosti-eu/dokumenty/partnerska-dohoda-sr/index.html.
The total volume of EU funds provided to Slovakia under the Partnership Agreement is almost €13 billion

9. Human capital, population development, migration

Several world regions will have to grapple with a shortage of human capital in the near future, which could result in social and economic imbalances. Both neighbouring continents, Asia and Africa, are seeing demographic growth (Asia 0.9%, Africa 2.5%, Europe 0.1% per year) and are strengthening their positions as population centres of the world (Asia 60% of the world population, Africa 17%, EU 5.7%). The average age in Asia is 32, in Africa 20 and in Europe 43. Africa's population is projected to double by 2050, while Europe's population will decline by 5%[120]. In the coming decades, countries will therefore have to invest significantly more in attracting "brains" to work in their economies to improve their global competitiveness, prosperity and influence. Slovakia's stability and prosperity will partly depend on its ability to develop its human capital and adapt the knowledge and skills of its people to the needs of the 21st century economy.



Map source - https://pure.iiasa.ac.at/id/eprint/15942/1/demographic_online_20190527.pdf

Highly skilled human capital is very mobile, responsive to deteriorations in the socio-economic environment and a lack of opportunities. At the same time, countries with good conditions (opportunities in science and research, political stability, developed business sector) are naturally attractive to skilled labour[121]. Good socio-economic conditions and a high concentration of quality human capital also attract investment and generally bring high added value to society.

In the World Talent Ranking 2021, Slovakia ranked 52nd[122], coming below average in investment in domestic human resources, attracting highly skilled human capital from abroad, and quality of opportunities for talent within the domestic economy. Slovakia had a similar ranking (44th rank, the lowest of the V4 countries) in The Human Capital Index 2020[123] published by the World Bank. It comprehensively surveys human capital development across age categories. Slovakia also ranked below average in spending on education (3.7% of GDP compared to the OECD average of 4.9%), employment of young graduates (worst among OECD countries – 32% unemployed)[124], , spending on research and development (0.9% of GDP in 2020 – 24th in the EU)[125], and PISA testing results[126].

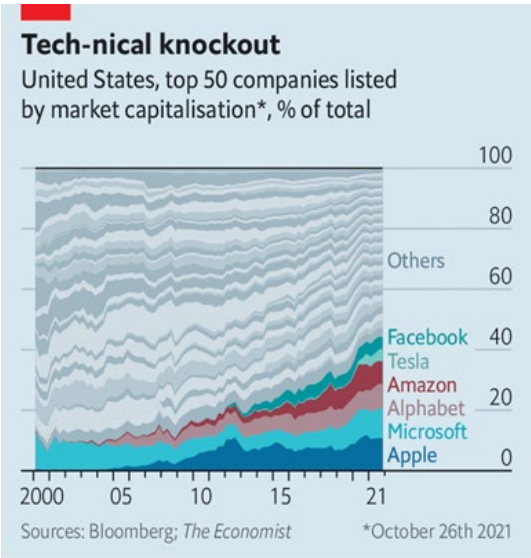
The main challenge for Europe, including Slovakia, will be coping with natural migration pressures, while tackling labour market shortcomings through controlled labour migration. Developing domestic human resources while attracting promising and talented human capital from abroad will be essential for further growth in living standards in Slovakia and to overcome "middle-income traps". In addition to skilled labour, low-skilled labour will be needed for sectors such as services, care, agriculture and construction[127]. Slovakia should therefore deepen cooperation and follow the good examples of leaders in human capital management and work (e.g. Scandinavian countries, Singapore, Canada). A specific medium-term challenge will be tapping into the migration wave from Ukraine, not just as a source of migration but potentially integration as well.

120 https://www.worldometers.info/world-population/population-by-region/
121 The Global Competition for Talent: Mobility of the Highly Skilled (oecd.org)
122 https://www.imd.org/centers/world-competitiveness-center/rankings/world-talent-competitiveness/#_booklet-talent-375876
123 The Human Capital Index 2020 Update : Human Capital in the Time of COVID-19 (worldbank.org)
124 https://www.oecd-ilibrary.org/sites/d8cc1985-en/index.html?itemId=/content/component/d8cc1985-en
125 https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20211129-2
126 https://gpseducation.oecd.org/CountryProfile?primaryCountry=SVK & treshold=10 & topic=PI
127 Newland K, Riester A.: Welcome to Work? Legal Migration Pathways for Low-Skilled Workers https://www.migrationpolicy.org/sites/default/files/publications/LegalPathwaysLowSkilledWorkers-finalweb.pdf

10. State-corporate relationship

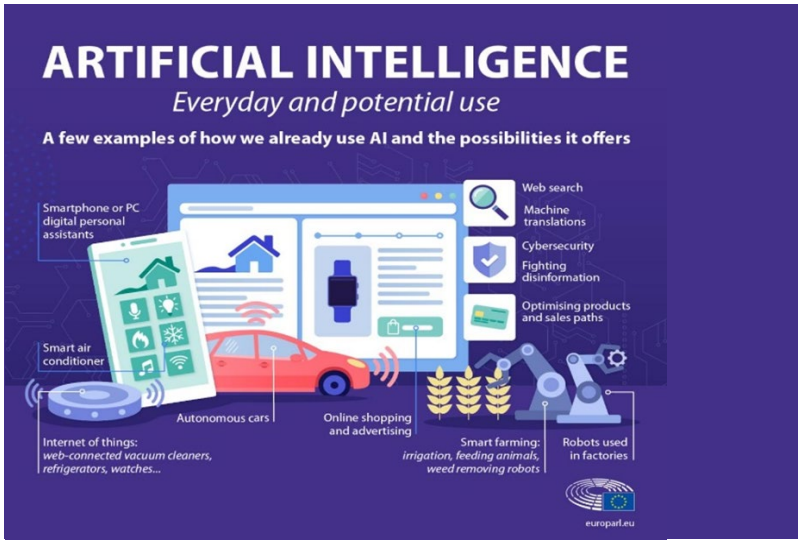
Private businesses are an important component of the global economy, meeting the vast majority of the needs of today's society. In addition to the private sector's growing share of GDP, the trend is for economic power to be increasingly concentrated between a handful of corporations, which has implications for the political, economic and social world order[128]. In 2016, among the top one hundred global entities ranked by annual revenue, 71 were corporations and just 29 were countries[129]. The top 100 companies ranked by market capitalisation alone are worth US$ 35.2 trillion, representing approximately 35% of global GDP (70% is accounted for by American corporations[130]).

The largest technology corporations are now so large that they can no longer be ignored, even in geopolitics. Only 14 countries in the world have an annual revenue greater than that of



Amazon[131], and as many as a third of the 100 largest corporations are technology corporations. The remaining two-thirds are in the energy, financial, healthcare, basic materials, consumer goods, industrial and telecommunication sectors (the largest include: Saudi Arabian Oil, Tesla, Berkshire Hathaway, Visa, United Health, Johnson & Johnson, Walmart, JPMorgan Chase)[132]. During the pandemic, technology companies significantly strengthened their market capitalisation relative to companies in other sectors, and revenues are still rising. In particular, the five largest technology companies, known as Big Tech (Alphabet/Google, Amazon, Apple, Meta/Facebook, Microsoft)[133]. play a dominant role in the world. In China, Alibaba, Huawei, Tencent, Baidu, Xiaomi hold a similar position. Global corporations are growing rapidly. Half of the world's eight largest companies were created less than 30 years ago (Amazon, Tesla, Alphabet/Google, Meta/Facebook), two of them less than 20 years ago[134]. Big Tech companies are adding a whole new dimension to geopolitics, economics and social interaction. Their algorithms determine economic and political decision-making. An increasing proportion of everyday working and personal life takes place in the digital world dominated by big companies, and that will only increase as the metaverse[135] improves.

Artificial Intelligence (AI) is becoming a major technology of the future[136]. By 2030, AI-generated economic growth was around US$15 trillion, equivalent to 14% of global GDP in today's terms[137]. Big Tech is set to dominate this area. Google alone has bought over 30 AI companies in the last 15 years[138].

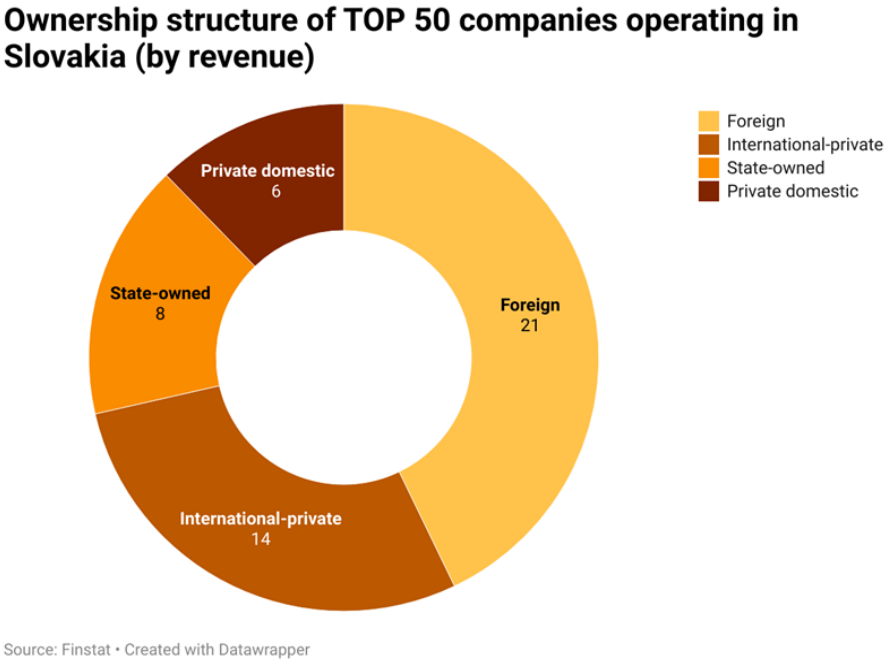


On the other hand, the digital world is inevitably rooted in physical reality (location of servers, production, employees, infrastructure, etc.), where the US still has a major say. Both the EU and the US will have to tackle the lengthy and problematic regulatory process of coming up with new rules on digital privacy and regulating the actions of technology companies. China will continue to pressurise its technology

128 http://speri.dept.shef.ac.uk/2019/01/03/corporate-power-the-global-economy/
129 For the US, the amount of tax revenue is calculated by Babic Milan, Fichtner Jan, Heemskerk Eelke. Who is more powerful – States or Corporations? https://pure.uva.nl/ws/files/29580101/Who_is_more_powerful_states_or_corporations_.pdf
130 https://www.pwc.com/gx/en/news-room/press-releases/2022/global-top-100-companies-market-cap-2022.html
131 https://www.heritage.org/index/explore?view=by-variables & version=1293
132 https://www.pwc.com/gx/en/news-room/press-releases/2022/global-top-100-companies-market-cap-2022.html
133 Diagram source - https://www.economist.com/business/2021/10/30/how-the-pandemic-has-changed-the-weather-in-the-technology-industry
134 https://companiesmarketcap.com/
135 The metaverse, as currently understood, describes the merging of the real, augmented and virtual worlds into a single reality in which people can live fully-fledged lives that has a separate economy and is not governed by one particular society.
136 https://www.europarl.europa.eu/news/sk/headlines/priorities/umela-inteligencia/20200827STO85804/umela-inteligencia-definicia-a-vyuzitie
137 https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/637967/EPRS_BRI(2019)637967_EN.pdf
138 https://foreignpolicy.com/2021/08/11/artificial-intelligence-big-tech-regulation-monopoly-antitrust-google-apple-amazon-facebook/

companies into adapting to national priorities, improving firewalls and tracking devices[139]. Smaller states may seek to limit at least the types of data that can cross borders. No government in the foreseeable future will be able to counter the impact of Big Tech alone and its efforts to take over some state functions (education, public media, health care, finance etc.)[140]. Meanwhile, the average tax burden for Big Tech is about 15%, which is 40% less than the average for the rest of the world's 50,000 large companies[141].

Foreign corporations play a significant role in Slovakia's economy as its economy is very open, pro-export and the recipient of high levels of foreign direct investment in recent years. In 2021, fifty of the largest companies operating in Slovakia had revenues of 64% of the country's GDP (€62.7 billion)[142]. Up to 35 of these were either foreign-owned or privately owned multinationals. The automotive industry forms the backbone of the Slovak economy and was built on foreign investment. It currently accounts for 12% of GDP and directly or indirectly employs over 270,000 people[143]. At the same time, technology corporations are playing an increasing role in the structure of the economy, providing employment to more than 100,000 people and contributing 4.15% to GDP growth [144].



The interdependence of state and multinational corporations in providing for the needs of modern society is set to deepen. Slovakia has limited ability to regulate the influence of transnational corporations, but being integrated into international structures helps. Areas that deserve particular attention include data protection, taxation of multinational corporations, transparency, enforcing corporate accountability and antitrust measures. Multinational corporations also represent an opportunity for Slovakia's development potential. In order to strengthen the competitiveness of the economy, the state should focus on encouraging company investments that bring additional added value by increasing the innovative capacity of the Slovak economy or attracting talent.

139 https://www.dotcom-monitor.com/blog/2020/06/15/the-great-firewall-of-china-obstacles-to-monitoring-performance/
140 https://asia.nikkei.com/Opinion/Conflict-between-Big-Tech-and-governments-invites-technopolar-world
141 https://asia.nikkei.com/Spotlight/Datawatch/Big-Tech-tax-burdens-are-just-60-of-global-average
142 Finstat – revenue analysis
143 SARIO, Automotive sector in Slovakia 2022 - https://sario.sk/sites/default/files/sario-automotive-sector-in-slovakia-2022-03-14.pdf
144 SARIO, ICT sector in Slovakia 2022 - https://sario.sk/sites/default/files/sario-ict-sector-in-slovakia-2022-02-09.pdf

IV. CONSOLIDATION

11. Effective multilateralism, international legal order and strategic stability

Even before the current geopolitical upheavals, the international order was under increased pressure from the growing distrust, unilateral actions and marginalisation of international mechanisms and organisations. Examples include the paralysis of the WTO appeal body[145], protracted negotiations to fill Organisation for Security and Co-operation in Europe (OSCE) leadership positions[146], the non-payment of financial obligations arising from UN membership[147], or the doubling of the number of vetoes against UNSC decisions in the last decade, compared to the two previous decades[148].

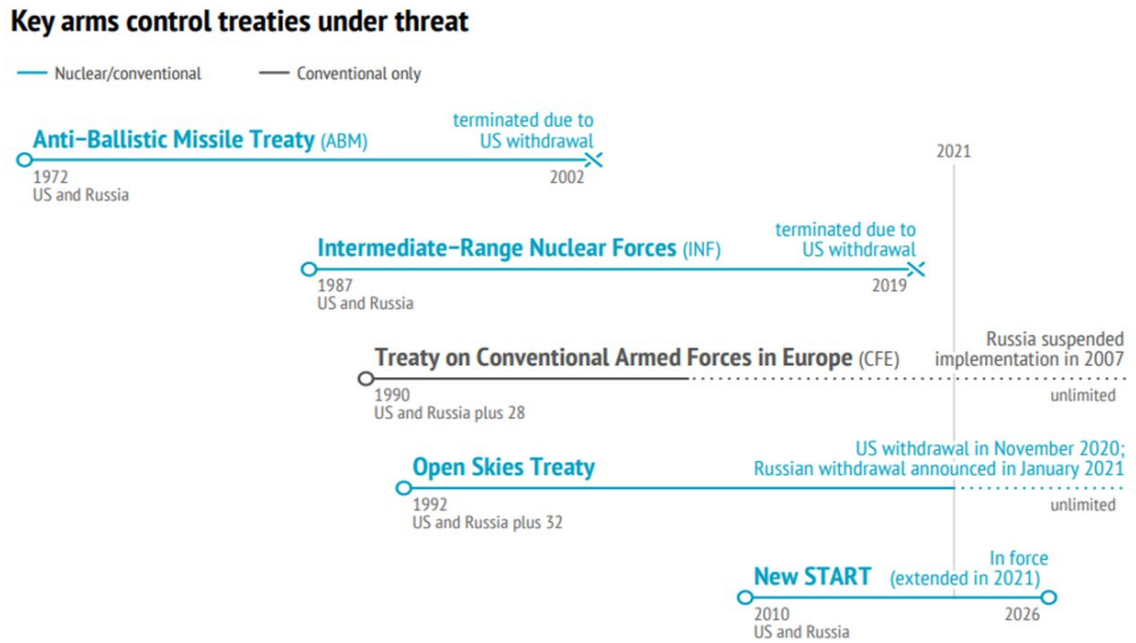
The poor state of multilateralism is highlighted by developments in arms control, disarmament and non-proliferation, as well as the related strategic stability. Of the key treaty frameworks belonging to the relatively robust normative architecture, the only ones to remain in force are the New START Treaty, the Nuclear Non-Proliferation Treaty (NPT) and the Comprehensive Nuclear-Test-Ban Treaty (CTBT)[149]. More broadly, the poor state of multilateralism is illustrated by the lack of progress on the Iran nuclear deal (JCPOA)[150] and the questioning of the role of the Organisation for the Prohibition of Chemical Weapons (OPCW)[151].

The bilateral US–Russia talks on strategic stability have been suspended as a result of Russia's aggression in Ukraine[152] and China had avoided engaging in the dialogue even before the Russian invasion.

The crisis in multilateralism is reaching a height with Russia's aggression in Ukraine, which has called into question even the most elementary principles and rules of international law. Moreover, the fact that the aggression was perpetrated by a permanent member of the UN Security Council is paralysing the council, which has primary responsibility for maintaining international peace and safety. The situation has also exacerbated the crisis in OSCE[153] and led to Russia's exclusion from the Council of Europe[154] and to the initiation of a process of reflection on its future[155].

The continuing great power rivalry and the revival of the concept of spheres of influence pose a strategic challenge to small and medium-sized countries whose interests are best guaranteed by a functioning system of international law and institutions.

Different concepts are coming to the fore, challenging the primacy of effective multilateralism. One response to the increasingly paralysed multilateral system is '"minilateralism", where smaller coalitions are formed of countries willing to work together on specific issues[156]. On the other hand, there



145 https://www.wto.org/english/tratop_e/dispu_e/appellate_body_e.htm
146 https://www.reuters.com/article/us-osce-jobs-idUKKBN28B6KW
147 https://press.un.org/en/2022/gaab4383.doc.htm
148 https://research.un.org/en/docs/sc/quick/veto
149 https://www.iss.europa.eu/sites/default/files/EUISSFiles/CP_166.pdf
150 https://edition.cnn.com/2022/06/29/politics/iran-nuclear-deal-talks-end-no-progress/index.html
151 https://carnegiemoscow.org/commentary/86015; https://reliefweb.int/report/syrian-arab-republic/syria-s-failure-remedy-pending-issues-chemical-weapons-use-wake-call
152 https://www.reuters.com/world/europe/russia-says-strategic-stability-dialogue-with-us-formally-frozen-tass-2022-04-30/
153 https://www.crisisgroup.org/europe-central-asia/eastern-europe/ukraine/preserving-osce-time-war
154 https://www.coe.int/en/web/portal/-/the-russian-federation-is-excluded-from-the-council-of-europe
155 Irish Presidency welcomes the first meeting of the High Level Reflection Group - News (coe.int)
156 https://www.orfonline.org/research/minilateralism-weighing-prospects-cooperation-governance/

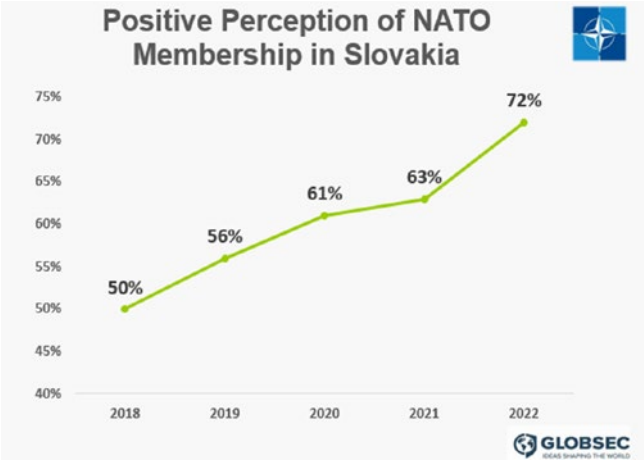
is growing appetite among some countries to modify the current multilateral system which is leading to multipolarity, where multiple power centres (poles) form around closely connected spheres of influence with their own integrative and regulatory structures. An analogy can be drawn between multipolarity and the increasing regionalisation – seen for example in the creation of the African Continental Free Trade Area[157] that took effect in 2021, which is the largest free trade area by number of countries, or the Regional Economic Partnership (RCEP) in 2022 that brings together 16 countries in the Asia-Pacific region. The latter represents 30% of the world's population, 30% of global GDP, over a quarter of world trade and almost a third of global foreign direct investment[158].

Slovakia's global position is strengthened by its membership of the EU and NATO. At the same time, as a country with limited economic, technological, military and political power and a very open economy and society, it is in Slovakia's interest to defend the multilateral world order that respects rules and democratic principles. Rather than calling for the radical reorganisation of the world order, we need to push for the revival of the multilateral system that has guaranteed international peace and stability up until now and for it to be adapted it to the reality of the 21st century. The best alternative is a multilateral cooperation model based on respect for international law and institutions, in which attention is focused on the global security architecture. A number of international organisations will need to be reformed to improve their functionality and adapt them to the challenges of the 21st century. However, it must be based on the condition that they respect the sovereign equality of states, the prohibition of the threat and use of force, the peaceful settlement of disputes, and the principles of democracy, international law and universal human rights[159].

12. Slovakia as part of a strong, united and responsive EU and NATO

The EU and NATO will remain crucial to guaranteeing stability and prosperity in Europe in the period ahead. Geopolitical changes and crises in the previous period have put pressure on the internal cohesion and functioning of integration formats, but they have also provided new incentives to deepen and consolidate European and Euro-Atlantic integration.

NATO will continue to be the key pillar of Euro-Atlantic security, and its main purpose will be to ensure the collective defence of its members[160]. The provision of unprecedented security guarantees, including a protective nuclear shield, will remain vital for Slovakia, both because of its exposed position on the eastern wing of the Alliance and the sheer scale of the security threats and challenges that are beyond Slovakia's capabilities. On the positive side, support for Slovakia's membership of the Alliance is growing, and Russia's aggression in Ukraine has reinforced this.



Russia's aggression has also strengthened NATO cohesion[161]. The Alliance's vision and objectives for the next decade are embodied in the new NATO Strategic Concept adopted in June 2022. The Alliance has strengthened its presence on its eastern wing and is prepared to reinforce deterrence and defence across all five operational domains – land, maritime, air, cyber space and outer space. This will be matched by greater defence funding at both Alliance and member state level. The dynamism in NATO can be seen in its open-door policy, testified by the historic decision to invite Sweden and Finland to join the Alliance.

From 2008 to 2022, the EU faced a series of crises that weakened its internal cohesion, capacity for action on the international scene (the economic and financial crisis, migration, the COVID-19 pandemic) and, last but not least, the integrity of the European Union (Brexit). Nevertheless, it is precisely in this period that the EU has been able to take decisions with the potential to strategically transform the Union – e.g. the Recovery Plan[162], the European Peace

157 https://african.business/2022/02/trade-investment/what-you-need-to-know-about-the-african-continental-free-trade-area/
158 https://asean.org/rcep-agreement-enters-into-force/
159 https://www.un.org/en/about-us/un-charter
https://www.osce.org/helsinki-final-act
https://www.un.org/en/about-us/universal-declaration-of-human-rights
160 https://www.nato.int/strategic-concept/
161 https://www.nato.int/cps/en/natohq/official_texts_196951.htm
162 https://ec.europa.eu/info/strategy/recovery-plan-europe_sk - The EU's Recovery Plan will deliver over €1.2 trillion within the Multiannual Financial Framework for 2021–2027, extraordinary financing (NextGenerationEU – NGEU) of €806.9 billion for reforms and investments to be implemented by 2026, where the emphasis is on the

Instrument[163], the EU Strategic Compass[164] and the Global Gateway[165]. In particular, the ongoing green and digital transitions at the heart of the Recovery Plan offer a unique opportunity for the EU to remain globally relevant and at the forefront of technological progress. At the same time, however, a number of measures responding to the crises of the previous period remain unfinished – for example the single market, the banking union, the capital markets union, and the EU's migration and asylum policy. Finally, in relation to the Conference on the Future of Europe, and in the light of the restart of the EU enlargement process, the question of EU institutional reform is being raised again.

The restart of the EU enlargement process is an important element in the consolidation of Europe. The accession process is an essential instrument for enhancing the stability, security and prosperity of the immediate EU neighbourhood. There are 10 applicants interested in joining the Union and they are at different stages of integration[166]. The unblocking of enlargement in the Balkans[167] and especially the historic opening up of the membership perspective in the Eastern vector[168] may mean that, after a decade of stagnation, the next decade will be one of further enlargement of the Union. This process, together with NATO's open-door policy, could contribute significantly to the further political homogenisation of the European and transatlantic area.

Managing these processes will be crucial to the EU's ability to adapt to the strategic challenge posed by Europe's continued demographic marginalisation and the associated weakening of its global influence – it has been estimated that the EU's share of the world population will fall to 4.3% by 2050 (7.9% in 1990) and to 11.3% of global GDP (27.4% in 1990)[169].

Scenario	Group	States	Change in land area		Change in population (in mil. inhabitants)		Change in GDP		GDP p. c. EU post enlargement		GDP p.c. SK post enlargement (in % EU average)
1	**West Balkans**	AL, ME, MK, RS, XK, BA	215 420	**5,39%**	19,54	**4,39%**	127 468	**0,75%**	42 566	**-2,48%**	81,79%
2	**Eastern Partnership**	GE, MD, UA	681 660	**17,05%**	51,76	**11,62%**	211 280	**1,24%**	40 571	**-7,06%**	85,81%
3	**Turkey**	TR	769 630	**19,25%**	84,34	**18,94%**	795 952	**4,68%**	41 840	**-4,15%**	83,21%
4	**Ukraine**	UA	579 320	**14,49%**	43,73	**9,82%**	181 038	**1,06%**	40 994	**-6,09%**	84,93%
5	**West Balkans + Ukraine**	AL, ME, MK, RS, XK, BA, UA	794 740	**19,88%**	63,28	**14,21%**	308 506	**1,81%**	40 105	**-8,12%**	86,81%
6	**West Balkans + Eastern Partnership**	AL, ME, MK, RS, XK, BA, GE, MD, UA	897 080	**22,44%**	71,30	**16,01%**	338 748	**1,99%**	39 712	**-9,02%**	87,67%
7	**All**	AL, ME, MK, RS, XK, BA, GE, MD, UA, TR	1 666 710	**41,69%**	155,64	**34,96%**	1 134 700	**6,67%**	38 668	**-11,42%**	90,04%

Impact of EU enlargement under different scenarios (Source: Ministry of Foreign and European Affairs of the Slovak Republic)

green and digital transitions and building EU resilience. In a new departure, the European Commission will borrow on international markets on the EU's behalf to finance the NGEU.

163 https://www.consilium.europa.eu/sk/policies/european-peace-facility/ - The European Peace Facility is the EU's new off-budget financial mechanism, worth €5.69 billion, for strengthening the EU's security and defence capabilities from 2021 to 2027.

164 https://www.eeas.europa.eu/eeas/strategic-compass-security-and-defence-1_en - Strategic Compass is the EU's action plan for strengthening EU security and defence policy by 2030. The aim of the Strategic Compass is to make the EU a stronger, more capable security actor. The Compass covers all aspects of safety and defence policy and is based on four pillars: activity, investment, partners and safety.

165 https://ec.europa.eu/info/strategy/priorities-2019-2024/stronger-europe-world/global-gateway_sk - The Global Gateway is the EU's new strategy for infrastructure investment in the world and will prioritise digitalisation, climate and energy, transport, health, education and research. The aim is to mobilise €300 billion of EU and national resources for such projects between 2021 and 2027.

166 Candidate status has been granted to Albania, Montenegro, Moldova, Serbia, North Macedonia, Turkey and Ukraine. The potential candidates are Bosnia and Herzegovina, Georgia and Kosovo.

167 https://www.euronews.com/my-europe/2022/07/19/historic-moment-eu-opens-accession-negotiations-with-albania-and-north-macedonia

168 https://www.euractiv.com/section/europe-s-east/news/eu-leaders-grant-candidate-status-to-ukraine-and-moldova/

169 https://ec.europa.eu/info/sites/default/files/strategic_foresight_report_2021_en.pdf

Opportunities to consolidate the European and Euro-Atlantic area will arise in the coming period, providing the political West can maintain unity in the face of the expected security and economic challenges and implement the internal reforms and enlargement of both the EU and NATO. Seizing this opportunity will be crucial to maintaining Europe's relevance amidst the geopolitical competition. Given the limits of the EU's global influence, its ability to maintain European economic, regulatory, technological and innovative leadership will play an important role. In the face of rising geopolitical tensions, it will be strategically important for NATO to remain the key guarantor of European security. Supporting the enlargement process and completing unification will present opportunities for the Slovak Republic to deepen cooperation with the potential applicant countries with which it has strong political and people-to-people relations, and to deepen these in the economic, investment and trade sectors. Handling the financial management of the forthcoming processes will present a specific challenge for Slovakia, bringing both unprecedented opportunities through the Multiannual Financial Framework, including the Recovery Plan, and higher expenditure on defence and energy transformation along with the prospect of declining net revenues from the common European budget.

13. Effective regional cooperation

For the first time since the Second World War, military conflict is taking place in Slovakia's immediate neighbourhood. Russia's aggression in Ukraine will have a substantial impact on Slovakia's neighbourhood and regional policy.

In the previous period, Central Europe was the target of growing geopolitical activity. The recent crises in Europe have left their mark on the political dynamics in the region, which can be seen in the variety of different approaches to resolving such crises, including divergent approaches to European integration. In addition, the slowdown in enlargement and the growing third country influence has introduced instability into the European neighbourhood. These internal dynamics and geopolitical influences in the region are reflected in the proliferation of regional formats and groupings.

In the light of current events, it is expected that the Bucharest Nine (B9)[170], will grow in importance and seek effective responses to security threats on the Alliance's eastern wing. Similarly, the Three Seas Initiative is likely to become more influential. It is particularly interested in solving North-South connectivity and at its June 2022 Summit offered participant status to Ukraine [171]. Conversely, the importance of China's 16+1[172] format is expected to decline.

Visegrad Cooperation, which has long dominated regional cooperation in Central Europe, may retain its relevance in a wide range of areas of pragmatic cooperation. However, politically the development of the Visegrad format will be directly proportional to its ability to overcome dissonance in foreign policy issues and differences of opinion on the rule of law and the future shape of the EU. By contrast, the Slavkov format may become more important politically given greater homogeneity of values. The role of the new C5 format, created in response to the Covid-19 pandemic, will depend on its ability to bring added value to the countries involved.

The importance of the immediate neighbourhood to Slovakia is also visible in the economic and social indicators. There are two exceptions to this. On the one hand, Germany features strongly in most indicators, while on the other hand, interaction with Ukraine, a close neighbour, is disproportionately low.

Selected regions/groupings/ countries	Exports (2015-2021)	Imports (2015-2021)	FDI in Slovakia (2020)	FDI abroad (2020)	Incoming tourism (2015-2020)	Out-going tourism (2015-2020)	ODA (2016-2020)	Immigration (2015-2021)	Emigration (2015-2021)	Slovaks abroad (2021)
Czech Republic	11,5%	11,2%	14,4%	56,6%	12,7%	0,7%	0,0%	25,5%	33,8%	12,4%
Austria	5,7%	3,2%	15,0%	8,2%	16,1%	1,3%	0,0%	9,3%	22,6%	3,7%
Hungary	6,3%	5,1%	4,2%	4,3%	1,1%	0,8%	0,0%	6,3%	2,2%	2,5%
Poland	7,9%	6,1%	1,0%	9,6%	1,2%	0,4%	0,0%	2,9%	0,5%	0,3%
Ukraine	0,8%	0,8%	0,0%	2,1%	7,8%	0,0%	6,9%	5,9%	0,0%	0,6%
Germany	22,0%	19,0%	7,4%	0,8%	17,4%	0,4%	0,0%	7,3%	8,8%	4,9%
SK neighbours	32,2%	26,5%	34,6%	80,8%	38,8%	3,2%	6,9%	49,9%	59,2%	19,4%
SK neighbours + Germany	54,1%	45,5%	42,0%	81,6%	56,2%	3,6%	6,9%	57,2%	68,0%	24,3%

Source: Ministry of Foreign and European Affairs of the Slovak Republic

170 https://www.nato.int/cps/en/natohq/news_196378.htm?selectedLocale=en
171 https://www.euractiv.com/section/politics/short_news/ukraine-becomes-participating-partner-of-three-seas-initiative/
172 https://news.err.ee/1608444908/foreign-committee-chair-estonia-should-leave-16-1-format; https://chinaobservers.eu/when-will-the-czech-republic-exit-the-161/

Ukraine's EU Association Process represents a historic opportunity for the Slovak Republic to work on developing full relations with our largest neighbour, as these lag far behind their potential according to most indicators. Slovakia's active involvement in Ukraine's post-war reconstruction presents a unique opportunity to correct this imbalance.

Another key opportunity to develop the region lies in the EU Recovery Plan. The Recovery and Resilience Facility alone will provide the nine countries on the EU's eastern wing with in excess of €95 billion over the next years, over and above the Cohesion Fund.

Developing Central and Eastern Europe will enhance the region's strategic importance. The key to consolidating regional cooperation, and thereby the region's importance and influence, lies in the participating countries' abilities to effectively draw on the various regional cooperation formats, in parallel to the management of bilateral relations, while helping find common solutions in both the EU and NATO and maintaining the unity of both. Bilateral, regional and European, or Euro-Atlantic, cooperation could become both mutually supportive and mutually exclusive. Besides the multilayered dynamics of relations in Central Europe, the Russian aggression in Ukraine will be a determining factor in the coming period and has the potential to transform both relations in the region and the nature of various formats of regional cooperation. It is in the Slovak Republic's strategic interests to use Ukraine's EU accession process to fully anchor Ukraine in Central Europe and the EU and to actively engage in the stabilisation and post-war reconstruction of Ukraine. Whether Ukraine becomes a stable, democratic, independent and viable state on Slovakia's eastern border will be a defining moment, not just for Slovakia's neighbourhood policy but for Central European dynamics as a whole.

V. CONNECTIVITY

14. Data and technology – future drivers of the modern economy

The growing importance of data and its transmission, storage and use is reflected in the term the "new oil of the 21st century". Data-based companies are increasingly among the largest global firms[173]. Data and technology will play a strategic role in the coming period, given its importance to the competitiveness and growth of economies as well as national security. According to UNCTAD, the volume of global data traffic is expected to grow from 200 EB[174]/month to around 800 EB/month between 2020 and 2026 alone. The International Data Corporation (IDC) predicts a five-fold increase in the creation of new data between 2018 and 2025 and that by 2027, 41% of company revenue will come from digital products and services.

According to the world's scientific and analytical organisations and specialist media[175] , the following technologies are the most important from a global perspective:

- 5G
- consumer data platforms (CDP)
- hybrid cloud architecture
- cyber-security
- artificial intelligence
- Internet of Things
- quantum computers

By 2026, 5G is expected to dominate mobile data transmission (up to 4.4 billion people will be on a 5G network by 2027)[176]. By 2035, 5G technologies alone are expected to add the equivalent of the GDP of India in value to the world economy[177]. UNCTAD[178] predicts that between 2021 and 2028 the size of the Internet of Things (IoT) market is expected to grow from US$0.38 trillion to US$1.85 trillion (an annual growth rate of 25%). The use of user data platforms to collect and sort data will also see increase rapidly. IBM estimates that so-called bad data costs US companies US$3 trillion a year.

The rivalry in the technology sphere extends to geopolitics. According to a Harvard University study[179] , of the six technology segments studied (5G, AI, quantum technologies, semiconductors, biotechnology and renewable energy sources), China has already surpassed the US in 5G and quantum technologies, and by the end of this decade, it is likely to overtake the US, including in the remaining segments[180]. China also performs comparatively well in 6G

173 https://www.forbes.com/lists/global2000/?sh=1e18a2cd5ac0
174 Exabyte – million terabytes, from 2016 to 2021 alone mobile data traffic grew from 6.7 EB/month to 65 EB/month. By 2026, it is expected to grow further to 230 EB/month.
175 www.forbes.com/sites/danielnewman/2020/09/21/top-10-digital-transformation-trends-for-2021/?sh=6ce92475c6f4
176 By the end of 2021 there were around 660 million users.
https://www.ericsson.com/4ad7e9/assets/local/reports-papers/mobility-report/documents/2021/ericsson-mobility-report-november-2021.pdf
177 https://www.technologyreview.com/2017/03/01/153487/the-5g-economy-how-5g-will-impact-global-industries-the-economy-and-you/
178 https://unctad.org/system/files/official-document/der2021_en.pdf
179 https://www.belfercenter.org/sites/default/files/GreatTechRivalry_ChinavsUS_211207.pdf
180 By the end of 2020, there were only 6 million 5G users in the US, while there were 150 million in CN; there were 700 thousand 5G transmitters in CN (14x fewer in the US), producing 6x faster speeds (300 Mbps).

patents and quantum patentsh[181]. By 2030, China is expected to be world leader in the production of semiconductors[182].

The European Commission publishes Resilience Dashboards[183] to compare the relative performance of EU member states and the resilience of the EU as a whole against selected non-EU countries (Australia, Brazil, Canada, Switzerland, China, Indonesia, India, Japan, Korea, Mexico, Norway, Russia, Turkey, the UK and the US) on various indicators. In the digital dimension, the EU performs above average, lagging behind only Australia and the US. Slovakia, despite improvement in a number of digital indicators, was average-to-below average compared to the EU[184].

EU member states lag behind in the introduction of 5G networks. By the end of 2020, 23 member states (including Slovakia) had launched commercial 5G network services and achieved the interim target of at least one major city having 5G access.

The National Broadband Plan of the Slovak Republic foresees domestic coverage of at least 100 Mbps by 2023, with the potential for 1 Gbps, as well as community coverage of 1Gbps (for schools, institutions, offices, transport hubs). In 2022, 41% of households in Slovakia did not have access to ultrafast internet[185].

The continual expansion of technology in domestic and business life will require reliable and secure digital infrastructure, enhanced cyber-security, better fast broadband and ultra-high capacity networks, as well as new regulatory frameworks for digital technologies (e.g. artificial intelligence, quantum computers, digital currencies). In order to fully exploit the potential of the fourth industrial revolution Slovakia will have to plug its digital gap with the EU, and the EU will have to defend its position in digital resilience and maintain its competitiveness in the global technological sphere.

15. Interconnecting regions and the continent – from North to South

The Central European region suffers from a lack of transport infrastructure, especially North-South connections. In road infrastructure, the main problem is the lack of motorway connections. The most well-known North-South regional connectivity project is Via Carpatia, which links the Baltic Sea ports to the Aegean Sea. However, the Slovak section had still not been completed by 2022 and is the only part of the project that has yet to reach the preparation phase[186].

Strategic defence is playing an increasingly crucial role in infrastructure – sufficient infrastructure links, both between and within countries, represent an important component of national defence. Military mobility is also becoming more important owing to the increasing military threat emanating from the East. Alongside satisfactory physical infrastructure, there is a need to harmonise administrative procedures, synchronise technical standards and ensure sufficient funding[187]. Military mobility is also covered in the EU's financial planning – in the Multiannual Financial Framework for 2021 to 2027, the EU foresees €1.5 billion in funding for military mobility projects[188].

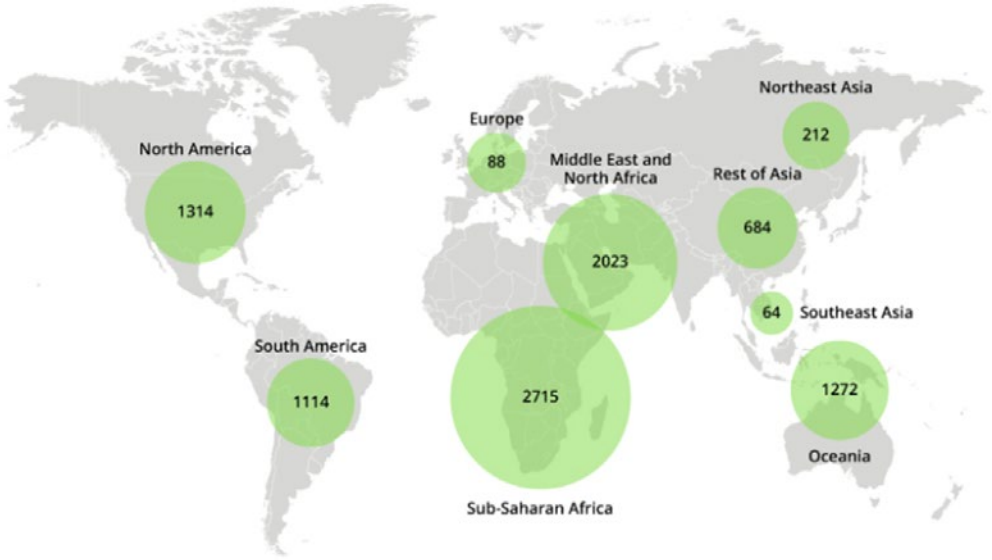
North-South connectivity and/or capacity is also an issue in rail transport. The European Commission aims to shift up to 30% of the freight transported more than 300 km by road onto either rail or water-borne transport by 2030 and more than 50% by 2050. CO_2 emissions for rail transport are 3.5 times lower per tonne-kilometre than road transport emissions[189], In addition to shifting freight to rail, the region will need to build high-speed rail links. These are still only in the initial preparation stages. Western European countries already have advanced high-speed rail networks[190] and one can assume this will gradually expand eastwards.

Energy-carrier transport corridors are also of strategic importance. North-South connectivity, especially gas infrastructure, will play a key role in reducing dependence on Russian gas in Europe in the coming years. It should be in Europe's strategic interest to build capacity interconnections to North and South Europe, and to connect the energy infrastructure with the South-East (potential energy sources in the Eastern Mediterranean) and the South. Africa, in particular, is a potential energy source. Currently, around 11%

181 CN has a 35% share of the world in 6G patents, US only 18%. For quantum patents, in 2010, CN and US were getting about 110 patents per year, in 2018, CN has already got 1,157 patents, while US only 363, with Beijing investing 4 times more per year in the technology.
182 In 2000 the US held 19% share of the semiconductor market (CN 1%), by 2030 CN should become the global leader in production with a share of 24% (US by contrast 10%), yet the rest of the US allies (TW, JP, KR, Europe) are still expected to hold another 61% of production.
183 https://ec.europa.eu/info/publications/resilience-dashboards-report-and-annex_en
184 Only in three indicators did Slovakia rank in the most favourable category of the low vulnerability index: *ICT trade deficit, the difference between the percentage of large and small businesses with broadband access, and the average proportion of cyber attacks and incidents.*
185 https://www.mirri.gov.sk/aktuality/digitalna-agenda/vicepremierka-remisova-predstavila-narodny-plan-pristup-k-ultra-rychlemu-internetu-maju-mat-do-roku-2030-vsetky-domacnosti/index.html
186 https://www.aktuality.sk/clanok/EDJxnwi/minister-dolezal-na-vladu-predlozi-material-ktory-bude-r4-na-severe-priorizovat/
187 https://cepa.org/wp-content/uploads/2021/05/CEPA-Military-Mobility-Report-web-5. 21. 21.pdf
188 https://www.euractiv.com/section/economy-jobs/news/europes-military-mobility-a-game-changer-for-regional-infrastructure-projects/
189 https://www.eca.europa.eu/Lists/ECADocuments/SR16_08/SR_RAIL_FREIGHT_SK.pdf
190 https://www.eesi.org/papers/view/fact-sheet-high-speed-rail-development-worldwide

of imported natural gas[191] and 18% of imported oil[192] comes from Africa. Moreover, Africa is expected to double its annual gas production over the next decade and enhance its LNG export capacity [193]. Up to 30 bcm could be supplied by the planned Trans-Saharan pipeline linking Nigeria and Algeria[194]. However, better links to energy sources in Africa could prove a promising source of affordable renewable energy. Only 0.02% of Africa's current RES potential is being utilised[195], By 2040, its RES potential is expected to exceed Africa's electricity demand a thousand times over[196]. In addition to the huge potential in green hydrogen production[197] the continent's solar potential should not be forgotten. Covering around 0.5% of the Sahara with solar panels could provide enough electricity for the whole of Europe and Africa, but the MENA region's capacity to generate electricity in the form of concentrated solar power (CSP) exceeds global consumption by a factor of 25[198].

Global green hydrogen production potential, by region (exajoules)



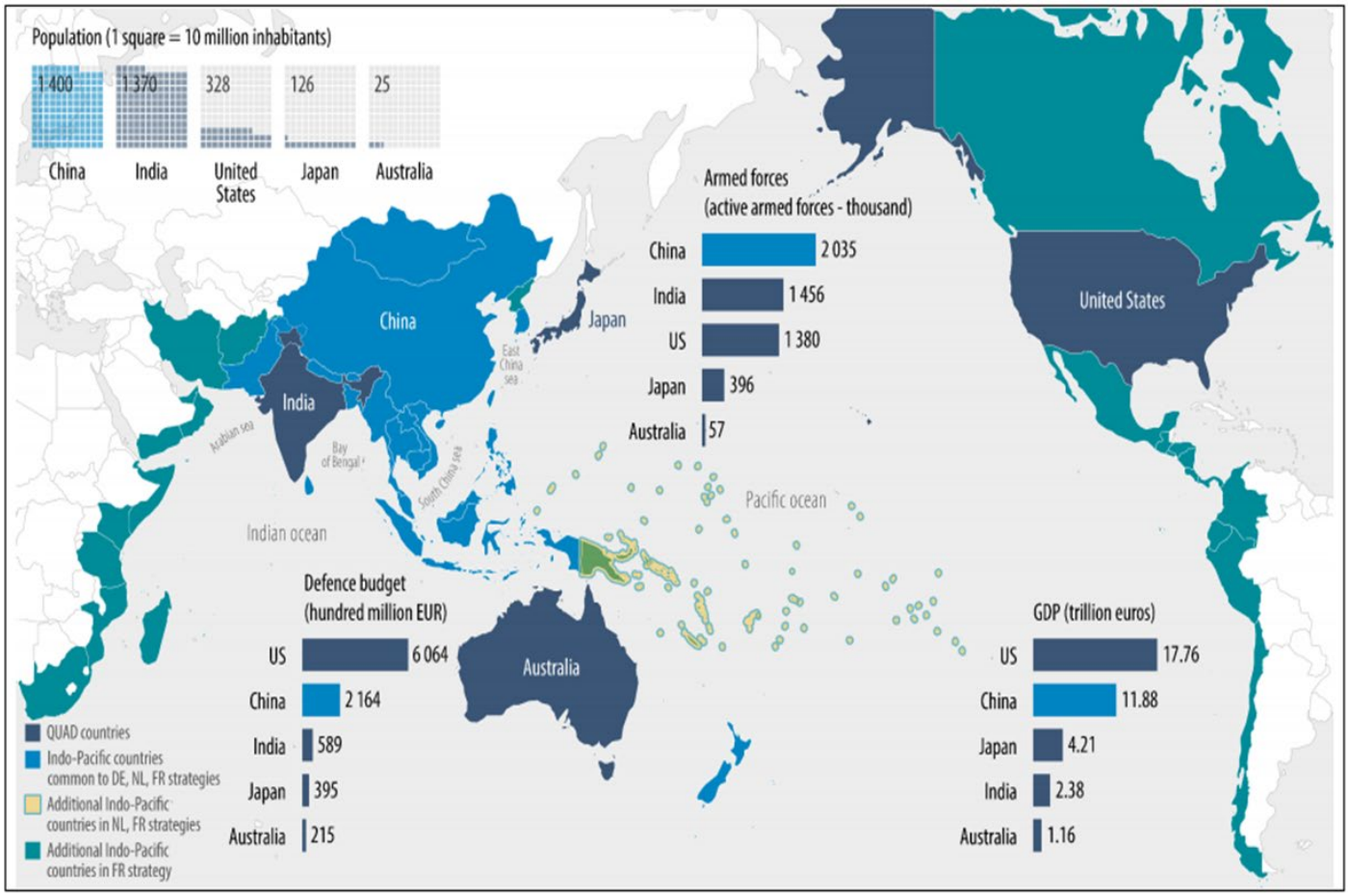
Located in the centre of Europe, Slovakia is well placed to develop its potential in the transport sector. The development of North-South interconnections is key to maximising Slovakia's economic potential and strengthening security. In road and rail infrastructure, it is essential that Slovakia completes or upgrades key mainline infrastructure projects, especially those connecting the north and south of the country. Otherwise, Slovakia risks being marginalised or bypassed in favour of more promising links abroad. High-quality infrastructure could improve the country's security – both by enhancing military mobility, and thereby strengthening the country's defence capability, and by improving Slovakia's energy security. The weakening of the EU's dependence on Russian energy supplies raises the option of importing energy sources from other regions. North-South energy interconnections could enable Slovakia to participate in planned projects utilising resources originating from Africa and the Eastern Mediterranean. Both regions have considerable fossil and renewable energy potential.

191 https://ec.europa.eu/eurostat/statistics- explained/index.php?title=File:Natural_gas,_main_partners,_2021.png
192 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Petroleum_oil,_main_partners,_2021.png
193 https://african.business/2022/05/energy-resources/europes-energy-crisis-will-africa-ride-to-the-rescue/
194 https://www.reuters.com/business/energy/algeria-niger-nigeria-revive-talks-saharan-gas-pipeline-2022-06-22/
195 https://www.brookings.edu/blog/africa-in-focus/2022/05/10/the-promise-of-african-clean-hydrogen-exports-potentials-and-pitfalls/
196 https://www.giz.de/en/downloads/Study_Renewable%20Energy%20Transition%20Africa-EN.pdf
197 https://www.controlrisks.com/our-thinking/insights/can-africa-clean-up-with-green-hydrogen (also source of the map)
198 https://energypost.eu/10000-sq-km-of-solar-in-the-sahara-could-provide-all-the-worlds-energy-needs/#post-28468-footnote-1

16. Indo-Pacific, Arctic, space – promising domains of global development

The Indo-Pacific, the Arctic and outer space have the potential to significantly redraw the geopolitical and geo-economic map of the world. Yet each of these domains has been brought to the fore by a different change – geopolitics, climate change and technology.

The Indo-Pacific[199] has the potential to become the centre of geopolitical events and great power rivalries, primarily because of its considerable size and economic potential – the region (including China) is home to 60% of the world's population, accounts for 60% of the world's GDP (it represents 3 of the 4 largest economies in the world outside the EU), it accounts for 2/3 of world economic growth, 2/3 of the world's container traffic, 1/3 of energy traffic, the region is also a leader in digitalisation and new technologies, but also a producer of more than 50% of global emissions and 70% of unprocessed plastic waste[200]. Although the region has opportunities to offer, it is also the site of several long-standing disputes (over the South China Sea, Taiwan, the Korean peninsula, the Indo-China border, India-Pakistan), with at least one of the actors having nuclear weapons at its disposal. The heightened insecurity, mainly associated with China's assertive behaviour, is reflected in the growth in defence spending. China itself invests more in defence than all the other Asian countries in the region combined. While in 2010 the region accounted for 17.8% of global arms spending, by 2020 that had risen to 25%[201]. The potential for conflict in the region has been exacerbated by the pandemic (production displacement, protectionism), disputes over natural resources (especially critical raw materials), ethnic and religious conflict, climate change, migration, terrorism and cyber space.



Geographical definition of the Indo-Pacific according to the EP research centre, drawing on strategy papers by France, Germany and the Netherlands[202]

199 There is no single accepted geographical definition of the Indo-Pacific region. Definitions vary from country to country. For more on this issue see for example: https://www.rsis.edu.sg/wp-content/uploads/2020/03/WP326.pdf

200 https://www.eeas.europa.eu/sites/default/files/eu-indo-pacific_factsheet_2022-02_0.pdf

201 https://www.iiss.org/blogs/military-balance/2021/02/global-defence-spending-increases

202 https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/690513/EPRS_BRI(2021)690513_EN.pdf

Despite its relatively small size (2.8% of the world's land surface) and small population (0.05% of the world population), the Arctic will become more important in the coming period and geopolitical rivalry in the region will intensify. The **Arctic** will become more strategically important owing to its mineral deposits and the potential for the "ring of instability" to expand from the south and the east of the EU to include the far north of Europe. The Arctic has long been regarded a zone of low tension, but rising temperatures and retreating glaciers have made the region appealing and of interest to major powers. The retreat of the glaciers could substantially reshape world trade in the coming decades, turning the region into a major trade route and important source of minerals. The region has three major trade routes – Eurasian, North American and Polar. In 2020, the Eurasian route was passable for 112 days of the year, a record number for a single year – the route has the security advantage of being short with no malignant non-state actors operating in the region. It also bypasses the ocean shipping "bottlenecks". A key factor is its rich mineral deposits. The region contains approximately 13% of global oil reserves and 30% of undiscovered natural gas reserves[203]. Up to 75% of Russian oil and 93% of natural gas comes from the Arctic. Greenland, which could hold up to a quarter of global reserves of critical raw materials, has emerged as a lucrative area and could become a serious competitor to China, which has a near-monopoly in the extraction of many of these materials[204].

Recent decades have seen the proliferation of actors and a substantial increase in **space** research, development and financing. Of the two original main players, the number of countries with the capacity to research and send their own devices into space has grown to a total of 11, with more than 50 countries operating satellites and engaging in space, albeit to a limited extent. The space industry has an annual revenue of around US$300 billion, approximately two thirds of which is generated by the private sector (more than US$100 billion comes from the data transmission sector and the production of space equipment and technologies) and around US$80 billion comes from government funding[205]. On GDP, and in absolute numbers, the US leads the way, investing about 60% of global public space spending in space activities (in 2019 about 0.24% of US GDP, i.e. $50 billion), followed by Russia (0.17% of GDP), Saudi Arabia (0.12%) and France (0.10%)[206]. . It is estimated that the space industry could generate around US$1.25 trillion by the end of the decade, equivalent to the size of the global tourism industry[207]. Approximately 5,000 satellites are currently operating in space[208]. That figure could rise to 100,000 by 2030. The great powers are increasingly open to space being an operational area in conflict and are adapting their military strategies and equipment accordingly[209]. The growing number of commercial and strategic activities in space also puts pressure on the legal environment. "Space law" consists of five major international treaties concluded between 1967 and 1979, the first of which, the Outer Space Treaty, has been ratified by 111 countries worldwide to date (the others have been ratified by a smaller number of states). However, these legal frameworks will not suffice as space activities increase[210].

The Indo-Pacific, the Arctic and outer space will continue to grow in strategic importance for both economic and security reasons. Slovakia will need to make effective use of the opportunities in these areas, especially through cooperation within the EU. Given Slovakia's capacities, economic opportunities could be sought by engaging in initiatives such as the Global Gateway[211], the EU Indo-Pacific Strategy, and by joining the European Space Agency.

203 https://crsreports.congress.gov/product/pdf/R/R41153
204 https://www.diis.dk/en/research/greenlands-minerals-to-consolidate-chinas-rare-earth-dominance
205 https://crsreports.congress.gov/product/pdf/IF/IF10337
206 https://www.oecd-ilibrary.org/sites/c5996201-en/1/2/1/index.html?itemId=/content/publication/c5996201-en & _csp_=ffe5a6bbc1382ae4f0ead9dd2da73ff4 & itemIGO=oecd & itemContentType=book
207 https://advanced-television.com/2022/01/28/forecast-space-economy-worth-1-25tn-by-2030/
208 How space debris could threaten modern life (ft.com)
209 https://crsreports.congress.gov/product/pdf/IF/IF11895
210 For example, there is no uniform view on liability for damage caused by space debris, nor legal frameworks regarding the extraction of raw materials, building infrastructure, etc.
211 https://ec.europa.eu/info/strategy/priorities-2019-2024/stronger-europe-world/global-gateway_sk

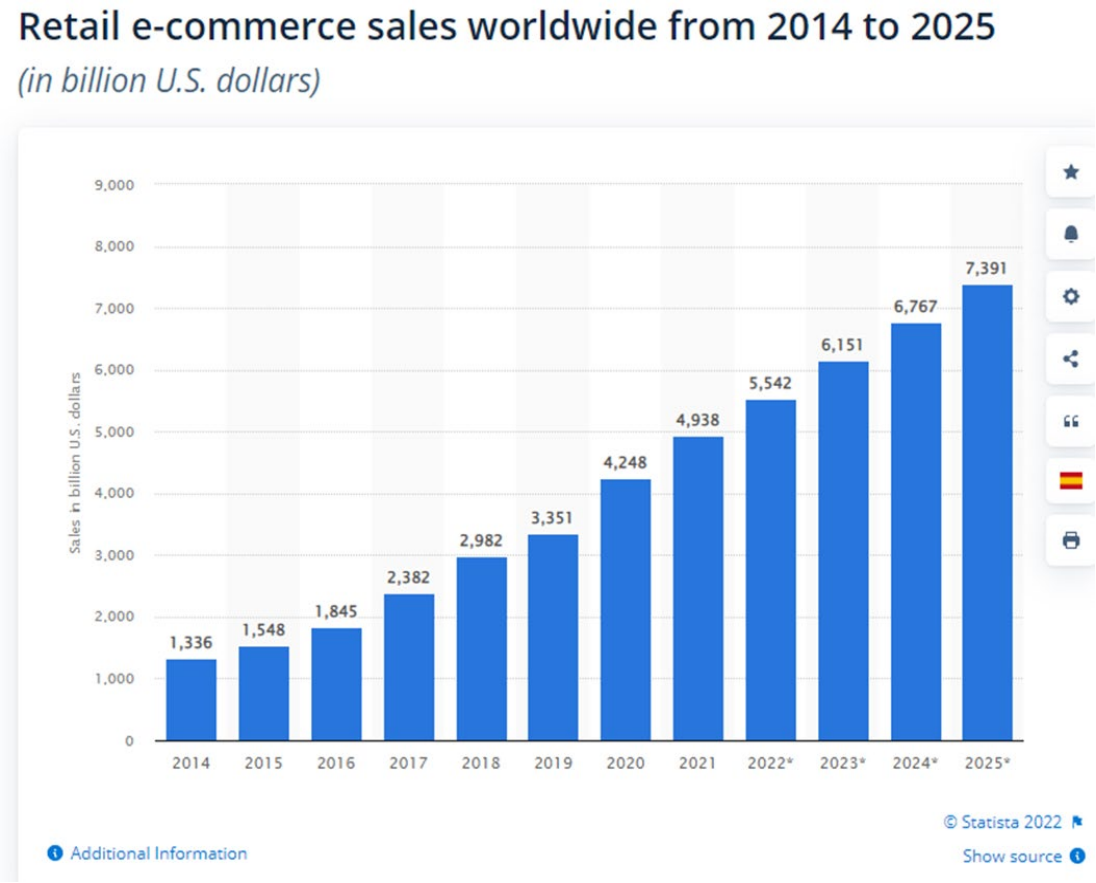
17. International trade and self-sufficiency

Despite the ongoing COVID-19 pandemic, international trade reached a record $28.5 trillion in 2021[212]. This represents a 25% increase compared to 2020 and a 13% increase compared to 2019, the year before the COVID-19 pandemic. However, the COVID-19 crisis disrupted global supply chains, exposing the vulnerability of the global economy.

Growth in digitalisation has brought about changes in the functioning of international trade and is an aspect that will have a major impact on its future direction. This is linked particularly to the growth of digital platforms and e-commerce, which bring trade into the digital space, optimise the cost of business operations, and provide scope for the greater involvement of small and medium-sized enterprises (SMEs) in international trade. While in 2021, e-commerce revenues reached US$4.9 trillion globally, they are projected to grow by 50% by 2025[213]. Development will also be aided by the rise in connectivity, since estimates suggest that the number of connected devices worldwide may increase from 30.4 billion in 2020 to 200 billion in 2030, leading to new services, business models and an increase in end-product trading[214]. Moreover, in OECD countries, services account for around 75% of GDP and 80% of employment, yet the present value of trade in services worldwide is only one-third that of manufactured goods, suggesting that there is considerable scope for growth in services[215].

Another obvious trend is regionalisation – intra-regional trade as a share of global trade in goods has increased by 2.7% since 2013, reflecting development in Asia and EU countries primarily[216]. For example, intra-EU trade in goods is about 1.5-times higher than non-EU trade. Regionalisation is self-evidently important for enhancing self-sufficiency in key areas such as energy, food and medical supplies. This often results in restrictive and protective trade policy measures, which increased by 200% between 2008 and 2018 (Latin America accounted for 30% and Asia for 40%)[217].

Last but not least, the shift of consumption to China and South-East Asian countries will affect the performance of world trade. As consumption grows, more and more of the goods made in China are sold domestically. Within industry



212 https://unctad.org/news/global-trade-hits-record-high-285-trillion-2021-likely-be-subdued-2022
213 https://www.statista.com/statistics/379046/worldwide-retail-e-commerce-sales/
214 https://ec.europa.eu/info/sites/default/files/foresight_report_com750_en.pdf
215 https://www.dni.gov/index.php/gt2040-home
216 https://www.mckinsey.com/featured-insights/innovation-and-growth/globalization-in-transition-the-future-of-trade-and-value-chains
217 https://www.dni.gov/index.php/gt2040-home

value chains, China exported 17% of everything it produced in 2007. By 2017, the export share had fallen to 9%[218], indicating a gradual shift towards domestic consumption. At the same time, the developing world, excluding China, is projected to account for 35% of global consumption by 2030, with India, Indonesia, Thailand, Malaysia and the Philippines leading the way[219]. Growing demand in developing countries also offers opportunities for exporters in developed economies.

Slovakia is a highly open economy with a long-standing, high dependence on foreign trade. Given its geographical location and the absence of mineral resources, foreign trade has formed the basis of economic growth. However, Slovakia's foreign trade is largely oriented towards EU countries and commodity diversification is low. The high share of foreign value added in Slovakia's exports, which reached 48% in 2018 (fourth highest in the OECD)[220]. , is another problem. Slovakia consumes twice as much foreign (not domestic) value added in exports, or inputs that it must first import and then use in production. In addition, compared to neighbouring countries with global value chains, Slovakia has more "backward" participation[221], which means that domestic enterprises are less competitive and mainly produce intermediate products that are finished off abroad[222].

The country's high degree of involvement in supply-customer chains also carries risks, which were evident during the pandemic crisis. According to IMF calculations, during the pandemic crisis, the high dependence of export-oriented economies, such as the Czech Republic or Germany, on supply chains caused a loss in potential GDP growth of 4% (the Czech Republic) and 2.5% (Germany)[223]. Moreover, estimates show that supply shocks are most damaging to the automotive industry, which is highly dependent on intermediate inputs,. That poses a significant risk for Slovakia as well.

Regarding digitalisation and services, Slovak e-commerce is currently below world-class growth rates. Another problem is the low level of digital technology use in domestic enterprises – 52% of Slovak SMEs achieve at least a basic level of digital intensity (EU average: 60%), and the share of SME turnover from e-commerce is 11% (EU average: 12%)[224].

The recent crises are reshaping international trade, and digitalisation and regionalisation will become increasingly important. As an open economy, Slovakia must be able to respond to the growth in online trading, the realignment of value chains and growing consumption – including in developing countries – by seeking to strengthen e-commerce, raise the share of services exports and rebalance Slovakia's foreign trade by diversifying opportunities in developing markets and focusing on the opportunities offered by the economic boom in Asia and the Indo-Pacific.

218 https://www.mckinsey.com/featured-insights/innovation-and-growth/globalization-in-transition-the-future-of-trade-and-value-chains
219 Ibid
220 Share of foreign value added in gross exports - https://stats.oecd.org/Index.aspx?DataSetCode=TIVA_2021_C1
221 Backward participation is where a country imports intermediate inputs for use in exports. Strong backward participation indicates that the country has negative net value added gains.
222 https://www.economy.gov.sk/uploads/files/6bv03TEM.pdf
223 https://www.imf.org/en/Publications/WP/Issues/2022/02/15/Supply-Bottlenecks-Where-Why-How-Much-and-What-Next-513188
224 Slovakia country report - https://digital-strategy.ec.europa.eu/en/policies/desi

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Published by:
Ministry of Foreign and European Affairs of the Slovak Republic

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