



Supply-chain and Logistics Challenges for Alkali Manufacturers

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Alkali Industry Performance: Rising Output, Stable Capacity Utilization and Export Strength

Alkali Chemicals – Soda Ash, Caustic Soda and Liquid Chlorine – are among the most widely produced chemicals in India, supporting multiple downstream industries

All Figures in '000 MT	FY 18		FY 25
EXPORTS	273	17% ↑↑	863
IMPORTS	1194	0%	1176
PRODUCTION	7631	4% ↑	9938

Caustic Soda is the major driver of Exports - South Africa and Indonesia accounted for ~ 60%

Imports of Soda Ash has gone up by 4% and Caustic Soda has come down by 13% per annum

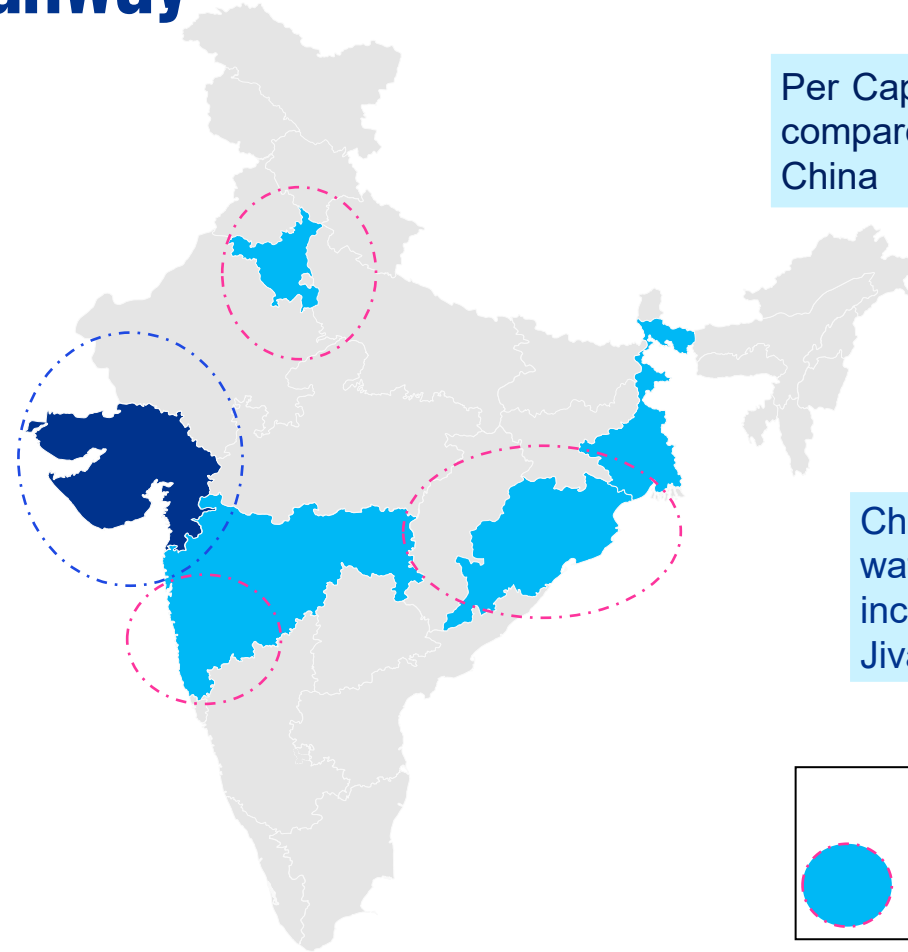
Production has grown at 4% ~ Capacity Utilization is at 83%

India's structural consumption gap & National priorities offers a Multi-decade growth runway

Per Capita Chemical Consumption in India is 1/3rd compared to China and 1/10th compared to USA

66% of the PVC needs of India is met through Imports – head room for Indian Industries to grow

Rising per capita consumption of FMCG drives soaps, detergents and packaging

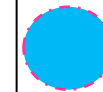


Per Capita Aluminum Consumption is 3 Kg compared to 15 Kg in USA and 28 Kg in China

Annual addition of 25-30 GW of Solar Capacity

Chlorine - effective solution for safe water – In Line Chlorination being increasingly introduced under Jal Jivan Mission

LEGEND



Consumption hubs



Raw Material & Production Cluster

Alkali production clusters are near raw-material sources (primarily in Western India), while consumption is geographically dispersed, driven by proximity to end markets or key downstream inputs (Odisha for aluminum)

Supply Chain as a Structural Constraint in the Alkali Industry

Continuous Capital-Intensive System



Supply Chain failures directly convert into production loss - Even minor delays in salt inflow or product evacuation can force output cuts — the plant cannot stop and start without losing throughput.

Different Inbound & Outbound Logistics



Bulk, low-value inbound salt moves with extreme cost sensitivity, while hazardous, high-risk outbound chemicals demand uncompromising safety, quality and availability

Salt Logistics – Competitive Advantage



Logistics capability - not salt price - is increasingly the real driver of competitiveness. - With dependence on captive salt decreasing, Industry is now far more exposed to transported salt, raising both cost and operational risk.

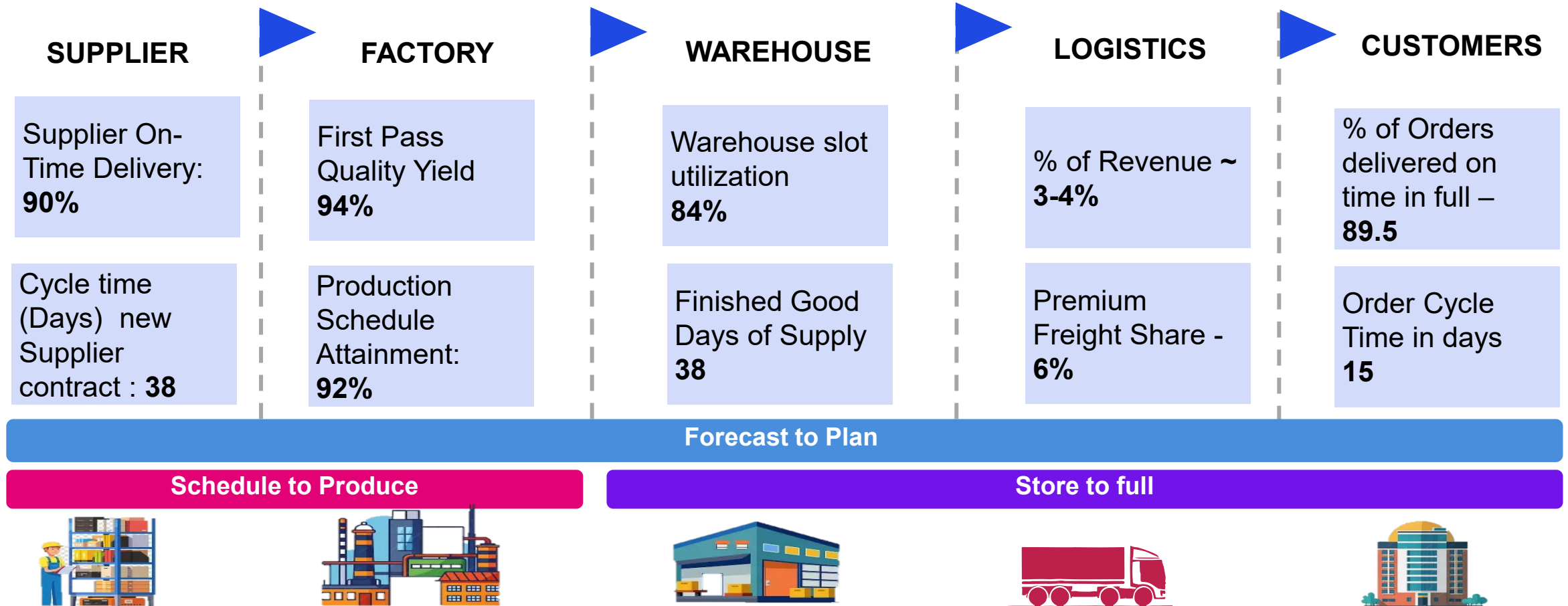
Assured, Safe Evacuation – Real Edge



Hazardous and quality-sensitive outbound products - (Liquid Chlorine, Caustic Soda, and Soda Ash)- demand flawless logistics; reliability, safety compliance, & interface readiness have become the real differentiators



From Industry Growth to Execution Excellence: Global Supply Chain Performance Benchmarks *



Companies may be better or lesser than these median figures – offering an opportunity to review the metric and identify improvement initiatives

Performance Benchmark in Action (1/2) : Shin Etsu Chemicals, Japan



Scale with Full Value-Chain Integration

Operates one of the world's largest PVC platforms, built on end-to-end integration from chlor-alkali to vinyl, enabling stable operations and resilience across chemical cycles.



Optimised Salt & Energy Sourcing

Long-term salt contracts, coastal plant locations, and on-site brine purification minimize raw-material volatility, while modern membrane cell technology partly offsets higher power costs.



Chlorine Conversion as a Structural Advantage

By fully consuming chlorine internally into downstream products, Shin-Etsu avoids merchant chlorine exposure, sustains high plant utilization, and significantly reduces hazardous logistics risk.



Logistics-Led Market Flexibility

Integrated coastal complexes with port-linked storage and export infrastructure allow Shin-Etsu to rebalance volumes across regions, supporting exports and margin stability through cycles.

Performance Benchmark in Action (2/2) : Olin Corporation , USA



Strategic Asset Location Creates Cost Leadership

Olin's chlor-alkali assets are concentrated along the U.S. Gulf Coast, providing advantaged access to salt-dome brine, low-cost natural gas, and deep-water ports, resulting in a lower cost base



Multi-Modal Logistics Enable Market Flexibility

A diversified logistics architecture - pipelines, rail tank cars, barges, and marine terminals, allows Olin to dynamically shift volumes between markets in response to regional price signals

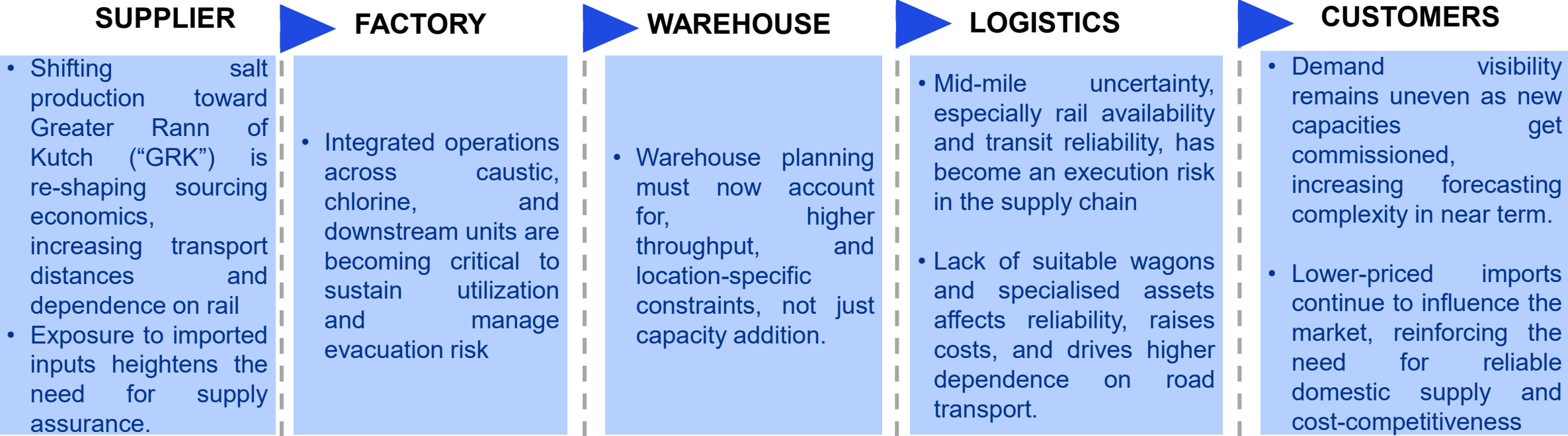


Chlorine Integration Resolves the Core Industry Constraint

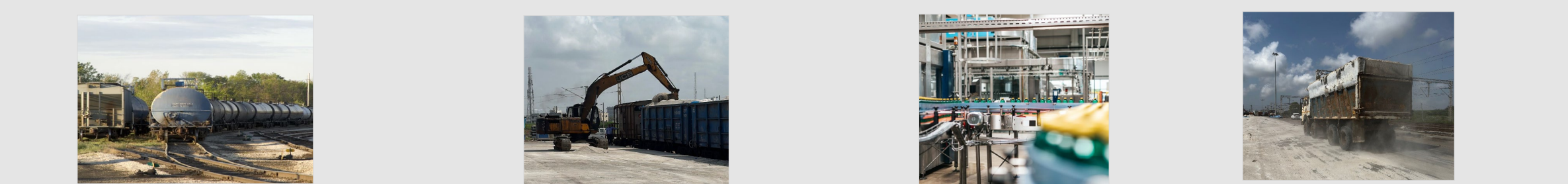
By directly piping chlorine into downstream vinyl intermediates, Olin minimizes merchant chlorine exposure, sustains high operating rates, and stabilizes caustic - chlorine economics across cycles

These examples reinforce that in chlor-alkali industry, supply chain integration determines long-term competitiveness

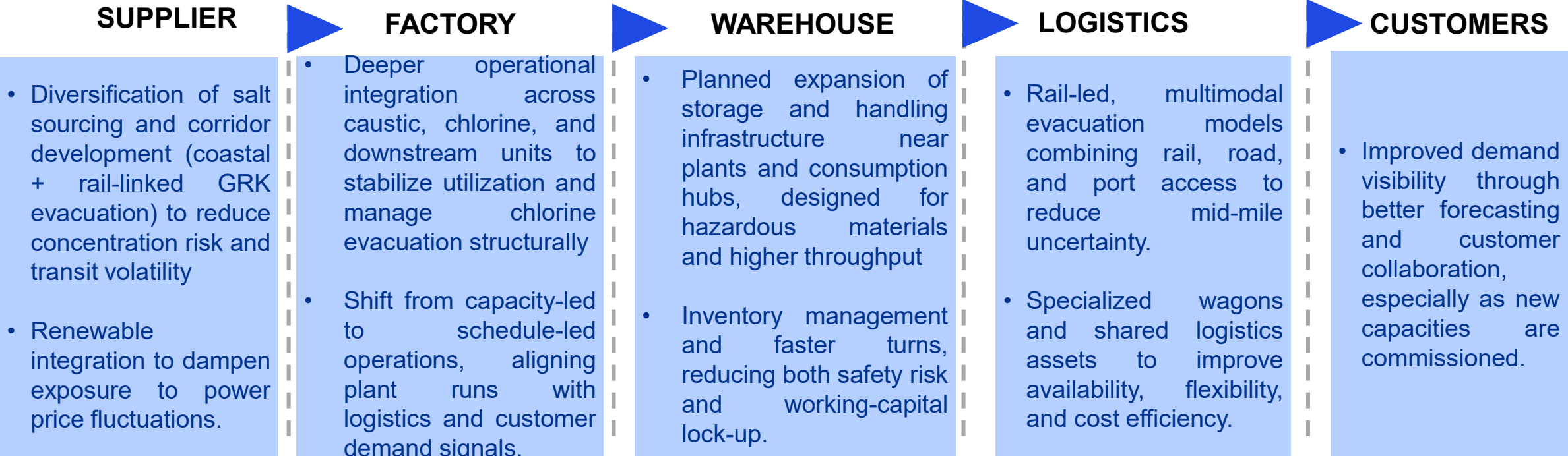
India's Operating Reality: The Strategic Challenge of Execution



High dependency on Road : modal share > 70% impact all the legs of the supply chain



Looking Ahead: Enablers of the Next Phase of Alkali Growth



Export-ready supply chains to displace imports and tap regional trade opportunities.



Thank You

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(Views expressed are personal)