GLOBAL DISRUPTION & TRENDS REPORT *2026*

VIETNAM 2045: NAVIGATING GLOBAL DISRUPTION THROUGH SYSTEMIC RESILIENCE

ViCo

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“Change is inevitable, and the disruption it causes brings both inconvenience and opportunity.”

- Robert Scoble

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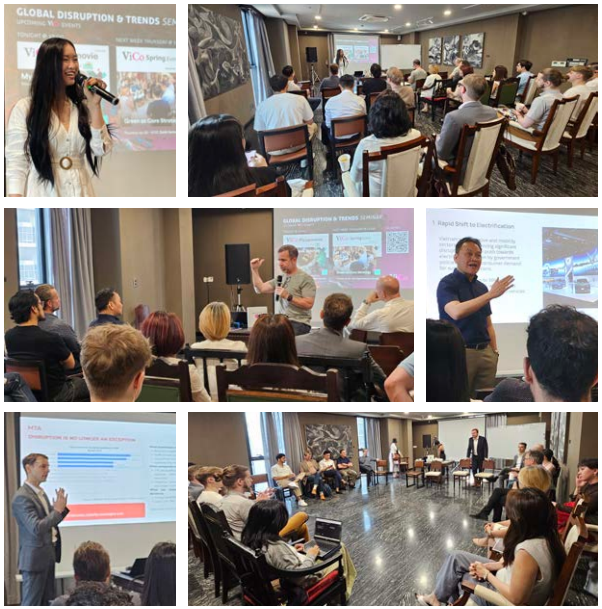

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INTRODUCTION

A WORLD OF ACCELERATING CHANGE

We are living through a period of extraordinary transformation. The next twenty years will reshape economies, societies, and ecosystems in ways that are already becoming visible but whose full implications remain difficult to grasp.

Climate patterns are shifting measurably. Technologies that seemed distant possibilities a decade ago are now restructuring entire industries. Geopolitical alignments that appeared stable for generations are being redrawn. Supply chains that enabled global prosperity are fragmenting and reforming along new lines.

These are not abstract future scenarios. They are forces already in motion, with momentum that will carry them forward regardless of what any single nation chooses to do. The question is not whether these disruptions will arrive, but how prepared we are to navigate them, and whether they will emerge stronger or weaker from the turbulence ahead.

For some nations, the coming decades represent an existential threat. For others, they present a rare opportunity to leapfrog into positions of strategic advantage.

The difference between these outcomes is not luck, nor is it simply a matter of geography or current wealth. It is a function of systemic resilience; the capacity of a country's interwoven economic, social, environmental, and institutional systems to absorb shocks, adapt to new realities, and maintain the essential functions that allow people to live well.

We hope this report helps you, and many decision-makers, investors, and entrepreneurs, make decisions that help build a rising Vietnam.

Tom Bosschaert & Tam Le
May 2026

Vietnam 2045: Navigating Global Disruption through Systemic Resilience

CRITICAL SYSTEMIC VULNERABILITIES

165% Trade Exposure to GDP

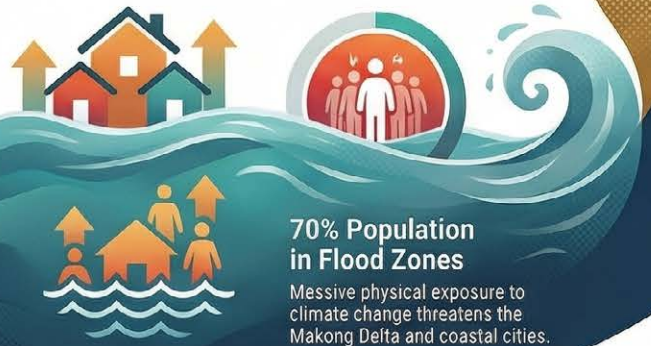
Extreme integration into global markets makes the economy highly sensitive to trade fragmentation.

The Energy Import Flip

Vietnam shifted from a **30% energy exporter** to a **27% net importer** since 2000.

70% Population in Flood Zones

Massive physical exposure to climate change threatens the Makong Delta and coastal cities.



Current Systemic Sustainability Status

Harmony

Strong: 90% poverty reduction and low income inequality (Gini 36.1).

Resilience

Moderate: Strong economic diversity offect by high trade exposure and flood risk.

Autonomy

Weak: Accelerating energy dependency and low circularity (1.2%).

THE STRATEGIC WINDOW OF OPPORTUNITY

The 15-20 Year Demographic Window

Vietnam must rebuild autonomy before aging pressures intensity and fiscal flexibility decreases.

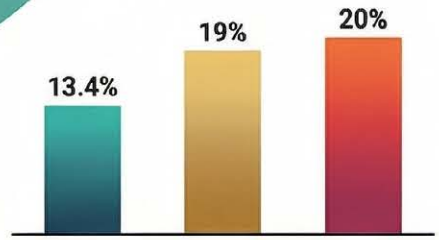
Rebuilding Energy Autonomy

Accelerating solar and wind deployment to reach a **30% renewable mix** by 2050.

The Manufacturing Value-Add

Moving from low-cost assembly to domestic design and high-tech component manufacturing.

Vietnam's Demographic Advantage



	Vietnam	Thailand	China
Old-age dependency implication	A critical 20-year lead to refurm the economy.	Already facing aging-related fiscal constraints.	Rapidly closing window for labor-led growth.

VIETNAM'S SHIFTING REALITY

Vietnam stands at a unique crossroads. Over the past three decades, it has achieved one of the most remarkable economic transformations in modern history: moving from one of the world's poorest countries to a rapidly industrializing middle-income economy. Its GDP has grown at an average rate of 6-7% annually. Poverty rates have plummeted. A new middle class has emerged. Foreign investment has poured in, particularly in manufacturing, making Vietnam a critical link in global supply chains.

But the same **global forces that enabled this rise are now shifting**. The economic model that worked so well for the past thirty years may not be the model that works for the next thirty.

> *"Don't confuse risk with uncertainty. Don't predict. Use effectual principles to create a future. And don't stop."*
> – Willem Smit, Global Disruptions & Trends Seminar, Jan '26.

Vietnam's success has been primarily built on its integration into a globalized trading system, but **that system is fragmenting**. It has benefited from being a low-cost manufacturing hub, but automation and artificial intelligence are changing what that means. It has grown rapidly with relatively light attention to environmental constraints, but climate change is no longer a distant threat; it is **reshaping the Mekong Delta**, threatening coastal cities, and altering agricultural viability.

At the same time, Vietnam possesses **distinctive strengths** that many other nations lack. It sits in a strategic geographic position between major powers, with options that landlocked or peripheral nations do not have.

The question this report seeks to answer is: **How resilient is Vietnam to the global disruptions that are coming, and where does it need to build additional capacity to not just survive but thrive through the next two decades?**

We do this through two analyses, and one synthesis:

- **Part 1: Disruption Analysis;** What are the global forces acting on Vietnam from outside
- **Part 2: Resilience Analysis;** How sensitive is Vietnam to disruption?
- **Part 3: Synthesis;** Where do the likely global disruptions intersect Vietnam's strengths and weaknesses?
- **Part 4: Action;** What can businesses and policy makers do to prevent the worst, and capitalize on the best of this projected future?

Details on the analysis and data sources are listed in the appendices, as well as details on the authors and Except.

Our approach is built on data; specific, measurable indicators drawn from international databases, research institutions, and established forecasting bodies. We are not here to advocate for a particular political or economic philosophy. We are here to assess, as objectively as possible, where Vietnam stands across the multiple dimensions of national resilience, and what the evidence suggests about its trajectory.

SEMINAR SPEAKER INSIGHT SUMMARIES

The below summaries express some of the core points made by the speakders during the Global Disruption Seminar held in HCMC on January 22 2026, regarding Vietnam's present state, and future foresight.

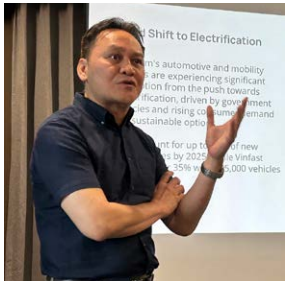
Tom Bosschaert, Founder Except Systemic Strategy & ViCo:
Vietnam traded autonomy for growth. It was energy-independent until 2014, now imports 40%. Economic complexity rose dramatically but so did fragility. A 15-20 year demographic window exists before aging sets in. The path forward: rebuild energy autonomy (stellar energy model), escalate value chains (stop exporting raw commodities under foreign brands), and above all: cooperate. Vietnam's competitive business culture is the binding constraint preventing the integrated manufacturing, industrial symbiosis, and coordinated climate response it needs.

Paul Tonkes, Core5; Industrial Development:
Three global disruptions converge on industrial real estate: AI arms race (semiconductors, rare earth, power), demographic collapse elsewhere (creating manufacturing demand Vietnam can serve), and circular economy. Vietnam risks three traps: staying a transshipment corridor, productivity plateauing, and resource constraints (water, power, recycling virtually nonexistent despite regulation). The opportunity: become the "Switzerland of manufacturing" for rare earth processing (neutral territory, China controls 90%) and the "Germany of the Global South" through the Living Factory: power-autonomous, AI-augmented, climate-resilient manufacturing within a 15-year window. Remanufacturing licensing remains a dead-end regulatory barrier.

Matthew McGarvey, Xylem Capital; International Finance:
Vietnam needs $600 billion for energy transition by 2050 but has an "epileptic allergy" to debt learned through hard experience. International lenders (Bank of Tokyo, PIBG) arrive with appetite; EVN says "you take the risk"; they leave for Sri Lanka. Meanwhile AI ambitions are fundamentally an energy plan, three once-in-100-year storms hit in three years, and the government compresses 40 years of growth into 10. Lego's DPPA was industry-setting. Policy sandboxing is emerging. Hanoi's thinking is further along than outsiders perceive. Vietnam snaps together when backs are against the wall: and backs are hitting the wall now. But there's a vision for five years, not beyond.

Phuc Pham, VinaCrowd; Real Estate sector:
Metro Line 1 took 20 years. Six new lines are breaking ground now, driven by private sector motivation (Vingroup, Masterise, Tasco own projects along routes): expect radically faster delivery. But housing is broken: 20-21x income to buy a standard apartment (should be 15-16x). The F1/F2/F3 multi-level agency scheme inflates sales costs to 15-18% (vs. 5-7% in China), creates fake sellouts, and priced out ethical foreign developers (Hong Kong Land withdrew). Over 90% of developers use this scheme. Laws exist but enforcement is near zero. The generational shift: second-generation developers with overseas education: is the real hope for ethical market reform.

Guillaume Rondan, MoveToAsia; International Manufacturing & trade:
The China+1 wave has broadened from multinationals to SMEs, with clients demanding 20% relocation in 6 months (vs. years-long strategies before). Cost is no longer the primary driver: resilience, stability, speed are. Vietnam is top-3 destination. But the operational reality is harsh: a Guangzhou factory owner with a Bac Ninh operation still can't match his Chinese supply chain smoothness. Factories hire more people instead of investing in automation; 30-50% of machines are Chinese imports. Malaysia is already pushing low-value production out and building automated clusters. Vietnam's government talks high-tech but factory-level investment doesn't follow.



Paul Nguyen, DealersEdge ; Mobility & Infrastructure:
Vietnam is #1 ASEAN, #2 globally in EV adoption at 36%. VinFast: 8 years old: outsold 31-year incumbent Toyota by 100,000 units in 2024. GSM captured 40% ride-hailing share in 2-3 years. 700+ electric buses run in HCMC. This is the bamboo model: strong, fast, relentless. But innovation means nothing without supply chain: MedEV's launch was killed overnight by a single tariff-triggered supplier shutdown. 76% of companies can't recruit the advanced talent they need. Vietnam's 22 million students aged 15-29 are both the market and the solution, but premium European-standard talent remains absent. The single best investment: people.

Wolfgang Bäcker, DEKRA Group; International Regulations and Compliance:
The question is no longer whether companies want to be sustainable but whether they're capable of it under constant disruption. CBAM, supply chain due diligence, and disclosure requirements are turning sustainability into hard market access criteria.
Vietnam faces a strategic inflection: compete on cost (increasingly volatile) or build competitiveness on trust, quality, and certified capability. Certification is widely treated as a necessary evil: audit fatigue, paper systems, zero organizational relevance. But done right, it creates four things: early risk visibility, alignment between boardroom intent and shop floor action, organizational learning, and trust infrastructure across borders. The real risk is not the cost of sustainability: it's the cost of losing access, relevance, and competitiveness.

Willem Smit, Fulbright University, Strategic decision-making:
Business schools teach disruption wrong by confusing risk (calculable probability) with uncertainty (unknowable). Traditional frameworks: Porter, BCG, scenario planning: assume 19th-century predictability. Under true uncertainty, the alternative is effectuation: start with what you have (not goals), assess affordable loss (not expected returns), seek partnerships (not competition), and leverage contingencies (not avoid surprises). His own research confirms the problem: as uncertainty rises, managers predict harder rather than shifting to control-based action. This is flat rigidity: doing more of what doesn't work. The Ice Hotel was born from melting ice, not from a business plan.

OUR ANALYTICAL LENS: THE SYMBIOSIS IN DEVELOPMENT (SID) FRAMEWORK

To organize this analysis, we use the Symbiosis in Development (SiD) framework. SiD is a deep approach to measuring resilience of organizations ans systems, that has evolved in application to cities, regions, and national economies around the world since 1999. SiD is open source and freely available.

Resilience is the single key measureable property of any system to overcome global disruption. The SiD framework recognizes that resilience is not a single attribute but emerges from the interaction of multiple systemic properties.

Resilience acts across sectors and economic boundaries. A country might have strong economic growth but fragile environmental systems. It might have excellent health infrastructure but high inequality that undermines social cohesion and thus endanger stability. It might be energy-independent but dependent on critical material imports. True resilience requires strength across domains and, crucially, the right relationships between domains.

The SiD framework organizes analysis around four foundational layers: Energy & Materials, Life (ecosystems and biodiversity), Society (economy and culture), and Individual (health and happiness). It evaluates the interaction between these through three systemic indicators:

Resilience: The ability to absorb shocks and continue functioning. This includes flexibility, diversity, stability, redundancy, and adaptive capacity.

Autonomy: The capacity to meet needs and operate with reduced external dependency. This includes self-sufficiency, circularity, efficiency, and control over critical resources.

Harmony: Fairness, inclusion, legitimacy, and information quality. This includes equity, access, power balance, and expression.

By measuring Vietnam across these dimensions using quantifiable indicators, we can build a picture of systemic strength and weakness. From this we have extracted the qualitative assessment this report presents.

Read more about SiD on www.thinksid.org.

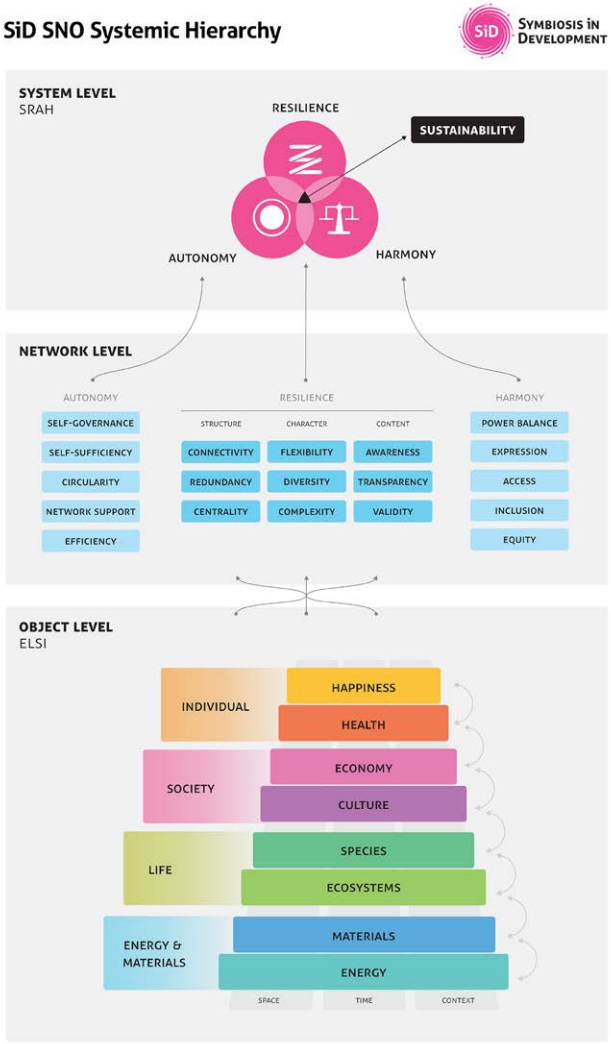


Diagram of SiD's indicator hierarchy, from object (bottom) level to network (mid) to systemic level (top).

"The real voyage of discovery consists not in seeking new landscapes, but in having new eyes."

Marcel Proust

Image: Except's strategy and design for Handan's regenerative urban masterplan

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PART 1: THE EXTERNAL FORCE FIELD: GLOBAL MACRO EVENTS

WHAT TRENDS ARE SHAPING VIETNAM'S STRATEGIC ENVIRONMENT?

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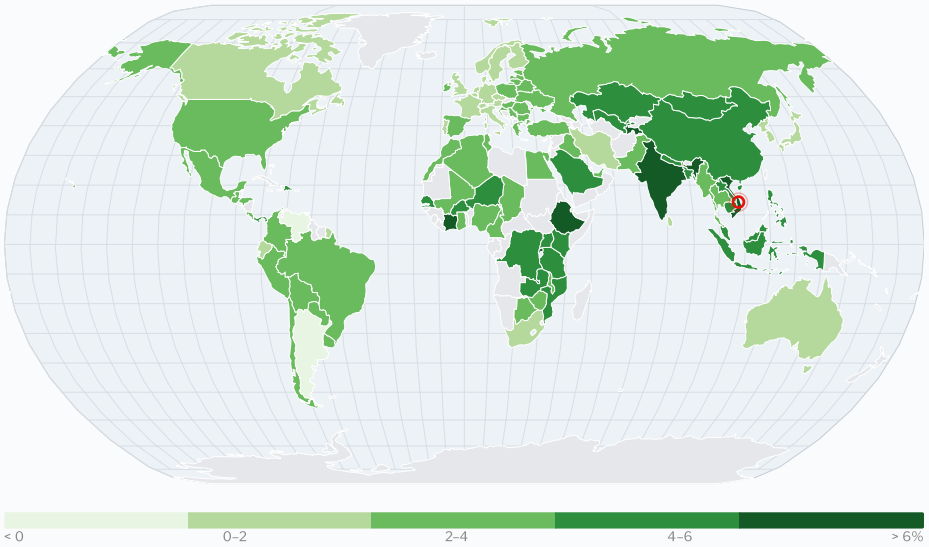
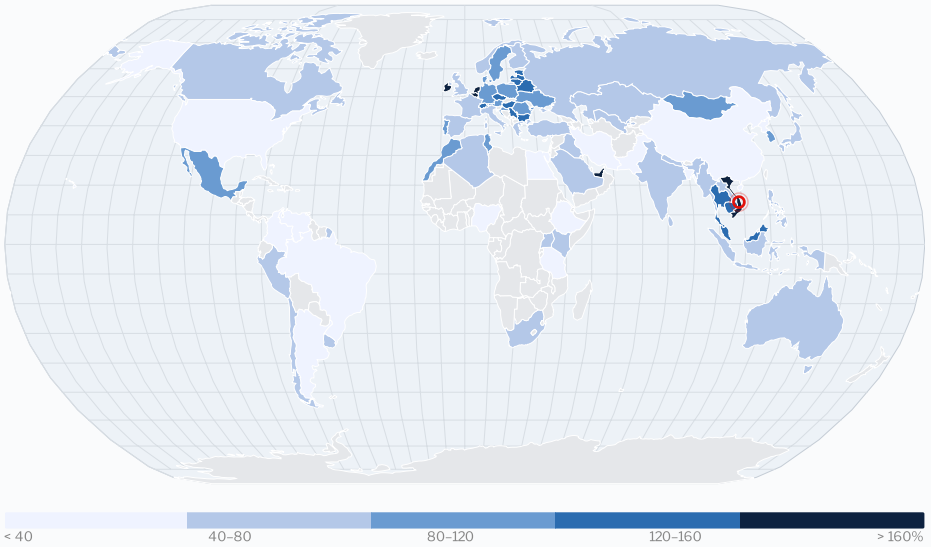
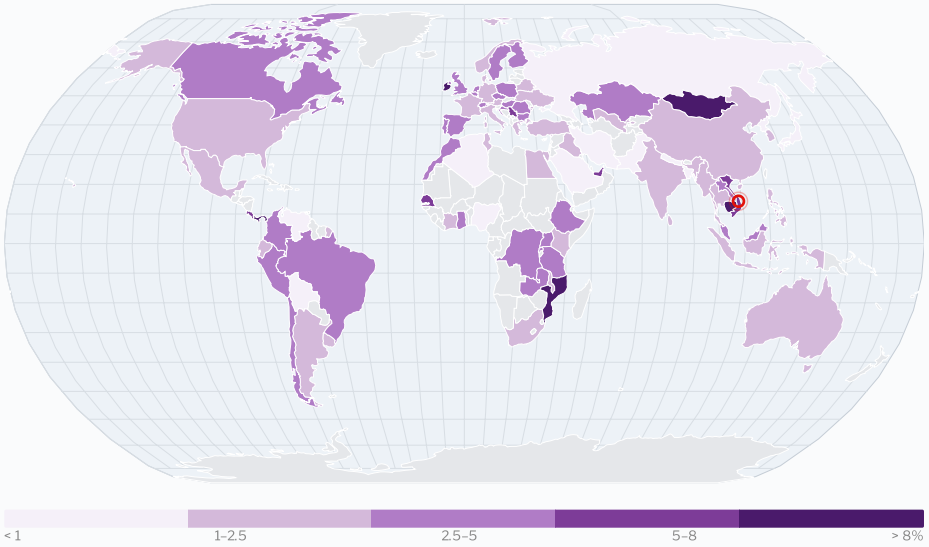
Real GDP Growth Annual %, 2024 — Vietnam: 6.5%



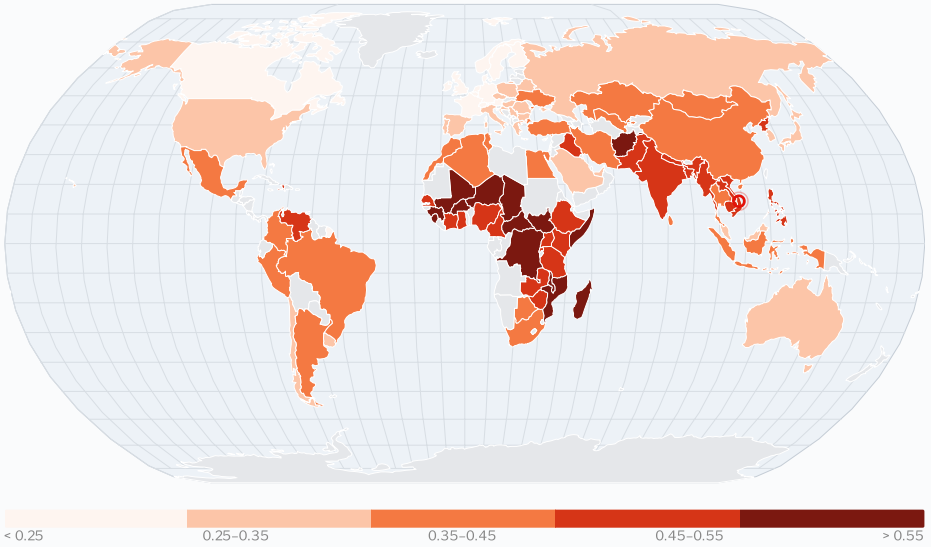
Trade Openness Trade/GDP %, 2023 — Vietnam: 186%



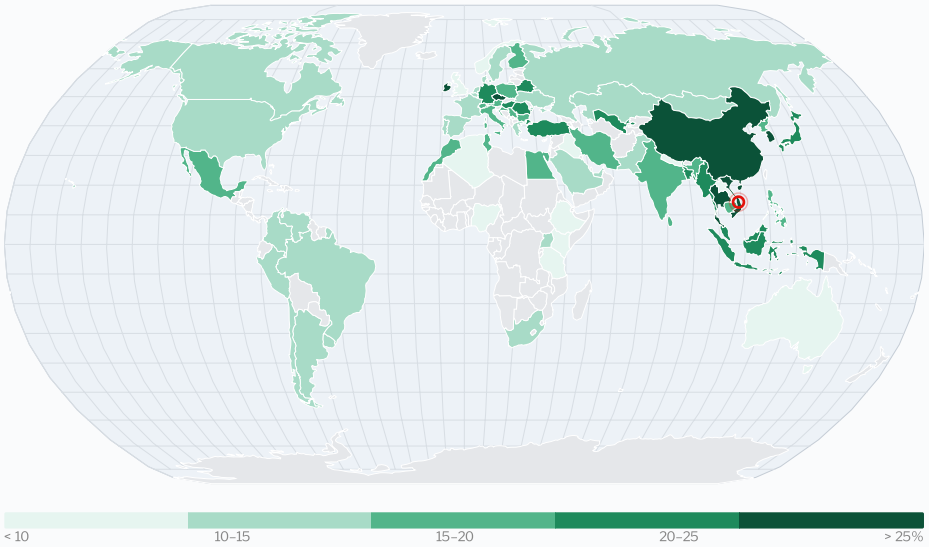
FDI Net Inflows % of GDP, 2023 — Vietnam: 5.5%



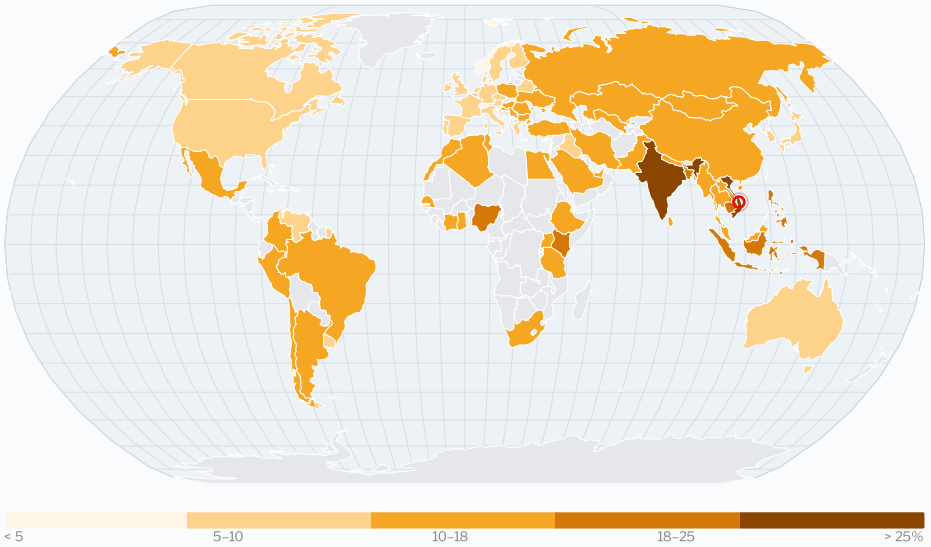
Climate Vulnerability ND-GAIN Index, 2023 (higher = more vulnerable) — Vietnam: 0.45



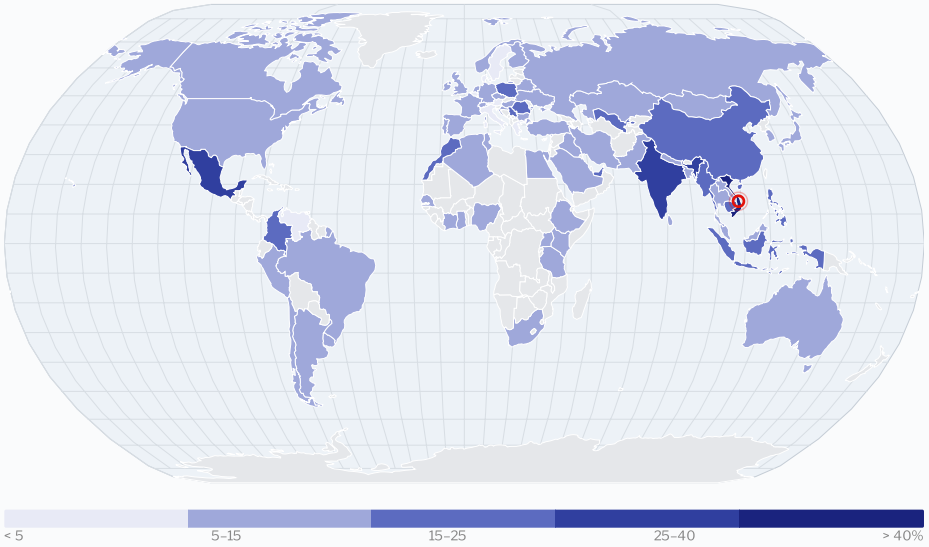
Manufacturing Value Added % of GDP, 2023 — Vietnam: 25%



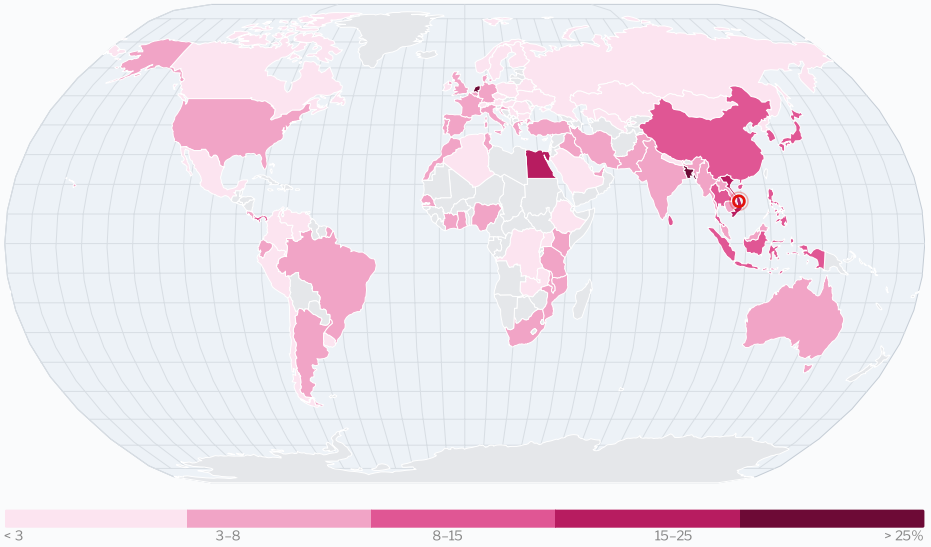
Digital Economy Growth Internet economy CAGR %, 2019–2024 — Vietnam: 28%



Manufacturing Export Growth %, 2019–2024 — Vietnam: +45%



Coastal Flood Exposure Population in low-elevation zones, % — Vietnam: 23%



1.1 OVERVIEW: A WORLD IN FLUX

GLOBAL DISRUPTION: UNEXPECTED LOCAL EVENTS THAT HAVE A GLOBAL IMPACT THROUGH SYSTEMIC 'RIPPLING'

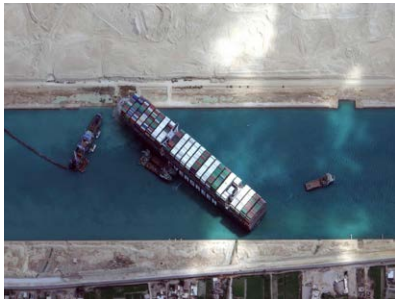
This chapter synthesizes 91 major global trends from 25 reports published by leading international institutions in 2024-2025. These trends represent external forces largely beyond Vietnam's direct control, yet will fundamentally influence the country's development trajectory, economic prospects, and strategic options over the next two decades.

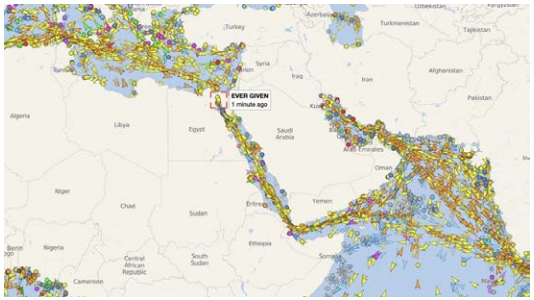
Our analysis reveals a global landscape marked by four defining characteristics: heightened economic and trade uncertainty, fragmenting international cooperation, accelerating climate and technological disruption, and profound demographic shifts.

Of the 91 trends identified, 42 (46%) present primarily negative implications, 21 (23%) offer positive opportunities, and 28 (31%) present mixed or context-dependent outcomes. This distribution underscores both the challenges ahead and the strategic opportunities that exist for well-positioned economies like Vietnam.

Below we investigate 6 subdomains of global trends:

- 1.3 Economic and Trade Environment
- 1.4 Geopolitical Realignment
- 1.5 Climate and Environmental Pressures
- 1.6 Technology and Workforce Transformation
- 1.7 Demographic Transitions
- 1.8 Health and Biosecurity
- 1.9 Synthesis: The External Force Field





Ever Given stranded in Suez Canal: $50 billion+ in disrupted trade value (15% of Vietnam GDP '21)

1.2 METHODOLOGY

This chapter draws on systematic analysis of reports from (Appendix B3):

1. Multilateral institutions (IMF, World Bank, OECD, ADB, BIS, UN agencies),
2. Specialized agencies (IEA, UNEP, IRENA, IPBES, WHO)
3. Economic forums (WEF)
4. Regional body (ASEAN Secretariat)
5. Leading research organizations (McKinsey Global Institute, Stanford HAI, Eurasia Group, EY-Parthenon, KPMG).

Each trend is categorized into six thematic domains (Appendix A2), assessed for directional impact (+/-/mixed), and evaluated for specific implications for ASEAN and Vietnam. Read more about the methodology and all sources in the appendixes.

1.3 ECONOMIC AND TRADE ENVIRONMENT

The global economic outlook through 2025-2027 points to a period of subdued growth, heightened policy uncertainty, and structural transformation for Vietnam. Multiple institutions converge on a picture of, hopefully, global resilience undermined by fragmentation.

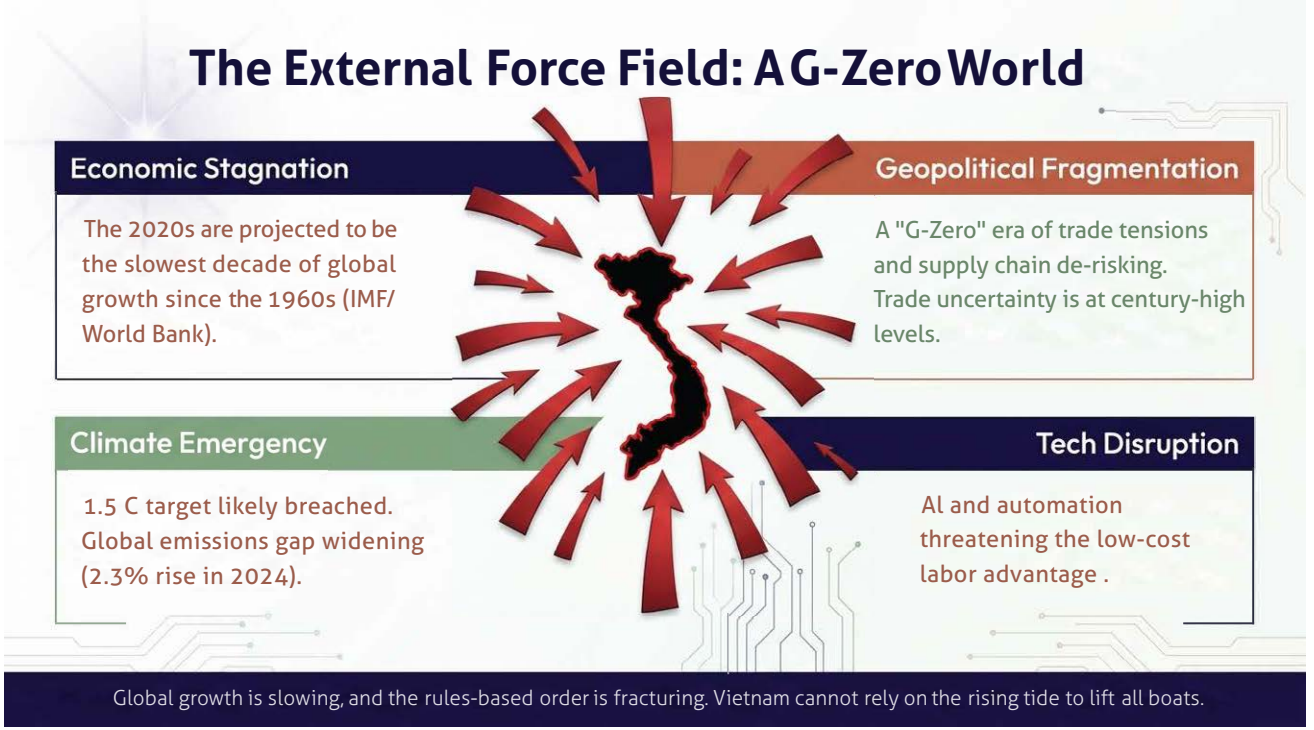
THE STRUCTURAL SLOWDOWN: A DECADE OF DIMINISHED GROWTH

Sources converge on a sobering outlook: the 2020s are likely to be the weakest decade of global growth since the 1960s outside recession periods. The IMF projects global growth of 3.2% in 2025 and 3.1% in 2026, well below the 2000–2019 average of 3.7%. Advanced economies are expected to grow at just 1.5%, while emerging market and developing economies (EMDEs) exceed 4%, reinforcing a "two-speed" global economy. The OECD similarly forecasts global GDP growth of 3.2% in 2025, slowing to 2.9% in 2026 before a modest recovery to 3.1% in 2027.

The World Bank's Global Economic Prospects (June 2025), citing UN data, is more pessimistic, projecting global growth of only 2.3% in 2025. If realized, the 2020s would register the slowest average growth of any decade since the 1960s. The Bank notes that "outside Asia, the developing world is becoming a development-free zone," underscoring Asia's role as a relative outlier amid broad stagnation.

This prolonged low-growth environment signals a structural reordering of the global economy rather than a cyclical slowdown. Weak expansion in advanced economies alongside continued momentum in emerging Asia suggests simultaneous erosion of traditional growth engines: developed-world consumption and broad-based developing-country convergence.

For ASEAN, this creates a paradox. The region is positioned to capture a larger share of global growth, but within a smaller overall economic pie, constrained by weaker export demand, reduced capital flows to developing regions, and persistent productivity challenges among major trading partners.



TRADE TENSIONS AND POLICY UNCERTAINTY

Trade policy uncertainty has peaked for this century according to UNCTAD. The Economic Policy Uncertainty Index spiked to unprecedented highs in early 2025 (2.53 SD above historical baseline), with the IMF estimating that trade tensions are costing between 0.7% and 2% of global GDP.

The BIS Annual Economic Report 2025 notes that the global economy "appeared firmly on track for a soft landing" until Q2 2025, when larger-than-expected US tariffs "darkened the outlook."

Financial markets experienced **significant volatility**, with the VIX reaching its third-highest level in history, exceeded only during the 2008 financial crisis and 2020 pandemic.

INDICATOR	2025 PROJECTION	SOURCE	IMPLICATION
Global GDP Growth	3.2% (IMF), 2.3% (WB)	IMF/World Bank	Below historical average; slowest decade since 1960s
Trade Policy Uncertainty	Century-high levels	UNCTAD	0.7-2% GDP cost; investment delays
Developing Asia Growth	5.1%	ADB	Outperforming global; regional resilience
South-South Trade Share	~33% of global	UNCTAD	Growing buffer against uncertainty
Inflation (G20)	3.4%; 2.5% by 2027	OECD	Disinflation enabling monetary easing

Table 1. Global Key Economic & Trade Projection, 2025

However, UNCTAD also identifies **positive dynamics**: South-South trade now accounts for approximately one-third of global trade and is expanding faster than other trade flows, offering developing economies a buffer against uncertainty and new avenues for growth.

REGIONAL DYNAMICS: ASIA AS GROWTH ENGINE

The Asian Development Bank (ADB, December 2025) upgraded its forecast for developing Asia growth at 5.1% (earlier this year: 4.8%), driven by India's 7.2% expansion and **solid export performance** across the region's technology-exporting economies.

ADB's Southeast Asia's **growth forecast has been upgraded** to 4.5%, with strong Q3 performance in Indonesia, Malaysia, Singapore, and Vietnam defying global headwinds. This said, ADB's forecast did not yet factor in 2026's global conflic spectrum.

McKinsey Global Institute (2024) framed the on-going moment as a fundamental transition in global economic distribution. Asia now accounts for 57% of global GDP growth, 64% of patent generation, and more than half of global middle-class households. The region has shifted from being a "rule-taker" to a potential "**rule-shaper**" in the emerging global order. Notably, 75% of Asia Business Council members surveyed indicated that the new era requires fundamental reshaping of corporate strategies and business models.

1.4 GEOPOLITICAL REALIGNMENT

The geopolitical landscape is undergoing profound restructuring, with implications for trade patterns, technology access, and regional security.

FRAGMENTATION AND MULTIPOLARITY

The Eurasia Group's Top Risks 2025 characterizes the current period as a "**G-Zero world**"; an era without global leadership or functioning multilateral cooperation, comparable to the 1930s or early Cold War. The WEF Global Risks Report 2025 reinforces this assessment, with nearly two-thirds of surveyed experts anticipating a "turbulent or stormy" global landscape by 2035 and 64% expecting a fragmented global order marked by competition among middle and great powers.

State-based armed conflict emerged as the top immediate risk for 2025 and beyond in the WEF survey, identified by nearly 25% of respondents. A dramatic shift from just two years ago when it was not considered a major risk. This reflects the destabilizing consequences of ongoing conflicts in Ukraine, the Middle East, and Sudan, as well as broader geopolitical tensions.

US-CHINA DYNAMICS AND SUPPLY CHAIN RECONFIGURATION

The US-China relationship continues to drive global economic restructuring. EY-Parthenon's Geostrategic Outlook 2025 identifies accelerating supply chain de-risking, with "**friendshoring**" and "**reshoring**" to political allies intensifying. KPMG's analysis notes the formation of technology blocs around the US and China, with AI, quantum computing, and semiconductor industries increasingly subject to geopolitical considerations.

Vietnam sits at a distinctive node within this reconfiguration. At Global Disruptions 2026, **Paul Tonkes of Indochina Kajima Development** pointed to a striking concentration of supply chain risk that the institutional data confirms:

"China currently controls approximately 90% of global rare earth processing, materials that underpin semiconductors, EV batteries, and defence technologies."

As geopolitical pressure to diversify said dependency intensifies, Vietnam's combination of geological endowment, geographic proximity, and, crucially, its posture of strategic neutrality positions it as a **credible alternative processing hub**.

Guillaume Rondan of Move to Asia noted at the seminar that SMEs have been implementing China+1 strategies in earnest over the last five to seven years. A 2025 survey of 180 companies his firm conducted found economic volatility, tariff barriers, and geopolitical instability displacing cost as the primary supply chain motivation. As Rondan observed:

"The last 10 years... one of the main reasons was costs. Now people are looking for something else."

Paul Tonkes, Indochina Kajima Development, at the Seminar

Guillaume Rondan, Move to Asia

INFORMATION ENVIRONMENT CHALLENGES

Misinformation and disinformation rank as leading short-term risks in the WEF analysis, eroding trust and exacerbating societal divides. This trend complicates the urgent need for cooperation on shared crises and undermines the capacity for collective action on global challenges from climate change to pandemic preparedness.

TREND	DIRECTION	SOURCE	STRATEGIC IMPLICATION
G-Zero World Order	Negative	Eurasia Group	Multilateral frameworks weakening
Supply Chain De-risking	Mixed	EY-Parthenon	China+1 opportunities but new dependencies
Tech Bloc Formation	Mixed	KPMG	Standards fragmentation; compliance complexity
Armed Conflict Risk	Negative	WEF	Top immediate risk for 2025
Regional Trade Agreements	Positive	KPMG	RCEP and bilateral deals gaining importance

1.5 CLIMATE AND ENVIRONMENTAL PRESSURES

Climate and environmental trends represent perhaps the most consequential long-term forces shaping the global operating environment for the region. The data presents a stark picture of accelerating impacts alongside insufficient response.

TEMPERATURE TRAJECTORY AND EMISSIONS

The UNEP Emissions Gap Report 2025 delivers a sobering assessment: global greenhouse gas emissions **reached a record 57.7 gigatonnes of CO_2** equivalent in 2024, growing 2.3% year-on-year, more than four times faster than the decade average. The report concludes that exceedance of the Paris Agreement's 1.5°C target is now "very likely" within the next decade.

Current Nationally Determined Contributions (NDCs) would result in **warming of 2.3-2.5°C by century's end**, while current policies alone point toward 2.8°C. The report notes that new NDCs have "barely moved the needle," with the US withdrawal from the Paris Agreement canceling approximately 0.1°C of projected improvement.

To align with 1.5°C pathways, **emissions would need to fall 55% from 2019 levels by 2035**. This target appears increasingly out of reach given current trajectories. Every fraction of a degree of avoided warming reduces damages, costs, and reliance on uncertain carbon dioxide removal technologies.

ECONOMIC COSTS OF CLIMATE INACTION

The NGFS Climate Scenarios 2025 quantify the economic stakes: under current policies, **GDP losses could reach 30% by 2100**, with tail risks up to 50%. These represent **more than double previous estimates**. Some countries could see economies shrink by a quarter as soon as 2050 from chronic climate risks alone, before accounting for extreme weather events.

The NGFS short-term scenarios (May 2025) indicate that climate disasters could reduce global growth by up to 3% within just five years. Africa faces potential GDP impacts of up to 13% from severe droughts. These findings underscore that climate change is not a distant threat but a current economic reality.

Critically, the IEA's World Energy Outlook 2025 demonstrates that **the net-zero pathway has the lowest overall energy system costs**, while the fossil fuel-dependent current policies scenario has the highest. The transition is not just an environmental imperative but an economic opportunity.

ENERGY TRANSITION DYNAMICS

Despite the alarming emissions trajectory, the **clean energy transition continues to accelerate**. The IEA reports that renewables set deployment records for the 23rd consecutive year in 2024, now representing 46% of global generation capacity. **Clean energy investment reached $2.2 trillion in 2025**, double the $1.1 trillion going to oil, natural gas, and coal combined.

> *In terms of global decarbonization momentum measured by capital raised and corporate impact commitments, McGarvey from Xylem Capital observed that the movement has peaked around 2021 and has been declining since; a retreat accelerated by political shifts from Global North since late 2024.*

IRENA's Renewable Capacity Statistics show record additions of 585 GW in 2024, the largest annual increase ever. However, this remains below the pace needed to meet the COP28 target of tripling renewable capacity by 2030, which would require 1,122 GW of annual additions through 2025-2030.

A **critical bottleneck is grid infrastructure**. IRENA estimates that $670 billion annually is needed for grid investment, substantially above current levels. Without adequate grid and storage investment, renewable deployment will be constrained by curtailment and integration challenges.

INDICATOR	VALUE	SOURCE	IMPLICATION
Global Emissions (2024)	57.7 $GtCO_2e$ (record)	UNEP	2.3% YoY growth; 4x decade average
Temperature Trajectory	2.3-2.5°C (NDCs)	UNEP	1.5°C exceedance very likely this decade
GDP Loss Risk (2100)	Up to 30-50%	NGFS	Physical impacts exceed transition costs
Renewable Additions (2024)	585 GW (record)	IRENA	46% of global capacity; still behind target
Clean Energy Investment	$2.2T vs $1.1T fossil	IEA	Investment shift accelerating

REGIONAL CLIMATE VULNERABILITIES

The ASEAN State of Climate Change Report and related analyses identify Southeast Asia as **one of the world's most climate-vulnerable regions.** Bangkok, Manila, Ho Chi Minh City, and Jakarta rank among the cities **most exposed to sea-level rise globally**. Climate change is also driving internal migration patterns, with populations moving to coastal areas and flood basins that are themselves increasingly vulnerable.

The ADB's Asia-Pacific Climate Report (2024) projects that **climate change could lead to a 17% GDP decline across Asia and the Pacific by 2070** under a high-emissions scenario, rising to 41% by century's end. These projections underscore the asymmetric vulnerability of the region relative to its contribution to historical emissions.

1.6 TECHNOLOGY AND WORKFORCE TRANSFORMATION

Technological change, particularly the rapid advancement and deployment of artificial intelligence, is reshaping labor markets, business models, and competitive dynamics at unprecedented speed.

LABOR MARKET RESTRUCTURING

The WEF Future of Jobs Report 2025 projects **net creation of 78 million jobs globally by 2030** (170 million created, 92 million displaced), representing 22% structural churn in labor markets. However, **63% of employers cite the skills gap as their top business barrier, and an estimated 39% of current skills will be outdated by 2030**.

McKinsey's analysis indicates that **27-30% of work hours could be automated** by 2030, with generative AI accelerating automation particularly in cognitive tasks. Lower-wage workers are 14 times more likely to need occupational transitions, and women face 1.5 times higher transition probability than men. An estimated 12 million additional occupational transitions will be needed beyond pre-AI projections.

Positively, **demand for social-emotional skills is rising** 11-14%, reflecting the growing value of uniquely human capabilities that remain difficult to automate. The green transition is also expected to create 34 million additional agricultural jobs by 2030, demonstrating that technological displacement can be offset by new growth sectors.

AI DEVELOPMENT AND DEPLOYMENT

The Stanford HAI AI Index Report 2025 documents the **explosive growth of AI investment and adoption**. US AI investment reached $109 billion, nearly 12 times China's $9.3 billion and 24 times the UK's $4.5 billion. Generative AI alone attracted $33.9 billion globally.

Business adoption of AI has accelerated dramatically, from 55% in 2023 to 78% in 2025, with 71% of organizations now using generative AI in at least one function. In healthcare, FDA-approved AI medical devices increased from 6 in 2015 to 223 by 2023, revolutionizing diagnostics and treatment planning.

However, **AI incidents are rising sharply**: 233 in 2024, up 56.4% year-on-year, involving deepfakes, harmful applications, and system failures. The governance gap between AI capabilities and regulatory frameworks continues to widen, with international cooperation on AI safety faltering.

Notably, **China is rapidly closing the AI performance gap** with the US, narrowing from a 9.26% quality differential in January 2024 to just 1.70% by February 2025. This intensifying competition has implications for technology access, standards-setting, and the geographic distribution of AI benefits.

TREND	DATA POINT	SOURCE	WORKFORCE IMPLICATION
Net Job Creation by 2030	+78M globally	WEF	22% labor market churn
Skills Obsolescence	39% outdated by 2030	WEF	Massive reskilling requirement
Work Automation Potential	27-30% of hours	McKinsey	Lower-wage workers 14x more exposed
AI Business Adoption	78% (up from 55%)	Stanford HAI	Rapid enterprise transformation
AI Investment (US)	$109B	Stanford HAI	12x China; concentration concerns

1.7 DEMOGRAPHIC TRANSITIONS

Global demographic trends are entering a new phase characterized by population stabilization, aging, and fundamental shifts in workforce composition.

POPULATION DYNAMICS

The UN World Population Prospects 2024 projects **global population peaking in the mid-2080s** at approximately 10.3 billion: 700 million fewer than projected just a decade ago. Already, 63 countries have passed their population peaks, including China, Germany, Japan, and Russia. **Global fertility has fallen to 2.3 children per woman** (down from 3.3 in 1990), with over half of countries now below the 2.1 replacement rate.

The aging trajectory is accelerating: by the 2070s, the **global population aged 65 and over will exceed those under 18 for the first time in human history**. By the 2030s, the population aged 80 and above will exceed infants. These shifts will fundamentally reshape consumption patterns, labor markets, healthcare systems, and fiscal sustainability.

For approximately 100 countries, a **"demographic dividend" window** remains open: a period when the working-age population grows faster than dependents, which includes Vietnam. However, **this window is time-limited** and depends critically on investments in education, healthcare, and job creation to realize potential benefits.

DEVELOPMENT PROGRESS UNDER PRESSURE

The UNDP Human Development Report 2025 identifies an unprecedented slowdown in human development progress. This is the smallest improvement in the Human Development Index since 1990. For the fourth consecutive year, inequality between countries is widening, reversing the long-term convergence trend that characterized the post-Cold War era.

Traditional development paths based on export-oriented manufacturing are increasingly squeezed by automation, climate constraints, and geopolitical fragmentation. The report notes that AI could serve as a "development accelerator" but warns that outcomes depend on how societies deploy these technologies; they could equally exacerbate existing inequalities.

The OECD projects that without policy action, government debt in OECD countries could rise from approximately 75% of GDP today to 230% by 2060, driven primarily by pension and healthcare costs from aging populations. This fiscal pressure will constrain development assistance, climate finance, and international cooperation capacity.

INDICATOR	PROJECTION	SOURCE	STRATEGIC IMPLICATION
Global Population Peak	Mid-2080s at 10.3B	UN DESA	700M lower than 2015 projections
Countries Past Peak	63 (incl. China)	UN DESA	Labor supply constraints spreading
Global Fertility Rate	2.3 (below replacement)	UN DESA	>50% of countries below 2.1
HDI Progress	Smallest since 1990	UNDP	Development convergence reversing
Debt Trajectory (OECD)	75%; 230% GDP by 2060	OECD	Aging costs constrain fiscal space

1.8 HEALTH AND BIOSECURITY

The global health landscape is characterized by significant advances in medical technology alongside persistent vulnerabilities and emerging threats.

PANDEMIC PREPAREDNESS GAPS

The Global Preparedness Monitoring Board (GPMB) and WHO's 2025 assessment concludes that the world remains highly vulnerable to future pandemics despite advances since COVID-19. Persistent inequities in healthcare access, eroding public trust, and chronic underinvestment in preparedness continue to undermine global health security.

Future pandemics will differ from COVID-19, influenced by climate change, urbanization patterns, and human mobility. The report emphasizes that investment in primary healthcare systems is the most effective shield against both pandemic threats and broader socioeconomic impacts of health crises.

HEALTH ACHIEVEMENTS AND THREATS

WHO World Health Statistics 2025 documents substantial progress: 1.4 billion more people are living healthier lives due to reduced tobacco use, cleaner air, and improved water and sanitation. Measles deaths have declined 88% since 2000, with vaccination saving nearly 59 million lives. Multiple countries have achieved elimination of diseases including mother-to-child HIV transmission, trachoma, and sleeping sickness.

However, funding cuts announced in 2025 have disrupted maternal care, vaccination programs, HIV prevention, and disease surveillance in many developing countries. Preliminary estimates suggest an 18% decline in official development assistance from major donors between 2023-2025, threatening hard-won health gains.

BIOTECHNOLOGY REVOLUTION

EY's Biotech Beyond Borders 2025 documents transformative advances in medical technology. The CRISPR gene therapy market is projected to grow from $3.3 billion in 2023 to $24.6 billion by 2033, making precision medicine an increasingly practical reality. AI is transforming drug discovery, reducing development timelines from 5 years to 12-18 months, with 62% of healthcare executives now implementing generative AI.

These advances promise significant improvements in health outcomes but raise equity concerns about access. Biotech funding remains challenging, with traditional equity investment giving way to royalty-based structures and investors favoring later-stage, proven assets over early-stage innovation.

1.9 SYNTHESIS: THE EXTERNAL FORCE FIELD

The aggregate picture emerging from this meta-analysis reveals a global environment characterized by:

STRUCTURAL DECELERATION

Global economic growth is settling into a "new normal" below historical averages, with the 2020s potentially recording the slowest growth since the 1960s. Productivity stagnation in advanced economies and development slowdowns in vulnerable regions compound these pressures.

ACCELERATING FRAGMENTATION

The rules-based international order that facilitated Vietnam's economic opening is fragmenting. Trade tensions, technology blocs, and geopolitical competition are creating a more complex operating environment requiring careful navigation.

CLIMATE EMERGENCY

The window for limiting warming to 1.5°C is effectively closed; the focus has shifted to minimizing overshoot and adapting to impacts. Southeast Asia faces disproportionate climate vulnerability, with potential GDP losses far exceeding global averages.

TECHNOLOGICAL DISRUPTION

AI and automation are restructuring labor markets at unprecedented speed, with 22% structural churn projected by 2030. Countries that successfully adapt their education systems and workforce policies will capture significant advantages.

DEMOGRAPHIC TRANSITION

The global population is stabilizing and aging faster than previously projected. Approximately 100 countries retain a demographic dividend opportunity, but the window is narrowing.

STRATEGIC OPPORTUNITIES

Despite the predominantly challenging outlook, significant opportunities exist: Asia's rising share of global economic activity, the accelerating clean energy transition, growing South-South trade networks, and the potential for AI to accelerate development. Economies that position themselves strategically can capture disproportionate benefits from these transitions.

The following chapter examines Vietnam's internal resilience: its capacity to absorb these external shocks, maintain autonomy under pressure, and preserve internal harmony through the transition ahead.

PART 2: VIETNAM'S SYSTEMIC RESILIENCE

UNDERSTANDING VIETNAM'S CAPACITY TO ABSORB DISRUPTION

This section evaluates Vietnam's internal capacity to withstand global disruptions over the next two decades using the Symbiosis in Development (SiD) framework.

While Part 1 analyzed external forces acting on Vietnam, this section examines Vietnam's **internal systemic composition**, where its major strengths and vulnerabilities lie, and how resilient and sustainable its systems are.

02

EXCEPT
INTEGRATED SUSTAINABILITY

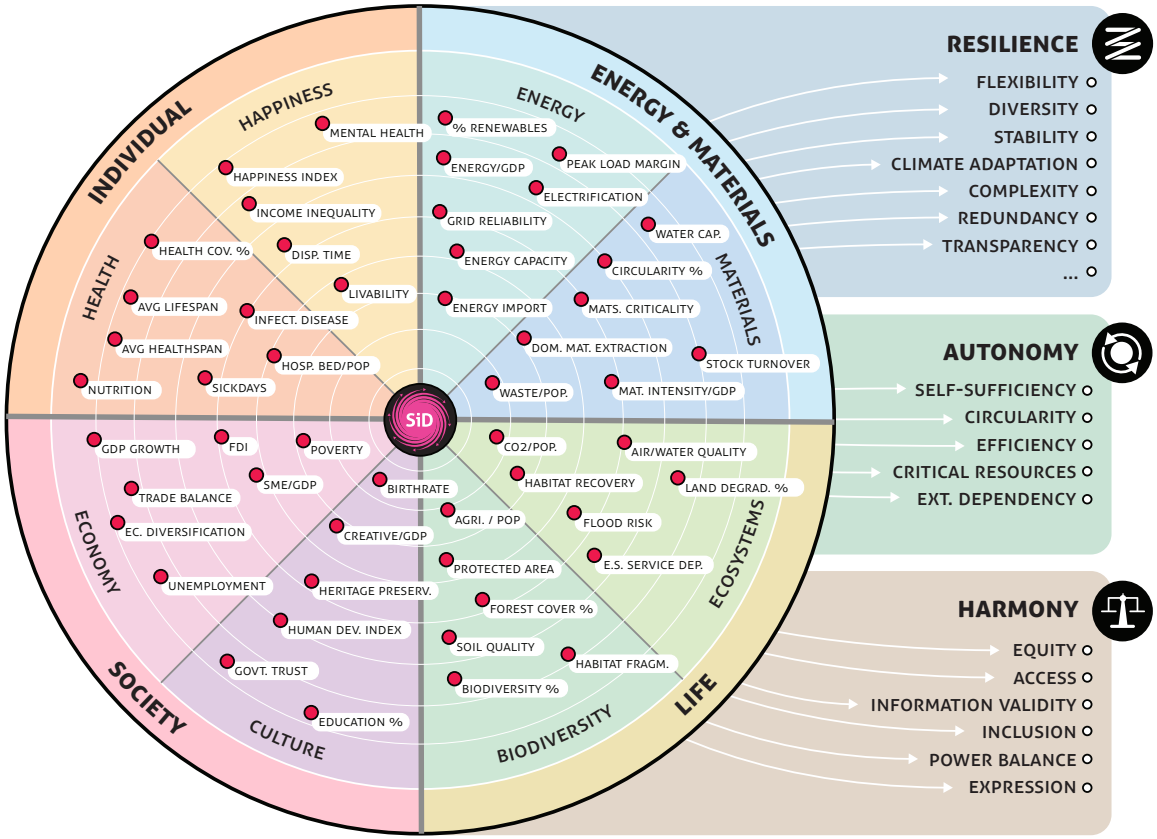
INTEGRATED SID ASSESSMENT

The analysis draws on 24 key performance indicators across economic, social, environmental, health, and infrastructure dimensions, tracking trajectories from 2000-2024 and comparing Vietnam to six regional peers: Thailand, Indonesia, Malaysia, Philippines, Singapore, and China. Data sources include the World Bank, UNDP, WHO, IEA, FAO, and national statistical offices. Complete KPI data and methodology are provided in Appendix B.

CENTRAL FINDINGS

Vietnam has built exceptional social foundations and economic dynamism, but is simultaneously constructing critical vulnerabilities in energy dependency, trade exposure, and environmental management that undermine its capacity to absorb external shocks. The country has a 15-20 year demographic window to address these structural weaknesses before aging pressures reduce flexibility.

SiD COUNTRY RESILIENCE AUTONOMY HARMONY (RAH) SCAN



The SiD framework scans for a multitude of systemic KPIs to evaluate the total systemic sustainability (Resilience, Autonomy, Harmony) of a country, business, or project.

2.1 RAH ASSESSMENT SUMMARY

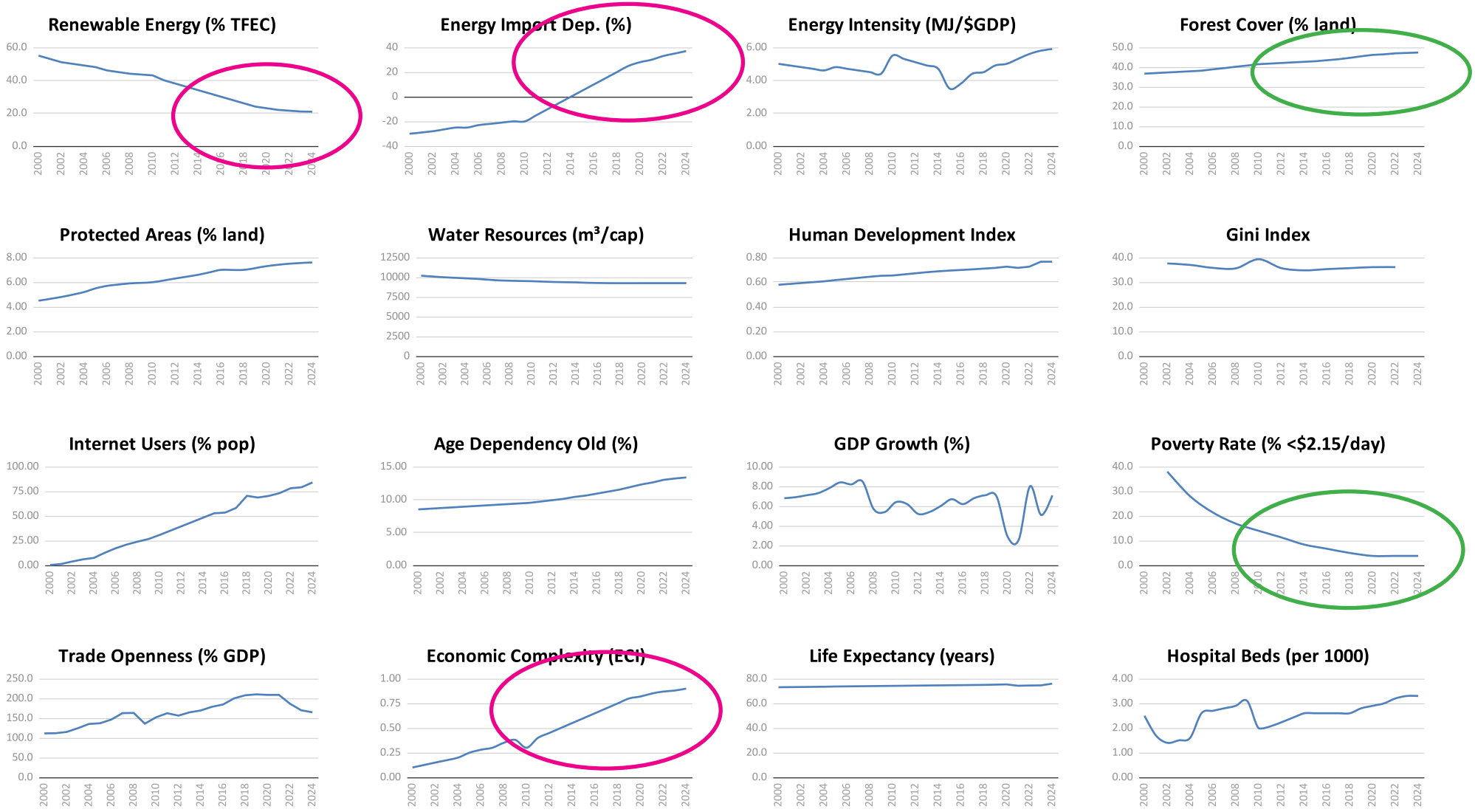
The SiD framework evaluates systemic sustainability through three dimensions: Resilience (capacity to absorb shocks and continue functioning), Autonomy (capacity to meet needs independently), and Harmony (fairness, inclusion, and internal balance). Vietnam's current assessment reveals a system with strong social foundations being undermined by deteriorating autonomy.

DIMENSION	STATUS	TREND	KEY DRIVERS
Harmony	Strong	Improving	Poverty reduction (90%), relatively low inequality (Gini 36.1), UHC expansion
Resilience	Moderate	Mixed	Strong diversity offset by 165% trade/ GDP exposure, flood vulnerability
Autonomy	Weak	Declining	Energy flip: exporter to 37% importer; low 1.2% circularity; water stress

2.2 DETAILED RAH IMPACT ASSESSMENT

RESILIENCE: CAPACITY TO WITHSTAND EXTERNAL DISRUPTION

POSITIVE FACTORS	NEGATIVE FACTORS
Economic complexity index +800% since 2000	Trade exposure 165% of GDP (4x Indonesia)
Forest recovery: 28% to 47.4% cover (+69%)	Energy import flip: -30% to +37% net imports
Human capital: HDI +32% (0.58 to 0.73)	Renewable share collapse: 55% to 21%
Digital connectivity: 84% internet penetration	Carbon emissions +429% (0.7 to 3.7 tonnes/capita)
Low unemployment: 2.3%	Protected areas: only 7.6% vs Thailand 18%



Time graph series of 16 key KPI's of Vietnam used in the Vietnam Resilience analysis (Except).

AUTONOMY: CAPACITY TO MEET NEEDS INDEPENDENTLY

POSITIVE FACTORS	NEGATIVE FACTORS
Governance effectiveness improved +33%	Energy import dependency accelerating
Food production self-sufficient (rice exporter)	Trade structure: 70%+ exports foreign-controlled
Strong manufacturing base	Near-zero circularity: 1.2% vs 9.1% global average
Demographic dividend: 15-20 year window	High energy intensity: 5.9 MJ/$ (worst in ASEAN)
Strategic ASEAN network position	Technology and IP dependency on FDI

HARMONY: CAPACITY TO PREVENT INTERNAL CONFLICT

POSITIVE FACTORS	NEGATIVE FACTORS
Poverty reduction: 38% to 3.8% (-90%)	Governance transparency gaps (CPI 40/100)
Income inequality: Gini 36.1 (lowest in region)	Ethnic minority gaps: 27% poverty vs 1.2% Kinh
Universal health coverage expansion +62%	Urban-rural digital divide persists
Education access +18 percentage points	Air quality burden: ~70,000 deaths/year
Rising life satisfaction scores	Climate impact distribution uneven

*RAH Impact Key: R = Resilience, A = Autonomy, H = Harmony. Arrows indicate direction of impact on each dimension: ↑ positive, ↓ negative. Single arrows indicate a moderate or secondary impact; double arrows (↑↑ / ↓↓) indicate a strong or primary impact. Example: A↓↓ R↓ means the factor strongly undermines Autonomy and moderately undermines Resilience.

2.3 CRITICAL VULNERABILITIES: 12 SYSTEMIC RISKS

The following vulnerabilities represent areas where Vietnam can take action to improve resilience. Unlike external global forces, these are internal factors that can be addressed through policy, investment, and institutional reform.

#	VULNERABILITY	DOMAIN	EVIDENCE	RAH IMPACT*
1	Energy Import Dependency	Infrastructure	-30% to +37% (67pp swing since 2000)	A↓↓ R↓
2	Trade Exposure	Economic	165% of GDP (4x Indonesia)	R↓↓ A↓
3	Flood and Climate Risk	Environment	70% population in flood zones; $2.6B/year losses	R↓↓ H↓
4	Air Pollution Burden	Health	~70,000 deaths/year; PM2.5 6x WHO guidelines	H↓↓ R↓
5	Groundwater Depletion	Environment	Mekong: 0.3-0.5m/year decline; 90% household use	A↓↓ R↓
6	FDI/Technology Dependency	Economic	70%+ exports foreign-controlled	A↓↓
7	Renewable Energy Collapse	Infrastructure	55% to 20.9% share (-62%)	R↓ A↓
8	Circular Economy Failure	Governance	1.2% vs 9.1% global average	A↓↓
9	Energy Inefficiency	Infrastructure	5.9 MJ/$ (worst in ASEAN)	A↓
10	Carbon/Border Tax Exposure	Environment	CO2 +429%; CBAM exposure rising	R↓
11	Ethnic Minority Exclusion	Social	27% poverty vs 1.2% Kinh majority	H↓↓
12	Mekong Delta Displacement	Social/Env	6-12M affected by coastal flooding by 2070-2100	H↓ R↓

KEY PATTERN: VIETNAM HAS TRADED AUTONOMY FOR GROWTH

The export-led, FDI-driven, fossil-fueled development model delivered remarkable results: 7% average annual growth and 90% poverty reduction over two decades. However, this model has created structural dependencies that will be severely tested when external shocks arrive. The strategy of prioritizing rapid growth over systemic resilience has left Vietnam increasingly vulnerable to supply chain disruptions, energy price volatility, and climate impacts.

2.4 ENVIRONMENTAL AND PHYSICAL RISK ASSESSMENT

Worth noting separately, Vietnam faces severe but highly actionable environmental risks where domestic policy, infrastructure investment, and regulation can materially reduce vulnerability. Typically only qualitatively present in macroeconomic documentation, research institutions worldwide agree that Vietnam is high on the list of global top contenders of the below risks.

FLOOD AND STORM RISK

Around **70% of the population lives in flood-prone coastal and delta regions**. Floods currently affect about 930,000 people annually, causing GDP losses of roughly $2.6 billion (≈1% of GDP). By mid-century, millions more could be exposed, particularly in the Mekong Delta, which faces compounded risks from sea-level rise, land subsidence, and saltwater intrusion. Targeted responses include flood-resilient infrastructure, nature-based solutions, improved drainage, early warning systems, and stricter land-use zoning.

AIR QUALITY CRISIS

Air pollution is one of Vietnam's most urgent public health challenges. An estimated 70,000 premature deaths per year are attributed to air pollution, with urban centers such as Hanoi experiencing PM2.5 levels far above WHO guidelines. Economic costs are projected to reach $1–3 billion annually by 2050, alongside productivity losses. Key levers include tighter vehicle and industrial emissions standards, coal phase-down, controls on agricultural burning, and expanded urban green space.

WATER SECURITY AND GROUNDWATER DEPLETION

The Mekong Delta depends on groundwater for about 90% of household water, yet **extraction is driving rapid depletion and land subsidence**, intensifying flood and salinity risks. Saline intrusion now affects about 1.7 million hectares annually, undermining agriculture and water supply. Priority actions include groundwater licensing and metering, managed aquifer recharge, surface water systems, desalination in coastal zones, and improved agricultural water efficiency.

2.5 UNIQUE STRENGTHS: VIETNAM'S COMPETITIVE POSITION

Despite significant vulnerabilities, Vietnam possesses distinctive advantages relative to regional peers that provide a foundation for building resilience:

STRENGTH	VIETNAM	REGIONAL COMPARISON	STRATEGIC VALUE
Demographic Window	13.4% old dependency	Thailand 19%, China 20%	15-20 year advantage for reform
Forest Recovery	47.4% cover (+69%)	Only ASEAN country reforesting	Carbon economy positioning
Social Cohesion	Gini 36.1 (lowest)	Regional average 38.6	Stability for long-term planning
Poverty Reduction	38% to 3.8%	Fastest in region	Strong harmony foundation
Economic Dynamism	7.09% GDP growth	Regional average 4.68%	Resources for investment
Real Economy Base	Manufacturing + Agriculture	Unlike Singapore (services)	Production redundancy
Trade Network Position	RCEP, CPTPP, EVFTA	Strong FTA coverage	Market access diversity

VIETNAM'S SUPERPOWER: THE DEMOGRAPHIC WINDOW

Vietnam's 15-20 year window before aging pressures intensify represents its most significant strategic asset. Thailand (19% old dependency) and China (20%) are already facing aging-related fiscal constraints. This window of demographic advantage is what Vietnam must leverage to reach sustainable prosperity and resilience, as put directly by **Paul Nguyen** of MedEV:

> *"If there's any opportunity to invest, it would be into people development, into skills and talent. The people are where Vietnam has the best opportunity."*

This demographic advantage is Vietnam's single most valuable factor for reaching sustainable prosperity and resilience. However, the resource is time-limited. Twenty years is not long in macroeconomic terms; decisive action is required now to maximize this window of opportunity.

2.6 GOVERNANCE AND INSTITUTIONAL CAPACITY

Vietnam's institutional capacity to implement resilience-building measures shows mixed signals. Progress is evident in some areas, while persistent gaps remain in others.

INDICATOR	CURRENT STATUS	TREND
Corruption Perception Index	40/100 (rank 88/180)	Improved from 31 (2012) to 42 (2022), slight decline to 40 (2024)
Logistics Performance Index	3.3/5.0 (rank 43/139)	Highest score since 2007; infrastructure improving
Government Effectiveness (WGI)	+33% improvement since 2000	Positive trajectory
E-Governance Adoption	Expanding digital citizenship	Progress noted in 2023 PAPI
Transparency in Governance	Gaps identified in local governance	Backsliding noted in 2023 PAPI
Disaster Risk Management	Fragmented across agencies	Reactive responses often override prevention

Sources: Transparency International CPI 2024; World Bank LPI 2023; World Bank Worldwide Governance Indicators; UNDP PAPI Report 2023.

2.7 SUMMARY: THE RESILIENCE IMPERATIVE

Vietnam's RAH profile reveals a fundamental paradox: strong Harmony foundations are being undermined by deteriorating Autonomy, which will eventually threaten resilience when external shocks occur.

The country has achieved remarkable success in poverty reduction, social cohesion, and economic growth, but has simultaneously built critical dependencies on energy imports, foreign-controlled trade, and climate-vulnerable geographies.

The strategic imperative: Use Vietnam's unique advantages (demographic window, social cohesion, forest resources, manufacturing base) to rebuild Autonomy before the next major disruption tests the system.

The 12 critical vulnerabilities identified in this analysis represent actionable areas where policy intervention, infrastructure investment, and institutional reform can significantly improve Vietnam's capacity to absorb shocks and emerge stronger.

Next up: Part 3 examines how these internal vulnerabilities and strengths intersect with the global disruption forces identified in Part 1, mapping the highest-risk and highest-opportunity scenarios for Vietnam over the coming two decades.

PART 3: THE INTERSECTION - WHERE GLOBAL FORCES MEET VIETNAMESE OPPORTUNITIES

WHERE GLOBAL FORCES MEET VIETNAMESE REALITIES

This section maps the global disruption forces identified in Part 1 against Vietnam's systemic profile from Part 2.

The intersection reveals where Vietnam faces compounding risks, when external pressures meet internal vulnerabilities, and where strategic opportunities emerge from the alignment of global shifts with Vietnamese strengths.

03

EXCEPT
INTEGRATED SUSTAINABILITY

3.1 DISRUPTION-RESILIENCE MATRIX

The matrix below juxtaposes the six major global disruption categories of part 1 with Vietnam's corresponding vulnerabilities and strengths of part 2. Color coding indicates net assessment: red for high-risk intersections, green for opportunities, and yellow for mixed outcomes requiring active management.

GLOBAL FORCE (PART 1)	VIETNAM VULNERABILITY	VIETNAM STRENGTH	NET INTERSECTION
Trade Fragmentation & Tariffs	165% trade/GDP exposure; 70%+ FDI-controlled exports; US tariff vulnerability	RCEP/CPTPP/EVFTA access; China+1 positioning; ASEAN network	**HIGH RISK: Extreme exposure partially offset by diversification**
Geopolitical Realignment & Tech Blocs	Technology dependency on FDI; semiconductor supply chain exposure	Strategic geography; multiple FTA coverage; balanced diplomacy	**MIXED: Supply chain beneficiary but tech bloc risks**
Climate Physical Risks (1.5°C breach)	70% population in flood zones; $2.6B/yr losses; Mekong triple threat	Forest recovery (+69%); reforestation leadership; nature-based solutions capacity	**HIGH RISK: Severe exposure; adaptation investment urgent**
Energy Transition & CBAM	Energy import flip (-30% to +37%); 5.9 MJ/$ intensity; CO2 +429%; CBAM exposure	PDP8 commitment; solar/wind potential; $135B investment opportunity	**MIXED: High transition risk but major opportunity if executed**
AI & Workforce Transformation	12% high-skilled workforce; automation exposure in textiles/assembly	Young tech-savvy population; 84% internet; digital economy 14% GDP	**OPPORTUNITY: Demographics + digital adoption = transition capacity**
Global Aging & Development Squeeze	Window closing; ethnic minority gaps; HDI slowdown globally	15-20 year demographic dividend; 13.4% vs neighbors 19-20%; Gini 36.1	**OPPORTUNITY: Comparative advantage vs aging competitors**

3.2 CRITICAL INTERSECTION POINTS

HIGHEST-RISK INTERSECTIONS

These represent convergence points where external pressures compound internal vulnerabilities, creating potential systemic failures:

1. **Trade Shock + Energy Dependency:** A tariff escalation or supply chain disruption simultaneously hitting exports (165% GDP exposure) while energy import costs spike would create a dual balance-of-payments crisis with limited fiscal buffers.
2. **Climate Event + Mekong Vulnerability:** An extreme flood or drought in the Mekong Delta, which produces 50% of rice and 60% of shrimp, combined with accelerating groundwater depletion and saltwater intrusion could trigger food security concerns and mass internal displacement.
3. **CBAM Implementation + Carbon Intensity:** With Vietnam's export carbon intensity 45% above middle-income average and CO2 emissions having grown 429%, EU border carbon adjustments will directly impact competitiveness in steel, cement, and eventually textiles: core export sectors.

HIGHEST-OPPORTUNITY INTERSECTIONS

These represent convergence points where global shifts align with Vietnamese strengths, creating strategic advantages:

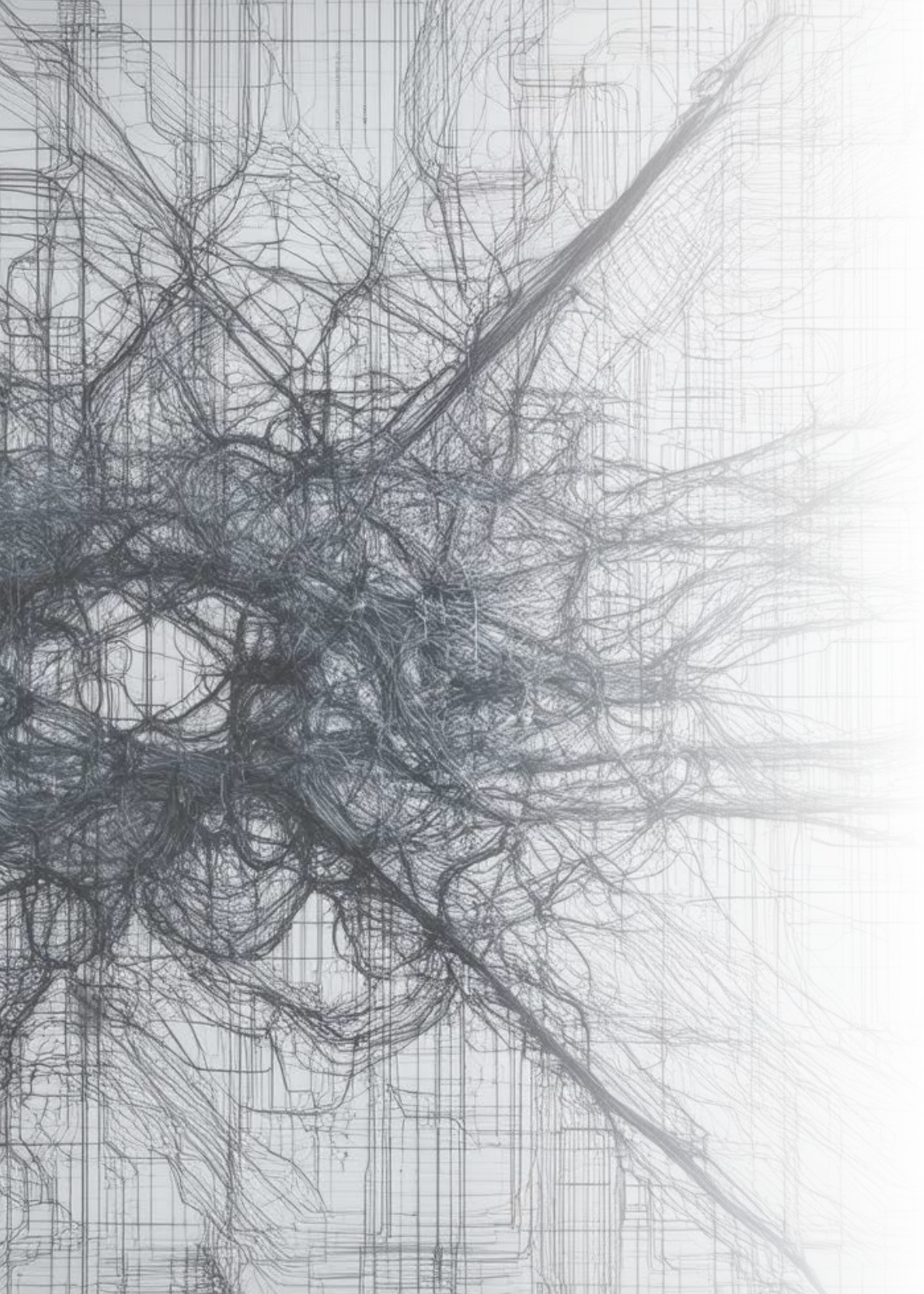
1. **China+1 + Manufacturing Base:** Global supply chain de-risking from China directly benefits Vietnam's established manufacturing ecosystem, FTA network, and competitive labor costs. This is already driving record FDI inflows. The opportunity extends further, however. At the Global Disruptions & Trend 2026, Paul Tonkes argued that:

   "Vietnam's neutrality makes it "the Switzerland of manufacturing" for geopolitically sensitive industries, and that if the converging disruptions are navigated well, "it could also become the Germany of the Global South"".

2. **Demographic Dividend + AI Adoption:** Vietnam's young population (13.4% old dependency vs 19-20% for Thailand/China) combined with 84% internet penetration and rapid digital adoption positions it to capture AI productivity gains while competitors face aging-related constraints.
3. **Clean Energy Transition + Solar/Wind Potential:** The $2.2 trillion annual global clean energy investment surge aligns with Vietnam's geography and PDP8 ambitions. Moving from energy importer to renewable equipment manufacturer could flip a vulnerability into a strength.
4. **Forest Carbon Economy + Reforestation Success:** As the only ASEAN country actively reforesting (+69% forest cover), Vietnam can position for emerging carbon markets and nature-based climate finance; a unique regional advantage.

3.3 TIMELINE: WHEN INTERSECTIONS INTENSIFY

PERIOD	CRITICAL RISKS	STRATEGIC OPPORTUNITIES
2025–2030	Tariff impacts materialize; front-loading ends; CBAM phase-in begins; energy import costs volatile	Peak China+1 FDI wave; digital economy expansion; renewable deployment acceleration
2030–2037	Climate physical impacts intensify; Mekong stress peaks; workforce automation pressure; aging begins	Demographic dividend peak; value-added manufacturing maturity; regional leadership potential
2037–2045	Demographic window closes; sea level rise acceleration; AI labor displacement peaks	Net zero positioning; carbon economy maturity; high-income transition possible if foundations built



3.4 SYNTHESIS: THE STRATEGIC EQUATION

The intersection analysis reveals a clear strategic equation for Vietnam:

Vietnam's window of opportunity is defined by the gap between its demographic advantage (15–20 years) and the timeline of its most severe risks (climate impacts intensifying 2030–2040, CBAM full implementation 2026–2034, automation pressure 2027–2035).

The next 10–15 years represent a decisive period. Actions taken now determine whether Vietnam:

Scenario A (Proactive): Uses its demographic dividend, manufacturing base, and social cohesion to build energy autonomy, climate resilience, and value-added industries, emerging as a high-income, climate-adapted economy by 2045.

Scenario B (Reactive): Continues current trajectories, depleting the demographic dividend while vulnerabilities compound, facing simultaneous climate, trade, and energy crises with diminished capacity to respond.

The difference between these scenarios is not determined by global forces, those are largely fixed. It is determined by the strategic choices Vietnam makes in the areas it can control. In the context of quality control and interacting with certification bodies, **Wolfgang Bäcker of DEKRA Vietnam** framed the problem between the 2 scenarios as:

> *"Whether Vietnam continues to compete primarily on cost, which is becoming more difficult and more volatile, or whether it deliberately builds competitiveness around trust, quality, and sustainability capability."*

Part 4 outlines the action strategies that can shift Vietnam toward Scenario A.

PART 4: ACTION & STRATEGIC DIRECTIONS

FROM ANALYSIS TO ACTION: WHAT VIETNAM CAN DO

The intersection analysis in Part 3 identified a 10–15 year window during which Vietnam can convert vulnerabilities into strengths.

This section outlines actionable strategies across sectors, organized by urgency and RAH impact. These are not prescriptions but strategic directions: options for businesses, policy-makers, and civil society to consider based on the evidence presented.

04

EXCEPT
INTEGRATED SUSTAINABILITY

4.1 STRATEGIC FRAMEWORK: THE THREE IMPERATIVES

All strategies flow from three core imperatives derived from the RAH analysis:

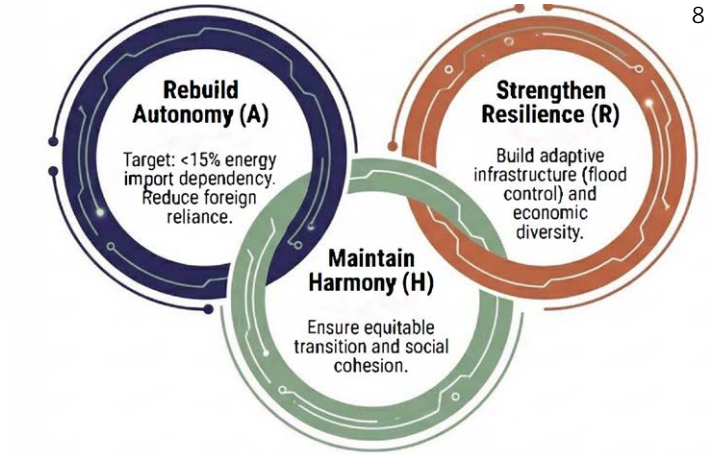
Rebuild Autonomy (A): Reduce critical dependencies on energy imports, foreign-controlled exports, and external technology before external shocks test the system.

Strengthen Resilience (R): Build adaptive capacity in infrastructure, ecosystems, and institutions to absorb climate impacts, trade disruptions, and technological change.

Maintain Harmony (H): Ensure the benefits of transition reach all segments of society, particularly ethnic minorities and climate-vulnerable communities, to preserve social cohesion.

Below we outline specific high-potential strategies for the following sectors:

› Energy Sector: From Importer to Producer
› Manufacturing
› Agriculture & Food
› Digital Economy & Workforce
› Finance & Investment



4.2 PRIORITY ACTION MATRIX

PRIO.	ACTION DOMAIN	KEY TARGET	RAH IMPACT	URGENCY
1	Energy Autonomy	<15% import dependency by 2035	A↑↑ R↑	IMMEDIATE
2	Trade Diversification	Reduce single-market concentration	R↑↑ A↑	IMMEDIATE
3	Climate Adaptation	Mekong resilience; flood infrastructure	R↑↑ H↑	IMMEDIATE
4	Circular Economy	10% circularity by 2035	A↑↑	HIGH
5	Value-Added Manufacturing	Move up value chains	R↑ A↑↑	HIGH
6	Workforce Transition	Upskilling for AI/ automation	R↑ H↑	HIGH
7	Air Quality & Health	Reduce PM2.5 to WHO interim levels	H↑↑	STRATEGIC
8	Carbon Economy	Forest carbon monetization	R↑ A↑	STRATEGIC

4.3 SECTOR-SPECIFIC STRATEGIES

ENERGY SECTOR: FROM IMPORTER TO PRODUCER

Current state: Vietnam flipped from 30% energy exporter to 37% importer since 2000. Energy intensity (5.9 MJ/$) is worst in ASEAN. Renewable share collapsed from 55% to 21%.

Strategic directions:

› **Accelerate PDP8 renewable deployment:** Vietnam's solar and wind potential is substantial. Government targets are on point and target 30% renewable mix by 2030 (current gov. target), carbon neutral in 2045.

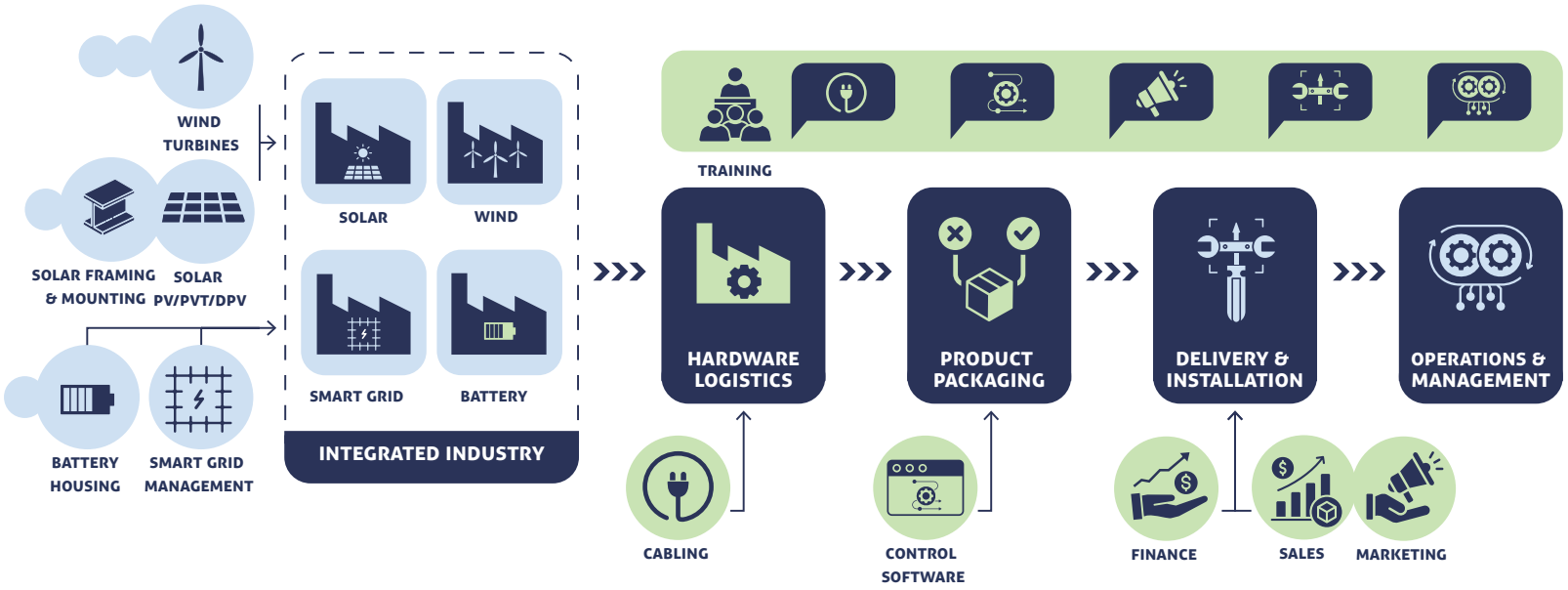
› **Rooftop solar at scale:** Unlock distributed generation through streamlined permitting and net metering policies.

› **Grid and storage investment:** Address the $670B global grid investment gap locally, without storage and transmission, renewables cannot scale

› **Go Stellar;** Widespread grid-battery adoption balanced with generation offers a specific opportunity to reach 'Stellar Energy' (see RethinkX) configuration where electricity becomes nearly zero cost during most parts of the day. This would boost Vietnam's manufacturing sector to new heights, decoupled from global energy price fluctuations.

› **Energy efficiency programs:** Industrial efficiency improvements can reduce energy intensity by 30–40%, cutting import dependency and CBAM exposure simultaneously.

› **Domestic renewable equipment manufacturing:** Move from importing all solar/wind equipment to producing regionally: a major value-capture opportunity. Battery technology (including Iron-Oxide to rival Lithium-Ion) will drive the energy economy of the future, and to a lesser degree green hydrogen and alternative energy carriers.



Example of an integrated industrial park strategy, orchestrating supply chain partners to colocate to enable value capture. Part of strategy proposal for undisclosed location by Except.

MANUFACTURING: VALUE-ADDED TRANSFORMATION

Current state: Vietnam is a manufacturing hub, but 70%+ of exports are foreign-controlled, with limited domestic value capture. Low-cost assembly models face automation pressure.

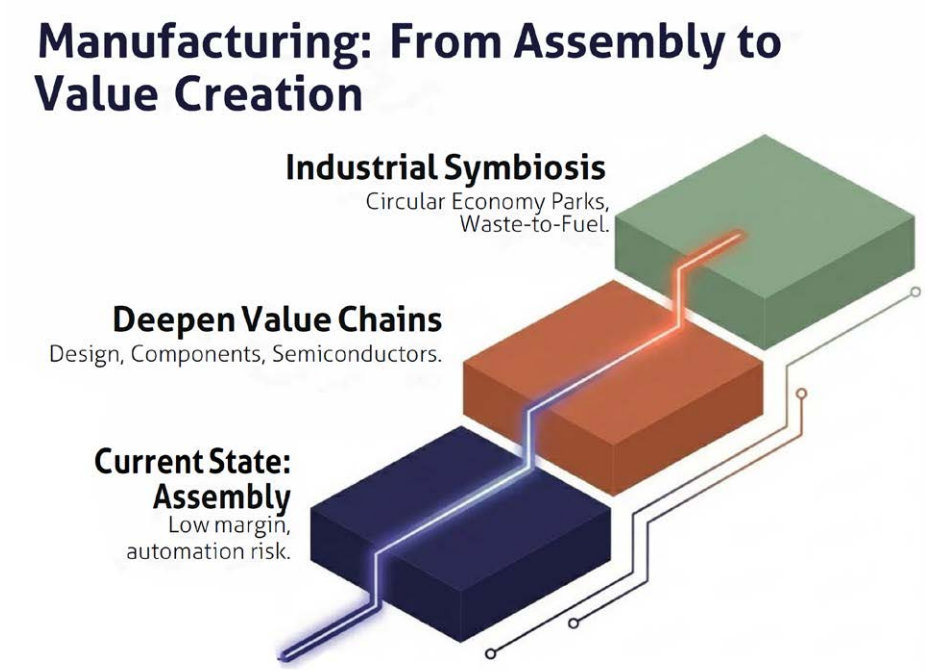
Strategic directions:

› **Prefab construction systems:** Transform raw material exports (steel, cement, wood) into integrated building systems for regional markets.

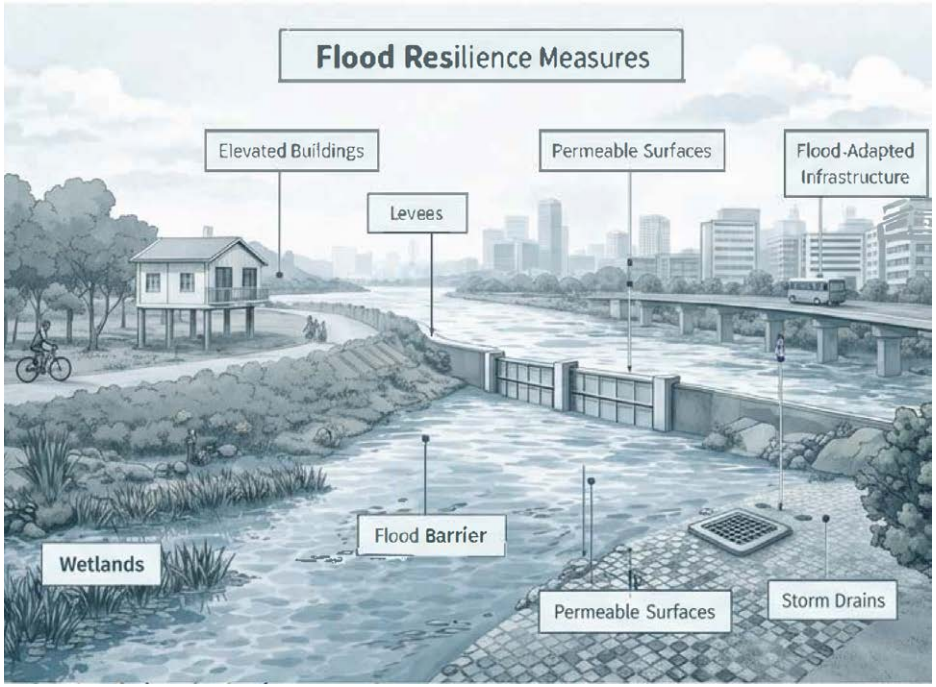
› **Electronics value chain deepening:** Move from assembly to design, testing, and component manufacturing in semiconductors and electronics.

› **Industrial symbiosis zones:** Co-locate industries to enable waste-to-input flows, improving circularity and resource efficiency.

› **Domestic brand development:** Support Vietnamese companies in building exportable brands, not just contract manufacturing.



Right: Chain integration using prefab CLT/ CNC construcrtion.



AGRICULTURE & FOOD: FROM COMMODITY TO BRAND

Current state: Vietnam exports raw commodities (rice, coffee, seafood) at low margins. Mekong Delta faces climate threats. Inefficient agricultural water use.

Strategic directions:

› **Integrated agri-food processing clusters:** Co-locate processing, packaging, and logistics to export finished products rather than raw commodities.

› **Climate-smart agriculture:** Saltwater-tolerant crops, automated polyculture greenhouses (e.g. Polydome), drought-resistant varieties, precision irrigation to adapt Mekong production systems.

› **Precision fermentation:** enable and accelerate production of valuable baseline products with specialized bacteria and fungi cultures.

› **Aquaculture sustainability:** Address the shrimp-groundwater depletion feedback loop through sustainable practices and alternative water sources.

› **Regional food security positioning:** As climate impacts hit neighboring countries, Vietnam's food production capacity becomes a strategic asset.

Left: Hydroponic agriculture by Orlar, pioneer in Vietnam.

INFRASTRUCTURE: CLIMATE-RESILIENT DEVELOPMENT

Current state: Logistics Performance Index improving but disaster risk management fragmented. 70% of population in flood zones. Urban drainage inadequate.

Six metro lines are breaking ground simultaneously in 2025–2026, backed by major private developers, showing signs that infrastructure momentum is building, though affordability and climate resilience remain unresolved. — Phuc Pham, Global Disruptions & Trends Seminar '26.

Strategic directions:

- **Mekong Delta integrated program:** Coordinated investment in flood control, freshwater conveyance, managed aquifer recharge, and coastal protection.
- **Urban flood resilience:** Upgrade drainage systems in HCMC and Hanoi; integrate green infrastructure and permeable surfaces.
- **Nature-based solutions:** Mangrove restoration, wetland preservation, and reforestation as cost-effective flood buffers.
- **Early warning systems:** National network for flood, storm, and drought forecasting to enable proactive response.

DIGITAL ECONOMY & WORKFORCE

Current state: Digital economy at 14% GDP targeting 30% by 2030. Only 12% high-skilled workforce. 84% internet penetration provides foundation.

Strategic directions:

- **STEM and technical education reform:** Address the engineer and technology professional shortage critical for semiconductor ambitions.
- **Reskilling programs:** Prepare textile, mobility, and assembly workers for transition as automation advances; the 14x exposure gap for lower-wage workers requires proactive intervention.
- **AI adoption acceleration:** Support SME digitalization to capture the $120–130B AI economic contribution projected by 2040.
- **Social-emotional skills emphasis:** As AI automates cognitive tasks, education systems should emphasize uniquely human capabilities where demand is rising 11–14%.

FINANCE & INVESTMENT

Current state: Climate investment needs estimated at $254-368B through 2040. Green finance underdeveloped. Carbon pricing is minimal.

Strategic directions:

- **Carbon pricing implementation:** Increase carbon tax to $29/ton by 2030 and $90 by 2040 to generate $80B in transition revenue while changing behavior.
- **Green bond market development:** Mobilize private capital for renewable energy, sustainable infrastructure, and climate adaptation.
- **Climate risk disclosure:** Require financial institutions and listed companies to assess and disclose climate-related financial risks.
- **Blended finance mechanisms:** De-risk private investment in emerging sectors through public guarantees and concessional finance.

4.4 THE BINDING CONSTRAINT: COOPERATION

Every strategy outlined above requires something Vietnam's business culture has historically underemphasized: cross-sector collaboration. Industrial symbiosis, integrated value chains, public-private climate investment, and coordinated regional programs all demand cooperation between competitors, sectors, and levels of government.

Vietnam's competitive business culture delivered results in the growth phase. The transition phase requires a different approach, as Bosschaert noted at Global Disruptions & Trend 2026:

> *"The essential component of some of these transitions is not money, it's not space, it's not resources, it's not knowledge. It's cooperation.".*

The shift from competition to strategic cooperation may be the single most important development priority. Not because it is idealistic, but because the math does not work otherwise. No single firm, sector, or ministry can address energy autonomy, climate adaptation, and value-chain transformation alone.

The ViCo community in Ho Chi Minh City brings togetherover 100 professionals from diverse sectors and disciplines to promote cooperation for a rising Vietnam, invluding investment, startup support, learning and knopwledge sharing..

"Never bet against Vietnam.
It's fine, we'll figure it out."

McGarvey, Global Disruptions & Trends 2026.

4.5 FINAL WORDS: VIETNAM'S CHOICE

The evidence in this report points to a clear conclusion: Vietnam has the assets to thrive through global disruption, but only if it deploys them strategically within the demographic window. The ones that have the most cards to play in this regard are the business and investor community.

The strategies outlined here are not radical; they build on existing capabilities, announced policies (PDP8, NDC commitments), and proven approaches from regional neighbors. The question is not whether these directions make sense, but whether Vietnam will execute with sufficient speed and coordination.

The window is open. The tools are available. The choice is ours.

APPENDICES

A

EXCEPT
INTEGRATED SUSTAINABILITY

APPENDIX A: METHODOLOGY GLOBAL FORCES PART 1

A.1 RESEARCH METHODOLOGY

Part 1 of this analysis synthesizes findings from 25 authoritative reports published by major international institutions between 2024–2025. The research employed a systematic thematic analysis approach to identify, categorize, and assess global trends relevant to Vietnam's strategic environment over the 2025–2045 timeframe.

SELECTION CRITERIA FOR SOURCE REPORTS

- Published by internationally recognized institutions (multilateral organizations, central banks, major consultancies)
- Publication date within 2024–2025 to ensure currency
- Focus on forward-looking projections rather than historical analysis
- Coverage of global or regional (Asia/ASEAN) scope

TREND EXTRACTION PROCESS

Each report was analyzed to identify discrete trends with quantifiable projections or clearly stated directional forecasts. Trends were extracted verbatim where possible and summarized where necessary for clarity. A total of 91 distinct trends were identified across six thematic categories.

CLASSIFICATION FRAMEWORK

Each trend was classified by: (1) Category (Economic & Trade, Geopolitical, Climate & Green, Technology & Workforce, Demographics & Social, Health & Biotech); (2) Directional impact (Positive/Negative/Mixed); (3) Specific relevance to ASEAN and Vietnam.

A.2 TREND DISTRIBUTION SUMMARY

CATEGORY	TOTAL	POSITIVE	NEGATIVE	MIXED	KEY THEME
Economic & Trade	35	10	16	9	Growth slowdown, trade tensions, AI investment
Geopolitical	10	2	4	4	G-Zero world, tech blocs, de-risking
Climate & Green	19	3	12	4	1.5°C breach, renewable deployment
Technology & Workforce	11	3	3	5	AI transformation, skills gaps
Demographics & Social	9	0	5	4	Aging, development stalling
Health & Biotech	7	3	2	2	Tech advances, funding cuts
TOTAL	**91**	**21**	**42**	**28**	

A.3 SOURCE REPORTS

REPORT	PUBLISHER	YEAR	PRIMARY FOCUS
AI Index Report 2025	Stanford HAI	2025	AI development and adoption
Annual Economic Report 2025	BIS	2025	Financial stability, monetary policy
Asia on Cusp of New Era	McKinsey	2024	Regional transformation
ASEAN State of Climate Change	ASEAN Secretariat	2021	Regional vulnerability
Asian Development Outlook 2025	ADB	2025	Regional growth, Vietnam focus
Biotech Beyond Borders 2025	EY	2025	Biotechnology advances
Climate Scenarios 2025	NGFS	2025	Financial climate risks
Economic Outlook Q4 2025	OECD	2025	Advanced economy projections
Emissions Gap Report 2025	UNEP	2025	Climate trajectory
Future of Jobs Report 2025	WEF	2025	Labor market transformation
Geostrategic Outlook 2025	EY-Parthenon	2025	Supply chain reconfiguration
Global Economic Prospects 2025	World Bank	2025	Development economics
Global Risks Report 2025	WEF	2025	Systemic risks assessment
Human Development Report 2025	UNDP	2025	HDI, development progress
IPBES Nexus Assessment 2024	IPBES	2024	Biodiversity-climate nexus
A New Future of Work	McKinsey	2025	Automation, workforce transition
Pandemic Preparedness 2025	GPMB/WHO	2025	Health security
Top Geopolitical Risks 2025	KPMG	2025	Tech blocs, digital sovereignty
Top Risks 2025	Eurasia Group	2025	Geopolitical risks
Trade & Development Foresights 2025	UNCTAD	2025	Trade policy uncertainty
World Economic Outlook 2025	IMF	2025	Global growth, inflation, trade
World Energy Outlook 2025	IEA	2025	Energy transition scenarios
World Energy Transitions Outlook	IRENA	2025	Renewable energy deployment
World Health Statistics 2025	WHO	2025	Global health trends
World Population Prospects 2024	UN DESA	2024	Demographic projections

APPENDIX B: METHODOLOGY AND DATA SOURCES PART 2

B.1 RESEARCH METHODOLOGY

Part 2 evaluates Vietnam's systemic resilience using the Symbiosis in Development (SiD) framework. The analysis tracks 24 Key Performance Indicators (KPIs) across eight domains, with historical time series from 2000–2024 and comparative data against six regional peers: Thailand, Indonesia, Malaysia, Philippines, Singapore, and China.

DATA COLLECTION PRINCIPLES

› Prioritize internationally recognized databases (World Bank, UN agencies, IEA)
› Ensure data currency (within 5 years for most indicators)
› Use consistent methodologies across time series
› Cross-validate with multiple sources where possible
› Document data gaps transparently

SID FRAMEWORK APPLICATION

Each KPI was assessed through the three SiD dimensions: Resilience, Autonomy, and Harmony, to identify systemic strengths and vulnerabilities. The RAH assessment integrates quantitative indicators with qualitative analysis of trends, regional comparisons, and structural factors.

B.2 KEY PERFORMANCE INDICATORS

DOMAIN	KPI	SOURCE	UNIT
Energy	Renewable Energy (% TFEC)	IEA/IRENA	% of TFEC
Energy	Energy Import Dep. (%)	IEA/IRENA	% net imports
Energy	Energy Intensity (MJ/$GDP)	World Bank/IEA	MJ per $ GDP PPP
Environment	Forest Cover (% land)	FAO/World Bank	% land area
Environment	CO2 per Capita (tons)	World Bank/IEA	metric tons
Environment	PM2.5 (µg/m³)	IQAir/WHO	µg/m³
Environment	Protected Areas (% land)	UNEP-WCMC WDPA	% land area
Environment	Water Resources (m³/cap)	FAO Aquastat	m³/person/year
Society	Human Development Index	UNDP HDR	Index 0-1
Society	Gini Index	World Bank/GSO VHLSS	Index 0-100
Society	Gov Effectiveness (pctl)	World Bank WGI	percentile 0-100
Society	Secondary Enrollment (%)	UNESCO/World Bank	% gross
Society	Internet Users (% pop)	ITU/World Bank	% population
Society	Age Dependency Old (%)	World Bank WDI	% working age
Economy	GDP Growth (%)	World Bank WDI	% annual
Economy	Poverty Rate (% <$2.15/day)	World Bank PIP	% population
Economy	Unemployment Rate (%)	ILO/World Bank	% labor force
Economy	FDI Inflows (% GDP)	World Bank WDI	% of GDP
Economy	Trade Openness (% GDP)	World Bank WDI	% of GDP
Economy	Economic Complexity (ECI)	Harvard Growth Lab	Index
Health	Life Expectancy (years)	World Bank/WHO	years
Health	Hospital Beds (per 1000)	WHO/World Bank	per 1,000 people
Health	UHC Coverage Index	WHO SDG 3.8.1	Index 0-100
Wellbeing	Life Satisfaction (0-10)	Gallup/WHR	Score 0-10

B.3 DATA SOURCES

SOURCE	DESCRIPTION	URL/ACCESS
World Bank WDI	World Development Indicators - primary source for economic, demographic, health data	data.worldbank.org
World Bank WGI	Worldwide Governance Indicators - government effectiveness, rule of law, etc.	govindicators.org
World Bank PIP	Poverty and Inequality Platform - poverty rates using international poverty lines	pip.worldbank.org
UNDP HDR	Human Development Report - HDI recalculated series for consistency	hdr.undp.org
WHO	World Health Organization - life expectancy, UHC index, health data	data.who.int
FAO Aquastat	UN Food & Agriculture Organization - water resources, forest data	fao.org/aquastat
IEA	International Energy Agency - energy intensity, CO2 emissions	iea.org
IRENA	International Renewable Energy Agency - renewable energy data	irena.org
ITU	International Telecommunication Union - internet/telecom penetration	itu.int
UNESCO	Education statistics - school enrollment rates	uis.unesco.org
ILO	International Labour Organization - unemployment, labor data	ilostat.ilo.org
UNEP-WCMC	World Database on Protected Areas	protectedplanet.net
IQAir	Air quality monitoring - PM2.5 data	iqair.com
Harvard Growth Lab	Economic Complexity Index	atlas.cid.harvard.edu
Gallup/WHR	World Happiness Report - life satisfaction scores	worldhappiness.report
GSO Vietnam	General Statistics Office - VHLSS surveys for Gini	gso.gov.vn

B.4 REGIONAL COMPARISON COUNTRIES

Vietnam's indicators are compared against six regional peers selected for geographic proximity, economic similarity, or relevance as regional benchmarks: Thailand (similar development trajectory), Indonesia (largest ASEAN economy), Malaysia (upper-middle income benchmark), Philippines (demographic comparator), Singapore (high-income regional hub), and China (largest trading partner and development model reference).

B.5 DATA COMPLETENESS

The dataset achieves high completeness for most indicators, with 24 of 24 KPIs having data coverage of 80% or greater for the 2000–2024 time series. Some indicators (e.g., Gini Index) rely on periodic survey data rather than annual reporting; in these cases, the most recent available data point is used for current status while trend analysis uses the full available series.

APPENDIX C: SYMBIOSIS IN DEVELOPMENT (SID) FRAMEWORK OVERVIEW

C.1 FRAMEWORK ORIGINS

Symbiosis in Development (SiD) is a systemic sustainability framework developed by Except Integrated Sustainability since 1999. First applied in rural Western Australia in 2000, SiD has evolved through application in hundreds of projects across cities, regions, organizations, and industries worldwide. The framework is open-source and freely available under Creative Commons license.

All reference materials for SiD can be freely downloaded on www.thinksid.org.

C.2 CORE PRINCIPLES

SiD recognizes that sustainability emerges from the interaction of multiple systems. True resilience requires strength across domains and, critically, the right relationships between domains. The framework integrates previously disconnected fields including circular economy, industrial ecology, transition theory, resilience science, and social justice into a unified analytical approach.

C.3 THE ELSI-8 DOMAINS

SiD organizes analysis around eight fundamental domains that together encompass all aspects of sustainable development:

LAYER	DOMAIN	DESCRIPTION
Energy & Materials	Energy	Energy production, distribution, efficiency, and sources
Energy & Materials	Materials	Resource extraction, processing, circularity, and waste
Life	Ecosystems	Natural systems, ecosystem services, and environmental quality
Life	Biodiversity	Species diversity, habitat preservation, and ecological balance
Society	Culture	Social cohesion, traditions, knowledge systems, and values
Society	Economy	Production, trade, finance, and economic structures
Individual	Health	Physical and mental health, healthcare access, and wellbeing
Individual	Happiness	Quality of life, satisfaction, and human flourishing

C.4 APPLICATION IN THIS REPORT

This analysis applies the SiD framework to assess Vietnam's systemic sustainability at the national level. Each of the 24 KPIs maps to one or more ELSI-8 domains and is evaluated through the RAH dimensions. The resulting assessment identifies where Vietnam has systemic strength (high scores across R, A, and H), where vulnerabilities exist (low scores or declining trends), and where trade-offs between dimensions may require strategic attention.

The SiD framework is documented in full in the open-source publication "Symbiosis in Development" (2019), available at thinksid.org.

APPENDIX D: COMPLETE SOURCE LIST

D.1 PART 1: GLOBAL FORCES – INSTITUTIONAL REPORTS

MULTILATERAL ECONOMIC ORGANIZATIONS:

› IMF (2025). World Economic Outlook. imf.org/en/publications/weo
› OECD (2025). Economic Outlook Q4 2025. oecd.org/economic-outlook/
› World Bank (2025). Global Economic Prospects. worldbank.org/en/publication/global-economic-prospects
› ADB (2025). Asian Development Outlook. adb.org/outlook
› BIS (2025). Annual Economic Report. bis.org/publ/arpdf/ar2025e.htm
› UNCTAD (2025). Trade and Development Foresights. unctad.org

RISK AND STRATEGY REPORTS:

› WEF (2025). Global Risks Report. weforum.org/publications/global-risks-report-2025/
› Eurasia Group (2025). Top Risks 2025. eurasiagroup.net/issues/top-risks-2025
› EY-Parthenon (2025). Geostrategic Outlook. ey.com/en_gl/geostrategy
› KPMG (2025). Top Geopolitical Risks. kpmg.com/xx/en/our-insights/geopolitical.html
› McKinsey Global Institute (2024). Asia on the Cusp of a New Era. mckinsey.com/mgi

CLIMATE AND ENERGY:

› IEA (2025). World Energy Outlook. iea.org/reports/world-energy-outlook-2025
› UNEP (2025). Emissions Gap Report. unep.org/resources/emissions-gap-report-2025
› NGFS (2025). Climate Scenarios. ngfs.net/ngfs-scenarios-portal/
› IRENA (2025). World Energy Transitions Outlook. irena.org/publications
› ASEAN Secretariat (2021). State of Climate Change Report. asean.org
› IPBES (2024). Nexus Assessment. ipbes.net/nexus

TECHNOLOGY AND WORKFORCE:

› WEF (2025). Future of Jobs Report. weforum.org/publications/the-future-of-jobs-report-2025/
› Stanford HAI (2025). AI Index Report. aiindex.stanford.edu/report/
› McKinsey (2025). A New Future of Work. mckinsey.com/mgi

DEMOGRAPHICS AND HEALTH:

› UN DESA (2024). World Population Prospects. population.un.org/wpp/
› UNDP (2025). Human Development Report. hdr.undp.org/
› GPMB/WHO (2025). Pandemic Preparedness. gpmb.org
› WHO (2025). World Health Statistics. who.int/data/gho/publications
› EY (2025). Biotech Beyond Borders. ey.com/en_gl/life-sciences/beyond-borders

D.2 PART 2: VIETNAM RESILIENCE – DATA SOURCES

PRIMARY DATABASES:

› World Bank World Development Indicators (data.worldbank.org)
› World Bank Worldwide Governance Indicators (govindicators.org)
› World Bank Poverty and Inequality Platform (pip.worldbank.org)
› World Bank Climate Change Knowledge Portal
› World Bank Logistics Performance Index 2023
› UNDP Human Development Report (hdr.undp.org)
› WHO World Health Statistics (data.who.int)
› FAO Aquastat (fao.org/aquastat)
› IEA Energy Statistics (iea.org)
› IRENA Renewable Energy Statistics (irena.org)
› ITU ICT Statistics (itu.int)
› ILO Statistics (ilostat.ilo.org)

SPECIALIZED SOURCES:

› Harvard Growth Lab – Economic Complexity Index (atlas.cid.harvard.edu)
› Transparency International – Corruption Perceptions Index 2024
› IQAir – Air Quality Data (iqair.com)
› State of Global Air 2024 – Health Effects Institute
› UNEP-WCMC World Database on Protected Areas (protectedplanet.net)
› World Happiness Report / Gallup World Poll (worldhappiness.report)
› UNDP PAPI Report 2023 – Vietnam Provincial Governance

VIETNAM-SPECIFIC REPORTS:

› World Bank (2022). Vietnam Country Climate and Development Report
› ADB – Vietnam Climate Risk Assessments
› GSO Vietnam – Vietnam Household Living Standards Survey (VHLSS)

ACADEMIC PEER-REVIEWED SOURCES:

› Economics of Disasters and Climate Change (Springer)
› Ambio – Royal Swedish Academy of Sciences
› PMC / PubMed Central peer-reviewed studies
› International Journal of Research Studies and Innovation (IJRSI)

APPENDIX E: ABOUT EXCEPT AND THE AUTHORS

E.1 ABOUT EXCEPT INTEGRATED SUSTAINABILITY

Except Integrated Sustainability is a strategy and concept development office working on resilient, just, and inspiring cities, organizations, and industries. Over its 25 years of operation since founding in 1999, the office has produced some of the most effective and remarkable sustainable innovations around the globe, including in Europe, Asia, the Americas, and the Middle East.

Throughout the years, Except has built a reputation for discovering and interpreting long-term macroeconomic, social, and ecological trends, and turning them into cutting-edge and practical solutions. These include innovations in sustainable urban planning, corporate strategy, real-estate, regenerative agriculture, circular industries, policy, manufacturing, and transition management.

Except's multidisciplinary team develops and applies the systems thinking innovation framework Symbiosis in Development (SiD) to effectively connect research, design, and business intelligence into ambitious and feasible solutions. The framework is open-source and freely available.

The main offices of Except are based in Utrecht, the Netherlands, and Ho Chi Minh City, Vietnam. Following Except's mission of creating the foundations of a sustainable society, the Vietnam office was established in 2022 to work in one of the fastest-growing economies in the world. Projects in Vietnam span F&B, resorts, hotels, manufacturing, industrial parks, and strategic advisory services.

Since its founding, Except has been a purpose-driven enterprise with a mission to develop the foundations of a sustainable society. The Except Company Principles, published in 2009, set a stringent ethical framework ensuring all work is fair, transparent, independent, and quality-controlled. Except has completed more than 700 projects worldwide while training and supporting over 270 sustainability professionals.

Read 50+ case studies and research at: www.except.eco

E.2 ABOUT THE AUTHORS

TOM BOSSCHAERT, LEAD AUTHOR

Founder and Director, Except Integrated Sustainability

Tom is the founder and director of Except, and the visionary force behind its development. He founded Except at the age of 19 in 1999 with a mission to find systemic solutions for societal challenges by combining science, business, design, and communication. Tom is also the chairman of the Environment Committee of the World Institute for Change Management and Innovation (WICMI) in Switzerland.

In the past decades, Tom has developed several hundred projects globally for groundbreaking sustainable cities, buildings, businesses, policies, and industries. His work demonstrates that societies can flourish globally when environmental, societal, economic, and technical aspects are simultaneously integrated. He is a frequent keynote speaker and author of the Symbiosis in Development (SiD) framework and books.

Tom has been recognized as a leader in sustainable thinking, the circular economy, and systemic innovation. In 2014, he was elected number 38 of the most influential sustainability professionals in the Netherlands by national newspaper Trouw. His project highlights include the Salesforce Park Transit Center in San Francisco (winner of the decade's most significant global architectural competition), ReGen Villages, and the Utrecht Community sustainability hub.

After completing his Master's in Industrial Design Engineering at Delft University of Technology, Tom studied Architecture at the University of Western Australia and obtained his Master's degree in Architecture & Urban Planning at Yale University.

Areas of expertise: Integrated Sustainable Development, Systems Analysis & Strategy, Architecture, Urban Design, City & Community Planning

Contact: tom@except.eco

TAM LE, CO-AUTHOR
Sustainability Enthusiast, Except Integrated Sustainability

Tam Le, having studied Anthropology and Social Studies at Fulbright University Vietnam, believes that the Humanities have more to offer sustainability and industry than they are often given credit for. Her studies focus on modern culture and society, environmental ethics, and sociolinguistics.

At Except, Tam contributes cross-cultural communication expertise, qualitative research skills, and storytelling for impact. Her perspective bridges the social sciences with sustainability practice, bringing insight into the human dimensions of systemic change.

Areas of expertise: Cross-cultural Communication, Qualitative Research, Story-telling and Communication for Impact

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"The best way to predict the future is to invent it."

- Alan Kay

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