

CATALYSTS

**MAADEN LOCALIZATION
OPPURTUNITY CARD**



CATALYSTS

OPPORTUNITY SUMMARY

Case Summary

Recurring Spend Base

Catalysts are used across a range of industrial processes and require periodic replacement, regeneration, or maintenance during operating cycles and plant turnarounds.

Current Supply Structure

Supply of many catalyst types is concentrated among a limited number of specialized international suppliers and technology providers.

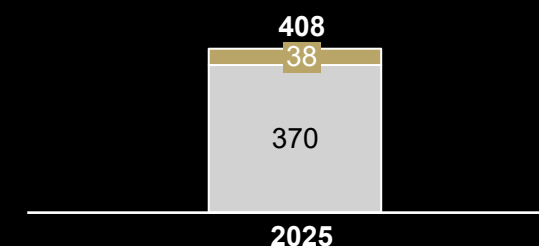
Localization Potential

Selective manufacturing and regeneration may enable value capture locally

Indicative Market & Maaden Consumption

GCC demand, mn SAR (2025)

■ Maaden Demand ■ Rest of GCC Demand



CATALYSTS

Localization Opportunity Overview

1

Catalyst Consumption Patterns

Maaden's catalyst spend is concentrated in a small number of bulk catalyst families, with replacement driven by turnaround cycles, resulting in relatively predictable and recurring demand rather than one-off purchases

2

High Import and OEM Dependence

The majority of catalysts are imported from a limited set of global OEMs, which may result in longer lead times and increased operational exposure during plant shutdowns.

3

Service-Led Localization Potential

While fresh catalyst synthesis is IP-protected, value may be captured locally through regeneration, handling, screening, loading, unloading, and lifecycle services

4

Selective Manufacturing Potential

Certain inorganic catalysts—such as zinc oxide sulphur removal media and inert alumina supports—are technically simpler and may offer pathways for local manufacturing and import substitution

5

Potential Platform for Expansion

A local catalyst services and selective manufacturing platform may scale across Maaden's phosphate, aluminum, and chemicals operations, with potential to expand to third-party industrial users over time

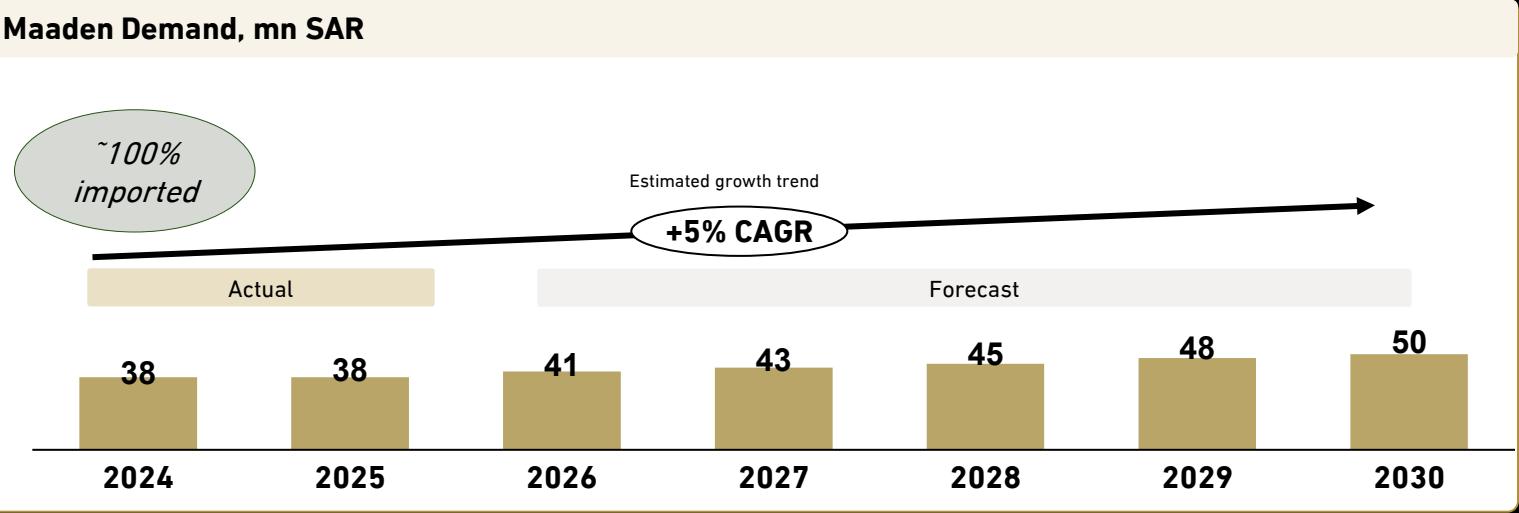
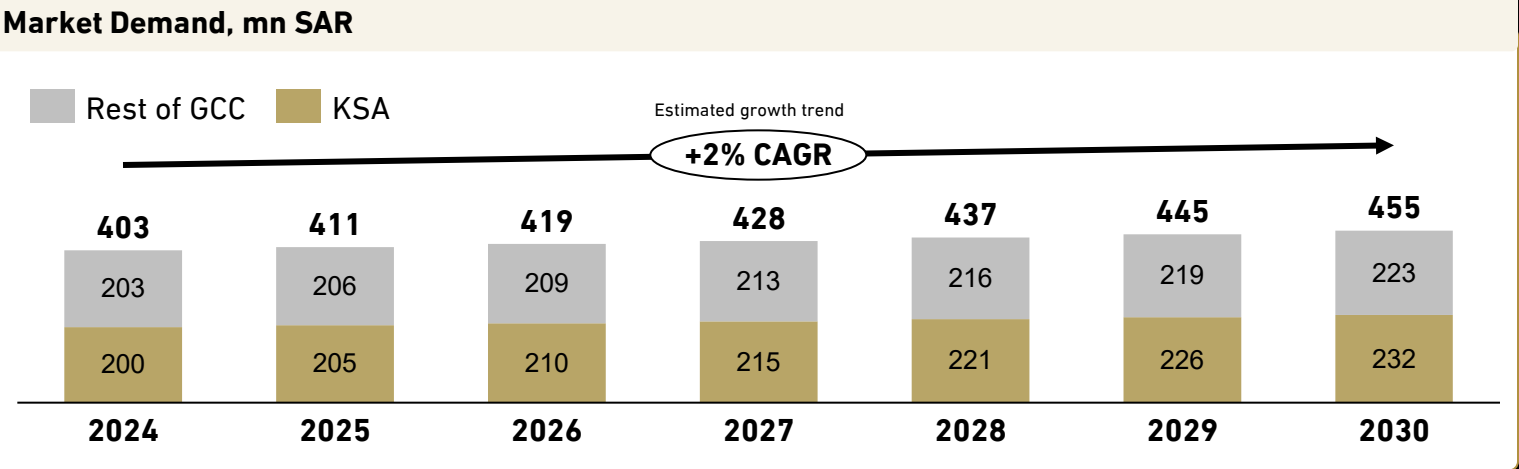
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VALUE CHAIN

Key Types	Value Chain			Illustrative Share of Catalyst Consumption Categories	Localization Potential
1 Zinc Oxide (ZnO) Sulphur Removal Catalysts	ZnO powder from zinc concentrates or recycled zinc streams	Pelletizing or extrusion into sulphur-absorbent shapes	Calcination to activate sulphur removal performance	20-25%	
2 Sulfuric Acid Plant Catalysts (Vanadium-based)	Silica or alumina ceramic carrier rings	Vanadium compound impregnation onto carrier	Finishing and screening to converter-pass specifications	15-20%	
3 Shift Catalysts (High- and Low-Temperature)	Iron–chromium or copper-based oxide precursors	Pellet or cylindrical shaping for fixed-bed reactors	Thermal activation and conditioning	40-45%	 <i>Potential partnerships with OEMs</i>

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MARKET DEMAND & SUPPLY



Market Trends & Demand Drivers

- 1 Industrial catalyst demand is driven by plant turnaround cycles rather than continuous consumption, leading to lumpy purchasing patterns and high spend concentration
- 2 Global catalyst supply is highly concentrated among a small number of OEMs, which may provide licensors with pricing influence and limiting buyers' ability to diversify
- 3 Lead times for catalyst supply and replacement have increased, especially for licensed and customized formulations, potentially increasing operational risk
- 4 Regeneration and reuse of catalysts is growing globally as operators aim to reduce cost, shorten lead times, and manage waste

CATALYSTS

The KSA ecosystem comprises six main categories, supported by key enablers

