

REINVENTING FERTILIZERS

THE PLAYBOOK FOR
THE NEXT DECADE OF
GLOBAL AGRICULTURE



FROST & SULLIVAN WHITE PAPER

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BEYOND COMMODITIES

THE RACE FOR DIFFERENTIATED GROWTH

The global fertilizer industry is entering its most consequential transformation in decades. A sector once shaped by commodity cycles and feedstock advantages is now being re-engineered by **geopolitical realignment**, **decarbonization mandates**, **precision agriculture**, and the rapid rise of **specialty fertilizers**. For CEOs, Strategy Heads, Investors, and new market entrants, the message is clear:

“

Growth in the next decade will not come from volume — it will come from strategy.

From technology. From specialization. And from moving closer to the farmer.”

APARAJITH BALAN

Associate Partner &
Global Practice Leader
Chemicals Growth Advisory



Across regions, the rules of competitiveness are being rewritten:



Global supply chains are shifting under geopolitical pressure.



Sustainability regulations are tightening.



Input costs are volatile and often structurally rising.



Farmers are demanding precision, efficiency, and customized solutions.



And specialty fertilizers are no longer niche — they are the center of future value creation.

In this environment, traditional advantages are no longer enough.

The leaders of tomorrow will be those who **rethink their portfolios**, **restructure costs**, **reimagine downstream access**, and **build capability extensions** across digital, agronomy, and technology partnerships.

This brochure distills **Frost & Sullivan's global perspective** on the **fertilizers sector** and outlines the strategic pathways companies must pursue to win the next decade.

THE FIVE SHIFTS TRANSFORMING THE GLOBAL FERTILIZER LANDSCAPE

01 Precision Agriculture Accelerates Fertilizer Efficiency



- ▶ Data-driven agronomy, sensor-driven irrigation, and AI-enabled advisory platforms are changing not just how fertilizers are applied — but how they are selected, dosed, and monitored.
- ▶ Efficiency is replacing volume as the core performance metric.

02 Rise of Specialty Fertilizers as the New Growth Engine



- ▶ Specialty segments — WSF, CRF, SRF, Biostimulants, Chelated Micronutrients — are seeing double-digit growth globally.
- ▶ Their higher margins, application specificity, and environment-friendly profiles make them the industry's most attractive frontier.

03 Cost Structure and Feedstock Competitiveness Under Pressure



- ▶ High energy costs, carbon pricing, and feedstock constraints are creating structural divergence between advantaged and non-advantaged regions.
- ▶ Companies are rethinking integration, partnerships, and capital allocation.

04 Trade Realignment and Geopolitical Exposure



- ▶ The Russia–Ukraine conflict, freight volatility, sanctions, and shifting alliances are re-balancing global flows.
- ▶ Countries are localizing supply chains and building strategic reserves.
- ▶ New corridors are emerging across MENA, South Asia, and LATAM.

05 Sustainability and Decarbonization Become Hard Requirements



- ▶ Carbon Border Adjustment taxes, national sustainability mandates, and the global push toward green ammonia are reshaping cost structures.
- ▶ Players must reassess asset footprints, emissions intensity, and product differentiation.

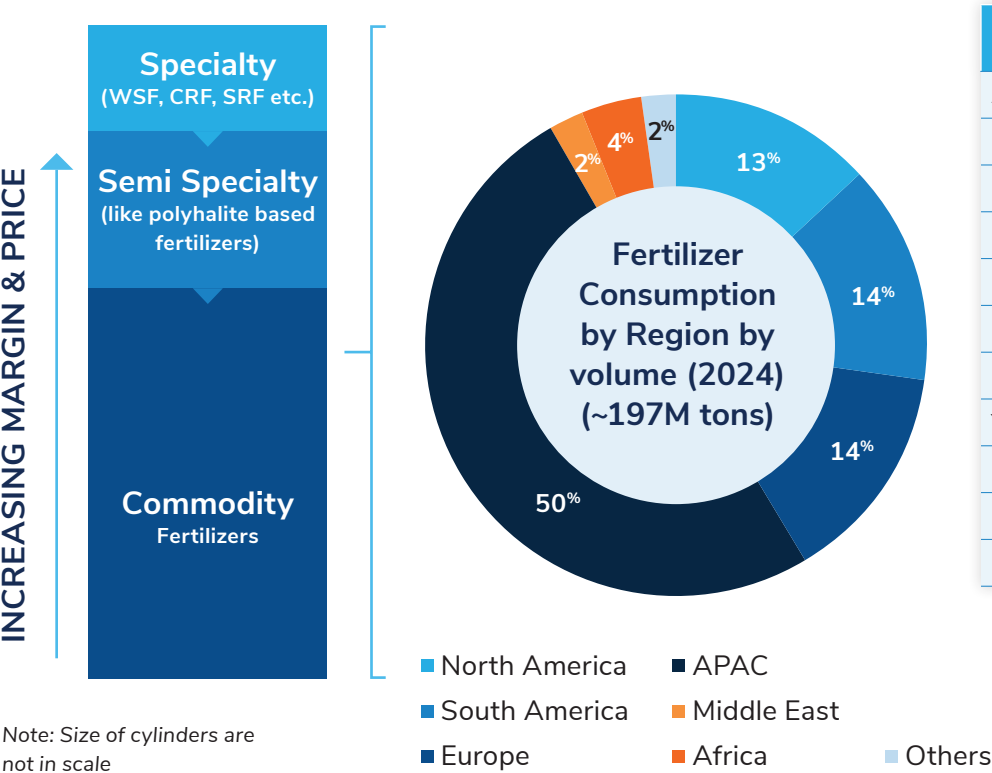
Together, these forces form the backdrop for the fertilizer industry's reinvention.

GLOBAL MARKET SNAPSHOT: A SECTOR AT AN INFLECTION POINT

The global fertilizer sector remains essential to food security, but the composition of demand and competitive advantage is shifting.

Global Fertilizer Consumption Patterns

- ▶ Asia and the Americas remain the largest consumers for NPK Fertilizers.
- ▶ Europe faces structural capacity rationalization due to carbon/energy costs.



Major Companies	N	P	K
Arab Potash			✓
Nutrien	✓	✓	✓
Mosaic	✓	✓	✓
Belaruskali	✓	✓	✓
Uralkali			✓
K+S	✓	✓	✓
OCP	✓	✓	
Yara	✓	✓	✓
CF Industries	✓		
Eurochem	✓	✓	✓
ICL	✓	✓	✓

Source: Nutrien Factbook 2024 and Company benchmarking

Note: Consumption in million tons of nutrients

The Margin Migration

Profit pools are moving upwards:

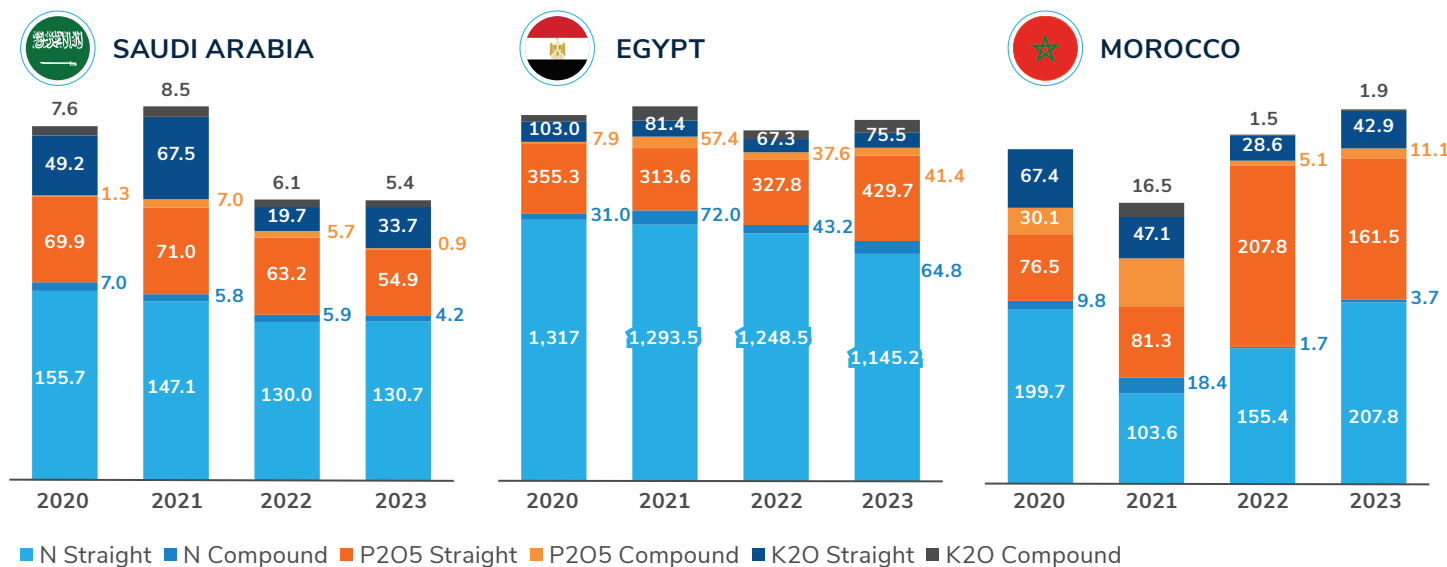
- ▶ Commodity fertilizers: volatile, thin margin
- ▶ Semi-specialty (e.g., polyhalite blends): moderate margin
- ▶ Specialty fertilizers: premium margin, premium adoption pathway

► Feedstock advantage anchors MENA in commodity N and P nutrients.

MIDDLE EAST OVERVIEW ON FERTILIZERS

MENA COMBINES GLOBALLY SIGNIFICANT NUTRIENT PRODUCTION CAPACITY WITH A SMALL NUMBER OF HIGH-IMPACT CONSUMPTION MARKETS

Key Markets, Primary Nutrient Consumption (‘000 Tons Of Nutrients)



The MENA Advantage

MENA is becoming strategically critical due to:

- Feedstock economics
- Geographic proximity to growth markets
- Government-backed supply chain reform
- Investments in downstream specialty capacities

FERTILIZER CAPACITY BY COUNTRY ('000 TONS OF NUTRIENTS PER YEAR) - 2023

N	Saudi Arabia	5,352	P	Morocco	8,085	Tunisia	2,123	K	Jordan	1,586
	Egypt	5,130		Saudi Arabia	3,107		Jordan			

Source: Nutrien Factbook 2024, IFASTAT

Global Competitor Moves

Leading producers have achieved scale and market leadership through:



Expanding retail footprints



Investing in R&D centers



Forming digital-advisory partnerships



Acquiring specialty fertilizer companies



Embedding farmer-centric ecosystems

The global market is no longer defined by scale — but by **strategic positioning, product mix, and downstream influence.**

GLOBAL COMPETITOR FOCUS AND ACTIONS

FERTILIZER PRODUCERS HAVE PRIORITIZED COST COMPETITIVENESS, STRENGTHENING SALES AND DISTRIBUTION; STRONG FOCUS ON R&D AND ACQUISITIONS

	ICL Group	Nutrien	Yara	OCP Group
R&D Infrastructure	Well equipped R&D Facility in 4 different regions	Partnered and collaborated with different companies	Multiple R&D and technology centers in Europe, India etc.	Founded UM6P and collaborated with companies & institutions
Sales & Distribution	More than 20 marketing offices around the globe	More than 2,000 retail outlets and distributors at different locations	More than 10,000 outlets; selling fertilizers in 140 countries	Partner with distributors to strengthen local distribution
Partnership & Acquisitions	Acquired 18 companies in different regions since inception	>45 acquisitions to develop retail network; partnered with research based companies	Acquired 26 companies and established 9 Joint Ventures	Established 5 joint ventures and 3 acquisitions
Mobile Apps for Farmers	Growers	Nutrien HUB	Yara Farmcare	@tmar, T@swiq
Partnership with Digital Solution Providers	Agrematch	BASF Acquired Agrile	IBM	Mohammed VI Polytechnic University

Source: Company annual reports

NATIONAL POLICY INTERVENTIONS

IMPACTING FERTILIZER TRADE AND COMPETITIVENESS

EGYPT



- ▶ Subsidized natural gas supports nitrogen-based fertilizer production
- ▶ 2025 price hike (\$1–2/MMBtu) offset by higher export quota flexibility
- ▶ Fertilizers taxed at reduced VAT of 5%
- ▶ \$0.8B in fertilizer subsidies enabling 2.4 MMT domestic supply

INDIA



- ▶ Green ammonia allocation increased from 550 → 750 KTPA under the National Green Hydrogen Mission
- ▶ Fixed nutrient-based subsidy (NBS) for phosphatic & potassic fertilizers (~\$4.2B in 2025)
- ▶ Urea price controlled; DAP receiving special support
- ▶ Key inputs (ammonia, sulfuric, nitric acid) moved into 5% GST slab (Sept 2025)
- ▶ Growing demand for WSF & early-stage adoption of CRF

CHINA



- ▶ Import tariff quota (13.65 MMT) to protect domestic producers
- ▶ Dual pricing system separates domestic & export markets
- ▶ Domestic fertilizer affordability tightly regulated
- ▶ Strong push for high-efficiency fertilizers (green-agri subsidies)

Strategic Implication:

National policy is now a hard competitiveness lever. Winning markets depends on subsidy flow, import controls, carbon cost, and feedstock economics — not only demand.



THE SPECIALTY FERTILIZER OPPORTUNITY: THE INDUSTRY'S NEW VALUE POOL

Specialty fertilizers are transitioning from niche products to mainstream growth drivers.

1. Water Soluble Fertilizers (WSF)

High compatibility with fertigation, precision dosing, and crop-specific nutrition needs. Strongest growth across India, China, LATAM, and Middle East.

2. Controlled Release Fertilizers (CRF)

Granular technologies with polymer coatings enabling multi-week to multi-month nutrient release. Growing adoption in high-value crops and sustainability-driven markets.

3. Slow Release Fertilizers (SRF)

Microbial-activity-based nutrient release. Opportunity for innovation in coating technologies and blended nutrient systems.

4. Chelated Micronutrients

Critical for alkaline and sandy soils. Rising demand with modern irrigation systems.

5. Biostimulants

A high-growth category enabling:



Stress
tolerance



Crop productivity
improvements



Enhanced
nutrient
uptake



Sustainable
farming
compliance

Specialty fertilizers are the fastest-growing segment — and the most strategic one.



Why the need for High-Efficiency Fertilizers Is Rising

- ▶ Reduce nutrient loss, improve application efficiency.
- ▶ Enhance yield through precision delivery.
- ▶ Support sustainability and soil health.
- ▶ Work synergistically with drip/fertigation systems.
- ▶ Critical for regions with water scarcity.

THE FROST & SULLIVAN FERTILIZER GROWTH PLAYBOOK

To win in this new environment, fertilizer companies must embrace a new set of strategic imperatives.

1. Rebalance portfolios toward specialty, water-soluble, and crop-specific solutions



Shift away from commodity concentration and build vertically integrated specialty lines.

2. Redesign Cost Structures & Feedstock Strategies



Secure advantaged feedstock access and optimize asset footprints for carbon competitiveness.

3. Move Closer to Farmers



Build omnichannel retail, agronomy services, and digital advisory platforms that lock in relationships.



4. Form Targeted Partnerships Across the Ecosystem



Secure capabilities through partnerships with:

- ▶ Technology providers
- ▶ Digital platforms
- ▶ Input manufacturers
- ▶ Regional distributors

5. Embed Sustainability into Product Positioning & Economics



Align nutrient-use efficiency with carbon reduction, water stewardship, and soil health outcomes.

This playbook allows market leaders — and new entrants — to build future-proof business models grounded in high-margin, high-impact growth.

WHY FROST & SULLIVAN

Your Partner in Navigating a Disrupted Fertilizer Landscape

Frost & Sullivan brings a unique combination of:

Deep Domain Expertise

65+ years supporting global fertilizer, agrochemical, and nutrient industries with strategic transformation, feasibility, and investment decisions.

Fertilizer-Specific Track Record

Extensive experience across:



Urea, DAP, AN, NPK complexes



Specialty fertilizers



Derivative chemicals



Phosphates, potassium, nitrates



Biostimulants & adjacent inputs

Global Footprint & Market Access

Teams across Middle East, India, Europe, and the Americas with access to value chain stakeholders, farmer communities, supply chain operators, and regulators.

Growth Pipeline Engine™

A proprietary framework used by global enterprises to identify, evaluate, and operationalize growth opportunities.

End-to-End Capabilities

From market analysis to feasibility studies, business model design, GTM strategies, M&A screening, financial modeling, and implementation support.

Proven Impact Through Case Studies

Our work has shaped multi-billion-dollar investments, diversification strategies, and new market entry blueprints for fertilizer market leaders.



CASE STUDY 1

PORTFOLIO FINALIZATION FOR SULFUR-BASED FERTILIZERS

The Challenge

A major industrial group in the GCC region sought to assess the viability of establishing a sulfur-based fertilizer unit as part of a broader petrochemical and O&G growth strategy. The client needed a structured, defensible view on the most attractive sulfur based products, target capacities, and investment pathway.

Our Approach

Frost & Sullivan executed a **multi-phase, data-driven portfolio and feasibility assessment**, including:

- ▶ Shortlisting **nine sulfur-based fertilizer products** based on global sulfate derivative and feedstock analysis.
- ▶ Leveraging **in-house market intelligence** and comprehensive secondary research.
- ▶ Conducting **discussions with manufacturers, distributors, end users, and influencers** across key regions.
- ▶ Performing **market segmentation and sizing**, including demand forecasts, application segments, drivers, and long-term outlook.
- ▶ Developing **global and regional supply-demand scenarios**.

- ▶ Undertaking **competitive benchmarking** across portfolios, market shares, and producer strengths.
- ▶ Benchmarking **cost of production** across major global regions.
- ▶ Conducting a **preliminary techno-economic review** covering process design options, CAPEX, logistics, utilities, manpower, and operating costs.
- ▶ Collating and analyzing qualitative and quantitative insights to support investment decisions.

Outcome

Phase 1 delivered an **investment-grade roadmap**, including:

- ▶ Recommended **product portfolio** and **target capacity**.
- ▶ Identification of the **most attractive markets** and **customer segments**.
- ▶ Comprehensive **competitive landscape** and **pricing structure**.
- ▶ A strong foundation for **Phase-2 techno-economic feasibility**.

Decision Enabled

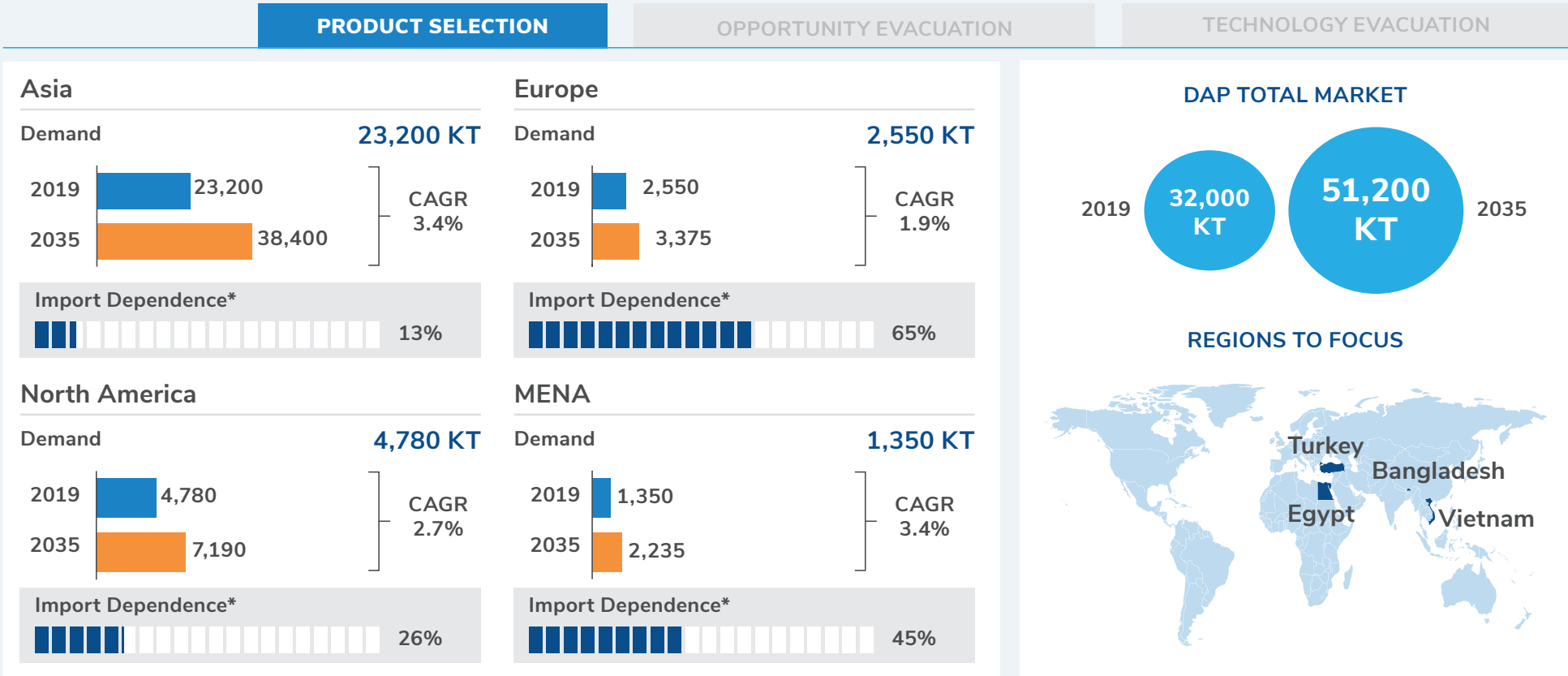
The client adopted Frost & Sullivan's recommendations - including product mix, market priorities, and capacity configuration—as the formal blueprint for detailed feasibility and subsequent investment activation.

SAMPLE DELIVERABLES

MARKET OVERVIEW AND GEOGRAPHICAL SEGMENTATION

GLOBAL MARKET OVERVIEW: DI AMMONIUM PHOSPHATE (DAP)

DAP is the world’s most widely used phosphorus fertilizer. Asia is the supply base of the world with MENA emerging as credible alternative.



* Refers to Inter-regional imports only (from outside the region)
ROW or the regions beyond the scope amount for another 577 KT and includes South America, Oceania etc.

All numbers are rounded. Source: UN Comtrade, ITC TradeMap, Frost & Sullivan Analysis

SAMPLE DELIVERABLES

PROPRIETARY ANALYTICS CONFIGUR8™ FRAMEWORK

We use a proprietary tool: Configur8™ GTM framework – to capture critical to win parameters of every GTM option for each product

Market Demand

32,000 KT

Versatile and well penetrated product with applicability across cropping systems.

Growth Potential

3.2%

2020 to be a slow year but growth expected to get back on track post 2021

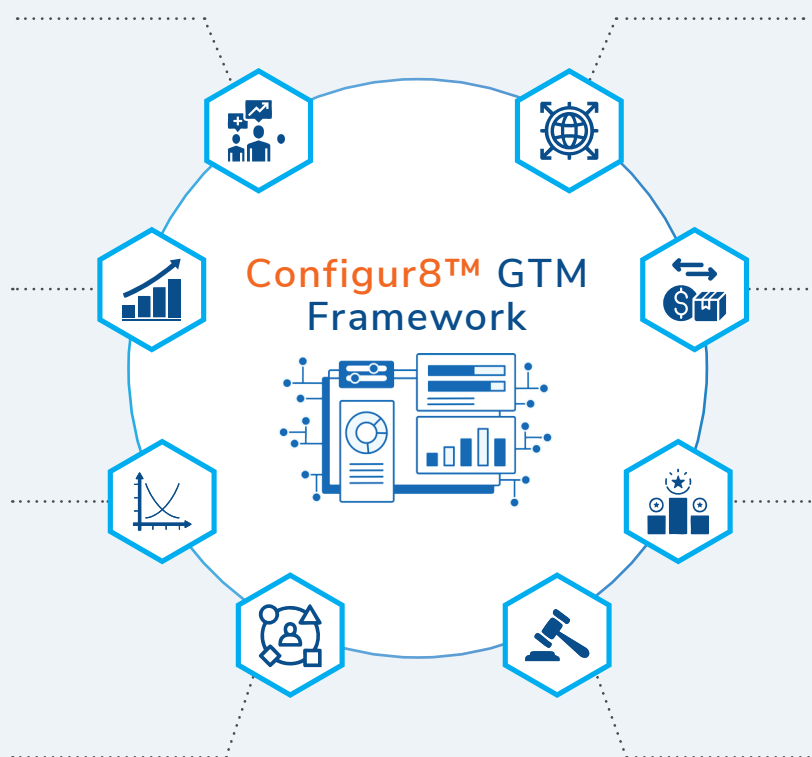
Demand Supply Equilibrium

Average Utilization Rate:

64% Driven up by nearly **90%** in Asia but dragged down by mid **70%** of EU & NA.

Application Diversity

Agriculture, Fermentation, Fire Retardants and Chemical additives are key applications; Agriculture application **68%**



Inter Regional Trade

18,857 KT

Globally traded product with hub in China

Intra Regional Trade

16,389 KT

Dominated by trade within Asia and EU

Competitive Intensity

20-25 key companies Sinofert (Sinachem), OCP and Nutrien are prominent players to benchmark

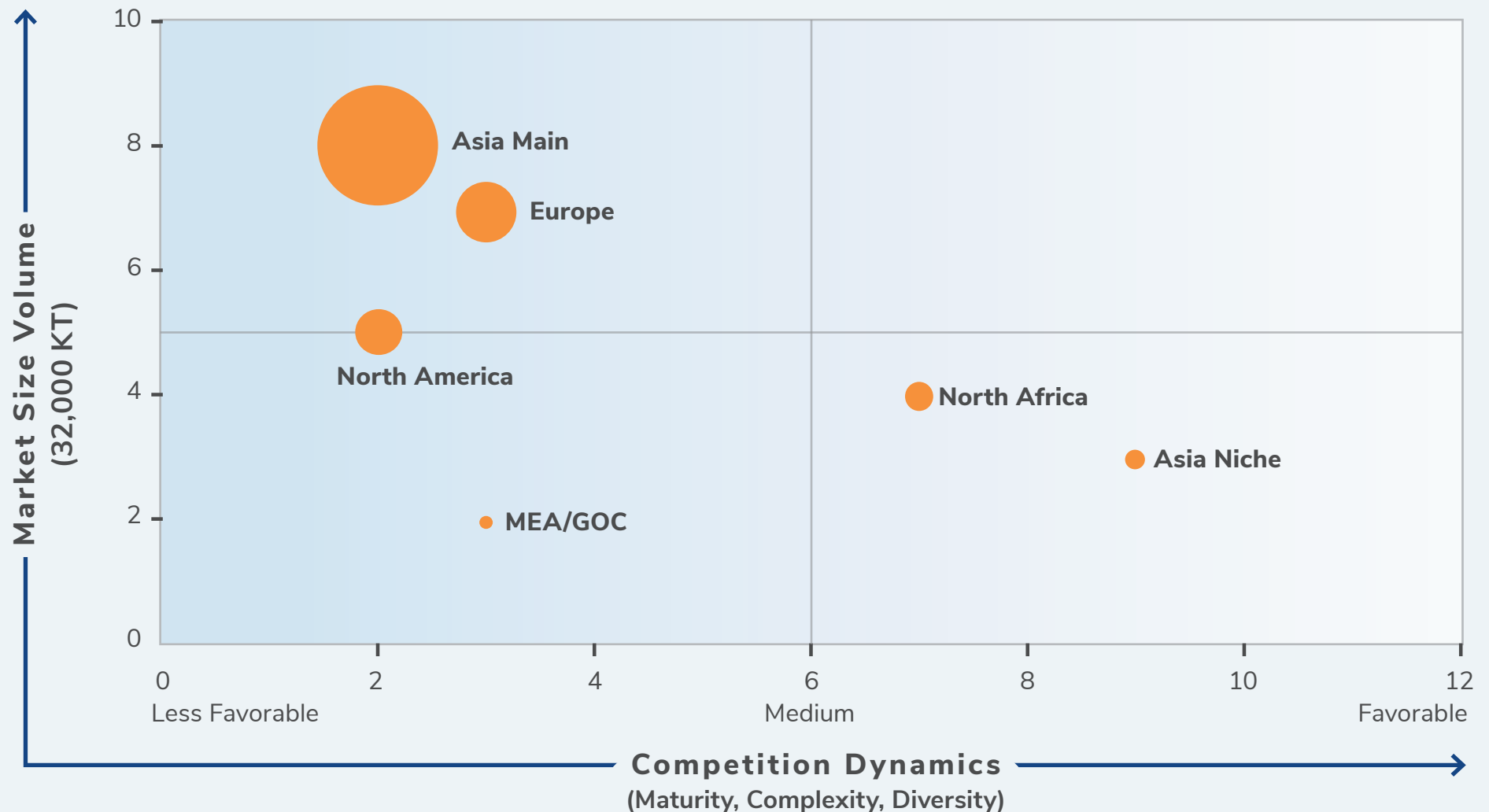
Regulatory Impact

Low; Majorly Europe Production and Dispersion norms.

All numbers are rounded. Source: UN Comtrade, ITC TradeMap, Frost & Sullivan Analysis

SAMPLE DELIVERABLES

GLOBAL MARKET ATTRACTIVENESS MAPPING

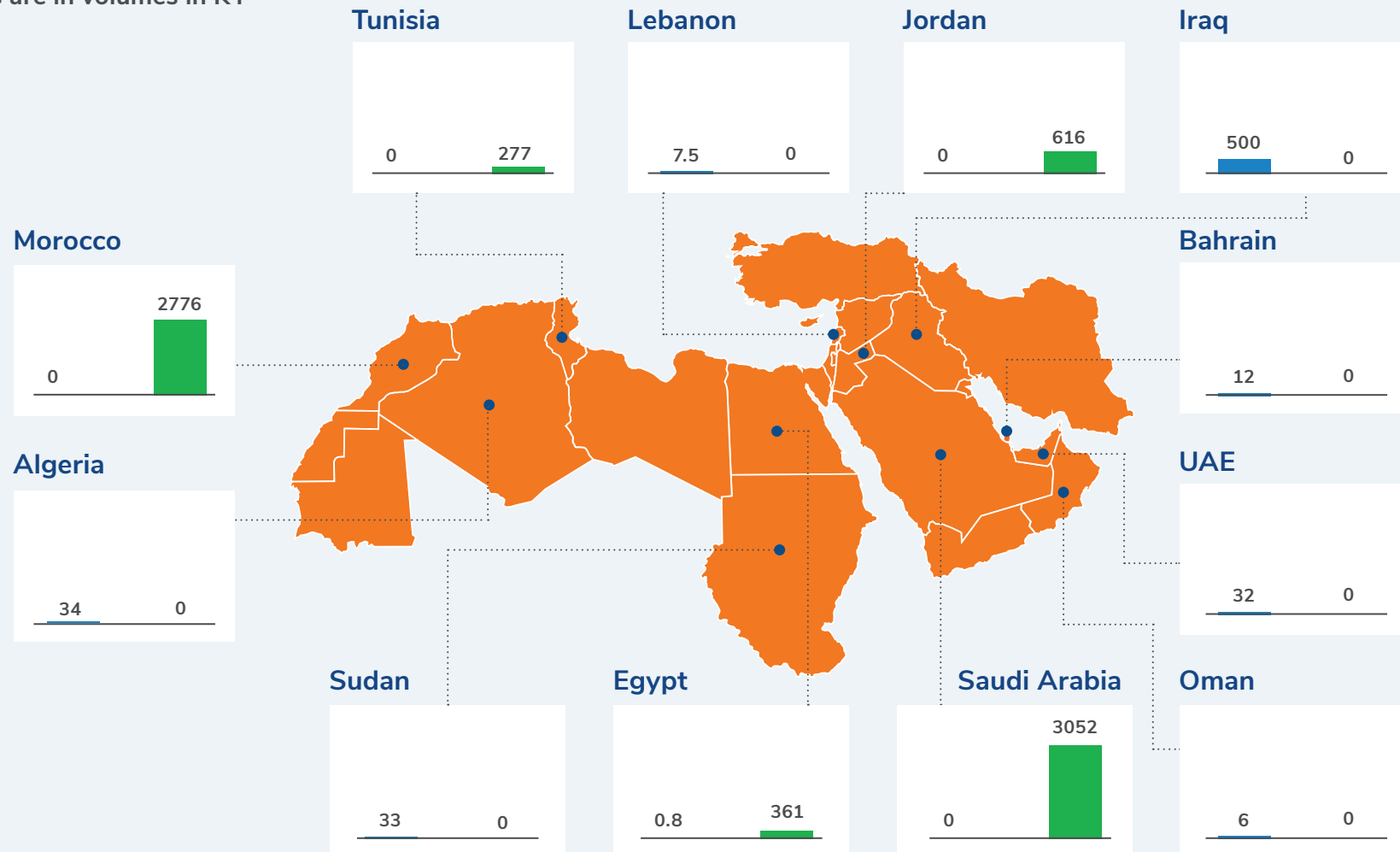


SAMPLE DELIVERABLES

REGIONAL TRADE MAPPING

All units are in volumes in KT

■ Import ■ Export



All numbers are rounded. Source: UN Comtrade, ITC TradeMap, Frost & Sullivan Analysis

CASE STUDY 2

GROWTH STRATEGY FOR VERTICAL & HORIZONTAL DIVERSIFICATION — FERTILIZER GROUP

The Challenge

A fertilizer group aimed to drive long-term growth by **vertically diversifying** into specialty fertilizers and chemicals and **horizontally expanding** into minerals. The leadership required a structured, fact-based strategy to evaluate opportunities, partnerships, and phased investments.

Our Approach

Frost & Sullivan conducted a **multi-step strategic assessment**, including:

- ▶ **Value chain mapping** across chemicals, specialty fertilizers, and minerals.
- ▶ Evaluation of **production capabilities**, synergies, and adjacencies across group entities.
- ▶ Country **advantage assessment** covering feedstock, infrastructure, and policy.
- ▶ **Competitor benchmarking** and best practice extraction from global leaders.

- ▶ Detailed **market analysis** (sizing, attractiveness, growth potential) across priority segments.
- ▶ **Opportunity prioritization** based on viability, alignment, and strategic fit.
- ▶ Identification of **strategic partners** to accelerate capability development.
- ▶ **High level financial feasibility** to support phased investment.

Outcome

The engagement produced:

- ▶ A prioritized portfolio of growth opportunities across specialty fertilizers, chemicals, and minerals.
- ▶ Defined success factors, risks, and mitigation levers.
- ▶ Partner landscapes and collaboration pathways.
- ▶ A phased investment roadmap aligned with market attractiveness and internal capability.

Decision Enabled

The client aligned its long-term diversification blueprint with Frost & Sullivan's recommendations. Several opportunities progressed into feasibility, partnerships, and capital planning, forming the foundation of the group's multi-year growth strategy.



SAMPLE DELIVERABLES

GROWTH STRATEGY FOR DIVERSIFICATION FOR FERTILIZER GROUP

To shortlist the most relevant opportunities both **market growth dynamics** as well as **strategic fitment with xx, MENA and Global ecosystem and growth ambitions** have been considered.

SHORTLISTING DIMENSIONS



Commercial Attractiveness (50%)

- Global demand
- Global demand growth
- Regional demand
- Regional demand growth
- Supply Gap
- Application diversity



Strategic Attractiveness (50%)

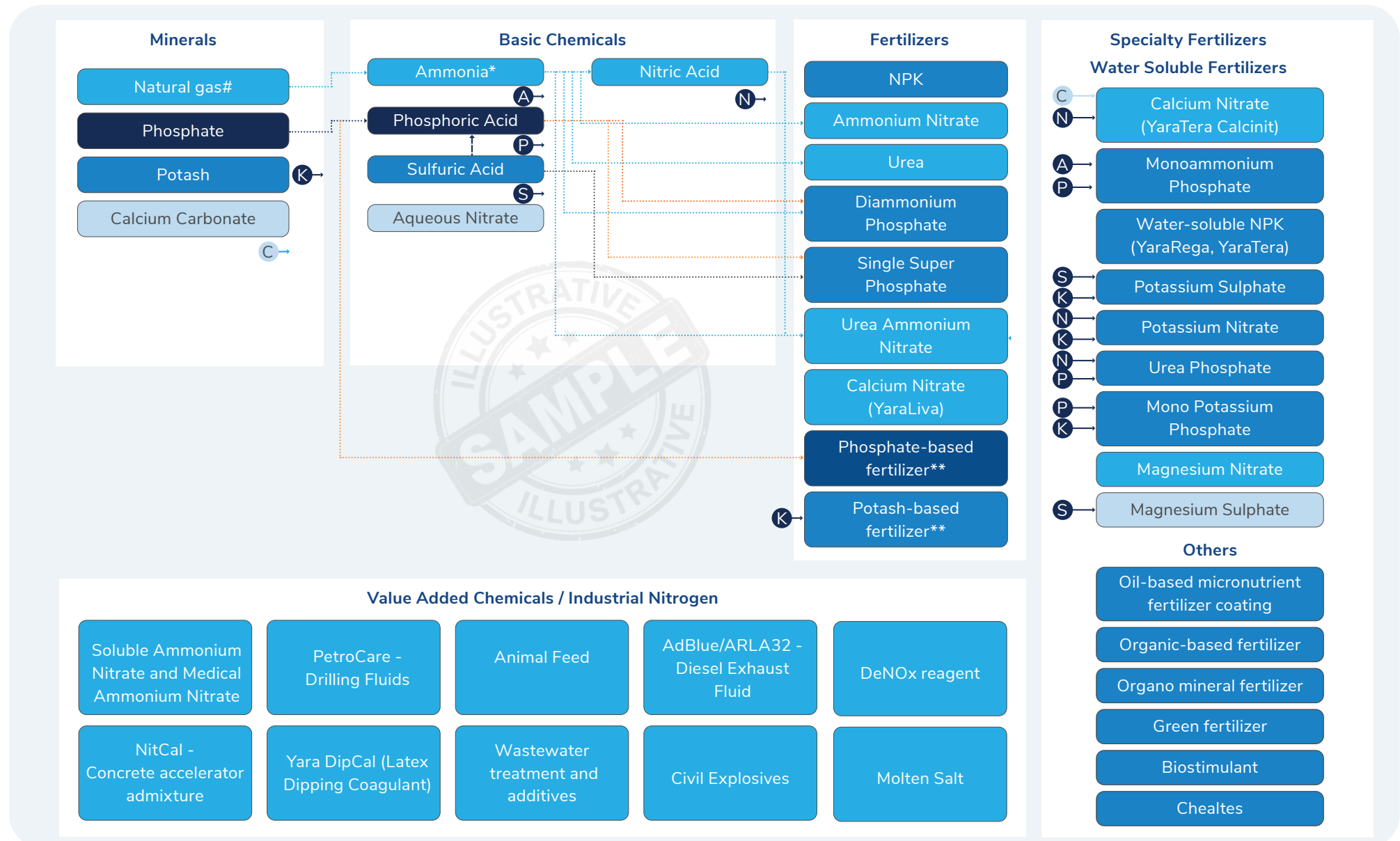
- Strategic fit
- Feedstock availability
- Cost competitiveness
- Technology availability
- Threats / Challenges
- Environment Risks

Products Coverage

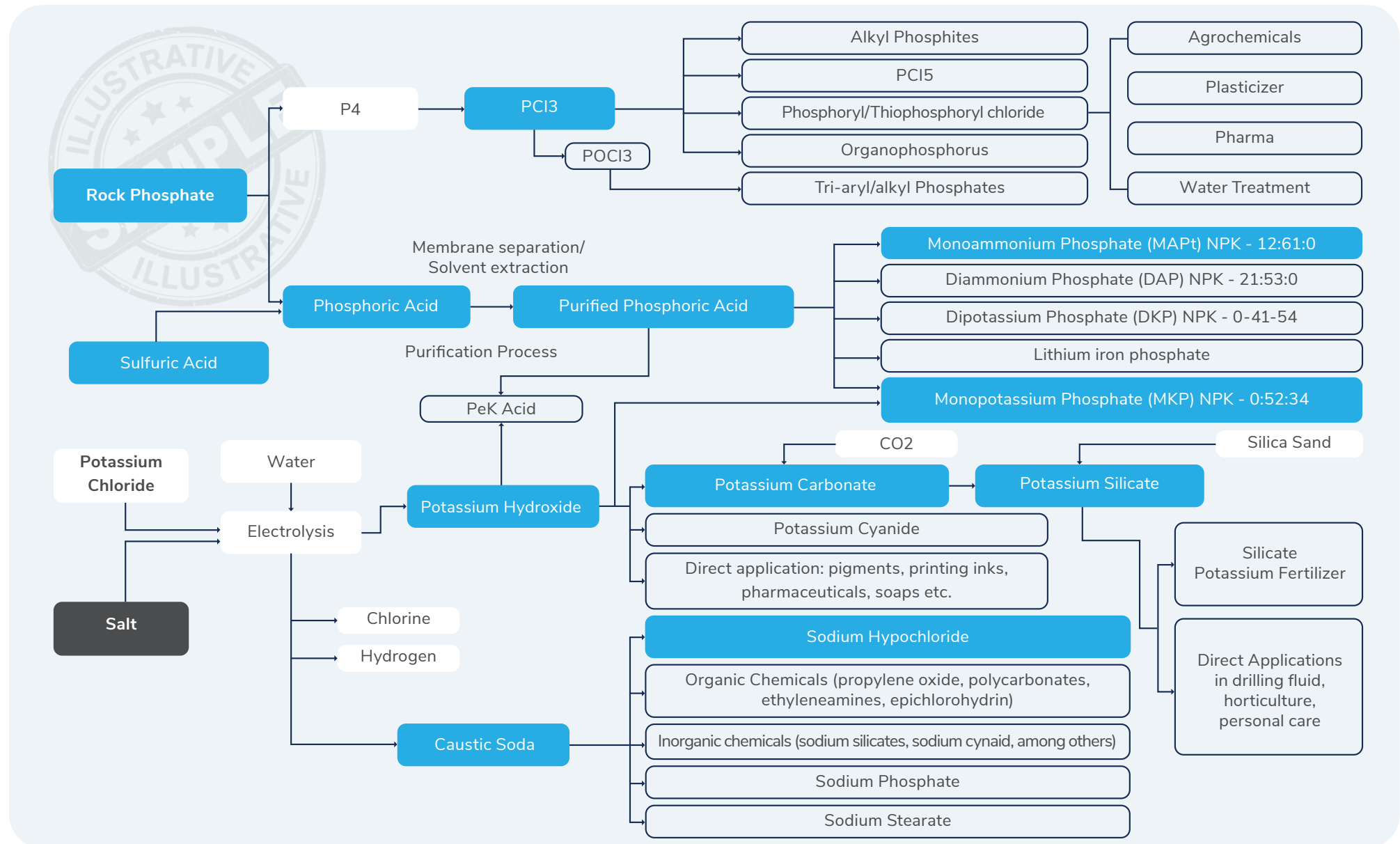
Specialty Fertilizers

- Water Soluble Fertilizers
 - Individual products
 - Monopotassium Phosphate (MKP)
 - Monoammonium Phosphate Technical (MAPt)
 - Calcium Nitrate (CN)
 - Potassium Nitrate (NOP)
 - Potassium Sulphate (SOP)
 - Magnesium Nitrate

SAMPLE DELIVERABLES

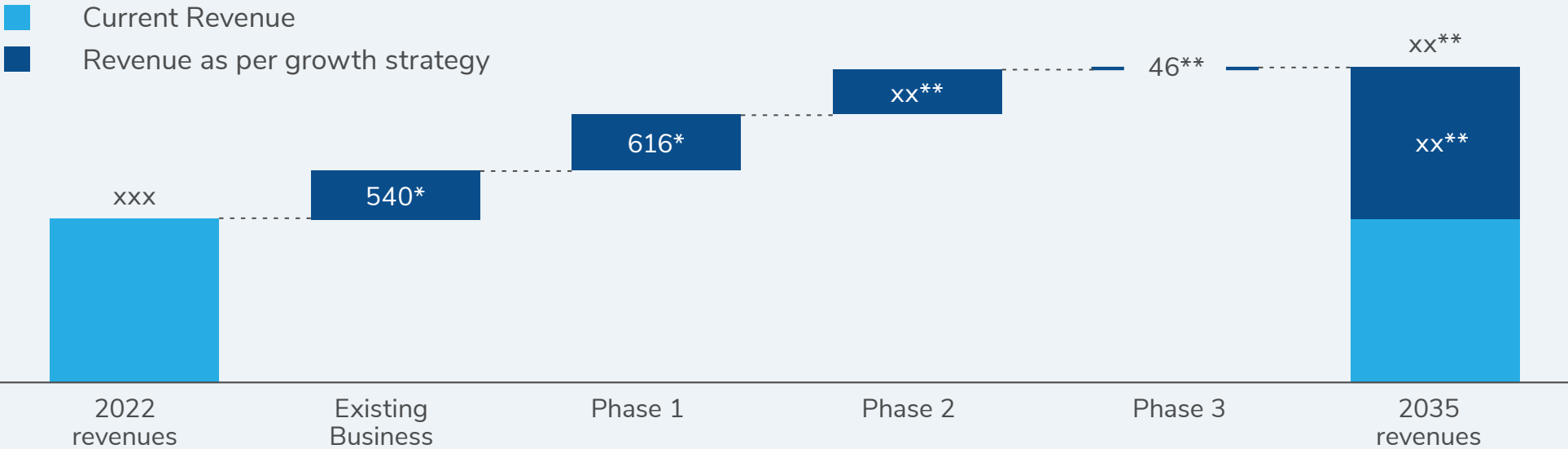


SAMPLE DELIVERABLES



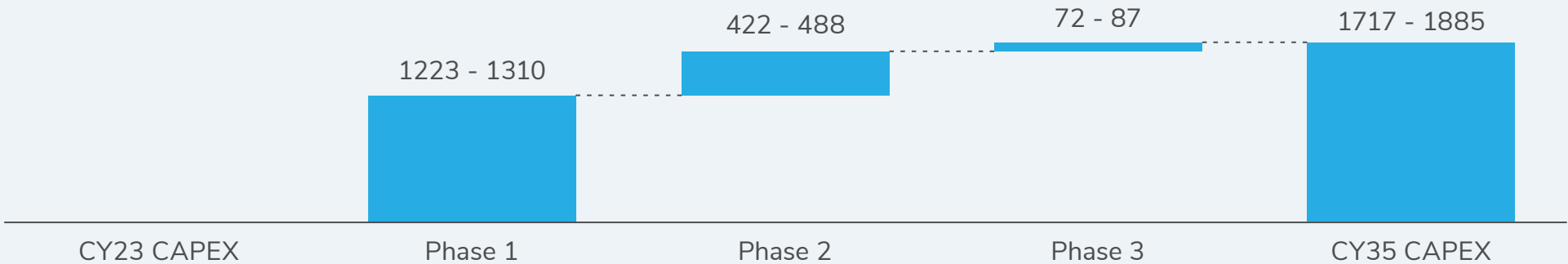
SAMPLE DELIVERABLES

Potential Revenues¹, mn USD



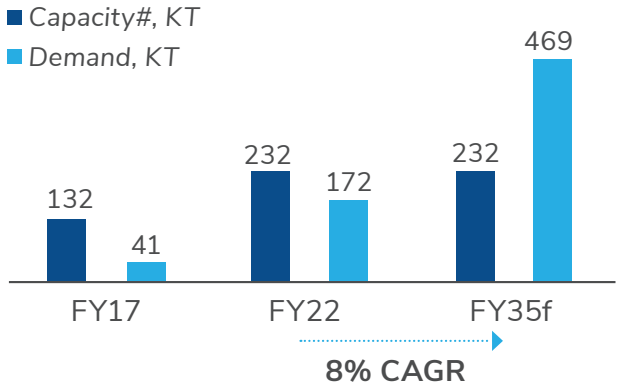
GROWTH STRATEGY FOR DIVERSIFICATION FOR FERTILIZER GROUP

Phase wise Investment Amount (CAPEX, mn. USD)

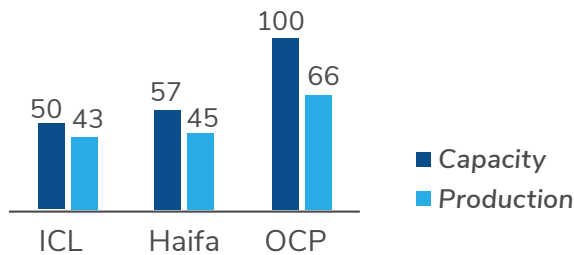


SAMPLE DELIVERABLES

MENA: Competitive Landscape



Distribution of Installed Capacity (KT), 2022



- The demand is met by indigenous production in the region
- OCP, based in Morocco, is the largest producer of MAPt in MENA along with ICL and Haifa. Currently, both the companies are not planning for any expansion

Capacity in KTPA



~100

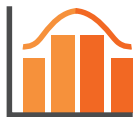
Phase-1: CAPEX

Average in Million US Dollars ~50 to ~55

Land Area Required

Area (hectares) ~7 to ~8

Expected Revenue



Expected Revenue in 2033 58 MN USD

Profit Margin (%)



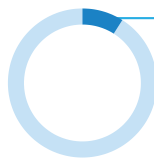
20 to 25%

ROI (%) 2035



27%

IRR (%)



9%

Expected Payback Period



64

Months

Note: All data is for representation only and not to be considered as actual quantification

SAMPLE DELIVERABLES

ORGANIZATIONAL CHANGES



Cross-functional teams

- Break down silos between production, R&D, marketing, sales

Empowered regional teams

- Autonomy to adapt strategies and offerings to local needs

Dedicated sustainability department

- Lead sustainability initiatives and ensure regulatory compliance

Talent development

- Attract and retain experts in key capability areas

ASSESSING CURRENT STRENGTHS, WEAKNESS, OPPORTUNITIES, AND THREATS

STRENGTHS



Strong production expertise, established customer base, regional market leader.

WEAKNESS



Limited market diversification, operational inefficiencies, potential environmental concerns.

OPPORTUNITIES



Growing global potash market, increasing demand for sustainable practices, potential for new.

THREATS



Competition from new producers, fluctuating potash prices, stricter environmental regulations.



IMPLEMENTATION APPROACH

Pilot initiatives

- Test new concepts before large-scale rollout

Change management training

- Equip leaders and employees to drive transformation

KPIs to track progress

- Quantitative metrics to monitor transformation impact

Stakeholder engagement

- Secure buy-in from all stakeholders for successful implementation

SAMPLE DELIVERABLES

Specialty Fertilizer Market Dynamics

- Specialty Fertilizer differ across regions (Europe, MENA, Americas).
 - Build well-qualified R&D teams tailored to each specialty fertilizer segment



Market Volatility

- Conduct through market research and forecasting
- Develop flexible pricing strategies and build a diverse customer base
- Pricing strategy is a critical aspect navigating the RM price volatility



Financial Constraints

- Difficulty balancing investments in R&D, acquisitions, and existing operations
- Prioritize investments based on potential return and strategic fit



R&D Capabilities

- Build qualified R&D teams for each specialty segment
- Continuous investment in R&D can lead the company to develop new formulations & have patents



Technical Expertise

- Invest in a diverse technical team who have deep knowhow in application engineering across the 3 core sectors
- Focus on meeting specific customer needs for specialty products



Execution Challenges

- Difficulty integrating new business and technologies seamlessly
- Develop a comprehensive growth strategy with clear timelines and milestones

SHAPE THE FUTURE OF FERTILIZERS **WITH FROST & SULLIVAN**

The next decade will redefine the global fertilizer industry — and the companies that act now will secure outsized advantage.

Whether you are a market leader, investor, or a new entrant, Frost & Sullivan can help you:



Decode market disruptions



Strengthen downstream channels



Identify high-value opportunities



Design investment-grade feasibility



Build differentiation in specialty fertilizers



Accelerate transformation



Enter new markets

**LET'S BUILD YOUR
GROWTH BLUEPRINT.**

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