

THE NEW SUPPLY CHAIN IMPERATIVE FOR THE GULF

SUBMITTED TO

The Leadership of the Gulf
Cooperation Council Member States

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Officials

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The collective insights shared by our members helped ensure this strategic paper reflects the realities, challenges and opportunities shaping family business supply chains across the region.

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EXECUTIVE SUMMARY

This White Paper presents a strategic imperative to the leadership of the Gulf Cooperation Council (GCC) member states: the construction of a fully integrated, resilient, multi-modal supply chain infrastructure network constitutes one of the most consequential national security investments the region can make in this decade to preserve and enhance generational economic security, growth and prosperity.

Strategic Thesis: The purpose of GCC supply chain resilience is not merely to survive an embargo after it is imposed. It is to deter the threat of embargoes by making them commercially, diplomatically, and operationally ineffective before they are attempted.

A region that can receive cargo outside a threatened chokepoint, clear it digitally, insure its carriers, move it overland through pre-authorised corridors, and draw from distributed strategic stocks cannot be isolated by a single maritime or political pressure point.

INTEGRATED INFRASTRUCTURE, COORDINATED GOVERNANCE, AND COMMERCIAL CONTINUITY DRIVE REGIONAL SUPPLY CHAIN RESILIENCE

3 CRITICAL MARITIME GATEWAYS HAVE FACED DISRUPTION

1 Strait of Hormuz ~20% of global petroleum liquids	2 Bab al-Mandab ~Zero LNG flows, 2024 – H1 2025	3 Suez Canal 30% of global container traffic
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IMPLICATION: GCC must reduce exposure through alternative routes, redundant capacity and strategic preparedness.

STRATEGIC PRIORITIES

STRENGTHEN CRITICAL INFRASTRUCTURE RESILIENCE 1	ENSURE COMMERCIAL CONTINUITY 4
DIVERSIFY REGIONAL SUPPLY ROUTES 2	COORDINATED GOVERNANCE 5
ENABLE SEAMLESS REGIONAL TRADE 3	

KEY RECOMMENDATIONS

1. Power Security

Building a Resilient, Integrated and Secure Energy Future for the GCC

Regional electricity integration represents the programme's highest-return investment opportunity



**US\$25-40
BILLION**
Required
Investment



15-20%
Potential
Operational
Savings



**US\$80-120
BILLION**
Avoided Generation
Investment
between 2025 and
2040 using World Bank
methodology

RECOMMENDED ACTIONS

- Expand GCC Interconnection Authority Network
- Deploy grid-scale battery storage
- Increase renewable and nuclear generation
- Strengthen regional cybersecurity

2. Water Security

Building a Resilient and Reliable Water Future for the GCC

DESALINATION

95% of potable water
supply in GCC

- Expand distributed and decentralised desalination capacity
- Establish 90-day strategic water reserves
- Maintain 90-day stockpiles of critical desalination chemicals and equipment spares
- Develop cross-border water pipeline and emergency transfer protocols

3. Energy and Pipeline Resilience

Recognizing the distinct resilience requirements of crude oil and LNG is central to the proposed regional strategy

6.8M bpd existing operational crude oil export capacity bypassing the Strait of Hormuz	up to 3.8M bpd additional bypass capacity under construction or discussion	LNG presents a fundamentally different challenge Because liquefaction and export infrastructure remains concentrated within the Gulf, physical bypass is not currently feasible
Recommendations for crude oil: - Expand Saudi East-West Pipeline export capacity - Accelerate UAE Fujairah bypass infrastructure - Enhance Northern GCC pipeline connectivity - Underground hardening of vulnerable pipeline segments - Distributed strategic petroleum reserves	Recommendations for LNG resilience: - Destination-flexible contracts - Floating storage & regasification units (FSRUs) - International cargo swap mechanisms - Demand-side management agreements - Diversify liquefaction infrastructure (Long-term)	

4. Rail

Building the Backbone of Regional Freight

The paper recommends completing the **2,177-kilometre GCC Railway** as the backbone of a regional freight network, linking Gulf, Red Sea and Arabian Sea ports while connecting to the Iraq Development Road, Turkey and wider Eurasian rail corridors.

Interoperable freight standards and seamless integration with ports, dry ports and logistics hubs.



PRIORITY PROJECTS:

- SAUDI
LANDBRIDGE
- ETIHAD
RAIL
- OMAN
RAIL
- KUWAIT-BASRA
CONNECTION
- QATAR-BAHRAIN
CONNECTIVITY

5. Enhanced Port and Warehousing Infrastructure

Creating a network of ports to ensure continuity under any disruption scenario

1 ARABIAN SEA / HORMUZ-BYPASS PORTS Duqm, Salalah, Sohar (Oman); Fujairah, Khorfakkan (UAE) Receive cargo without entering the Gulf; move critical freight overland into the GCC via Oman-Saudi and UAE-Saudi corridors. Primary bypass for a Hormuz closure.	2 RED SEA PORTS Jeddah Islamic Port, King Abdullah Port, Yanbu, Jazan (Saudi Arabia) Serve Europe/Mediterranean cargo, Saudi Landbridge flows, fuel export redundancy, and emergency stockpile access. Critical for Bab al-Mandab and Suez disruption scenarios.
3 GULF PORTS Jebel Ali, Khalifa (UAE); Hamad (Qatar); Dammam, Jubail (Saudi Arabia); Shuwaikh/Shuaiba (Kuwait); Mina Salman (Bahrain) Normal commercial throughput; surge redistribution when non-Hormuz lanes remain open; regional consolidation for intra-GCC delivery. Core for everyday flows and surge handling.	4 EXTERNAL FALLBACK PORTS Aqaba (Jordan); Mersin, Iskenderun, Ceyhan (Turkey); East Port Said, Sokhna (Egypt); Djibouti; Mundra, Nhava Sheva (India) Route substitution, supplier diversification staging, and crisis inventory pre-positioning outside GCC waters. Essential for 90-180 day scenarios requiring rebuilt supplier relationships.

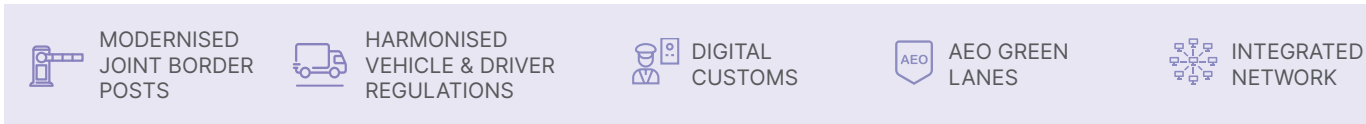
6. Expanded Overland Corridors

Building flexible, high-capacity road freight corridors

The paper recommends establishing a network of **pre-authorised GCC heavy freight corridors** linking Arabian Sea ports such as Duqm, Sohar and Salalah with Gulf and Red Sea gateways, integrating these routes with the GCC Railway and the Iraq Development Road to create **multiple bypass options** around regional chokepoints

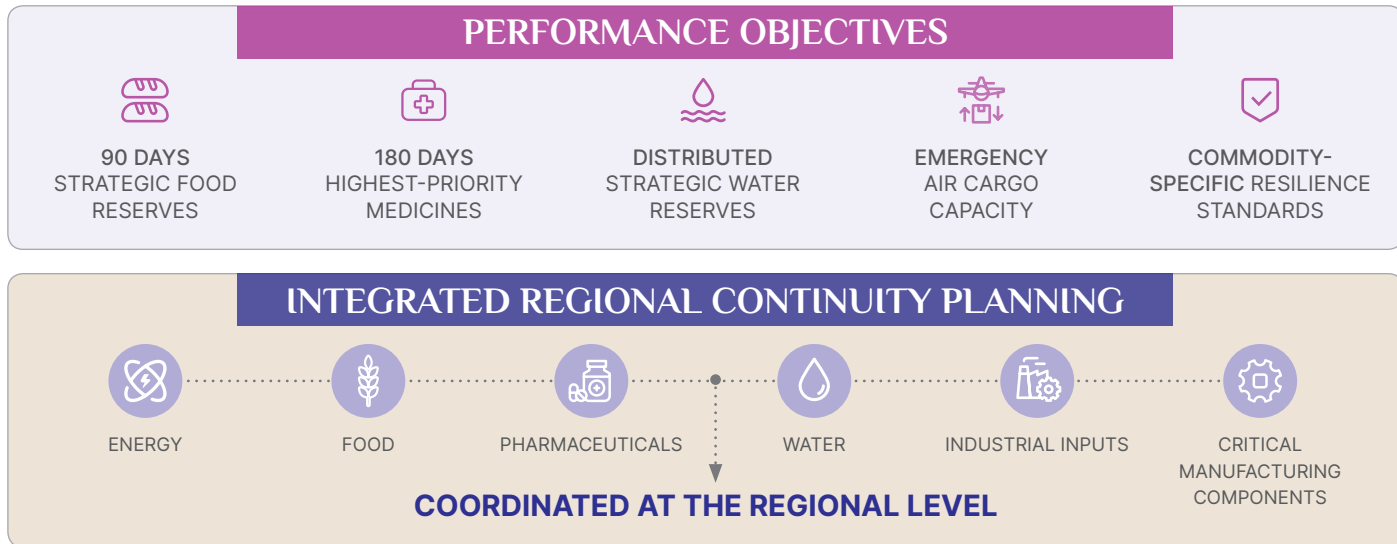


ENABLING FAST TRUSTED AND RESILIENT OVERLAND FREIGHT



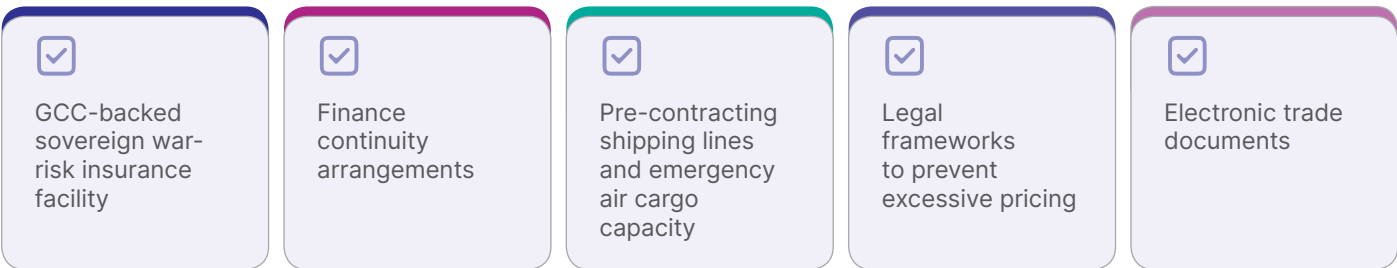
7. Critical Goods Continuity

Critical goods resilience should move beyond inventory management to integrated regional continuity planning.



8. Legal, Insurance and Commercial Continuity

RECOMMENDATIONS

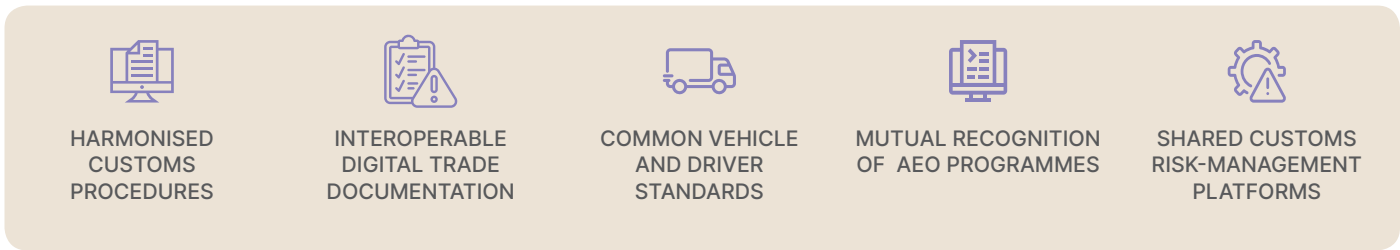


9. Cross-Border Harmonisation

Cross-border harmonisation is essential to unlocking the full value of GCC infrastructure investment



RECOMMENDED MEASURES

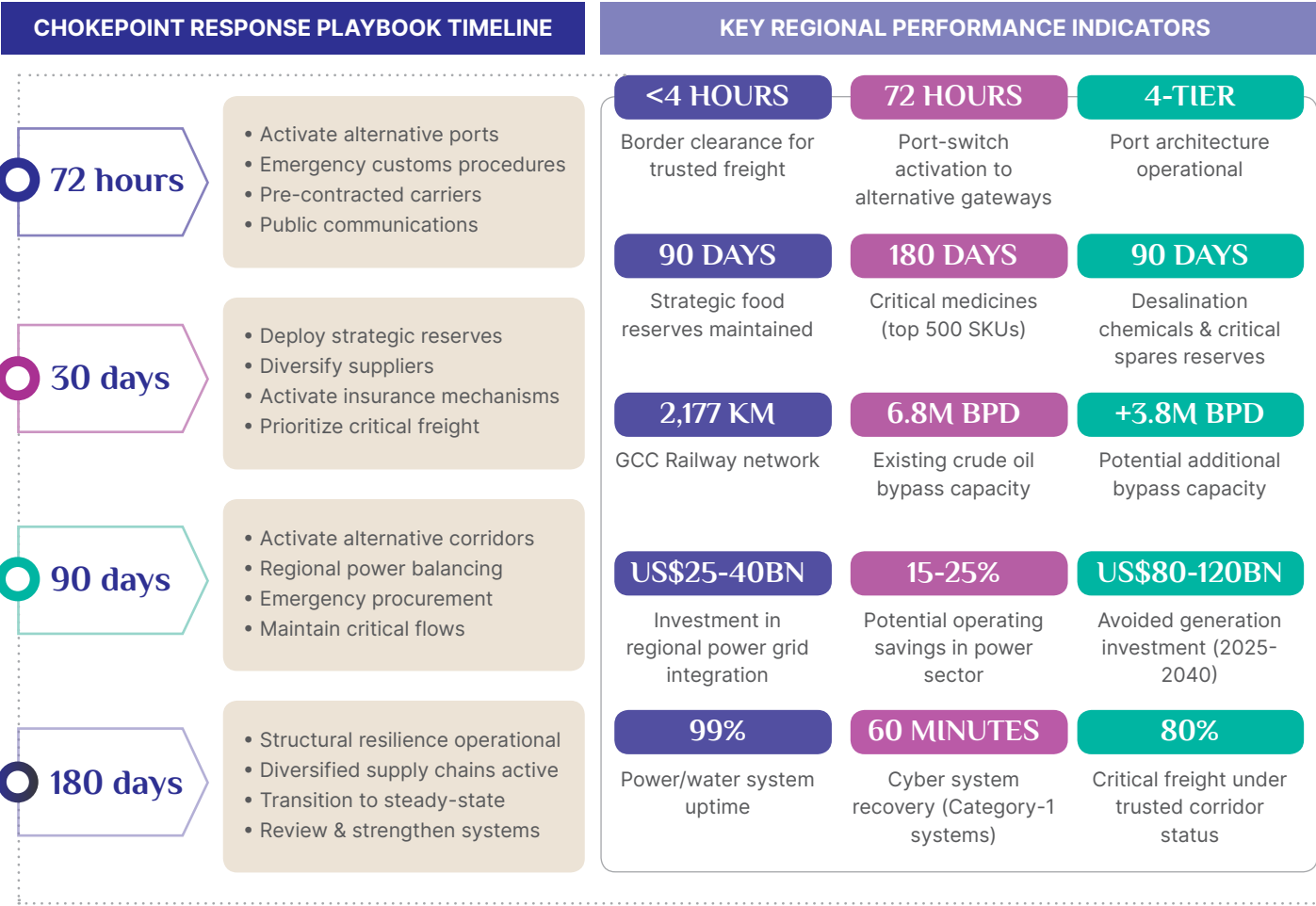


10. Resilience by Design

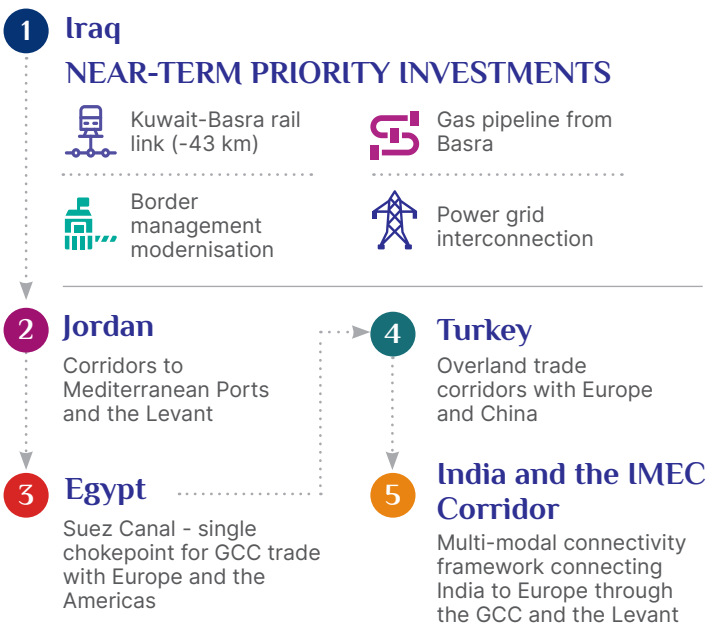
RECOMMENDATIONS



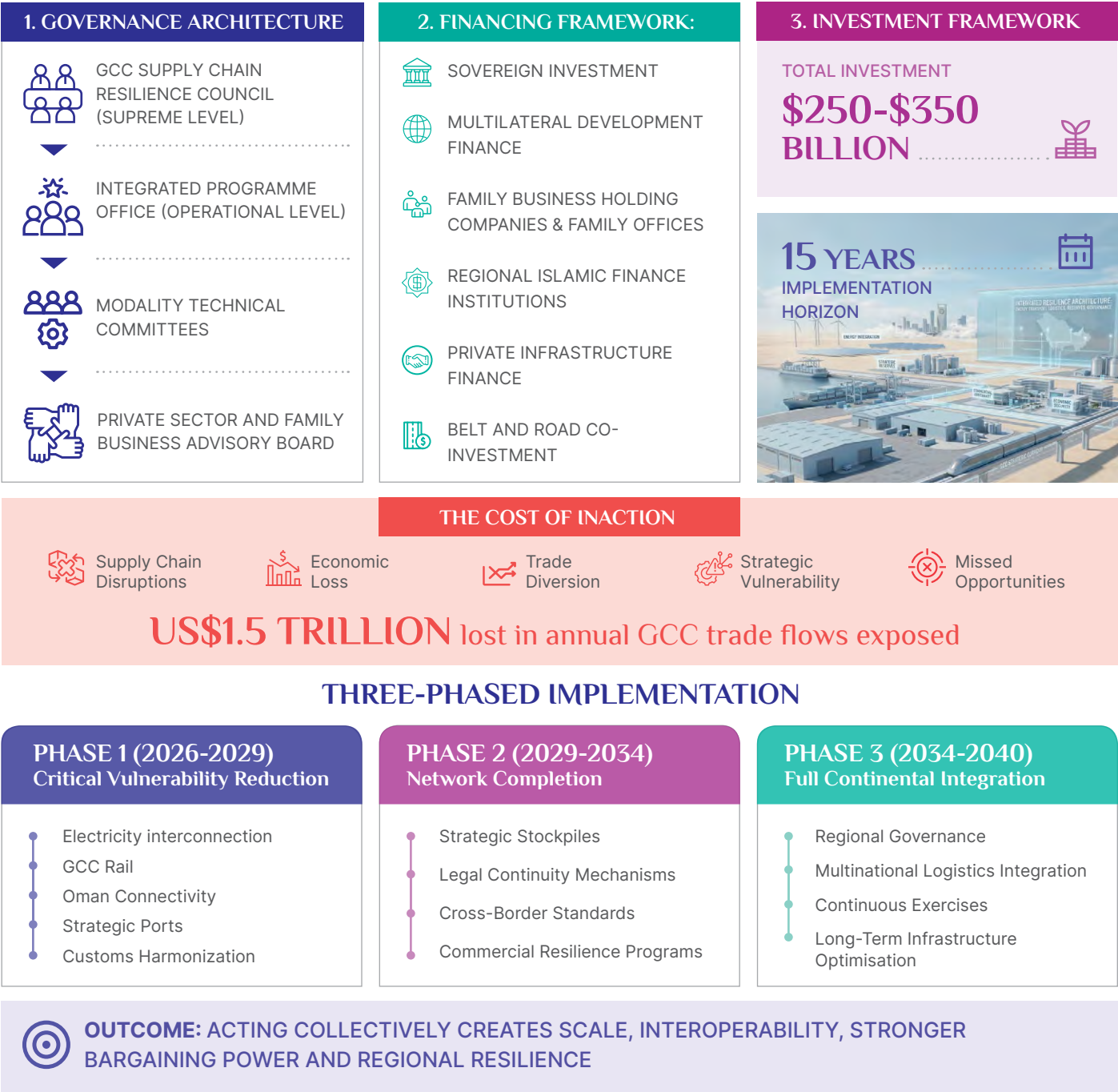
11. Crisis Response Playbooks



12. Multinational Node Integration



13. Governance, Investment and Implementation



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I. THE STRATEGIC CASE: MAKING EMBARGOES INEFFECTIVE

1.1 The Geopolitical Landscape

The GCC member states — Saudi Arabia, the United Arab Emirates, Kuwait, Qatar, Bahrain, and Oman — collectively represent one of the most strategically significant economic blocs in the world. The region accounts for a substantial share of global proven oil and gas reserves, serves as the critical artery for global energy trade through the Strait of Hormuz, and is home to rapidly diversifying economies pursuing ambitious transformation agendas.

Yet the region remains exposed to a category of strategic risk that conventional military deterrence cannot fully address: economic coercion through supply chain disruption. Recent events — most acutely the 2024-2025 Red Sea Houthi interdiction campaign — have illustrated with stark operational clarity how rapidly such disruptions can be imposed by small groups using limited resources, and how far-reaching the consequences can be when supply chains have not been sufficiently diversified and hardened.

1.2 Regional Resilience: Operational Lessons from Recent Disruptions

The GCC region has accumulated direct operational experience of supply chain disruption from multiple sources. Each episode has produced lessons that inform the architecture of this proposed programme. Across these experiences, several resilience mechanisms have consistently proven their value:

Alternative supplier activation:

Supplier diversification — pre-contracted and pre-authorised across multiple source nations — is consistently the fastest and most affordable resilience response available.

Port substitution:

Arabian Sea ports — particularly in Oman — have demonstrated that they can absorb significant cargo diversion when Gulf access is constrained. These ports must be treated as permanent strategic assets, not improvised emergency alternatives.

Air cargo surge:

For time-critical commodities — medicines, high-value electronics, critical spares — air cargo has absorbed volume that maritime routes could not deliver. Air logistics nodes must be formally integrated into the resilience architecture.

LNG resilience is structurally different:

LNG continuity during a Hormuz-closure scenario cannot be solved through physical rerouting. The strategic response is contract flexibility, floating storage, regasification capacity, fuel-switching, and demand-side management.

Commercial speed matters:

Private sector logistics providers have consistently adapted faster than government frameworks during disruption events. Pre-agreed commercial protocols and standing contracts must be central to the crisis response architecture.

Family business networks as operational backbone:

GCC family businesses operate the warehousing, cold chain, freight, and distribution networks that underpin day-to-day supply chain function. During disruption events, these networks have demonstrated the agility to reroute, substitute, and absorb that government and multinational frameworks alone cannot replicate. Their role must be formally recognised and embedded in crisis response architecture.

States' cooperation:

When GCC governments collaborate and cooperate during times of trade stress, cargo flows faster, costs are better contained, population needs are met, businesses prosper, economies continue to grow, and security is enhanced.

The overarching lesson from the GCC’s disruption experience is consistent: resilience built before a crisis neutralises the coercive mechanism before it can take effect. Pre-positioned distributed stockpiles, pre-cleared alternative routing, regional digital customs, and pre-authorised carrier agreements transform crisis response from improvisation into execution.

1.3 The 2024-2025 Red Sea Crisis: A Live Stress Test

The Houthi interdiction campaign in the Red Sea beginning in late 2023 and intensifying through 2024 constitutes the most significant real-world stress test of global maritime supply chains in decades. EIA data confirms that LNG flows through Bab al-Mandab fell to zero in 2024 and remained at zero through the first half of 2025. The Red Sea crisis demonstrated several critical vulnerabilities this programme directly addresses:

01

War-risk insurance withdrawal can functionally close a maritime route before any ship is physically intercepted

02

Cape of Good Hope rerouting adds cost, time, and vessel-demand pressure that drives freight inflation affecting all GCC imports and exports to and from the western hemisphere

03

LNG flows cannot be physically rerouted — the concentration of liquefaction and loading capacity inside the Gulf creates a structural chokepoint requiring a different strategic response

04

The crisis revealed the absence of pre-authorised regional rerouting protocols, and exposed the extent to which container cost volatility — driven partly by legitimate cost increases but also by elevated margins charged to customers — can compound the economic impact of supply chain disruption

1.4 The Embargo-Defeat Framework

An embargo derives its power from concentration — concentrated dependencies on a single supplier, a single corridor, a single energy source, or a single financial counterparty. The strategic response is systematic diversification and integration at a scale that exhausts the coercer’s ability to simultaneously sever all alternative channels.

A chokepoint disruption may not begin as a physical closure. It may begin when insurers withdraw cover, banks delay trade finance, carriers refuse charter exposure, or customs processes fail under rerouted volumes. Embargo resilience therefore requires a legal, insurance, and commercial continuity architecture as much as it requires physical infrastructure.

Critically, this programme does not propose to replace or compete with the ambitious supply chain and connectivity initiatives already underway across GCC member states. The Saudi Landbridge, UAE-Qatar connectivity projects, and the KSA-Qatar pipeline and corridor initiatives represent exactly the kind of foundational commitments this white paper seeks to accelerate and reinforce.

20.9M

bbl/day through Hormuz (EIA, H1 2025)

~20%

share of global petroleum liquids

6.8M

operational crude oil export bypass capacity (Saudi Arabia + UAE)

Zero

LNG cargoes passed through Bab al-Mandab during the 2024 Red Sea crisis.

The white paper’s primary function is to provide a comprehensive strategic framework and governance architecture that can help accelerate the completion of signed agreements and early-stage projects already in progress — not to propose new infrastructure where existing commitments already provide the path forward.

II. CHOKEPOINT EXPOSURE: A QUANTIFIED SCENARIO MODEL

2.1 The Three Strategic Chokepoints

GCC supply chain vulnerability concentrates around three maritime chokepoints. Each has a distinct exposure profile, a distinct set of affected commodities, and a distinct set of bypass and mitigation options. The GCC’s resilience architecture must address all three simultaneously

Strait of Hormuz

In the first half of 2025, oil flows through the Strait of Hormuz averaged approximately 20.9 million barrels per day — equivalent to roughly 20% of global petroleum liquids consumption and approximately one-quarter of all seaborne oil trade. Saudi Arabia and the UAE currently maintain approximately 6.8 million barrels per day of operational crude oil export bypass capacity. Projects under construction and discussion could increase this by up to approximately 3.8 million barrels per day over time. The vulnerability profile is critically uneven by commodity. Crude exports can be partially bypassed through Saudi Arabia’s East-West Pipeline to Yanbu and the UAE’s ADCOP to Fujairah. LNG exports are far more exposed — Gulf liquefaction and loading capacity is concentrated inside the Strait, and LNG continuity cannot be solved with a road or rail diversion.

Bab al-Mandab

The Bab al-Mandab strait connects the Red Sea to the Gulf of Aden and is the southern gateway for Asia-Europe trade through the Suez Canal. The 2024-2025 Houthi campaign demonstrated that this chokepoint can be effectively closed — not necessarily by physical blockade but by insurance withdrawal, carrier risk assessment, and the commercial decision by major shipping lines to reroute. When Bab al-Mandab is effectively closed, Asia-Europe cargo reroutes via the Cape of Good Hope, adding 10-14 days of transit time, significant fuel costs, and pressure on vessel availability.

Suez Canal / SUMED

The Suez Canal carries a significant proportion of Europe-Asia container traffic, Mediterranean-Gulf trade, and some crude and product flows. The 2021 Ever Given grounding demonstrated that even a temporary canal closure triggers immediate global shipping disruption. The 1888 Constantinople Convention guarantees free navigation in peacetime and war, but the Red Sea experience confirms that de facto closure through insurance and carrier withdrawal can precede any formal blockade.

Critical distinction: Hormuz can be partially defeated for crude oil exports and container imports. It cannot be fully defeated for Gulf LNG with current infrastructure. The paper addresses this asymmetry explicitly — LNG resilience is a separate strategic challenge requiring a different toolset.



2.2 Exposure by Duration: The Scenario Planning Matrix

Duration	What Breaks First	Strategic Response
72 hours	Port congestion, carrier reroutings, insurance premium spikes, border crossing delays as volumes shift	Activate pre-authorised alternative routing; open emergency customs lanes; contact pre-contracted carriers; issue public reassurance on stockpile adequacy
30 days	Food and medicine price inflation; fuel supply tightening at retail level; surface and air capacity constraints; insurance premium unsustainability; LNG buyer concern	Activate strategic stockpile drawdown; initiate supplier diversification contracts; activate war-risk insurance facility; implement freight prioritisation for critical goods
90 days	Depletion of standard commodity stockpiles without replenishment; industrial input shortfalls; power sector fuel and maintenance pressure; desalination chemical and equipment depletion; health, food security and nutrition disruption	Full alternative corridor activation; emergency procurement through non-affected suppliers; regional power grid load-balancing; demand-side management for gas and LNG
180 days	Structural supply shortfalls requiring rebuilt supplier and logistics relationships	Full structural resilience architecture must be in place before this horizon — the 180-day scenario tests infrastructure and institutions, not emergency responses

2.3 The Embargo-Defeat Performance Standard

Critical food continuity 90 days supply without Hormuz, Bab al-Mandab, or Suez	Crude export continuity outside Hormuz 50-70% depending on member state and investment phase
Essential medicine continuity 180 days for top 500 critical SKUs; emergency air bridge for life-critical items	Rail / road surge capacity 25-40% of diverted containerised critical imports
Water security and desalination continuity 90 days of desalination chemicals and critical equipment spares; distributed production architecture reduces single-point failure risk	LNG continuity Managed through swaps, storage flexibility, regasification, and demand-side measures — not physical bypass
Port-switch activation Cargo rerouting protocols operational within 72 hours of chokepoint event	Power sector / grid / water supply 99% uptime; sufficient fuel, parts and materials for all equipment for at least one year without external resupply
Border dwell time Under 4 hours for trusted freight on strategic corridors	Cyber system recovery Manual or backup operation within 60 minutes for Category-1 infrastructure
Authorised Economic Operator coverage 80% of critical freight volume under green-lane treatment	Crisis exercises Annual single-mode drills; biennial all-mode GCC exercise





III. POWER GRID INTEGRATION AND ENERGY SECURITY

3.1 Current State and Strategic Vulnerabilities

The GCC Interconnection Authority (GCCIA) has operated a regional power grid since 2009, linking the electricity networks of all six member states. This represents a significant foundational achievement. However, the current network operates with meaningful limitations: cross-border transfer capacity remains constrained relative to peak national demand, the network relies heavily on natural gas for generation, and the interconnection topology contains bottlenecks that, if severed, could partition the grid into isolated national islands.

Peak electricity demand across the GCC is forecast to reach 130-150 GW by 2030. Current vulnerabilities include:

Single-fuel dependency:	Transmission corridor concentration:	Limited grid-scale storage:	Cyber and physical exposure:
Overwhelming reliance on natural gas means any gas supply disruption carries immediate generation consequences across the region.	Key transmission lines between Saudi Arabia and the northern GCC states cross limited corridor options, creating geographic chokepoints.	Battery and pumped hydro storage remain in early deployment stages, limiting the ability to buffer against generation shortfalls.	Critical substation infrastructure has not universally been hardened against physical or cyber attack.

3.2 The Resilient Grid Architecture

Mesh topology expansion:	Increase cross-border interconnection capacity to achieve genuine N-1 redundancy
Fuel and generation diversification:	Accelerate integration of utility-scale solar, wind, and nuclear capacity to reduce gas dependency below 50% of generation by 2035. Accelerate local production and/or storage of grid critical parts and materials for all generation sources.
Grid-scale storage deployment	Co-locate battery energy storage systems at critical substation and interconnection points
Northern extension — Iraq linkage:	Extend GCCIA interconnection infrastructure northward to include Iraq, providing both a market for GCC renewable surplus and an additional generation resource
Smart grid and SCADA security	Unified regional cybersecurity standards for operational technology, with shared threat intelligence and incident response, and a requirement to move grids to N-2 redundancy

Resilience Design Standard: The target architecture should achieve N-2 redundancy on all critical trunk transmission corridors — meaning the simultaneous loss of two major links triggers automatic rerouting without manual intervention and without supply interruption to any population centre.

3.3 The GCC National Electricity Grid: A Flagship Opportunity

Among all the investments described in this programme, the full realisation of the GCC National Electricity Grid stands out as the most immediate, highest-return opportunity available to member states. A fully integrated GCC National Electricity Grid operating to N-2 resilience standards would deliver three simultaneous strategic benefits:

 Gas supply independence:

A fully meshed grid with diversified generation reduces each member state's dependence on uninterrupted gas supply for power security. When a member state's gas supply is constrained, the grid imports power from neighbouring states rather than suffering blackouts.

 Cross-border crisis continuity:

During any chokepoint event, the grid provides the energy backbone that keeps desalination plants, border crossing systems, cold-chain warehouses, port operations, customs processing, and hospital infrastructure functioning.

 Commercial and fiscal return:

The World Bank estimates 15-25% cost savings through optimised generation dispatch and shared reserve margins. For the GCC, avoided redundant national generation capacity over 2025-2040 is estimated at \$80-120 billion.



\$25-40 billion
Grid Investment Required

The investment required to bring the GCC National Electricity Grid to full N-2 resilience standards — including the Iraqi interconnection, renewable integration, and grid-scale storage — is estimated at \$25-40 billion over the programme horizon. This represents the highest strategic return per dollar invested of any single component in the programme, and it should be treated as Phase 1's anchor investment.



3.4 Water Security and Distributed Desalination Infrastructure

The Arabian Gulf provides the source water for the vast majority of GCC desalination capacity. Desalination infrastructure faces the same chokepoint vulnerabilities as energy systems, yet has historically been treated as an operational rather than strategic resilience concern. This white paper addresses that gap.

The GCC region's dependence on desalination for potable water supply — in some member states exceeding 95% of consumption — means that desalination plant failure cascades into a public health emergency within days. The vulnerability is compounded by the concentration of large-scale desalination plants at coastal sites that face the same geographic exposure as port infrastructure.

The programme recommends:

The programme recommends:		
	Distributed and decentralised desalination architecture:	Rather than concentrating desalination capacity in large coastal mega-plants, accelerate investment in distributed, smaller-scale desalination units that reduce single-point failure risk across the water supply system.
	Cross-border water supply arrangements:	Develop inter-member-state water pipeline redundancy and emergency water transfer protocols, so that a member state facing desalination infrastructure failure can draw on neighbours' surplus production.
	Strategic water storage reserves:	Establish strategic water storage alongside food and fuel stockpiles, with minimum reserve standards equivalent to those applied to critical food commodities — 90 days of operational water reserves at distributed storage sites across each member state.
	Desalination input security:	Maintain 90-day minimum stockpiles of desalination chemicals (coagulants, antiscalants, biocides, chlorine) and critical spare parts (membranes, pumps, pressure vessels) at each major plant and at distributed strategic sites.



Water security is not a sectoral concern — it is a national security imperative. The programme treats distributed desalination infrastructure, strategic water reserves, and cross-border water supply arrangements as equivalent in strategic priority to energy security and food stockpiling.



3.5 Economic and Security Returns

The World Bank's analysis of power sector integration in regional blocs identifies average cost savings of 15-25% through optimised generation dispatch and shared reserve margins. For the GCC, this translates to avoided capital expenditure on redundant national generation capacity estimated in the range of \$80-120 billion over the 2025-2040 investment horizon.

Source basis: GCCIA Annual Report 2023; World Bank ESMAP Regional Power Trade Programme; IEA World Energy Outlook 2024; IRENA Renewable Energy Outlook for GCC 2023.



IV. RAILWAY INTEGRATION: GCC, IRAQ, THE SILK ROAD, AND THE LEVANT

4.1 Strategic Context

Rail is the backbone of continental-scale supply chain resilience. The ability to move bulk commodities, containers, and passengers by rail — independent of port congestion, maritime security conditions, and Hormuz passage — provides a category of supply chain insurance no other modality can replicate. The GCC Railway Network and integration with the Belt and Road Initiative’s overland corridors represent a once-in-a-generation opportunity to anchor the GCC at the centre of Eurasian trade logistics.

In pursuing rail connectivity, the programme recommends prioritising commercially and operationally viable infrastructure and the acceleration of existing signed agreements and early-stage projects over new mega-project proposals. Where geopolitical conditions create execution risk — as is currently the case with Iraq and Syria, where political instability and unresolved security concerns make project execution and reputational exposure difficult to manage — the programme recommends a cautious, staged approach: maintaining connectivity ambitions at the planning level while deferring formal commitment until political conditions permit reliable project delivery.

4.2 The GCC Railway Network: Completing the Backbone

The GCC Railway Network concept envisioned a 2,177-kilometre rail corridor connecting Kuwait in the north to Muscat in the southeast. Full realisation of this network remains incomplete. Accelerating completion — with resilience-first engineering standards — must be treated as a national security priority, and specifically as an acceleration of the commitments already signed and partially underway across member states.

Saudi Landbridge	The Saudi Railways Organisation landbridge connecting Dammam on the Arabian Gulf to Jeddah on the Red Sea provides the critical rail link between Gulf and Red Sea port systems. Expanding this corridor’s capacity is among the highest-priority near-term investments in the programme — it is a signed and progressing project that deserves accelerated completion.
Etihad Rail (UAE)	The UAE national freight and passenger railway, when complete, will connect the UAE network to Saudi Arabia and onward to the GCC backbone.
Oman Rail	Oman’s planned rail network connecting Sohar, Muscat, and Duqm to the GCC backbone is among the highest-priority resilience investments — it provides the land connection that turns Arabian Sea bypass ports into functional supply chain assets.
Qatar and Bahrain connectivity	Rail connections to Hamad Port (Qatar) and through Bahrain complete the network’s commercial and resilience coverage. The UAE-Qatar connectivity projects, including those proposed by HE Dr. Sultan Al Jaber, deserve accelerated attention as particularly viable near-term investments.
KSA-Qatar pipeline and corridor initiatives	The KSA-Qatar pipeline and corridor initiatives are among the most commercially and strategically viable connectivity projects in the region. Their acceleration is endorsed as a priority within this programme’s framework.

4.3 The Iraq Development Road: A Staged and Cautious Approach

Iraq's Development Road programme envisions a multimodal transport corridor connecting the Grand Faw Port on the Arabian Gulf to the Turkish border at Ibrahim Khalil, and onward to European markets. For the GCC, the connectivity opportunity this represents is significant. However, the programme acknowledges the legitimate concerns raised by regional stakeholders regarding execution risk in Iraqi territory, given current political conditions.

The recommended approach is therefore staged: the Kuwait-Basra connection — estimated at approximately 43 kilometres and primarily on Kuwaiti territory — represents the highest-priority segment because it delivers meaningful connectivity benefit at manageable political and execution risk, without requiring deep engagement with Iraqi territory. Longer-range segments through Iraqi and Syrian territory are retained as long-term programme ambitions, subject to demonstrated improvement in political and security conditions before formal commitment.

The Kuwait-Basra connection (~43 km, primarily Kuwaiti territory) is the highest-priority rail segment: it delivers significant connectivity benefit at manageable risk and unlocks future options without committing to execution in higher-risk territories.

4.4 Silk Road Integration Approach

China's Belt and Road Initiative has created a continuous rail corridor from Chinese manufacturing centres to European markets. GCC integration with this network — via Turkey — would provide direct overland freight access to Eurasian markets while creating a logistics corridor largely independent of maritime chokepoints. From a resilience perspective, Silk Road rail integration provides the GCC with direct access to Central Asian energy, agricultural, and mineral resources.

4.5 The Levant Connection

The road and rail corridor through Jordan to the Gulf of Aqaba and Mediterranean ports completes the western dimension of the GCC's land connectivity. The Jordan-Saudi corridor provides western land access to Mediterranean ports and the European road and rail network. For cargo moving to and from Europe, a Red Sea-Jordan-Mediterranean routing bypasses the Suez Canal entirely while offering competitive transit times for certain trade lanes.

Source basis: OECD International Transport Forum Outlook 2023; UIC World Rail Statistics 2024; World Bank Iraq Reconstruction Assessment 2023; Reuters Grand Faw / Iraq Development Road reporting 2024-2025; Asian Development Bank Belt and Road Economic Corridor Assessment 2023.



V. PIPELINE RESILIENCE AND REDUNDANCY

5.1 Crude Oil — Uneven Bypass Capability

GCC crude oil export infrastructure includes two major pipelines that provide alternatives to the Strait of Hormuz. Saudi Arabia's East-West Pipeline can transport up to 7 million barrels per day (bpd) to Yanbu on the Red Sea, of which approximately 5 million bpd is available for export. The UAE's Abu Dhabi Crude Oil Pipeline (ADCOP) to Fujairah provides an additional 1.8 million bpd, giving the region a combined 6.8 million bpd of current operational export bypass capacity.

This capacity is set to expand. A planned UAE upgrade is expected to add 1.8 million bpd by 2027, while Saudi Arabia is considering a further extension of its East-West Pipeline.

Despite these investments, bypass capability remains uneven. Kuwait, Qatar, Bahrain and Oman have no alternative crude export routes that avoid the Strait of Hormuz, leaving a significant share of GCC exports exposed to disruption.

Strengthening regional resilience should therefore prioritize:

Parallel pipeline development	Northern GCC bypass connectivity:	Underground hardening:	Strategic petroleum reserve distribution:
A second East-West Pipeline alignment on a geographically separated corridor, providing genuine N-1 redundancy for Saudi crude bypass capacity.	New pipeline infrastructure connecting Kuwait, northern Saudi fields, and Basra (Iraq) to the existing East-West system.	Prioritised burial of above-ground pipeline sections in highest-vulnerability zones.	Geographically distributed strategic reserves at both ends of export pipeline systems.

5.2 LNG — The Harder Problem

The GCC must distinguish between crude oil resilience and LNG resilience. They are fundamentally different strategic problems. Unlike crude oil, LNG continuity cannot be addressed quickly with a road, rail, or pipeline diversion. Gulf liquefaction and loading capacity is concentrated inside the Strait of Hormuz zone. LNG continuity therefore depends on a different strategic toolset:

- Contract flexibility:**
Long-term LNG sale and purchase agreements with destination flexibility clauses that allow cargo swaps and alternative delivery points during disruption
- Floating storage and regasification units (FSRUs):**
Pre-positioned or deployable FSRUs at key import markets
- Buyer-side demand management:**
Agreements with key LNG importing nations for demand management protocols
- Fuel-switching readiness:**
Maintaining oil-capable generation capacity in power-consuming nations as a backup to gas-fired plants
- Long-term diversification:**
Feasibility assessment of LNG liquefaction capacity outside the Hormuz zone

Reality check: Hormuz can be partially defeated for crude oil exports and container imports through existing and planned bypass infrastructure. It cannot currently be fully defeated for Gulf LNG exports. The LNG resilience strategy is a demand management, contract flexibility, and storage strategy — not a physical bypass strategy.

5.3 Gas Pipeline Resilience and the National Grid Opportunity

The Dolphin Gas Project connecting the North Field to the UAE and Oman represents the region’s most significant cross-border gas infrastructure and has operated reliably since 2007. It remains, however, a single-pipeline asset with no parallel redundancy. The gas pipeline resilience programme should include: a parallel Dolphin pipeline along a geographically separated corridor; extension of equivalent capacity to Bahrain and Kuwait; development of Iraq-GCC gas pipeline infrastructure; and LNG regasification terminal development in each GCC member state as a fuel-of-last-resort capability.

Critically, gas pipeline resilience and power grid resilience are directly complementary. The single most effective way to reduce the consequences of a gas supply disruption is a fully integrated GCC National Electricity Grid with diversified generation. The GCC National Electricity Grid is therefore not just a power infrastructure project — it is the primary gas supply resilience instrument available to the region without requiring physical pipeline bypass.

Strategic Opportunity: The GCC National Electricity Grid, operating to full N-2 resilience standards with diversified generation and Iraqi interconnection, is the single investment that most directly addresses gas supply vulnerability, reduces embargo risk across all energy modalities, and generates measurable commercial returns simultaneously. It should be treated as the anchor investment of Phase 1.

Source basis: IEA Oil Security Report 2024; EIA World Oil Transit Chokepoints (eia.gov); S&P Global Platts Middle East Energy Infrastructure Review 2024; Oxford Institute for Energy Studies Gas Supply Security Report 2023.



VI. PORTS, DRY PORTS, AND STRATEGIC WAREHOUSING

6.1 The Node Architecture of Resilience

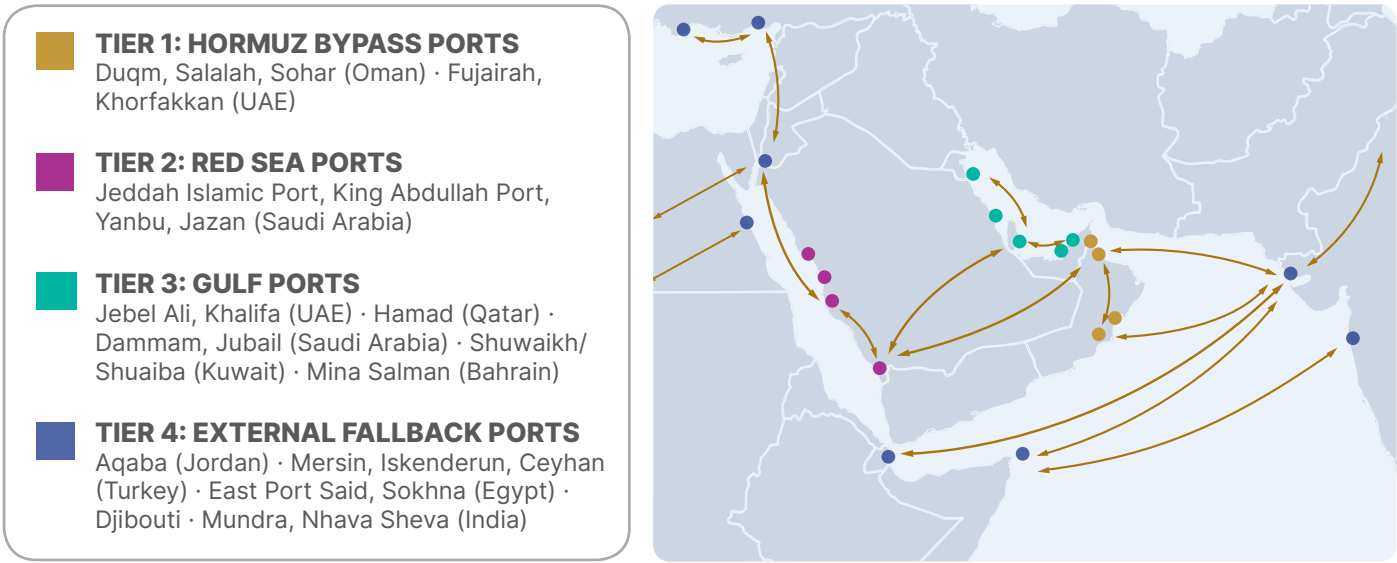
Line infrastructure — railways, pipelines, road corridors — cannot defeat an embargo on its own. The system also requires receiving nodes: ports capable of handling diverted cargo, bonded warehouses, customs zones, container yards, cold-chain facilities, and fuel terminals. A cargo rerouted from a Gulf port to Salalah is only useful if Salalah has the berth capacity, the customs clearance infrastructure, the inland transport link, the warehousing capacity, the next-generation port technology capability, and the energy sources required to operate at scale.

The GCC’s port and warehousing architecture must be understood in terms of its crisis function — not merely its commercial function. Every major port and inland logistics node should have a defined role in the embargo-response playbook, pre-agreed capacity commitments for emergency use, and pre-cleared customs arrangements for crisis-rerouted cargo.

Family businesses across the GCC operate a significant proportion of the warehousing, cold chain, freight forwarding, and inland distribution infrastructure that sits behind port gates. Their integration into port and logistics zone resilience planning — including pre-authorised crisis protocols, capacity commitment agreements, and participation in strategic stockpile rotation — is essential to ensuring that port-level resilience translates into market-level continuity.

6.2 The Four-Tier Port Architecture

Arabian Sea / Hormuz-bypass ports Duqm, Salalah, Sohar (Oman) · Fujairah, Khorfakkan (UAE) Receive cargo without entering the Gulf; move critical freight overland into the GCC through Oman-Saudi and UAE-Saudi corridors. These are the primary bypass nodes for a Hormuz closure scenario. Khorfakkan's position on the Gulf of Oman makes it a critical inbound shipment port that should be formally designated in the bypass architecture.	Red Sea ports Jeddah Islamic Port, King Abdullah Port, Yanbu, Jazan (Saudi Arabia) Serve Europe/Mediterranean cargo, Saudi Landbridge flows, fuel export redundancy, and emergency stockpile access. Critical nodes for Bab al-Mandab and Suez disruption scenarios.
Gulf Ports Jebel Ali, Khalifa (UAE) · Hamad (Qatar) · Dammam, Jubail (Saudi Arabia) · Shuwaikh/Shuaiba (Kuwait) · Mina Salman (Bahrain) Normal commercial throughput; surge redistribution nodes when non-Hormuz lanes remain open; regional consolidation for intra-GCC delivery.	External Fallback Ports Aqaba (Jordan) · Mersin, Iskenderun, Ceyhan (Turkey) · East Port Said, Sokhna (Egypt) · Djibouti · Mundra, Nhava Sheva (India) Route substitution, supplier diversification staging, and crisis inventory pre-positioning outside GCC waters. Essential for 90-180 day scenarios requiring rebuilt supplier relationships.



7.3 Air Cargo — The Decisive Continuity Channel

Air cargo should not be treated as a minor supplement to maritime and land transport. For medicines, vaccines, electronics, grid spares, aircraft parts, refinery components, and telecom equipment, air cargo may be the decisive continuity channel when maritime routes are disrupted. The GCC's air cargo node architecture is already a significant strategic asset: Dubai (DXB/DWC), Doha, Abu Dhabi, Riyadh, Jeddah, Bahrain, Muscat, Salalah, and Kuwait. The resilience programme must formalise the crisis role of these nodes through:



01

Priority cargo protocols for medicines, medical devices, grid spares, refinery parts, and telecom equipment



03

Pre-contracted additional belly and freighter capacity with major carriers, activated automatically when maritime disruption triggers defined thresholds



02

Sea-air logistics integration: cargo arriving at Oman, Djibouti, or Indian Ocean ports transferred to air freight for final delivery



04

Regional air cargo coordination centre: a joint GCC function that tracks available capacity and manages priority allocation



VIII. LEGAL, INSURANCE, AND COMMERCIAL CONTINUITY

8.1 The Non-Physical Mechanisms of Embargo

The most sophisticated and increasingly common embargo mechanism does not rely on ships being physically stopped. It operates through the withdrawal of marine war-risk insurance, the tightening of bank compliance standards for trade finance, flag-state or port-state pressure on carriers, and legal uncertainty about cargo liability and force majeure. The 2024-2025 Red Sea crisis provided a live demonstration: most major shipping lines chose to avoid Bab al-Mandab not because they were physically blocked but because their insurers repriced war-risk cover to prohibitive levels.

Beyond insurance repricing, the crisis also demonstrated a second non-physical mechanism: container cost volatility. During the 2024-2025 disruption period, container freight rates increased 4-6 times from pre-crisis levels — driven partly by legitimate cost increases (insurance surcharges, war-risk premiums, longer routing distances, additional fuel costs) but also by elevated commercial margins charged by shipping lines and road transport operators to customers with no alternative. This form of crisis-period profit extraction compounded the economic damage of the disruption and imposed costs on GCC importers disproportionate to the underlying logistics cost increases.

8.2 Legal Architecture

The legal foundation of the GCC's resilience architecture rests on several international instruments:

Charter of the Cooperation Council for the Arab States of the Gulf (Primary Law)	The Council's principal objectives are to 'achieve coordination, integration, and interconnection among member states in all fields leading to their unity' and to 'strengthen and deepen the bonds and ties of cooperation among their peoples in various fields.'
The Joint Defence Agreement of the CCASG	Articles 2 and 3 outline the nature of mutual assistance and defence. These Articles empower the states to take 'any necessary action' to assist member states 'that suffer aggression or the threat thereof.'
UNCLOS Part III — Transit Passage	Establishes the right of transit passage through straits used for international navigation, including the Strait of Hormuz and Bab al-Mandab.
The 1888 Constantinople Convention	Establishes the legal status of the Suez Canal as a waterway open to free navigation in peace and war.
WTO Trade Facilitation Agreement	Provides the legal and normative framework for pre-arrival processing, advance rulings, risk management-based customs, and border cooperation.
WCO SAFE Framework of Standards:	Underpins Authorised Economic Operator programmes, advance cargo information systems, and mutual recognition of customs security standards.
UNCITRAL Model Law on Electronic Transferable Records (MLETR):	Electronic bills of lading and digital trade documents are essential for rapid cargo rerouting — paper documents cannot be reissued at the speed that crisis logistics demands.

8.3 Insurance Architecture

The GCC should establish a sovereign war-risk insurance and reinsurance facility — a GCC-backed insurance pool that maintains coverage for commercial carriers operating critical cargo routes when commercial war-risk insurance becomes prohibitively expensive or unavailable. This facility would be capitalised by GCC member state sovereign funds and managed by an independent professional board; would define ‘critical cargo’ categories that qualify for subsidised or guaranteed coverage; and would operate trigger protocols that activate automatically when commercial war-risk premiums exceed defined thresholds.

8.4 Freight Cost Controls During Crisis Periods

The programme recommends that GCC member states, acting through the GCC Secretariat, develop a statutory guidance framework requiring shipping lines and road transport agencies to limit cost increases during declared supply chain emergency periods to actual incurred costs — covering legitimate incremental expenses such as war-risk surcharges, extended routing fuel costs, and insurance premium increases — without incorporating elevated commercial profit margins above pre-crisis levels.

This framework should include:

Crisis period cost transparency: Mandatory disclosure of freight cost components by carriers operating on GCC critical supply routes during declared emergency periods, enabling regulators to verify that rate increases reflect actual cost rather than opportunistic margin expansion.	GCC stakeholder coordination mechanism: A joint GCC coordination body — incorporating shipping line representatives, port operators, road transport agencies, and relevant regulatory authorities — that monitors freight rate movements during crises and has authority to issue binding cost-limit guidance.	Enforcement and dispute resolution: Regulatory frameworks in each member state empowering relevant authorities to require cost justification and issue penalties for excessive profit-taking during declared supply chain emergencies.
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The goal is not to suppress legitimate commercial cost recovery — war-risk, routing, and operational cost increases are real and must be recoverable — but to prevent crisis conditions from becoming an opportunity for profit extraction at the expense of critical supply continuity.

8.5 Commercial Carrier Commitments

Pre-negotiated framework agreements with major carriers — container shipping lines, tanker operators, Ro-Ro operators, air cargo carriers, and LNG tanker operators — should establish standing commitments to maintain service on GCC critical routes at defined minimum capacity levels, in exchange for guaranteed cargo volumes and, where necessary, freight support for critical commodities.

8.6 Claims Register

All embargoes and conflicts eventually end. However, in their wake, losses and damages can be complex to document and catastrophic in scale. It is important for GCC member states to develop technology-based systems and processes for any entitled party to document losses so they can be rectified following any embargo or conflict. States should develop Registers of Damage Caused by Embargo/Aggression in accordance with historical precedent from recent local and international conflicts.

Source basis: UNCLOS Part III; 1888 Constantinople Convention; WTO Trade Facilitation Agreement; WCO SAFE Framework; UNCITRAL MLETR; Lloyd’s Market Association war-risk guidance; BIMCO charter-party standard forms.

IX. CROSS-BORDER HARMONISATION AND FRICTIONLESS TRADE

9.1 The Economic Cost of Friction

Border delays, documentation redundancy, divergent technical standards, and inconsistent customs procedures impose enormous hidden costs on regional trade. The World Bank estimates that each day of border delay reduces trade volume by approximately 1% of annual bilateral trade value. For the GCC, divergent product safety standards and six separate customs regimes create friction estimated at 3-5% of total trade value annually. In a crisis, this friction becomes catastrophic: when cargo is rerouted to Oman or Red Sea alternatives, if customs at destination cannot process the rerouted volume quickly, the physical bypass route becomes effectively unusable.

1% Trade volume lost per day of border delay (World Bank)	3-5% Trade value lost to border friction in MENA (World Bank)	48hrs Average truck dwell at key GCC borders	4hrs OECD benchmark for border crossing
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9.2 The GCC Customs Union — Deepening and Completion

Single administrative document:

A common, digitised customs declaration accepted without modification at all GCC border posts, integrating with a shared risk management system.

Unified Authorised Economic Operator programme:

A single GCC AEO certification conferring green-lane treatment at all member state borders, reducing examination rates for compliant traders below 5%.

Mutual recognition of conformity assessment:

Elimination of duplicative testing and certification requirements for goods moving within the customs territory.

Joint border posts:

Co-location of all GCC member state customs, immigration, and standards authority functions at shared terrestrial border infrastructure.

9.3 Digital Trade Infrastructure

The WEF’s Digital Trade Facilitation Index highlights that economies with advanced digital trade infrastructure experience 20-30% lower trade costs. A regional digital trade architecture should implement: a GCC Regional Trade Single Window federating the national single windows of all six member states; electronic bills of lading and blockchain-based certificates of origin; real-time cargo tracking integration across all modes; and advance cargo information systems aligned with WCO SAFE Framework standards.

9.4 Passenger Movement Harmonisation

A fully harmonised passenger movement regime — extending to streamlined entry for business visitors, skilled and unskilled workers and dependents, military and peacekeeping personnel, UN agencies and NGOs, and transit passengers from key partner nations — significantly enhances the region’s ability to maintain economic continuity during external pressure.

Source basis: WEF Global Enabling Trade Report 2024; World Bank Business Ready Report 2024; WTO Trade Facilitation Agreement; GCC Secretariat Customs Union Annual Report 2023; UNCTAD Digital Trade Facilitation Assessment 2024.

X. LAND TRANSPORTATION CORRIDORS

10.1 Road Network Integration

Saudi-Iraq Highway Network:

Cross-border road infrastructure between Saudi Arabia, Kuwait, and Iraq — particularly the Safwan and Ar’ar border corridors — provides overland access to Turkish and European road networks.

Jordan-Saudi Corridor:

The road corridor through Jordan to Aqaba and onward to the Levantine road network provides a western land access route connecting the GCC to Mediterranean ports and European road networks.

Oman-Saudi Corridor:

The overland road link between Oman’s Arabian Sea ports (Duqm, Salalah) and the Saudi interior is the land-side component of the Hormuz bypass architecture.

10.2 Heavy Freight Corridor Development

The International Transport Forum’s analysis of Middle East freight corridors identifies heavy vehicle operating conditions, axle load limits, weigh station integration, and rest area infrastructure as critical gaps. A resilience-oriented programme should invest in: standardised axle load limits across all GCC and adjacent road corridors; integrated weigh-in-motion systems on designated heavy freight corridors; driver rest area and fuel infrastructure at regular intervals; and dedicated heavy freight corridors separated from general traffic.

10.3 Border Crossing Modernisation

The IRU has documented average truck dwell times at GCC terrestrial border crossings of 24-72 hours, compared to an OECD benchmark of 2-4 hours. Priority modernisation should deliver: integrated one-stop border post facilities where all inspecting authorities conduct functions simultaneously; pre-clearance infrastructure allowing high-volume, low-risk freight to be released before reaching the physical border; 24/7 operational capability at all strategic border crossings; and emergency bypass protocols activatable within four hours.

Source basis: International Transport Forum Middle East Freight Assessment 2023; IRU Road Transport Statistics 2024; OECD Regulatory Policy and Governance of Infrastructure 2023; Arab Road Federation Technical Standards Report 2022.





XI. RESILIENCE BY DESIGN: ELIMINATING SINGLE POINTS OF FAILURE

11.1 The Resilience Architecture Principle

Resilience is not a feature that can be added to infrastructure after the fact. It must be embedded in the engineering design, procurement specification, operational doctrine, and governance framework of every component of the integrated supply chain system. Every critical node, corridor, and system must be designed to continue functioning — at reduced but operationally adequate capacity — in the event of the simultaneous loss of any two non-adjacent components.

11.2 Network Topology

All supply chain modalities must transition from linear or hub-and-spoke topologies to mesh topologies characterised by: multiple paths between any two major nodes; distributed processing and storage capacity; and cross-modal interconnection so that a disruption to one mode can be partially absorbed by increased utilisation of alternatives.

11.3 Crisis Activation Protocols

Pre-authorised:	Crisis workarounds must not require new political decisions at the moment of crisis. Every realistic scenario should have a pre-agreed, pre-authorised response protocol activatable within four hours.
Regularly exercised:	Annual full-scale crisis exercises for each modality, with cross-modal integration exercises every two years.
Commercially integrated:	Crisis protocols must integrate major private carriers, freight forwarders, port operators, and logistics service providers — including the family business groups that operate a significant share of regional warehousing, cold chain, and distribution capacity.
Regionally coordinated:	Crisis coordination at GCC Secretariat level, with clear escalation and decision authority.

11.4 Cyber Resilience

Modern supply chain infrastructure is deeply dependent on digital systems. The programme must embed: air-gapped backup control systems for all Category-1 critical infrastructure assuming operational control within 60 minutes of a cyber attack; unified regional cybersecurity standards for operational technology; a GCC Cyber Threat Intelligence Sharing Platform; and mandatory incident reporting and coordinated response protocols.

11.5 Climate Resilience

The GCC faces intensifying climate risk over the programme’s investment horizon. Rising temperatures, increased frequency of extreme weather events, sea level rise affecting coastal infrastructure, and potential water scarcity affecting cooling requirements for power generation all constitute supply chain resilience risks that must be factored into infrastructure design from inception.

Source basis: CISA Critical Infrastructure Security and Resilience Framework 2023; ENISA NIS2 Implementation Report 2024; WEF Global Risks Report 2025; IPCC Sixth Assessment Report; OECD Resilience of Critical Infrastructure 2024.



XII. CHOKEPOINT RESPONSE PLAYBOOKS

12.1 Hormuz Closure



Strategic logic — crude & container cargo reroute via pipeline, rail and bypass ports. Gulf LNG cannot bypass — it loads inside Hormuz; continuity relies on swaps, storage, demand-side.

20.9M

bbl/day normal Hormuz flow (EIA, H1 2025)

~25%

of global seaborne oil trade

6.8M

bbl/day operational bypass capacity; **Up to 3.8M bbl/day** additional capacity under construction or discussion

0

physical LNG bypass route

What is affected first



Gulf LNG exports · Kuwait and Bahrain maritime access · Gulf-facing UAE and eastern Saudi container imports · Refined fuel imports · Spare parts and pharmaceutical flows · Some crude and condensate exports for producers without bypass pipeline access

Immediate response

Shift non-Gulf maritime imports to Oman (Duqm, Salalah, Sohar) and UAE Fujairah and Khorfakkan port bypass nodes

Move critical cargo overland through Saudi and Omani pre-authorised corridors to interior GCC markets

Activate food, medicine, desalination chemical, and fuel stockpile drawdown protocols

Maximise Saudi East-West Pipeline and UAE ADCOP/Fujairah crude export capacity

Surge air cargo for high-value spares and life-critical medicines

Activate LNG contract swaps with global buyers rather than attempting to physically reroute Gulf LNG exports

Utilise the GCC National Electricity Grid to redistribute power from states with secure generation to states whose gas-fired plants face supply disruption

Activate family business logistics networks and pre-agreed crisis protocols with major regional freight operators

Structural response

- Build Oman-GCC rail and heavy-road corridors to scale bypass port throughput
- Expand East-West Pipeline Phase 2, ADCOP/Fujairah, Yanbu, and Jazan crude and product export capacity
- Develop distributed fuel and food storage outside Hormuz-exposed zones
- Establish regasification and fuel-switching capability across power-consuming nations
- Develop required road infrastructure connecting with Jordan and points north and west

12.2 Bab al-Mandab Closure / Red Sea Interdiction

What is affected first

Asia-Europe shipping flows via Suez · Red Sea port access from Asia · LNG and container traffic through the Red Sea · Insurance rates and vessel availability · Freight costs across all GCC import categories



Immediate response

Activate Cape of Good Hope rerouting protocols with pre-contracted carriers

Use Oman and UAE ports for Asian-origin cargo that would normally route via Suez

Move cargo overland into GCC markets from Arabian Sea entry points

Activate freight-rate and war-risk insurance support facility; invoke cost-control framework to prevent excessive freight cost recovery

Deploy air cargo surge for high-value goods facing unacceptable maritime transit delays

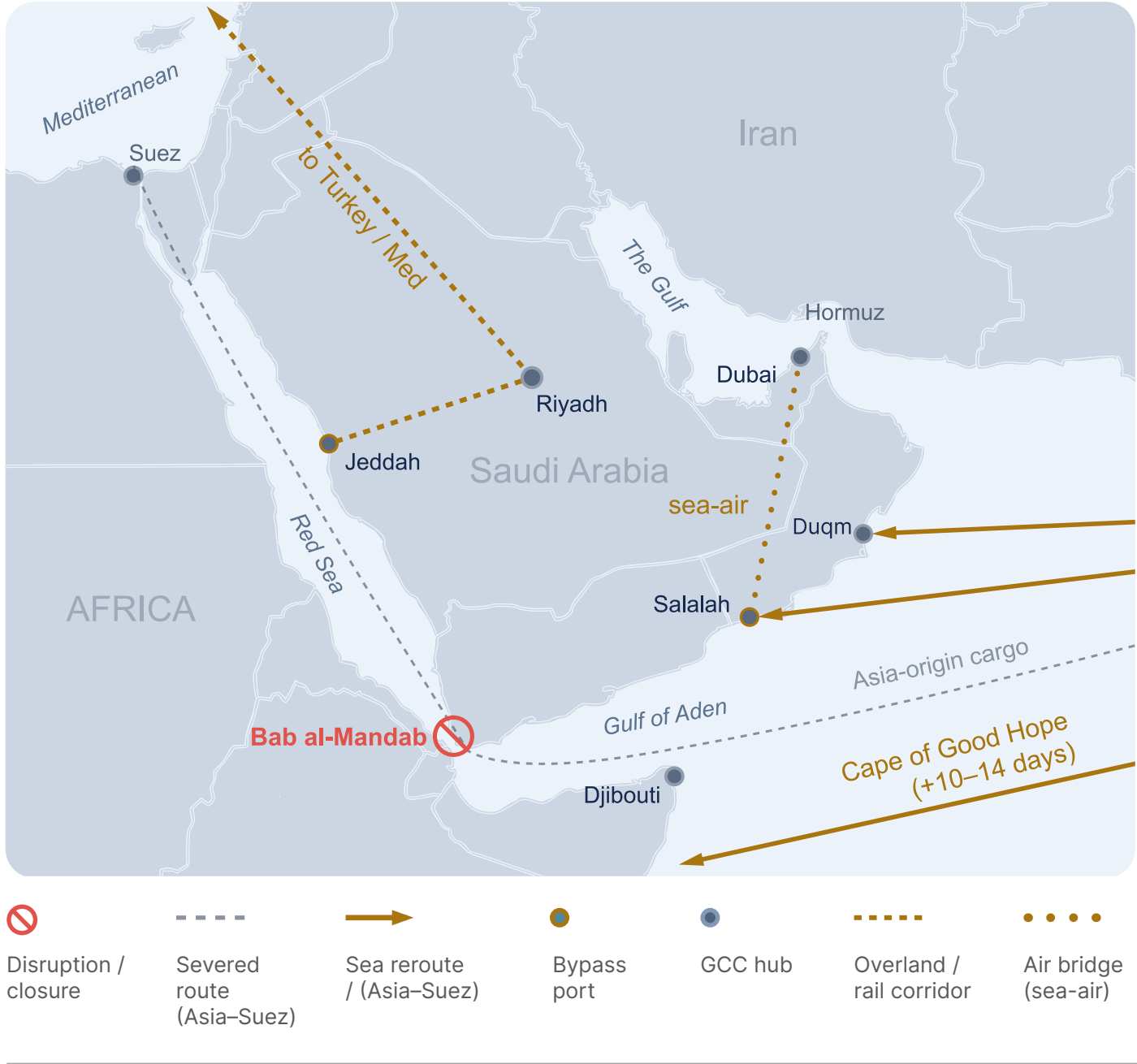
Structural response

Build Oman-to-Saudi and UAE-to-Saudi land corridors with customs pre-clearance scaled for sustained high volume

Develop Saudi Red Sea ports as permanent bypass gateways for Europe-Mediterranean cargo

Pre-contract Cape routing capacity with major container and tanker carriers

Diversify supply bases in India, East Africa, and Europe to reduce Asia-source concentration



10–14d

extra transit days via the Cape route

4–6×

container freight rates during 2024–25

0

LNG flow via Bab al-Mandab, 2024

War-risk

insurance withdrawal closed the route

12.3 Suez Canal Closure or Effective Disruption



Strategic logic — the 1888 treaty grants free passage, yet insurance can close the canal de facto. Crude bypasses via SUMED; cargo shifts to the Cape, Turkey corridors, the Landbridge and IMEC.

6 days	10–14d	4–6×	1888
Ever Given grounding blocked canal, 2021	Extra transit days via the Cape route	container freight rates during 2024–25	free-navigation treaty (peace and war)

What is affected first

Europe-Asia container flows · Mediterranean-Gulf trade · Some crude and product flows · Schedule reliability and freight rates across all GCC trade lanes



Immediate response

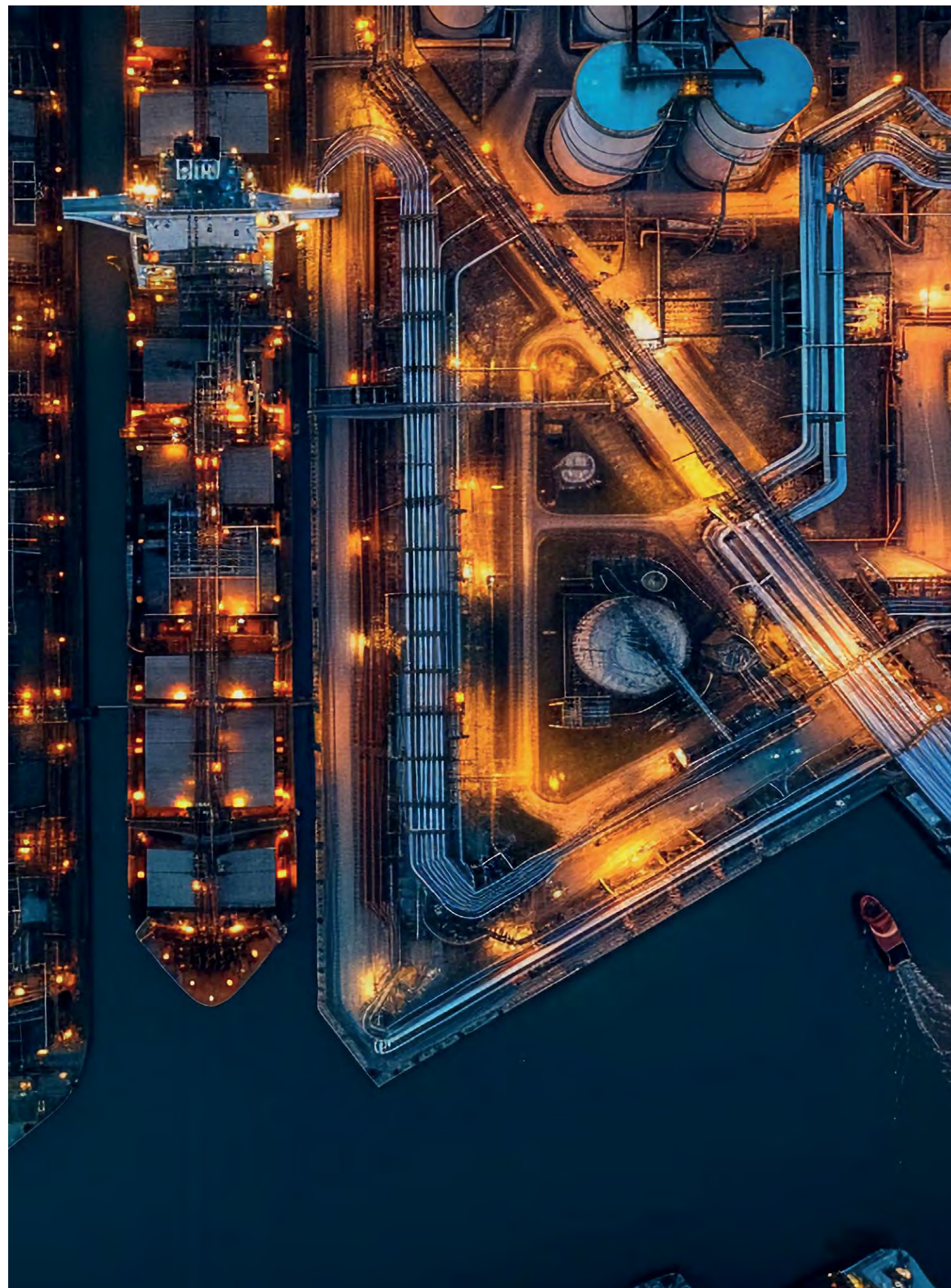
- Reroute ships around the Cape of Good Hope; use SUMED for crude where available
- Move urgent cargo through Turkey, Jordan, and available Mediterranean corridors
- Activate sea-air logistics for high-value goods at Indian Ocean transfer ports
- Activate European-side inventory buffers and pre-positioned stockpiles

Structural response

- Develop Turkey-Mediterranean land corridors for sustained alternative routing
- Build Saudi Landbridge Red Sea-to-Gulf rail capacity to provide a continental-scale bypass
- Deepen investment in Egypt's Suez Canal Economic Zone and East Port Said as resilience partners
- Develop supplier and warehouse buffers in Europe and the Mediterranean

Suez legal note: The 1888 Constantinople Convention guarantees free navigation through the Suez Canal in peace and war. Resilience planning must nonetheless assume de facto disruption from accident, cyber attack, insurance withdrawal, or political crisis — because physical legal rights cannot substitute for practical operational alternatives.





XIII. MULTINATIONAL NODE INTEGRATION



13.1 Iraq

Iraq represents an important external node for GCC supply chain connectivity due to its geographic position providing the land bridge to Turkey and Central Asia. The programme recommends a staged approach to Iraq integration, reflecting legitimate concerns about political and execution risk. The Kuwait-Basra rail link (~43 km) is endorsed as the near-term priority due to its limited exposure to Iraqi territorial risk. Longer-range Iraq Development Road segments are retained as long-term programme ambitions, subject to demonstrated improvement in political and security conditions.

Near-term priority investments include:



Kuwait-Basra rail link (~43 km) as the foundational connection to the Iraqi and wider Eurasian rail network



Gas pipeline from Basra to Kuwait and Saudi Arabia's northern grid, monetising Iraq's currently flared gas



Border management modernisation at Safwan (Kuwait-Iraq) and Ar'ar (Saudi Arabia-Iraq) with joint border post facilities



Power grid interconnection between northern Saudi Arabia and southern Iraq, with planned extension to the Iraqi national grid

13.2 Jordan

Jordan serves as the critical corridor to Mediterranean ports and the Levant. The Aqaba Special Economic Zone is already a significant transshipment hub. Deeper GCC-Jordan integration provides alternative container port access at Aqaba that bypasses both Hormuz and Suez for cargo moving to and from Europe and the Mediterranean.

13.3 Egypt

Egypt controls the Suez Canal — the most consequential single chokepoint for GCC trade with Europe and the Americas. Deep economic partnership with Egypt provides both commercial benefits and diplomatic leverage. Egypt's Suez Canal Economic Zone and East Port Said provide the platform for meaningful economic integration and supply chain depth.

13.4 Turkey

Turkey is the northern terminus of the most significant overland trade corridors connecting the GCC to Europe and China. Turkish rail, road, and port infrastructure — particularly Mersin, Iskenderun, and Ceyhan — provide the gateway to the European single market and the Black Sea region.

13.5 India and the IMEC Corridor

The India-Middle East-Europe Economic Corridor (IMEC), announced at the G20 New Delhi Summit in September 2023, creates a multimodal connectivity framework connecting India to Europe through the GCC and Levant. This corridor directly reinforces the strategic logic of the GCC resilience architecture — infrastructure investments that serve IMEC also serve resilience objectives.

Source basis: World Bank Iraq Reconstruction Reports 2022-2024; Arab Monetary Fund Regional Economic Outlook 2024; G20 IMEC Memorandum of Understanding 2023; ESCWA Regional Integration Assessment 2024; Reuters Grand Faw Port reporting 2024-2025.

XIV. GOVERNANCE, INVESTMENT, AND IMPLEMENTATION

14.1 Governance Architecture

GCC Supply Chain Resilience Council (Supreme Level):

Convening relevant ministers from each member state, chaired by the GCC Secretariat, meeting quarterly. This council must have decision authority over cross-border resilience standards and crisis activation protocols.

Integrated Programme Office (Operational Level):

A permanent secretariat function with technical and financial authority to coordinate implementation across modalities, track progress, and manage multilateral financing relationships.

Modality Technical Committees:

Specialist committees for each of the seven infrastructure pillars, comprising technical experts from all member states and relevant external agencies.

Private Sector and Family Business Advisory Board:

Formal representation of major private sector infrastructure operators, logistics service providers, insurers, and financial institutions — with dedicated representation for GCC family business groups who operate a significant share of the region’s warehousing, cold chain, freight, and distribution infrastructure. Family business input into crisis protocols, stockpile rotation arrangements, and financing structures is essential to programme effectiveness.

14.2 Investment Framework

Total investment required is estimated in the range of \$250-350 billion over a 15-year implementation horizon. This should be assessed against the far greater cost of inaction: continued exposure to supply chain disruption, strategic coercion and lost economic growth from trade friction. Today, approximately US\$1.5 trillion in annual GCC trade depends on the uninterrupted functioning of three critical maritime chokepoints.*

- Sovereign investment by GCC member states, particularly in highest-security-value components — grid interconnection, pipeline redundancy, border infrastructure, and strategic stockpiles
- Multilateral development finance: World Bank, Islamic Development Bank, Asian Development Bank, and European Bank for Reconstruction and Development
- Family business holding companies and family offices, which hold long-term investment mandates aligned with the programme’s infrastructure horizons, as co-investors in ports, logistics zones, warehousing, and cold chain infrastructure through PPP arrangements
- Regional Islamic finance institutions, whose product structures — sukuk, ijara, murabaha — are well-suited to long-duration infrastructure investment and can mobilise capital from a broad regional investor base
- Private infrastructure finance through project finance structures and concession agreements for revenue-generating infrastructure — ports, logistics zones, rail freight
- Belt and Road co-investment for components aligned with Silk Road connectivity objectives

PPP arrangements led by family businesses to participate in the development of overall supply chain infrastructure represent a particularly attractive financing modality: they leverage private capital and operational expertise while minimising the burden on public funds, and they align the incentives of the region’s largest privately-held infrastructure operators with the programme’s long-term resilience objectives.

* Supply Chain Institute Austria (March 2026) estimates that US\$1.2 trillion in annual trade, including US\$800 billion in energy products, transits the Strait of Hormuz. Team analysis estimates a further US\$350–500 billion in GCC-Europe trade passes through the Red Sea.

14.3 Implementation Phasing



Phase 1 (2026-2029) — Critical Vulnerability Reduction:

Grid N-1 resilience and planning for N-2; digital customs pilots at ports and cross-border stations; Kuwait-Basra pre-construction; war-risk insurance facility strategy and plan developed; strategic stockpile baseline standards including water security reserves; LNG strategy and contracts standardisation; acceleration of KSA-Qatar pipeline/corridor initiatives and UAE-Qatar connectivity projects.



Phase 2 (2029-2034) — Network Completion:

GCC Railway; Dolphin parallel pipeline; Iraq interconnection; regional single window; Arabian Sea bypass corridor fully operational; LNG floating storage, regasification, and fuel-switching development; strategic food, medicine, and water reserve infrastructure construction; war-risk insurance facility launches; expedited ports and cross-border trade processes implemented; freight cost control framework in operation.



Phase 3 (2034-2040) — Full Continental Integration:

Silk Road connectivity; Levant corridor; N-2 grid; IMEC operational; all crisis exercise standards at full readiness; LNG infrastructure developed; food, medicine, and water reserve infrastructure complete; war-risk insurance facility funded and returns meet reserve requirements; expedited cross-border trade is the norm.

Sequencing Principle: Phase 1 investments must deliver measurable, independently verifiable resilience improvement on their own — not merely lay the groundwork for future phases. Each investment decision must reduce vulnerability. Priority is given to acceleration of existing signed agreements and early-stage projects before committing to new infrastructure in higher-risk territories.



XV. CONCLUSION: THE STRATEGIC IMPERATIVE

The strategic case presented in this white paper reduces to a single, clear proposition: the GCC has the financial resources, the technical capability, the institutional frameworks, and the geopolitical urgency to build a supply chain architecture that renders economic coercion an ineffective instrument against the region. The only question is whether the political will exists to pursue it with the urgency the strategic environment demands.

The 2024-2025 Red Sea crisis has demonstrated what strategic planners have long assessed: these scenarios are not theoretical. They are operational realities that will recur with increasing frequency in a world of fragmenting geopolitical alignments, rising state competition, and the proven willingness of both state and non-state actors to weaponise trade flows.

The window for this investment is not unlimited. Supply chain architectures are long-lived assets. Decisions made in the next five years will determine the region’s vulnerability or resilience profile for the next fifty. Adversaries who observe the GCC constructing this architecture will recalibrate their strategic calculus — the deterrence effect begins before the first rail is laid or the first cable strung.

This programme is not a proposal for new institutions to replace those already building the GCC’s supply chain future. It is a framework to accelerate what is already in motion — to give the region’s governments, family businesses, and private sector operators a coherent strategic architecture within which their existing commitments deliver maximum resilience return. GCC family businesses, as the operational backbone of the region’s logistics and distribution networks, are essential partners in this effort — not merely beneficiaries of it.

The governments of the GCC member states are invited to treat this white paper as the basis for a summit-level strategic commitment: to build, collectively and individually, the integrated, resilient, multi-modal supply chain architecture that the region’s national security, economic prosperity, and generational responsibility demands.

Final assessment: The hardest vulnerabilities are LNG continuity, food and medicine supply during extended disruption, water security and desalination continuity, insurance and carrier withdrawal under war-risk conditions, and border friction that prevents alternative routing from functioning at speed. These five areas should receive the most immediate and most substantial policy and investment attention. They are also the areas where GCC collective action — not individual member state initiative — delivers the greatest return.

XVI. KEY SOURCE DOCUMENTS

The following reference documents form the primary evidence base for this white paper.

A. Energy and Chokepoint Data

Ref	Title / Report	Organisation	Year
EIA-CHOKE	World Oil Transit Chokepoints — eia.gov/international/content/analysis/special_topics/World_Oil_Transit_Chokepoints/	US Energy Information Administration	2024-25
IEA-HORM	Strait of Hormuz Oil Security and Emergency Response	International Energy Agency	2024
IEA-WEO-24	World Energy Outlook 2024	International Energy Agency	2024
IRENA-GCC	Renewable Energy Outlook for the Gulf Cooperation Council	IRENA	2023
GCCIA-23	GCC Interconnection Authority Annual Report 2023	GCCIA	2023
OIES-GAS	Gas Supply Security in the Gulf: Assessment and Options	Oxford Institute for Energy Studies	2023
SPG-ME-24	Middle East Energy Infrastructure Review	S&P Global Platts	2024

B. Maritime and Shipping Intelligence

Ref	Title / Report	Organisation	Year
UNCTAD-RMT	Review of Maritime Transport 2024 — unctad.org/publication/review-maritime-transport-2024	UNCTAD	2024
UNCTAD-RED	Navigating Troubled Waters: Impact to Global Trade of Disruption of Shipping Routes in the Red Sea, Black Sea and Panama Canal	UNCTAD	2024
SCA-STATS	Suez Canal Authority — Official Transit and Revenue Statistics	Suez Canal Authority	2024
DREWRY-23	World Container Index and Port Throughput Reports	Drewry Maritime Research	2023
IRU-RTS-24	Road Transport Statistics and Border Performance 2024	IRU	2024
ITF-OUT-23	International Transport Forum: Transport Outlook 2023	OECD / ITF	2023
UIC-WRS-24	World Rail Statistics 2024	UIC	2024

C. Legal Instruments

Ref	Title / Report	Organisation	Year
GCC-LAW	Charter of the Cooperation Council for the Arab States of the Gulf (Primary Law)	Gulf Cooperation Council	1981
GCC-JDA	The Joint Defence Agreement of the Cooperation Council for the Arab States of the Gulf (CCASG)	Gulf Cooperation Council	2000
UNCLOS-III	United Nations Convention on the Law of the Sea — Part III (Transit Passage)	United Nations	1982
CONST-1888	Convention Respecting the Free Navigation of the Suez Canal (Constantinople Convention)	International Treaty	1888
WTO-TFA	Agreement on Trade Facilitation — wto.org/english/tratop_e/tradfa_e/tradfa_e.htm	WTO	2017
WCO-SAFE	SAFE Framework of Standards to Secure and Facilitate Global Trade — wcoomd.org	World Customs Organization	2023
UNCITRAL-ML	Model Law on Electronic Transferable Records (MLETR) — uncitral.un.org	UNCITRAL	2017

D. International Organisations and Multilateral Bodies

Ref	Title / Report	Organisation	Year
WB-LPI-23	Logistics Performance Index 2023 — lpi.worldbank.org	World Bank	2023
WB-BRD-24	Business Ready Report 2024	World Bank	2024
WB-TRN-23	Transport Connectivity in the Middle East and North Africa	World Bank	2023
WEF-GET-24	Global Enabling Trade Report 2024	World Economic Forum	2024
WEF-GRR-25	Global Risks Report 2025	World Economic Forum	2025
IMF-MENA-24	Regional Economic Outlook: Middle East and Central Asia	IMF	Oct 2024
ESCWA-RI-24	Regional Integration Assessment: Arab Region	UN ESCWA	2024
G20-IMEC	India-Middle East-Europe Corridor Memorandum of Understanding	G20 / India-UAE-Saudi-EU	2023

E. Regional and National Sources

Ref	Title / Report	Organisation	Year
GCC-CU-23	GCC Customs Union Annual Coordination Report 2023	GCC Secretariat	2023
AMF-OUT-24	Arab Monetary Fund — Regional Economic Outlook 2024	AMF	2024
IRAQ-DR	Iraq Development Road Project — Grand Faw Port Reporting — reuters.com	Iraq Ministry of Transport / Reuters	2024-25
WB-IRQ-23	Iraq Reconstruction and Development Assessment	World Bank	2023
ADB-BRI-23	Belt and Road Economic Corridor Assessment	Asian Development Bank	2023

F. Cybersecurity and Resilience Frameworks

Ref	Title / Report	Organisation	Year
CISA-CISR	Critical Infrastructure Security and Resilience Framework	US CISA	2023
ENISA-NIS2	NIS2 Directive Implementation and Critical Infrastructure Report	ENISA	2024
OECD-RI-24	Resilience of Critical Infrastructure: Governance and Policy	OECD	2024
IPCC-AR6	Sixth Assessment Report — Physical Science Basis	IPCC	2021-2023

G. Think Tank and Specialist Research

Ref	Title / Report	Organisation	Year
CH-GCC-22	GCC Connectivity: From Vision to Infrastructure	Chatham House	2022
RAND-SCR-23	Supply Chain Resilience in the Gulf: Scenarios and Policy Options	RAND Corporation	2023
CSIS-GCC-23	GCC Economic Integration: Progress and Gaps	CSIS	2023
EGMONT-24	Economic Statecraft and Embargo Risk in the Gulf	Egmont Institute	2024
FBC-26	Family Business Community—Feedback on GCC Supply Chain White Paper	Family Business Community	2026

