

Perspectiva sobre Riscos Emergentes no Setor Energético

APE Conference

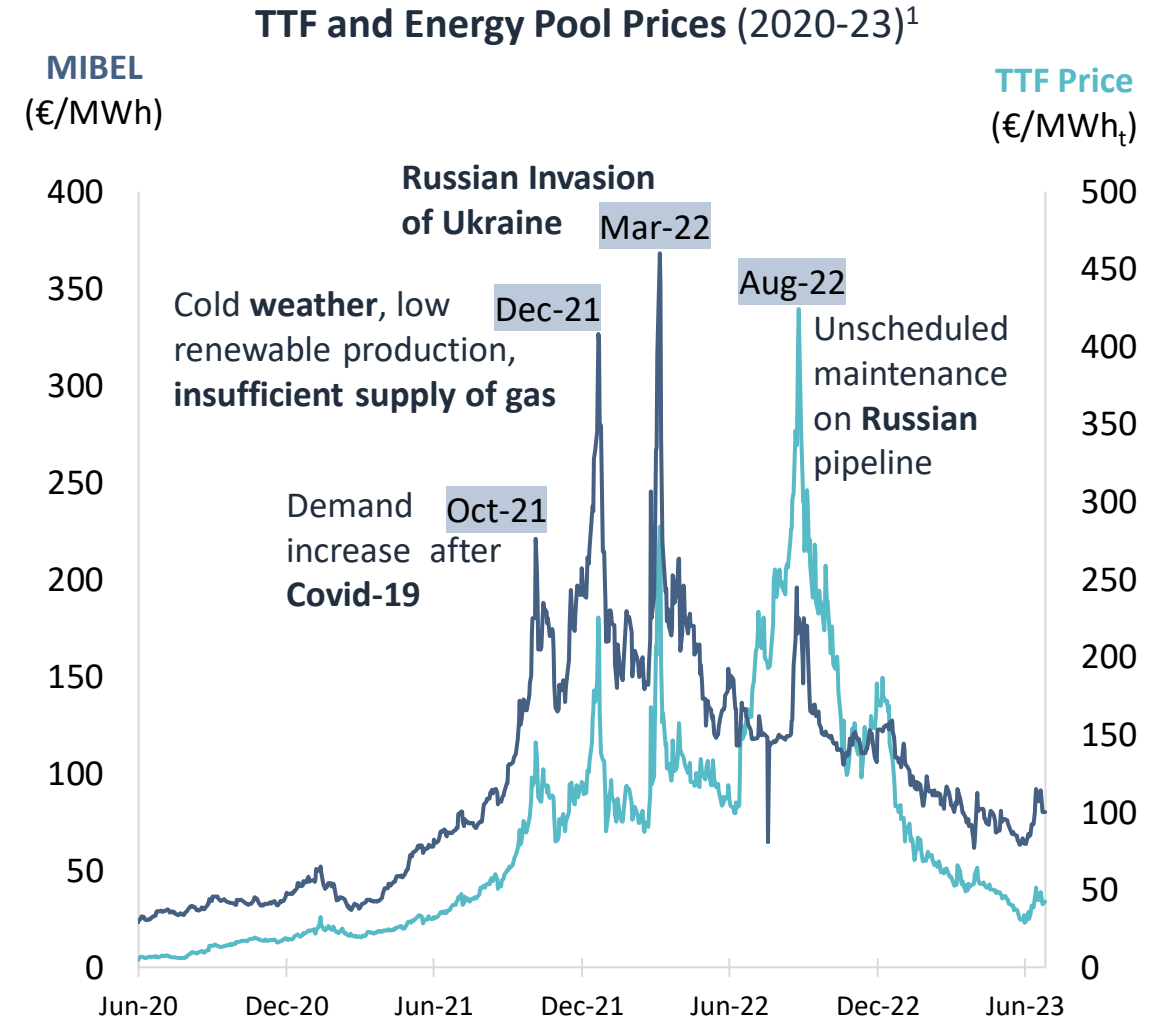


July 2023

Recent years have seen several examples of events, highly unexpected a few years ago, and with strong impact in economy and our sector



1 Bloomberg



Global Risks Report from WEF shows a structural change in emerging risk perception over the last 10 years



Top Global Risks by Likelihood¹

	1 st	2 nd	3 rd	4 th	5 th
2014	Income Disparity	Extreme weather	Unemployment	Climate action failure	Cyberattacks
2015	Interstate conflict	Extreme weather	Failure of national governance	State collapse or crisis	Unemployment
2016	Involuntary migration	Extreme weather	Climate action failure	Interstate conflict	Natural catastrophes
2017	Extreme weather	Involuntary migration	Natural disasters	Terrorist attacks	Data fraud or theft
2018	Extreme weather	Natural disasters	Cyberattacks	Data fraud or theft	Climate action failure
2019	Extreme weather	Climate action failure	Natural disasters	Data fraud or theft	Cyberattacks
2020	Extreme weather	Climate action failure	Natural disasters	Biodiversity loss	Human-made environmental disaster
2021	Extreme weather	Climate action failure	Human environmental damage	Infectious diseases	Biodiversity loss
2022 ²	Extreme weather	Livelihood crises	Climate action failure	Social cohesion erosion	Infectious diseases
2023 ²	Cost-of-living crisis	Natural disasters and extreme weather events	Geoeconomics confrontation	Failure to mitigate climate change	Erosion of social cohesion and societal polarization

1 WEF

2 For 2022 and 2023, the top short-term risks (0-2 years) were considered, since the WEF no longer presents risks by likelihood in 2022

Most of planning/ risk analysis are focused on short/ mid term BaU risks, however it should be complemented with LT analysis

EDP risk taxonomy (Utilities companies follow a similar risk categorization)

	Business	<ul style="list-style-type: none"> Energy markets Regulation 	“Business as Usual” risks	<ul style="list-style-type: none"> • Impact in the short/ mid-term horizons • Risk analysis process focus
	Financial	<ul style="list-style-type: none"> Financial markets Credit Liquidity/ solvability Social liabilities 		
	Operational	<ul style="list-style-type: none"> Physical assets Systems Execution of Processes Legal & Compliance 		
	Strategic & ESG	<ul style="list-style-type: none"> Strategic ESG 	Includes Emerging risks	<ul style="list-style-type: none"> • Includes impact in the long-term

An emerging risks assessment, based on a PEST type of analysis, can help to identify the most relevant emerging tendencies/ risks

What is an emerging risk?

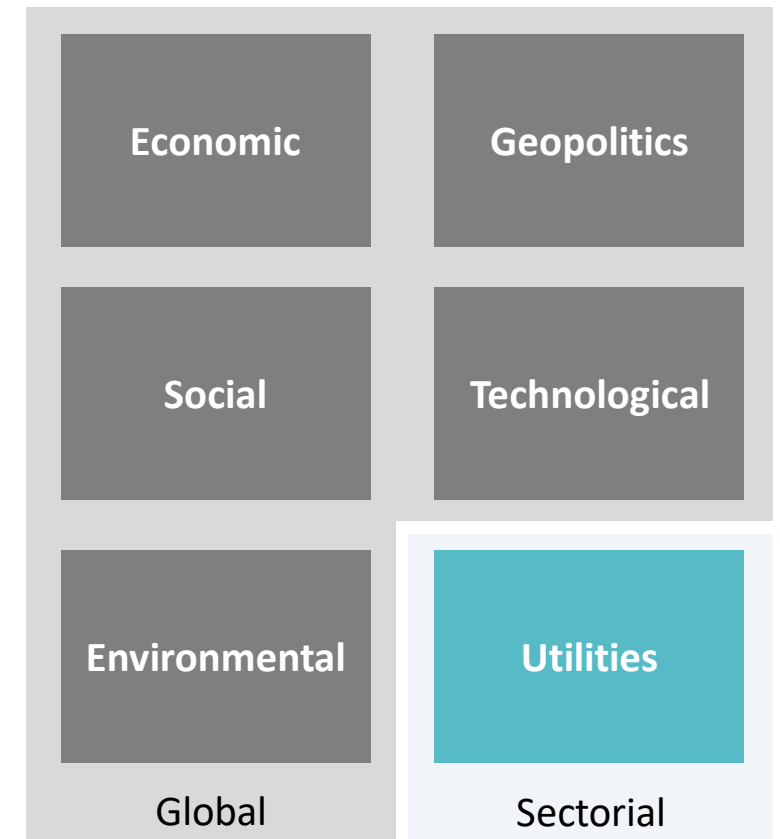
Proposed definition

Emerging risk is a **highly uncertain but conceivable** source of uncertainty (opportunity or threat) in the **medium/ long-term** (1-10 years), that despite not having yet materialized as a significant concern could have a **meaningful economic and/or reputational impact**

Key objectives of the exercise

- 1 **Complement shorter term risk analysis** focused on business-as-usual risks
- 2 Challenge **internal vision with external perceptions** (e.g., World Economic Forum)
- 3 Identify **potential deep-dives** or stress test needs
- 4 Confirm the **alignment between the strategy defined and the identified emerging risks**
- 5 Rise **awareness for emerging risks** and promote the **reflection at top management level**

Emerging Risks Assessment Support Framework



The impact of recent years pandemic and current war in Europe will have lasting effects in economy (particularly developed countries) (1/3)

Unprecedented inflation and subsequent IR rise

Increasing inflation rates pose challenges to economic stability and consumer purchasing power

10.7%

Inflation in the Eurozone in October 2022, a 40-year high

3.5%

Rate on the EUR deposit facility in Jun23, a 22-year high

Excessive debt and stimulus reduction

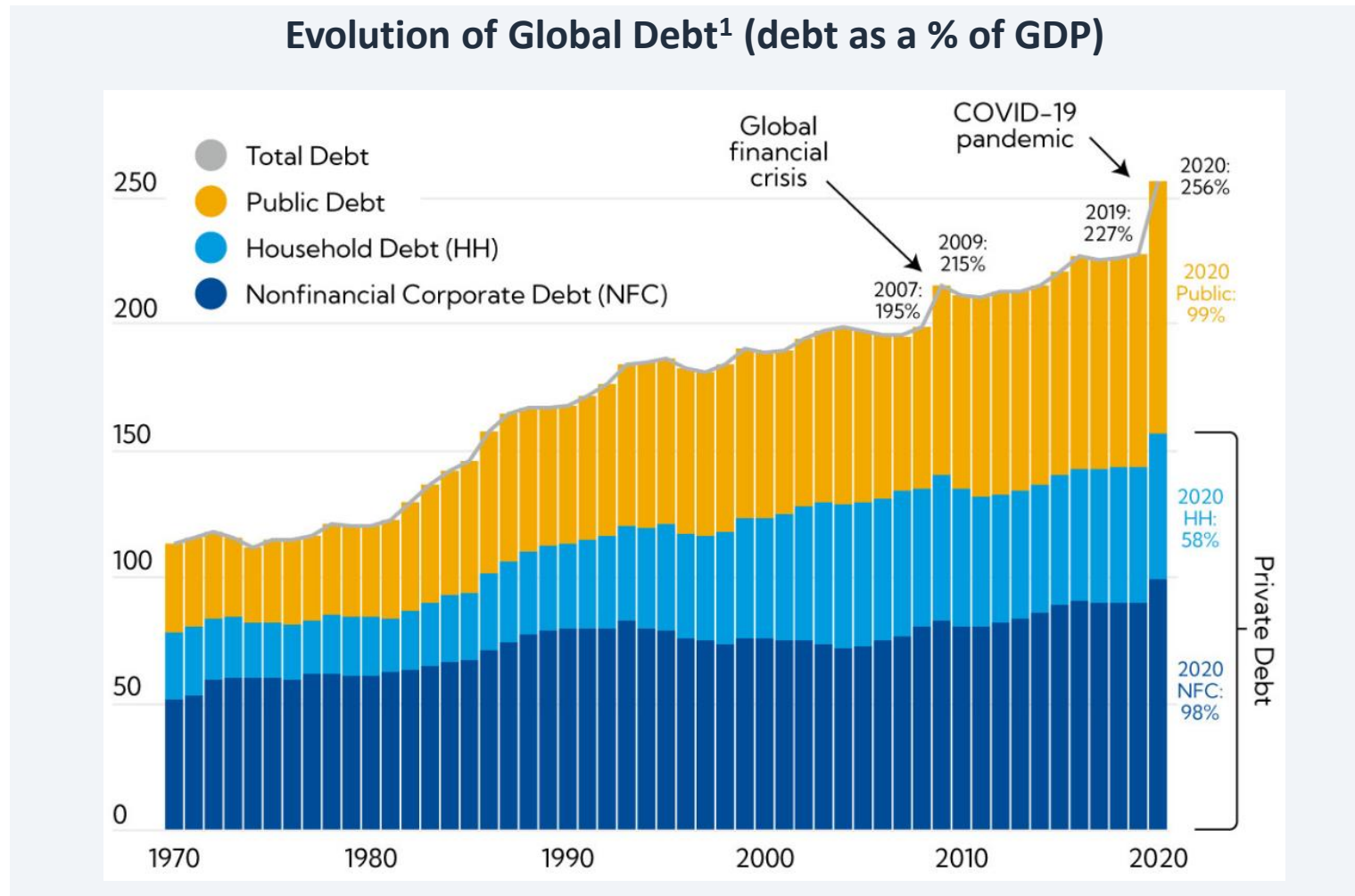
Excessive indebtedness and worsen of financial conditions (rise of inflation and rise of interests) pose severe challenges to companies, households and countries' liquidity and solvency

Global Debt Reaches a Record \$226 Trillion

Policymakers must strike the right balance in the face of high debt and rising inflation.

The impact of recent years pandemic and current war in Europe will have lasting effects in economy (particularly developed countries) (2/3)

In 2020, Global Debt experienced its most significant surge in the past 50 years



The impact of recent years pandemic and current war in Europe will have lasting effects in economy (particularly developed countries) (3/3)

Fragility and loss of economic potential. Uncertainty on Economic rebound

Steep deceleration of economic growth as result of COVID-19 fragility, conflict in Ukraine, economic constraints and rise of interest rates and inflation (mainly in developed countries)

Bubble markets

High volatility, liquidity and inflation in real estate, financial, and energy markets

Wilshire 5000 to GDP Ratio



There are growing geopolitical tensions between global players, and increasing instability (1/3)

Multipolarity

As economic development slows in the West, the trend of multipolarity continues, resulting in the rise of new geopolitical poles

ESSAY JUNE 16, 2023

Prospects for a multipolar world order

RUDOLF G. ADAM

The post-1945 order as we know it is coming to an end. While the U.S. remains dominant, other powers are vying for a multipolar future.

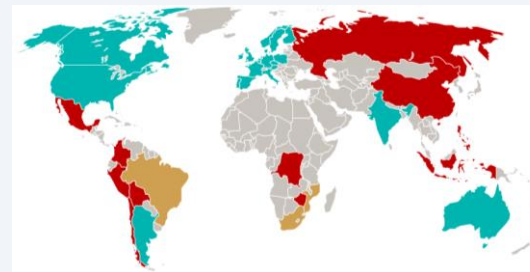
Military spending (CAGR 2018-2022)¹

World	2.8%
North America	2.4%
East Asia	3.8%
Europe.....	6.7%

From globalization to self-sufficiency

Geopolitical tensions expose domestic markets vulnerabilities leading to a rise on economic protectionism.

Policy Trajectory for Critical Materials²



- **Positive:** Policy improvement, less protectionism
- **Neutral:** No change
- **Negative:** Growing protectionism/ interventionism

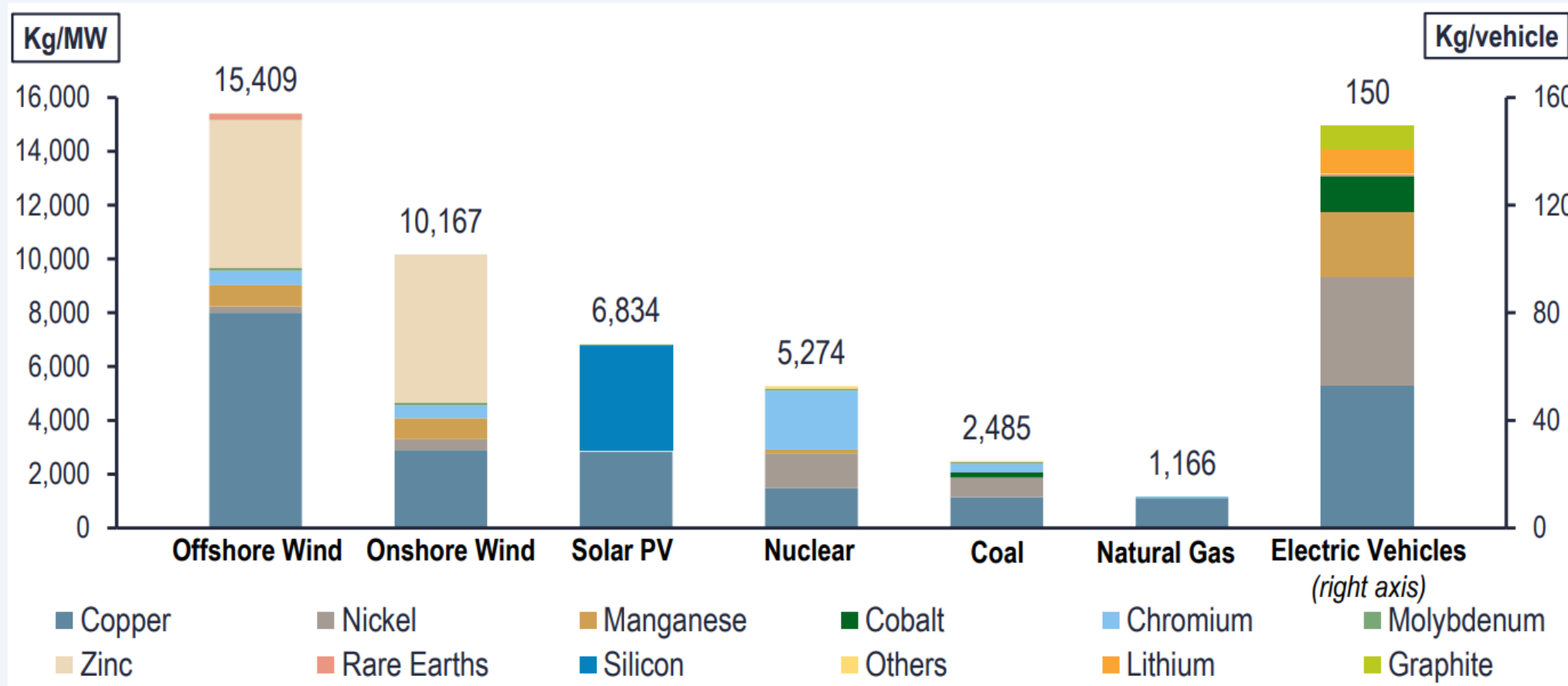
Resource geopolitics

Exploitation and concentration of global supply chains' resources as geopolitical influence

1 Sipri 2 LAZARD

There are growing geopolitical tensions between global players, and increasing instability (2/3)

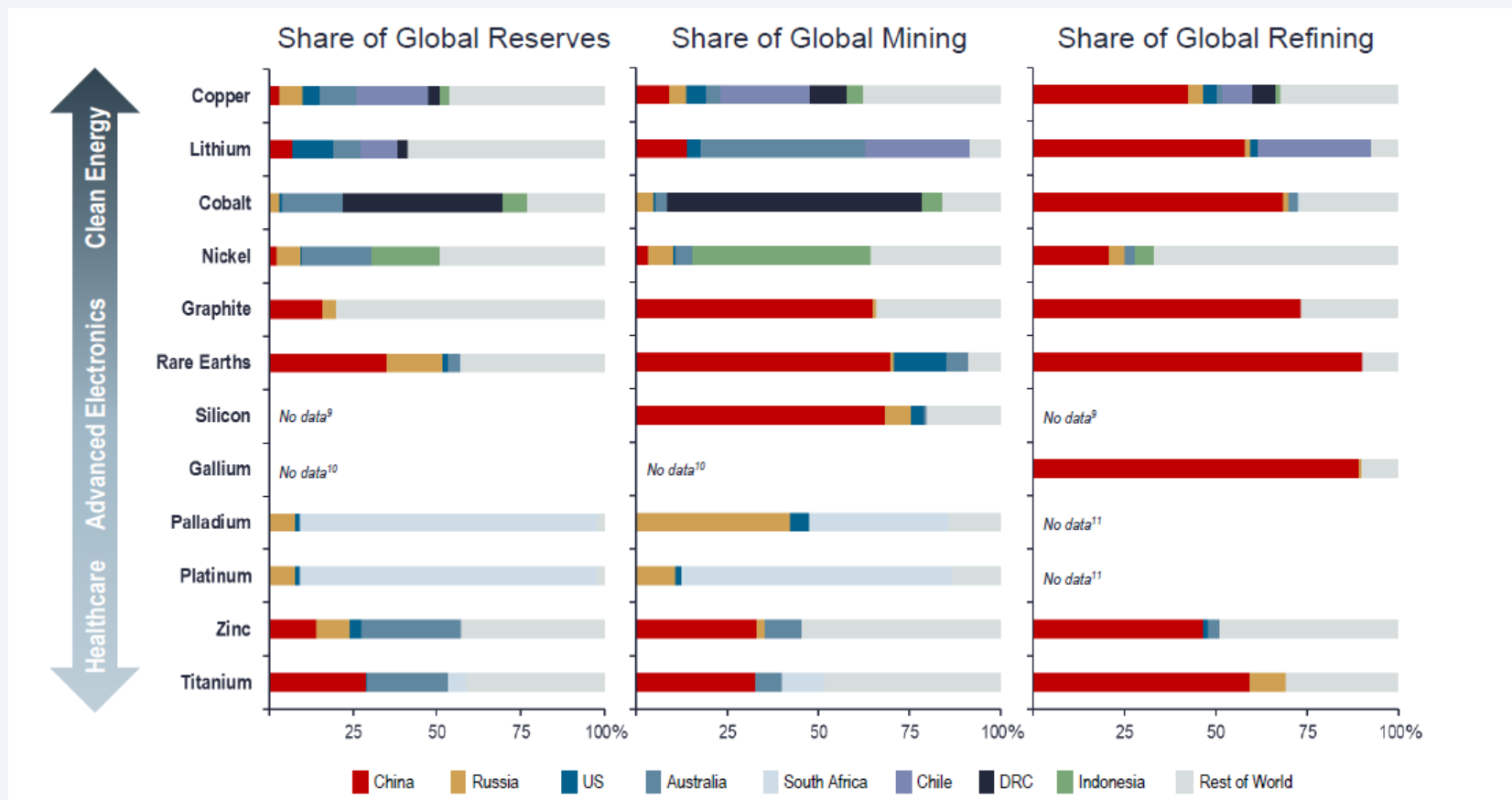
Critical Minerals Used by Energy Technologies (kg/vehicle for EVs, kg/megawatt for all other technologies)¹



1 LAZARD

There are growing geopolitical tensions between global players, and increasing instability (3/3)

World's Dependency on a few Players for Critical Materials across the Clean Energy, Advanced Electronics, and Healthcare Sectors¹



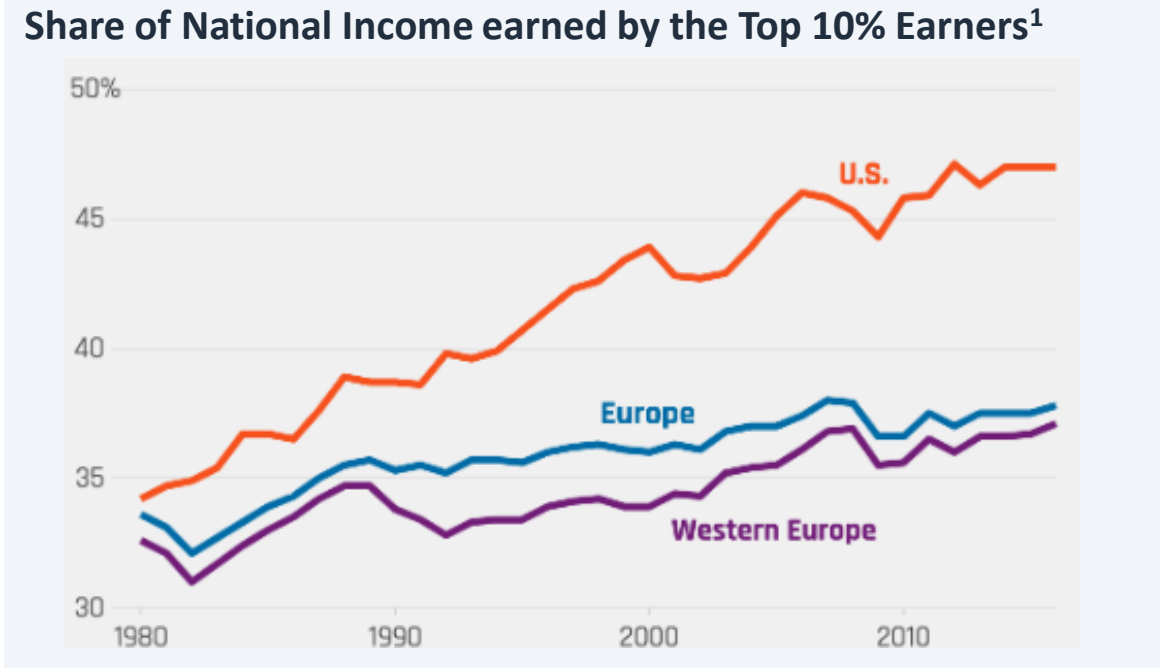
Social setback, disparity and radical populist movements threaten social and economic stability (1/3)



Social setback

Economic deceleration increases poverty and social inequalities worsened by the pandemic and economic constraints due to the conflict in Ukraine

Economic sustainability challenge and difficulty in sustaining social budgets



By **2030, 51 million more people** are projected to live in **extreme poverty** compared to the pre-pandemic trend²

Social setback, disparity and radical populist movements threaten social and economic stability (2/3)



Polarization of public opinion and radical movements

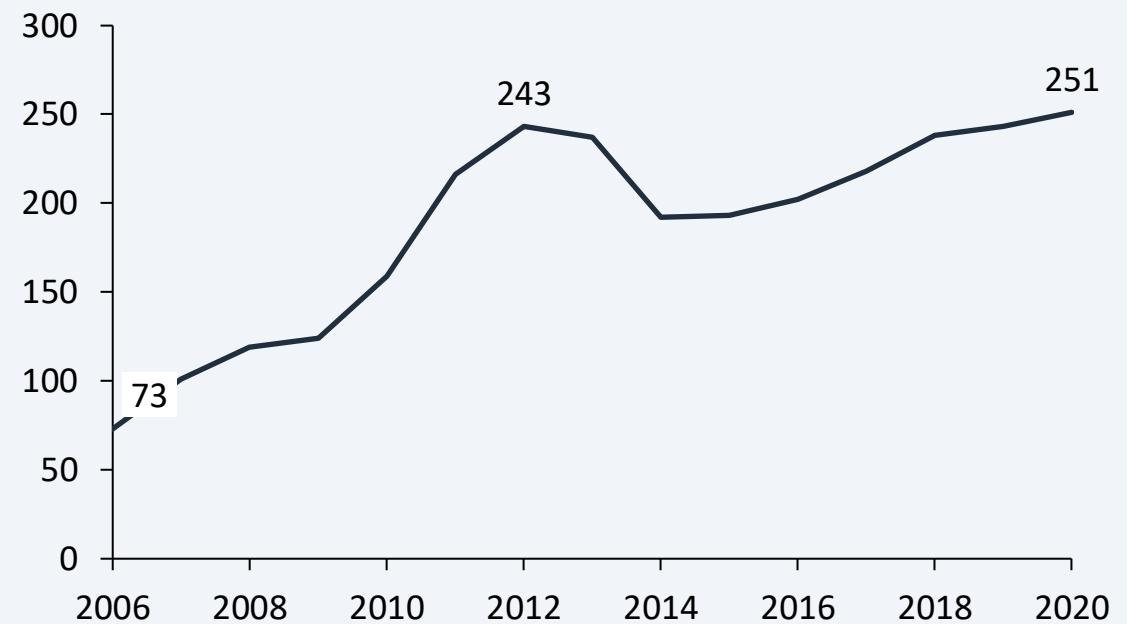
Populist movements, stimulated by media coverage and fueled by misinformation, undermine social unity and fragment current policies

The spread of misinformation and political scandals erodes trust in institutions, media sources, and democratic processes

Weakening of institutions and of multilateralism

Wave of protests and social unrest worldwide (economic inequality, political corruption)

Number of Protest Episodes by year¹



Protest Episode: Protest activities lasting up to 1 year, targeted at an event or sequence of events with a common and identifiable grievance or set of demands

¹ <https://worldprotests.org/>

Social setback, disparity and radical populist movements threaten social and economic stability (3/3)



Lasting effects of the current pandemic and emergence of new ones

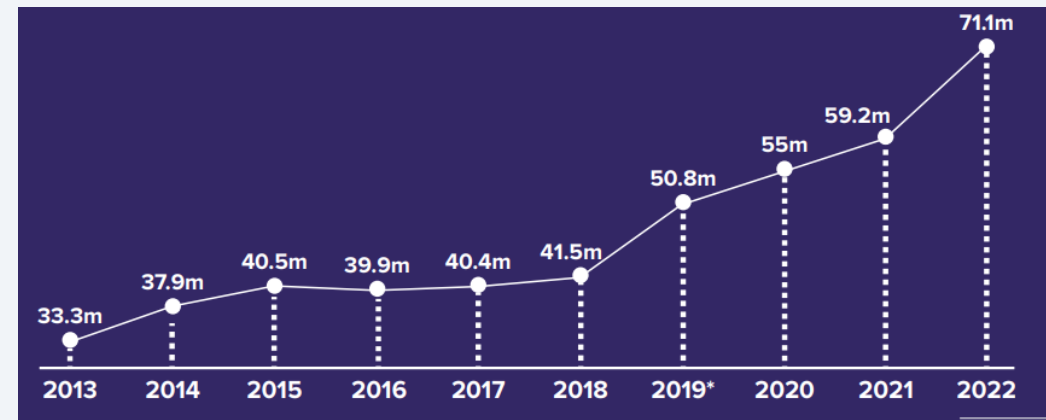
HR management adjustments and COVID-19 contingency plans continue to be critical in addressing the lasting effects of the pandemic

Globalization facilitates the emergence of new virus strains and increases the risk of future pandemics

Migration

Large-scale migration and movement across or within borders, stemming from persistent discrimination and persecution, lack of economic advancement opportunities, natural or human-made disasters, and internal or interstate conflict

Number of Internally Displaced People (IDPs)¹



Note: IDPs are "Persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized State border"

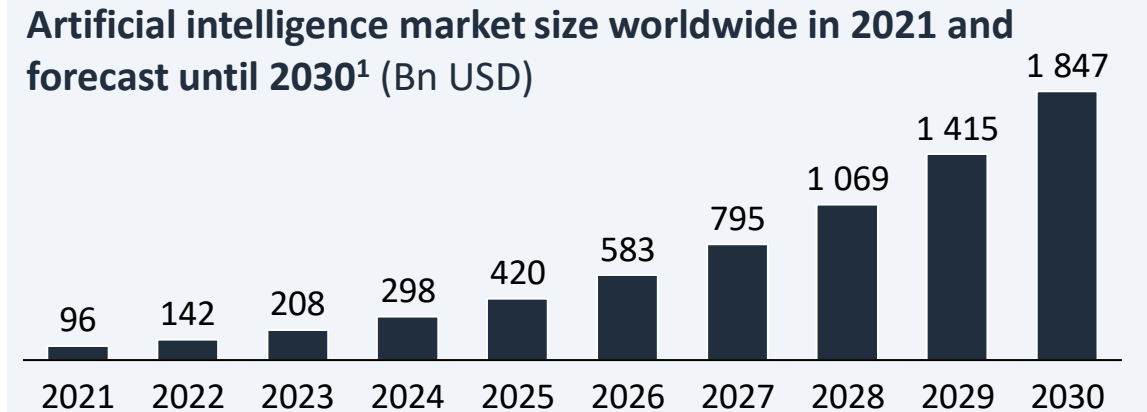
1 IDMC

Technological dependence and fast-paced development challenge business to adapt and incorporate it (1/2)



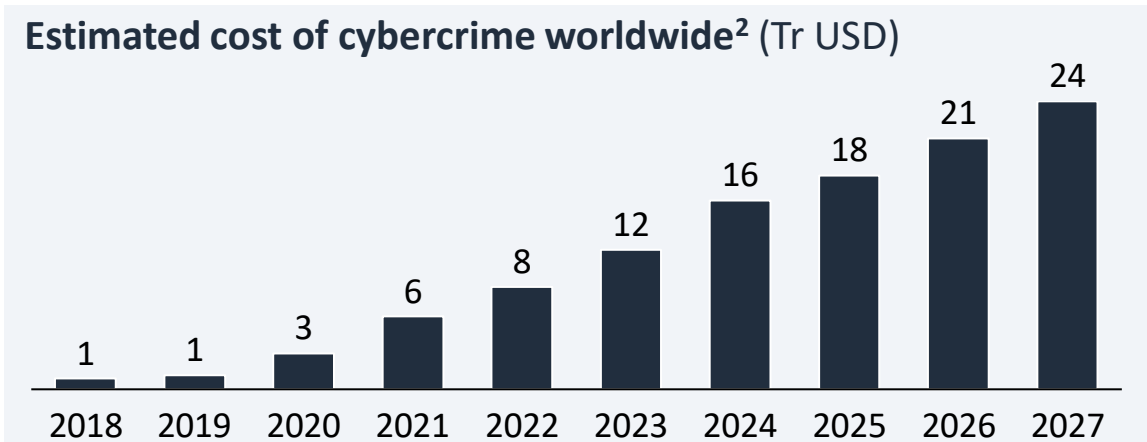
Rapid technological development & adaptation

Digitalization of businesses and the economy in general accelerated with the pandemic. Emerging technologies, (IoT, AI, etc.) have gained prominence, offering new opportunities and challenges



Cyber threat

Rise of cyber-attacks due to mass digitalization, exploiting digital vulnerabilities and posing risks to organizations



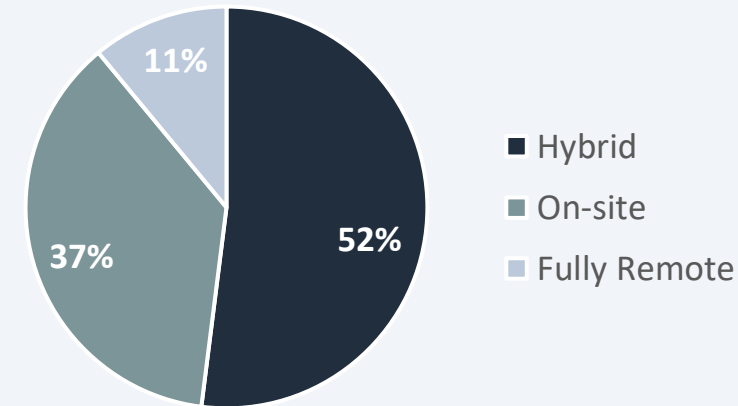
Technological dependence and fast-paced development challenge business to adapt and incorporate it (2/2)



Adapting workforce dynamics

The role of technologies changed consumer habits and drive a professional paradigm shift. Remote work and tech tools bring productivity gains but pose challenges in corporate culture and team dynamics

Employees working model desired postpandemic¹

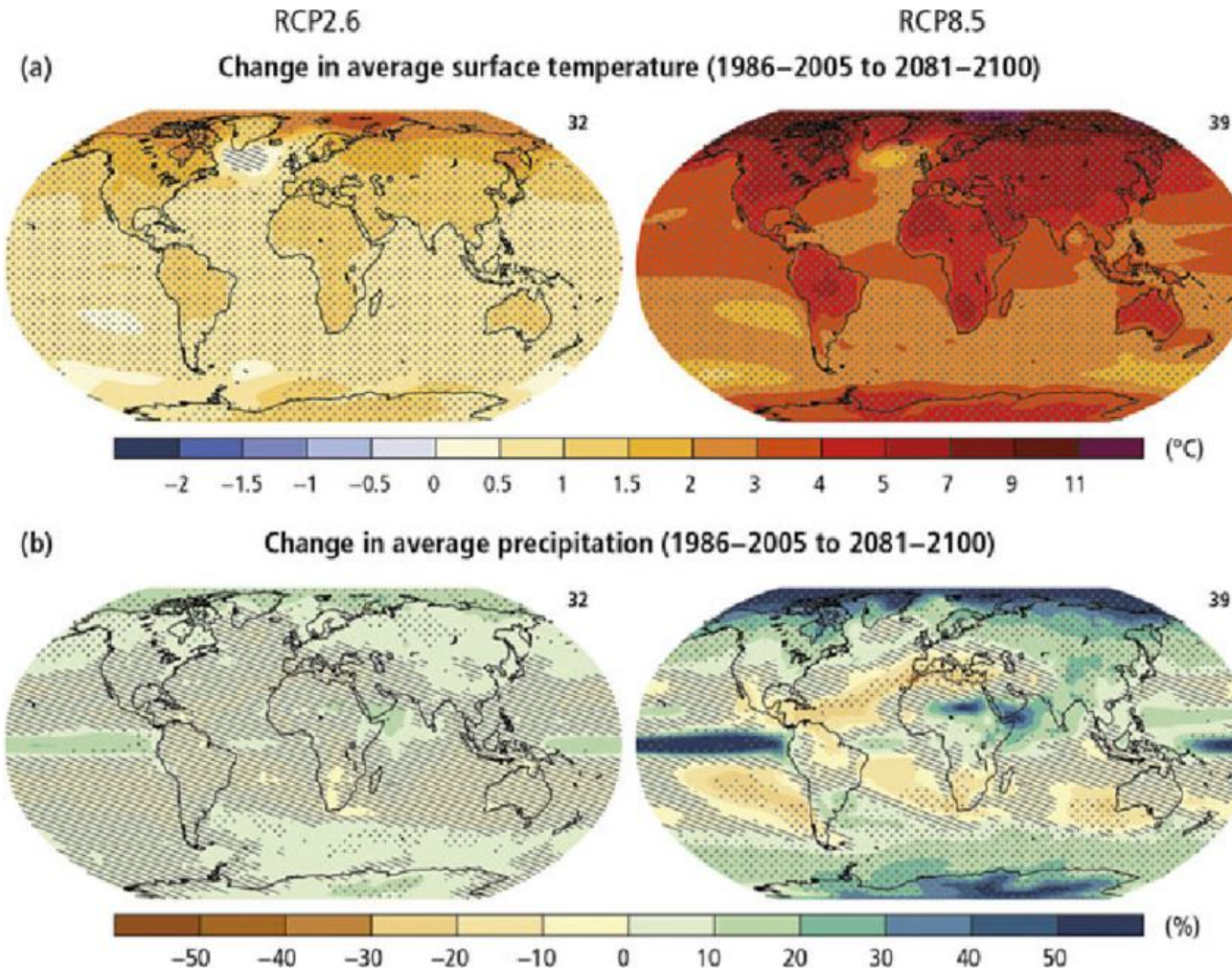


Digital regulation difficulties

Pressure to establish digital consumer and social protection mechanisms, challenges in adapting labor market regulations and concerns regarding privacy and security

1 McKinsey surveys

Climate change brought relevant medium/ long term challenges for economies, to be addressed today (1/2)



Climate change brought relevant medium/ long term challenges for economies, to be addressed today (2/2)

Great efforts, greater obstacles

Decarbonization commitments: International focus on energy transition for economic boost

Endangering biodiversity and ecosystems

Threat of ecosystems collapse and biodiversity loss due to the lack of integrated policies (environmental preservation climate transition) and human intervention

Occurrence of extreme weather events

Climate change acute risks, i.e., increasing frequency and severity of extreme weather events.
Readiness of companies highly dependent on physical infrastructure and dispersed supply chains

Change in physical parameters (precipitation and temperature)

Structural decrease in mean annual precipitation, accompanied by increased competition for water resources, and a global rise in average annual temperature

Energy sector is in constant change, with a framework still in definition to accommodate green energy, decentralization, and flexibility

Sectorial trends – non exhaustive

Commodities prices boom

New commodity prices cycle, with increased volatility, highly influenced by conjectural effects (e.g., raw material availability and prices, geopolitics)

Market Design Reform

New energy paradigm accelerating need to reform marginalist power market. The aim is to boost energy transition through renewables, protect consumers and enhance competitiveness

Interconnectivity and interoperability

Need for more flexible infrastructure and efficient management of the demand/ supply balance, due to renewables increase in energy mix

Political backing and regulatory support

Strong and continuous government and political support plans for energy transition and business focus

Decarbonization and electrification

Electrification as a driver for decarbonization and transition to green energy

New markets and business technologies

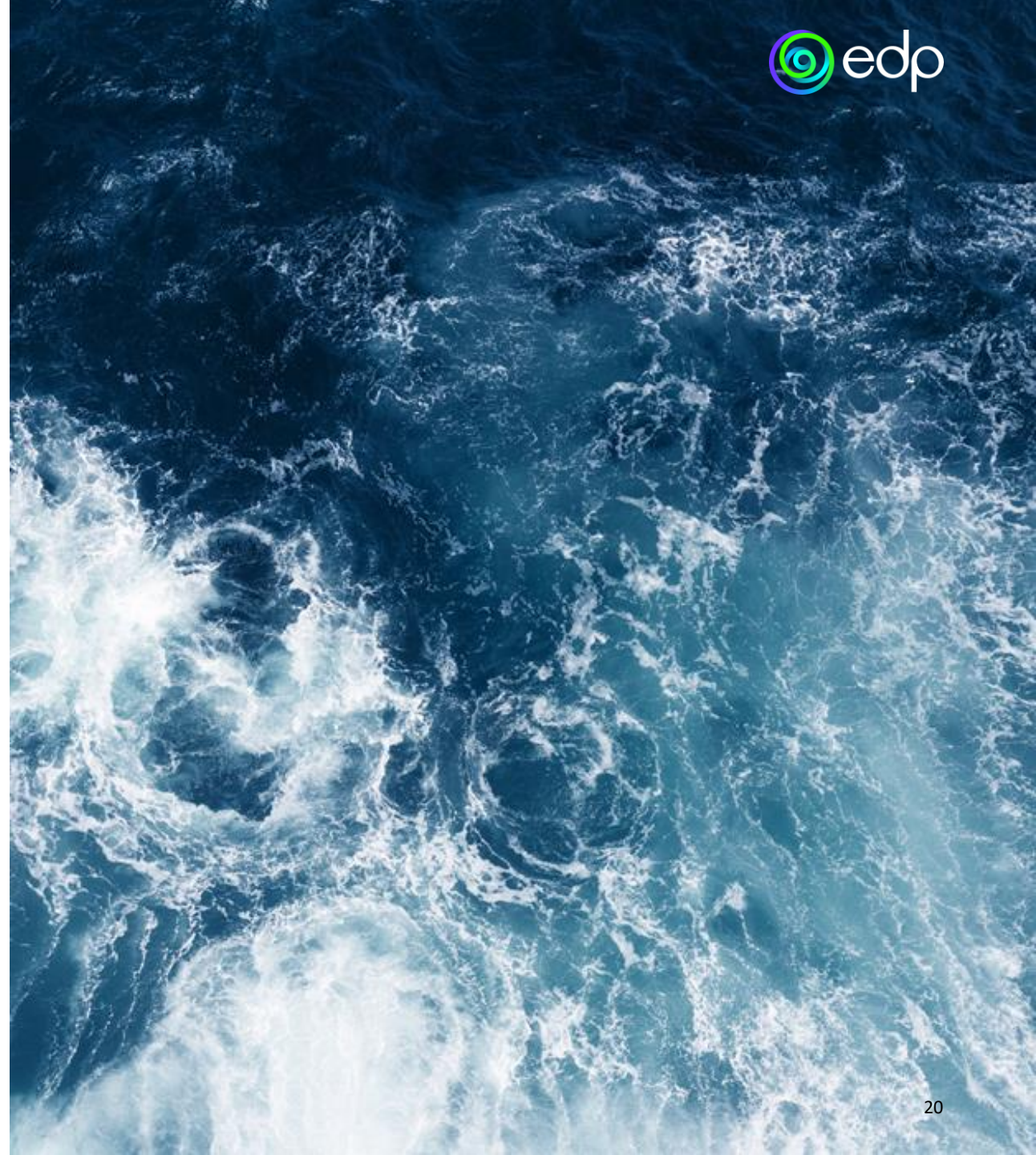
Development of new business technologies and expansion to new markets

Key takeaways and considerations

Recent years with several events that affected significantly the energy sector

Cycles are becoming shorter, even in a capital-intensive industry as energy

Permanent uncertainty is the new normal –agents need to learn how to do business in a highly volatile environment



Thank you



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The image features a central logo consisting of the lowercase letters 'edp' in a white, sans-serif font. This text is centered within a dark blue circular area. Surrounding this central circle are three overlapping, semi-transparent rings of different colors: a bright cyan ring, a vibrant green ring, and a purple ring. The rings overlap in a way that creates a sense of depth and movement, with the purple ring being the outermost and the cyan ring being the innermost. The background is a solid dark blue color.

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