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SME Electrical

Presented by: Khaled AlGhadhban

Business Opportunities Workshop

January 14th, 2025

SME Electrical Workshop

Catalyzing Supply Chains

This presentation may contain certain forward-looking statements. All statements other than statements relating to historical facts are, or may be deemed to be, forward-looking statements. Forward-looking statements include, but are not limited to, statements related to future events or to the company's future financial or operating performance such as the company's expectations and projections regarding its growth, initiatives and strategies, capital expenditures and investments, customer and partner relationships, major projects and product development. These statements may generally, but not always, be identified by the use of words such as "target," "goal," "aim," "believe," "expect," "commit," "anticipate," "intend," "estimate," "should," "will," "shall," "may," "likely," "plan," "strategy," "initiative," "project," "outlook" or similar expressions, including variations and the negatives thereof.

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Introduction

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iktva Program Overview (1/2)

The In-Kingdom Total Value Add (iktva) program is designed to drive increased investment, economic diversification, job creation, and workforce development within the Kingdom

Saudi Aramco aims to achieve 70% localization of all spending

iktva in Procurement

2000+ Service contracts

290+ Corporate purchase agreements

Business Opportunities

12 Sectors

210 Business Opportunities

$28 bn Annual Market Size

Anchor Projects

IMI

SPARK

Tuwaiq

6 Anchor projects

Local Workforce Development

16 National training centers

90+ Programs

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Note: IMI = International Maritime Industries; SPARK = King Salman Energy Park

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iktva Program Overview (2/2)

Non-exhaustive

iktva Business Development Team Support

- Market Analysis
- Technical Engagement
- Operational Support and Advisory Services[1]

Government/Semi-government key enablers

- Financial Support
- Fiscal Incentives
- Land Solutions
- HR Development
- Regulatory Enablers

1. Includes broad range of support services provided by the team: user requirements, advisory on available financial and fiscal incentives, guidance on localization process in line with local regulations and standards, action plan development etc.

Why invest in KSA?

Non-exhaustive

Strong GDP growth and healthy economy	Big market and game-changing opportunities	Government incentives and enablers	Ease of doing business	Strategic global location	Favorable demographics
Top 20 economies globally	**5** Special Economic Zones drive innovation	**$1.3T+** invested in private sector by 2030	one of world's most rewarding tax systems	**12-15%** of global trade passes via Red Sea	**17%** population growth from 2013-2023
GDP growth among highest projected in 2025 in top economies	**6** giga projects driving urbanization and industry	**5.7%** contribution of FDI to GDP by 2030	**Top 5** in the MENA region for ease of doing business	KSA container ports are among the most efficient globally	**67%** of population below the age of 35

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Note: FDI = Foreign Direct Investment
Source: IMF; MISA; Vision 2030 Key Performance Indicators; Shareek Program; World Bank

How do we define what is an opportunity?

1 Growing market

High growth high spend markets

2 Limited local players & import driven

Markets with few local contributors and high import resilience

3 Technological & labor feasibility

Markets with accessible or standardized technology and available skilled labor

KSA SME Electrical 2024 market snapshot (Billion USD)

3.8

KSA market size for opportunities in today's SME Electrical workshop

6%

Forecasted 5-year CAGR

Nine Business Opportunities to be discussed today

1. Vacuum circuit breakers
2. Overhead Power Lines
3. Diesel generator
4. Dry type transformer
5. Electric induction motor
6. Cable Bus
7. Industrial Battery Charger
8. UPS System
9. Protective relays

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Agenda – SME Electrical Sector Business Opportunities

No.	Title of the Investment Opportunity	Presenter
	Introduction	Khaled AlGhadhban
1	Vacuum circuit breakers	Fatima Alessa
2	Overhead Power Lines	Fatima Alessa
3	Dry type transformer	Maha Al Zahrani
4	Electric induction motor	Maha Al Zahrani
5	Cable Bus	Hasan Al Khater
6	Diesel generator	Faten Abusaeed
7	Industrial Battery Charger	Faten Abusaeed
8	UPS System	Norhan Khoja
9	Protective relays	Norhan Khoja
	Closing Remarks	Khaled AlGhadhban

01

Vacuum circuit breakers

Presented by: Fatima Alessa

Vacuum Circuit Breaker (VCB)
Opportunity Profile

1
Vacuum Circuit Breakers present an attractive investment opportunity

Types

Vacuum circuit breaker

- Saudi Aramco 9COM **6000000843**

2
VCB market is expected to grow over next 5 years

102 — Estimated 2024 KSA market size (Million USD)

5% — Forecasted 5-year CAGR

3
Attractive investment opportunities for VCB value chain

KSA value chain opportunities

- Raw materials
- Manufacturing & Assembly
- Installation & Maintenance

KSA enablers

- Financial support
- Land and infrastructure
- Technical Enablers

Source: MRF; Grandview; Credence; Fortune Business Insights; Expert inputs; Team analysis

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Vacuum Circuit Breaker (VCB)
Potential Localized Categories

Type(s)	Vacuum Circuit Breaker

Applications

- Medium voltage systems (1kV to 38kV)
- Indoor Metal-Clad Switchgear

Key technical specifications

- Saudi Aramco 9COM **6000000843**
- 16-SAMSS-522
- 16-SAMSS-504

Source: MRF; Grandview; Credence; Fortune Business Insights; Expert inputs; Team analysis

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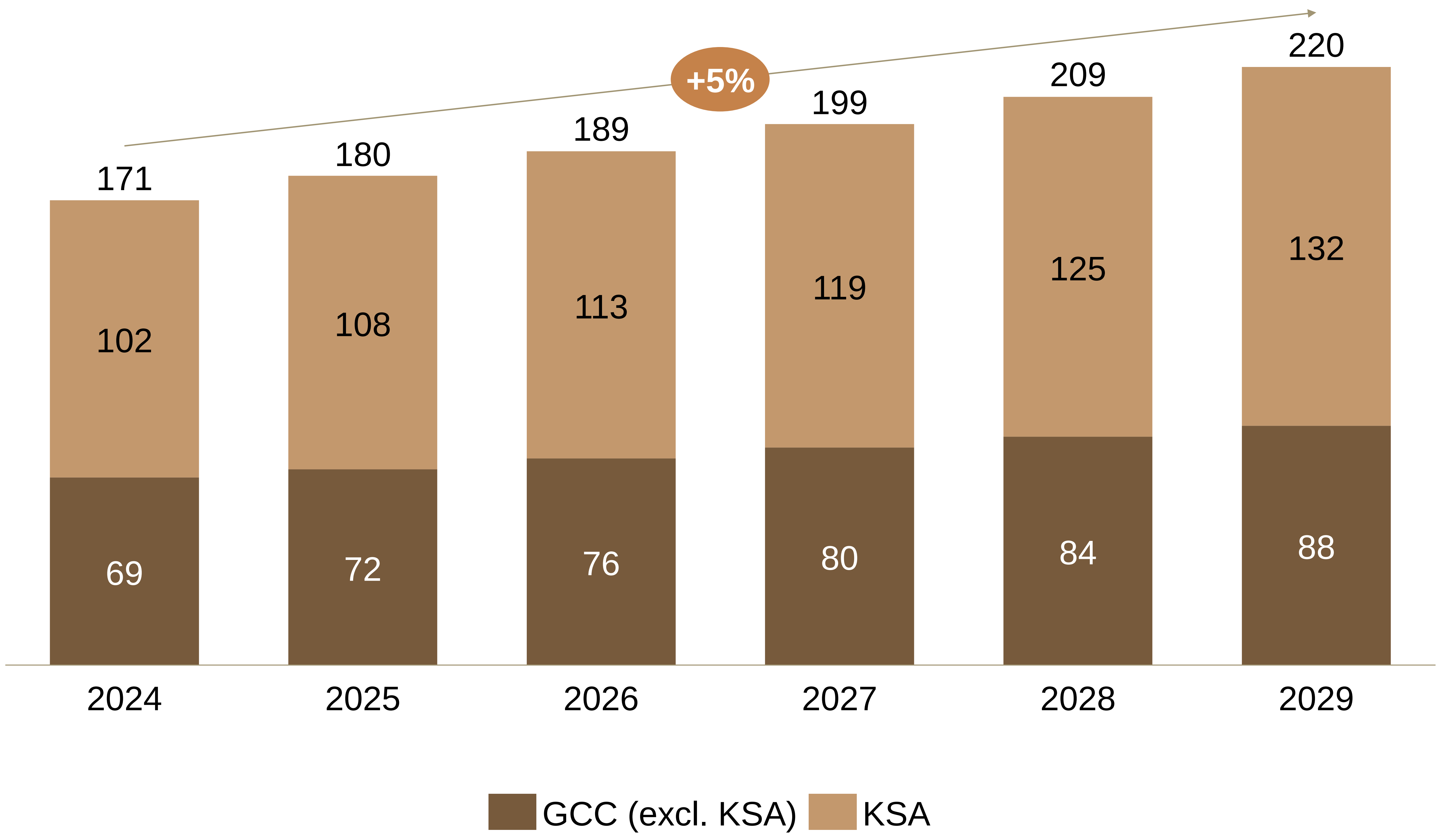
Vacuum Circuit Breaker (VCB)
Demand, Customers & Drivers

Forecasted KSA and rest of GCC vacuum circuit breaker market 2024-2029 (Million USD)



Vacuum circuit breakers customers in KSA

- Utilities & energy power systems
- Industrial players
- Critical Infrastructure[1]

Key KSA demand drivers

- Industrial expansion: With target of 36,000 factories by 2035, demand for high-capacity, electrical distribution systems is growing across industrial zones
- Infrastructure development: Development of smart grid technologies in ongoing megaprojects and need for efficient power management systems have led to increased demand for VCBs

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1. Metros, airports, transportation hubs, and megaprojects

Notes: VCB = Vacuum circuit breaker

Source: MRF; Grandview; Credence; Fortune Business Insights; Expert inputs; Team analysis

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Vacuum Circuit Breaker (VCB)
Value Chain and Key Localization Opportunities

	Raw materials	Manufacturing & Assembly	Installation & Maintenance
Local saturation	Some players	Few players	Few players
Current KSA value chain	• Raw materials required domestically available[1] with opportunity to localize copper refining and production Opportunity	• Opportunity to **manufacture VCBs in the Kingdom** • SME opportunities: manufacturing **metal enclosures, quality testing, sourcing of auxiliary components such as springs and seals** Opportunity	• Several local players currently providing servicing for electrical and power transmission equipment Opportunity

Key success factors

	Raw materials	Manufacturing & Assembly
Technology	Advanced refining and extrusion technology	Precision engineering tools like CNC machining for contact assemblies, and leak testing for vacuum interrupters
Labor	Skilled in process and quality control	Electrical engineers with expertise in precision machining and ability to work with CAD, vacuum technology specialists

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1. Steel; aluminum

Source: MRF; Grandview; Credence; Fortune Business Insights; Expert inputs; Team analysis

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Vacuum Circuit Breaker (VCB)
Investment Opportunity and Enablers

Key enablers in KSA to drive success

Localization incentives: Government programs – e.g., SIDF loan subsidies, Zakat & tax benefits, or export tax exemption

Land and infrastructure: Subsidized land and infrastructure in economic zones (e.g., Modon) reduce setup costs & accelerate

Widely available specialized labor: NCTC provides machinists, maintenance technicians, and equipment operators who can support manufacturing

Where is the opportunity

Raw materials

Opportunity to expand localization of copper production and refining in the Kingdom

Manufacturing & Assembly

Opportunity to increase localized manufacturing & assembly

For SMEs: metal enclosures, quality testing, sourcing of auxiliary components such as springs and seals, and assembly of VCB units

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Note: NCTC = National Construction Training Center

Source: MRF; Grandview; Credence; Fortune Business Insights; Expert inputs; Team analysis

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02

Overhead Power Lines

Presented by: Fatima Alessa

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Overhead Power Lines
Opportunity Profile

1

Overhead power lines present an attractive investment opportunity

Components

Galvanized Steel Line

Insulators

2

KSA is major demand of Total GCC demand

1,030 — Estimated 2024 KSA market size (Million USD)

4% — Forecasted 5-year CAGR

3

Attractive investment opportunities for Overhead Power Lines value chain

KSA value chain opportunities

- Raw materials
- Manufacturing & Assembly
- Installation & Maintenance

KSA enablers

- Government localization incentives
- Regulatory incentives
- Wide and qualified talent pool

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Catalyzing Supply Chains

Source: Global Market Insights; IEA; GaSTAT, Team analysis

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Overhead Power Lines
Potential Components Localized Categories

Components

Galvanized Steel Line

Insulators

Applications

- Power transmission networks
- Power distribution networks

- Overhead transmission insulation
- Insulation and mechanical support for distribution

Key technical specifications

- Saudi Aramco Engineering Standards (SAES-P-107)
- Saudi Aramco Material Specifications (14-SAMSS-603)
- Material Specifications (20-TMSS-02)
- Material Specifications (15-SDMS-02;15-TMSS-5)

Saudi Aramco 9COM Numbers:

- 6000000771:POLE; LINE; POWER DISTRIBUTION; STEEL
- 6000014870: POLE LINE; POWER TRANSMISSION, 69 KV
- 6000012401: OHL COMPOSITE INSULATOR FOR T & D

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Source: Global Market Insights; IEA; GaSTAT, Team analysis

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Overhead Power Lines
Overhead Power Line Components

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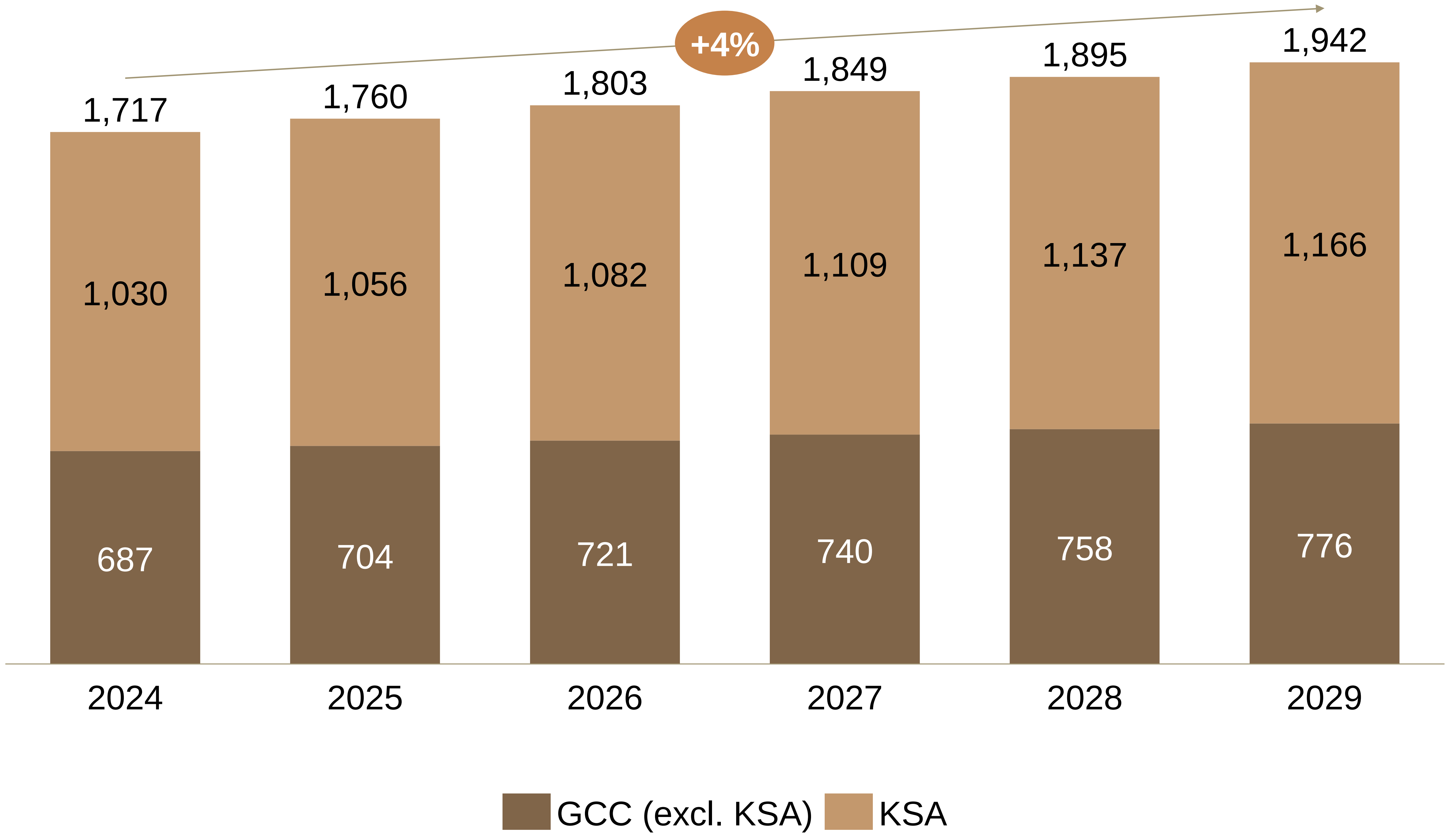
Overhead Power Lines
Demand, Customers & Drivers

Forecasted KSA and rest of GCC Overhead Power Line market 2024-2029 (Million USD)



Catalyzing Supply Chains

Overhead Power Line customers in KSA

- Oil & gas networks
- Utilities & energy power systems

Key KSA demand drivers

- Industrial expansion: Additional IBCs needed to support expansion of KSA industrial infrastructure – 36,000 plants expected by 2035
- Infrastructure development: Further overhead power lines required to support infrastructure development across megaprojects and existing city expansions

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Source: Global Market Insights; IEA; GaSTAT, Team analysis

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Overhead Power Lines
Value Chain and Key Localization Opportunities

	Raw materials	Manufacturing & Assembly	Installation & Maintenance
Local saturation	Few players	Few players	Few players
Current KSA value chain	• Opportunity to expand localization of galvanized steel, aluminum, copper, and FRP fittings Opportunity	• Opportunity to increase localized manufacturing & assembly • SME opportunities: provide **hardware fittings, additional wire, and FRP core and silicone housing protection** Opportunity	• Line installation and maintenance services Opportunity

Key success factors

	Raw materials	Manufacturing & Assembly
Technology	Processing equipment, CNC machines	Rolling, galvanization, and pultrusion equipment
Labor	Metallurgists, materials scientists, operators	Electrical engineers, machinists, technicians

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Note: FRP = Fiber Reinforced Polymer; CNC = Computer Numerical Control
Source: Global Market Insights; IEA; GaSTAT, Team analysis

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Overhead Power Lines
Investment Opportunity and Enablers

Key enablers in KSA to drive success

Localization incentives: Government programs – e.g., SIDF loan subsidies, Zakat & tax benefits, or export tax exemption

Land and infrastructure: Subsidized land and infrastructure in economic zones (e.g., Modon) reduce setup costs & accelerate

Widely available specialized labor: NITI provides machinists, maintenance technicians, and equipment operators who can support manufacturing

Where is the opportunity

Raw materials

Opportunity to expand localization of galvanized steel, aluminum, copper, and FRP fittings

Manufacturing & Assembly

Opportunity to increase localized manufacturing & assembly

For SMEs: provide hardware fittings, additional wire, and FRP core and silicone housing protection

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Note: NITI = National Industrial Training Institute

Source: Global Market Insights; IEA; GaSTAT, Team analysis

03

Dry type transformer

Presented by: Maha AlZahrani

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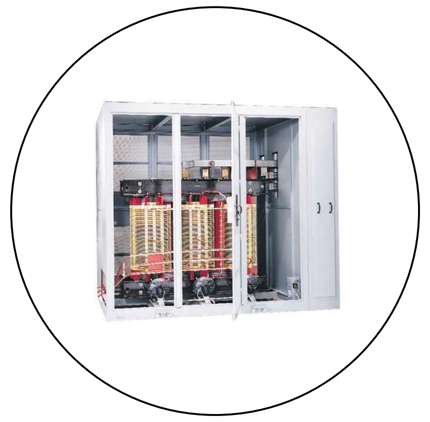
Dry Type Transformer
Opportunity Profile

1
Dry Type Transformers present an attractive investment opportunity

Key categories


Cast-Resin Dry-Type Transformers (CRT)


Vacuum Pressure Impregnated Transformers (VPT)


Ventilated Dry-Type Transformers

2
Dry Type Transformer is a growing market

306 — Estimated 2024 KSA market size (Million USD)

6% — Forecasted 5-year CAGR

3
Attractive investment opportunities for Dry Type Transformer value chain

KSA value chain opportunities

- Manufacturing & Assembly
- Installation & Maintenance

KSA enablers

- Government localization incentives
- Access to land and infrastructure
- Wide and qualified talent pool

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Catalyzing Supply Chains

Source: Fortune Business Insights; Allied Market Research; Grandview; Team analysis

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Dry Type Transformer
Potential Localized Categories

Type(s)

Cast-Resin Dry-Type Transformers	Vacuum Pressure Impregnated Transformers	Ventilated Dry-Type Transformers
		

Applications

Cast-Resin Dry-Type Transformers:
- Offshore platforms
- Refineries

Vacuum Pressure Impregnated Transformers:
- Petrochemical plants
- Substations

Ventilated Dry-Type Transformers:
- Onshore processing facilities
- Pumping stations

Key technical specifications

- Saudi Aramco Engineering Standards (SAES-P-121)
- Saudi Aramco Material Specifications (14-SAMSS-533)

Saudi Aramco 9COM Number:
- 6000000763: TRANSFORMER, POWER, DRY ABOVE 501 KVA

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Source: Fortune Business Insights; Allied Market Research; Grandview; Team analysis

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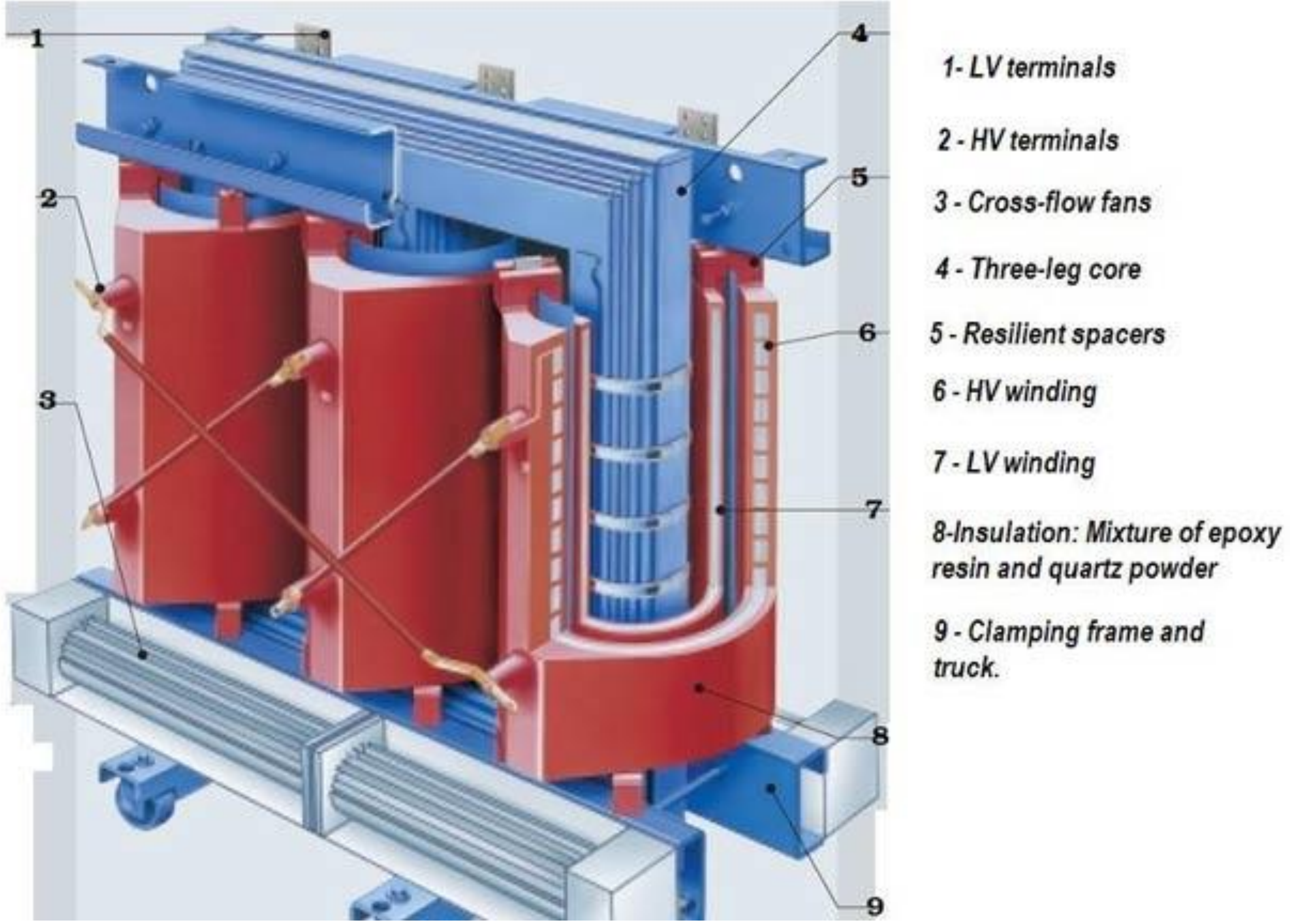
Key Components of Dry Type Transformers



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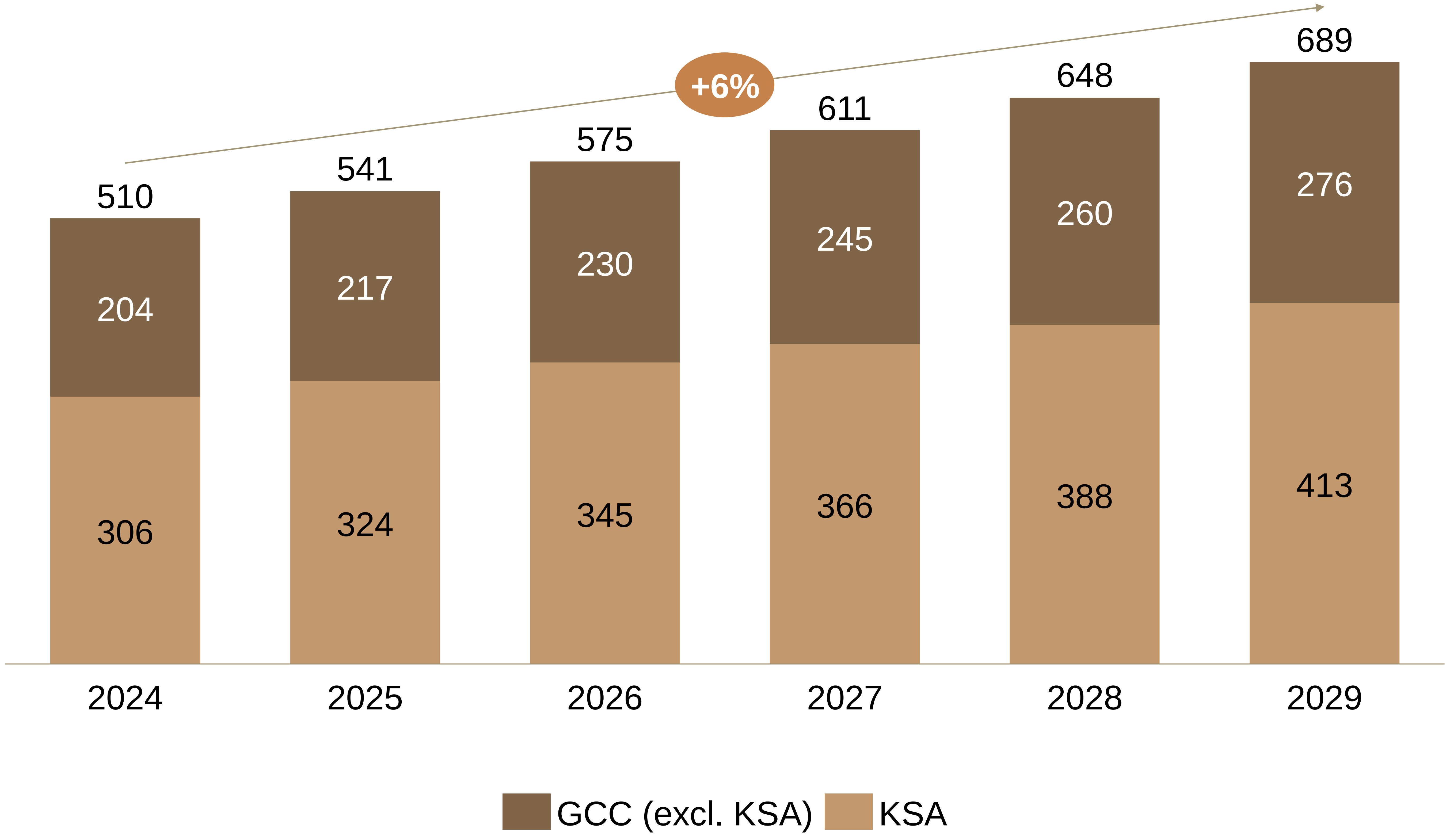
Dry Type Transformer
Demand, Customers & Drivers

Forecasted KSA and rest of GCC Dry Type Transformer market 2024-2029, (Million USD)



Dry Type Transformer customers in KSA

- Oil & gas
- Utilities & energy power sytesm
- Industrial & manufacturing

Key KSA demand drivers

- Industrial expansion: Additional Dry Type Transformers needed to support expansion of KSA industrial infrastructure – 36,000 plants expected by 2035
- Offshore activity: Further durable Dry Type Transformers required to match increase in offshore oil and gas activity

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Catalyzing Supply Chains

Source: Fortune Business Insights; Allied Market Research; Grandview; Team analysis

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Dry Type Transformer
Value Chain and Key Localization Opportunities

	Raw materials	Manufacturing & Assembly	Installation & Maintenance
Local saturation	Multiple players	Few players	Few players
Current KSA value chain	• Wide availability of steel, copper and aluminum cables and rods	• Opportunity to manufacture **dry type transformer** • SME opportunities: manufacture **grounding systems, insulation, terminals, bushings, enclosures and mechanisms.** Opportunity	• Opportunity to provide installation and maintenance services Opportunity

Key success factors

	Raw materials	Manufacturing & Assembly	Installation & Maintenance
Technology		Cutting, stacking, VPI machines, curing and testing equipment	
Labor		Design engineers, technicians	

Source: Fortune Business Insights; Allied Market Research; Grandview; Team analysis

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Dry Type Transformer
Investment Opportunity and Enablers

Key enablers in KSA to drive success

Localization incentives: Government programs – e.g., SIDF loan subsidies, Zakat & tax benefits, or export tax exemption

Land and infrastructure: Subsidized land and infrastructure in economic zones (e.g., Modon) reduce setup costs & accelerate

Widely available specialized labor: NITI provides machinists, maintenance technicians, and equipment operators who can support manufacturing

Where is the opportunity

Manufacturing & Assembly
Opportunity to increase localized dry type transformer manufacturing
For SMEs: manufacture grounding systems, insulation, terminals, bushings, enclosures and mechanisms

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Note: NITI = National Industrial Training Institute; BMS = Building Management Systems
Source: Fortune Business Insights; Allied Market Research; Grandview; Team analysis

04

Electric induction motor

Presented by: Maha AlZahrani

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Electric Induction Motor
Opportunity Profile

1

Electric Induction Motors present an attractive investment opportunity

Type(s)

Electric induction motor – Three Phase

2

Electric Induction Motor market is growing moderately

283

Estimated 2024 KSA market size (Million USD)

7%

Forecasted 5-year CAGR

3

Attractive investment opportunities for Electric Induction Motor value chain

KSA value chain opportunities

Manufacturing & Assembly

Installation & Maintenance

KSA enablers

- Financial support
- Regulatory incentives
- Technical enablers

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Source: Verified Market Reports, Mordor Intelligence; IMARC Team analysis

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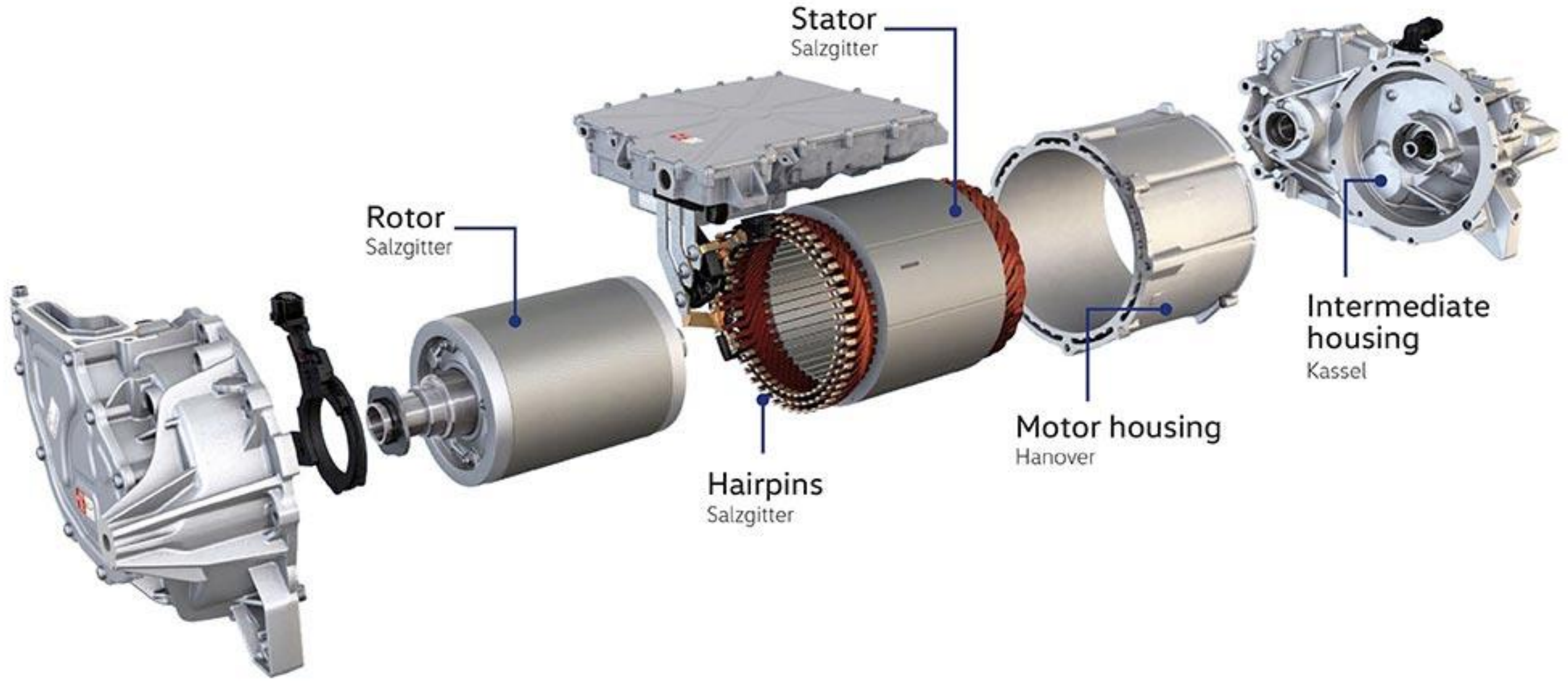
Electric Induction Motor
Technical Overview

Type(s)

Three-phase Electric Induction Motor



Applications

- Drilling rig equipment
- Pumps
- Centrifugal machinery

Key technical specifications

- Saudi Aramco Engineering Standards (SAES-P-113)
- Saudi Aramco Material Specifications (17-SAMMS-503 UP TO 500 HP)

Saudi Aramco 9COM Numbers:

- 6000000994: Electric motors up to 500HP Horizontal
- 6000000995: Electric motors up to 500 HP Vertical

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Source: Verified Market Reports, Mordor Intelligence; IMARC Team analysis

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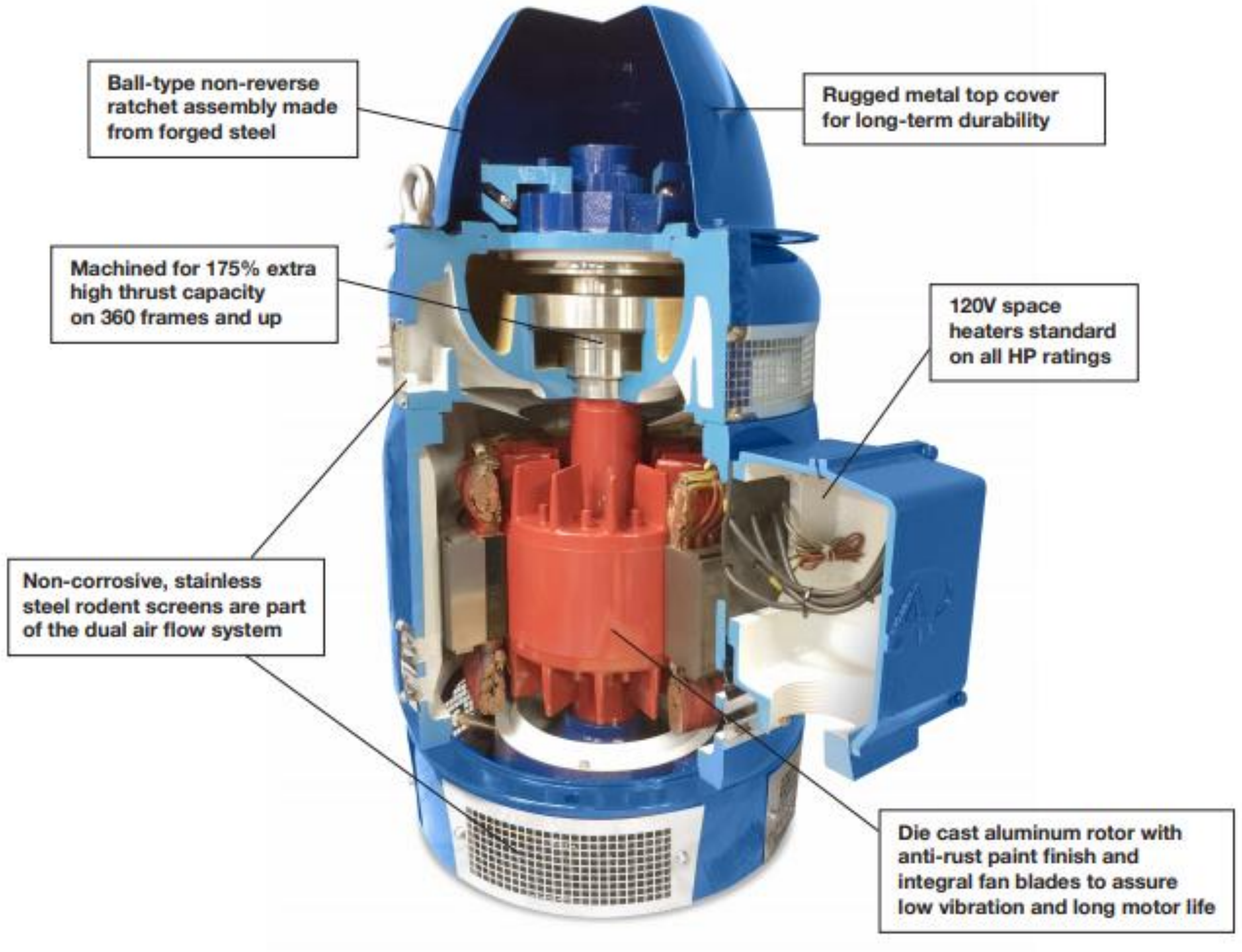
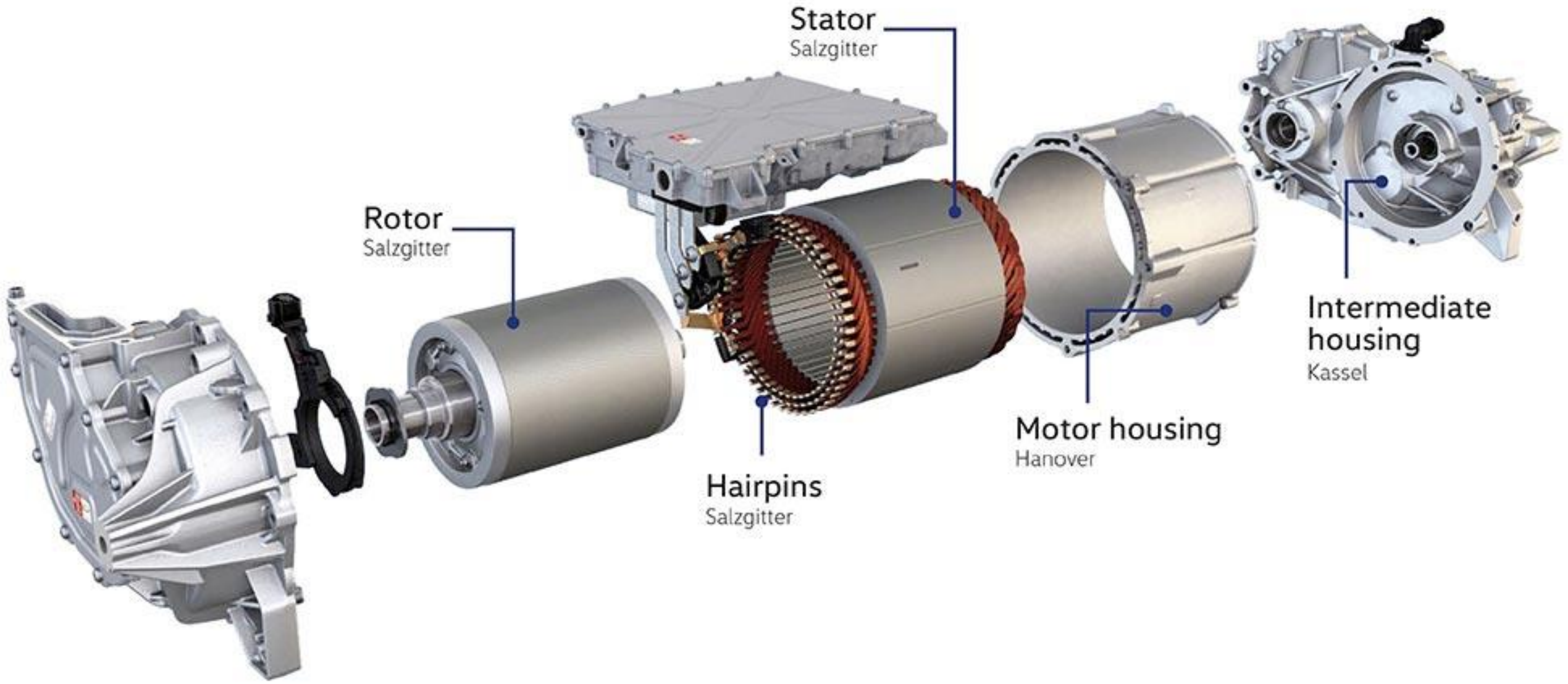
Key Components of Electric Induction Motors





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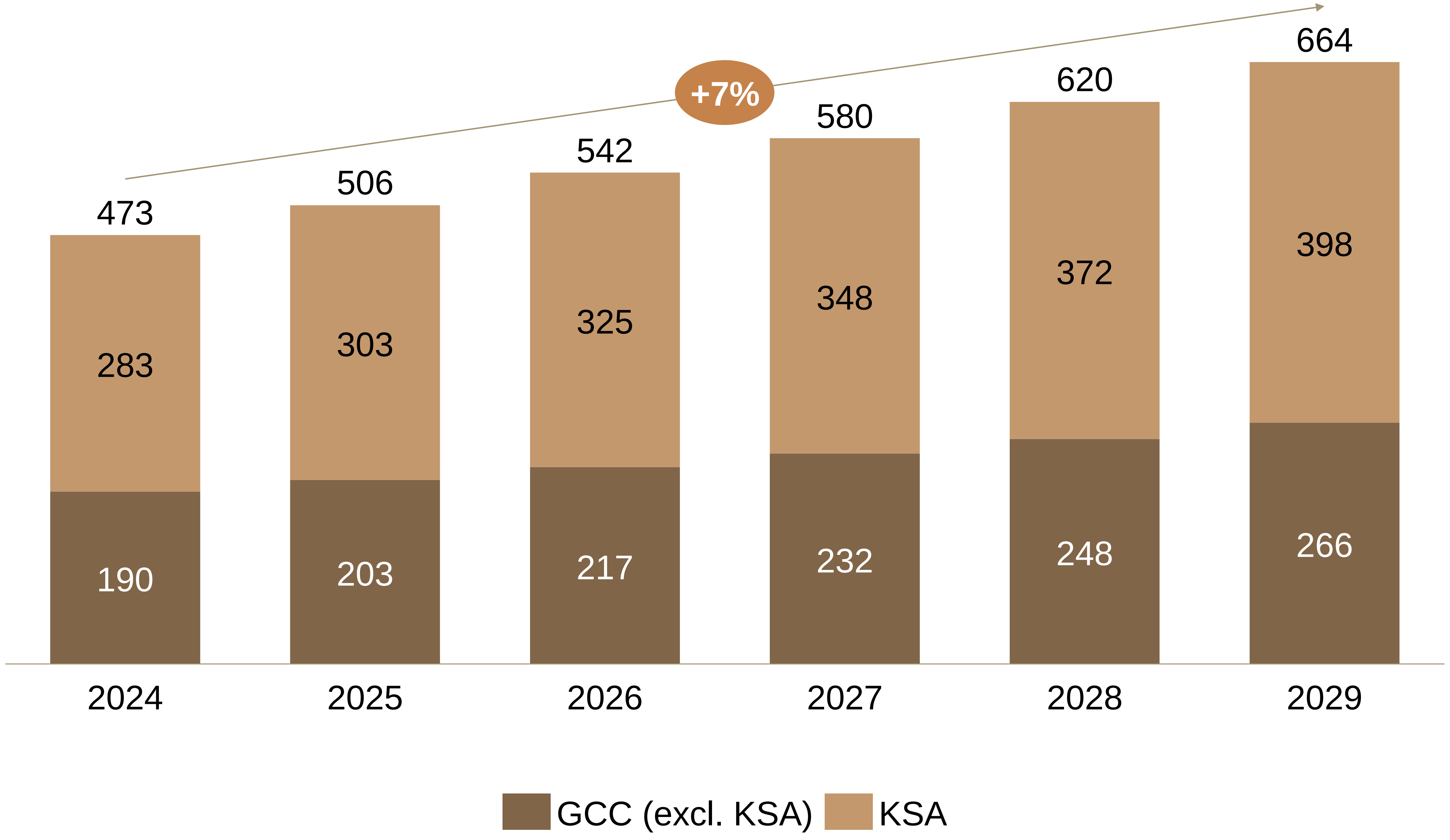
Electric Induction Motor
Demand, Customers & Drivers

Forecasted KSA and rest of GCC Electric Induction Motor market 2024-2030 (Million USD)



Electric induction motor customers in KSA

- Oil & gas facilities
- Utilities & energy firms
- Manufacturing firms

Key KSA demand drivers

- Industrial expansion: Additional electric induction motors needed to support expansion of KSA industrial infrastructure – 36,000 plants expected by 2035
- Infrastructure development: Further electric induction motors required to support infrastructure development across industrial cities, expanding O&G and utilities operations

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Note: O&G = Oil & Gas
Source: Verified Market Reports, Mordor Intelligence; IMARC Team analysis

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Electric Induction Motor
Value Chain and Key Localization Opportunities

	Raw materials	Manufacturing & Assembly	Installation & Maintenance
Local saturation	Multiple players	Few players	Few players
Current KSA value chain	• Steel, varnishes, and resins produced by multiple players	• Opportunity to manufacture **Electric Induction Motors** • SME opportunities: provide **bearings, stator windings, rotor windings, shaft, enclosures, and fans.** Opportunity	• Opportunity to provide installation and maintenance services Opportunity

Key success factors

	Raw materials	Manufacturing & Assembly	Installation & Maintenance
Technology		Cutting and stamping, winding, testing equipment	
Labor		Electrical engineers, machinists, technicians	

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Source: Verified Market Reports, Mordor Intelligence; IMARC Team analysis

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Electric Induction Motor
Investment Opportunity and Enablers

Key enablers in KSA to drive success

Localization incentives: Government programs – e.g., SIDF loan subsidies, Zakat & tax benefits, or export tax exemption

Land and infrastructure: Subsidized land and infrastructure in economic zones (e.g., Modon) reduce setup costs & accelerate

Widely available specialized labor: NITI provides machinists, maintenance technicians, and equipment operators who can support manufacturing

Where is the opportunity

Manufacturing & Assembly
Opportunity to increase localized manufacturing & assembly

For SMEs: provide bearings, stator windings, rotor windings, shaft, enclosures, and fans.

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Note: NITI = National Industrial Training Institute; BMS = Building Management Systems
Source: Verified Market Reports, Mordor Intelligence; IMARC Team analysis

05

Cable Bus

Presented by: Hasan Al Khater

Cable Bus
Opportunity Profile

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1

Cable Bus present an attractive investment opportunity

Type of product

Indoor

Outdoor

2

Cable bus market is moderately growing

282 Estimated 2024 KSA market size (Million USD)

6% Forecasted 5-year CAGR

3

Attractive investment opportunities for cable bus value chain

KSA value chain opportunities

Raw materials | Manufacturing & Assembly | Installation & Maintenance

KSA enablers

- Financial support including low interest loan programs
- Tax exemption from earnings and customs duty for exports
- Subsidized training programs

Source: Allied Market research; Grand view research; Saudi Aramco, Team analysis

Cable Bus
Potential Localized Categories

Type(s)	Outdoor	Indoor
		
Applications	• Power distribution between buildings • Renewable energy installations • Drilling equipment • Offshore platforms	• Manufacturing facilities and process control • HVAC systems, elevators • Critical medical equipment

Key technical specifications

- Saudi Aramco 9COM number: 6000000929
- Saudi Aramco Engineering Standards (16-SAMSS-520)

Cablebus is a system of a group power cable to supply load with current rated from 1,200 to 4,000 amperes and up to and including 34.5 kV nominal system voltage, suitable for indoor and outdoor

Source: Expert inputs; Team analysis

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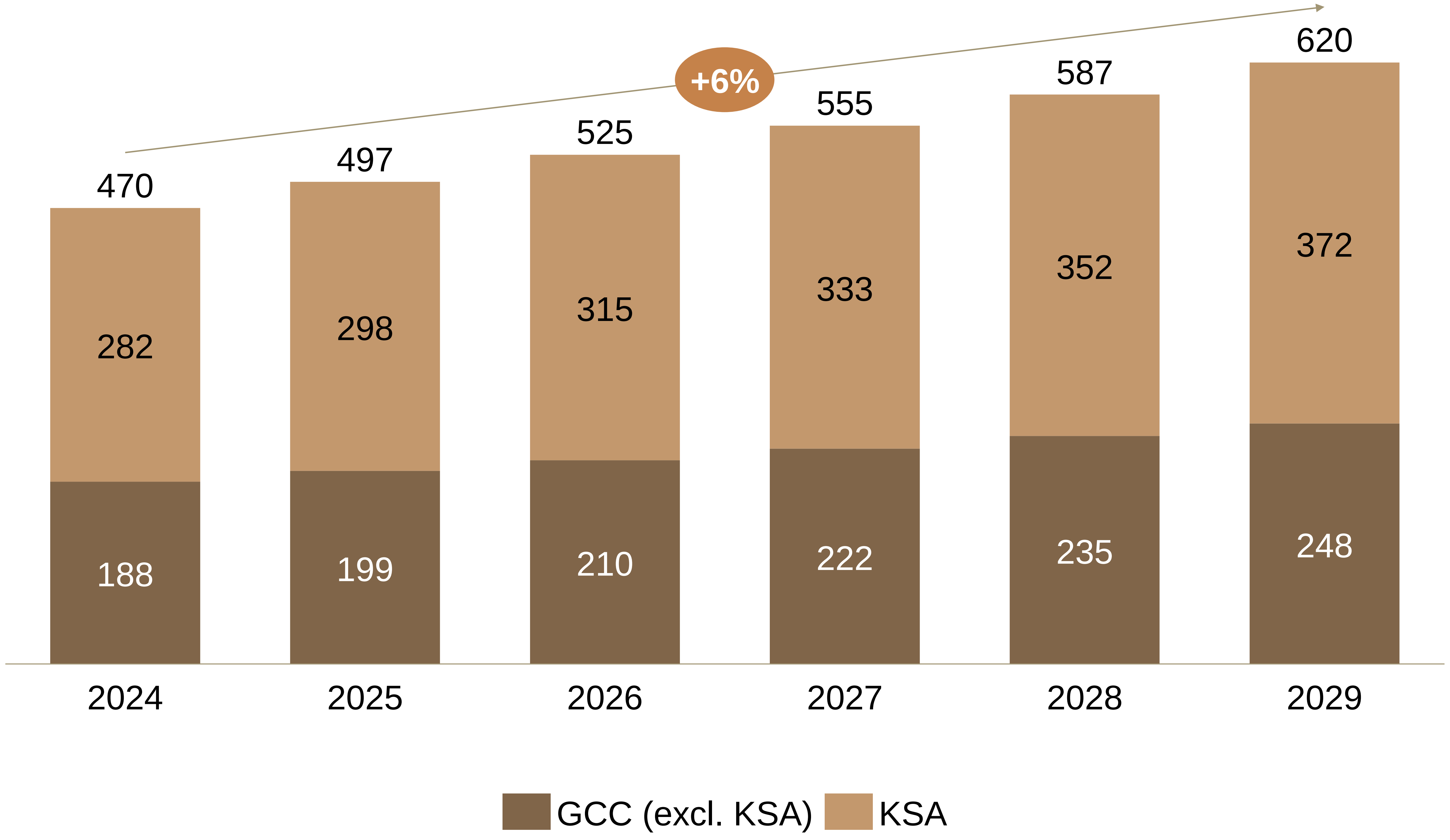
Cable Bus
Demand, Customers & Drivers

Forecasted KSA and rest of GCC cable bus market 2024-2029 (Million USD)



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Cable bus customers in KSA

- Oil & gas
- Industrial & manufacturing
- Utilities & energy

Key KSA demand drivers

- Industrial expansion: With target of 36,000 factories by 2035, demand for high-capacity, power distribution systems is growing across industrial zones
- Infrastructure development: Development of futuristic cities emphasizes the need for advanced and reliable electrical systems, where cable buses play a critical role

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Source: Allied Market research; Grand view research; Expert inputs; Saudi Aramco, Team analysis

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Cable Bus
Value Chain and Key Localization Opportunities

	Raw materials	Manufacturing & Assembly	Installation & Maintenance
Local saturation	Few players	Few players	Few players
Current KSA value chain	• Opportunity to localize copper refining and production of insulation materials Opportunity	• Opportunity to localize manufacturing of **cable bus** • SME opportunities: manufacture **cable bus enclosures, assemble conductors, and production of ancillary components such as cable clamps and mounting brackets** Opportunity	• Opportunity to provide installation and maintenance services Opportunity

Key success factors

	Raw materials	Manufacturing & Assembly
Technology	Advanced refining and extrusion technology	Simulation tools to create cable bus layouts
Labor	Skilled in process and quality control	Skills advanced machinery handling and assembly process

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Source: Team analysis

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Cable Bus
Investment Opportunity and Enablers

Key enablers in KSA to drive success

Financial support: Access to subsidized capital and financial support from SIDF (e.g., WC loans, 'Afaq' program)

Export enabler: Financing, insurance, and trade facilitation support to ease procedural hurdles for commodity exports

Workforce development: Subsidized training programs for Saudi nationals by HRDF

Where is the opportunity

Raw materials
Establish facilities for copper refining and insulation material production

Manufacturing & Assembly
Establish facility to manufacture cable bus

For SMEs - opportunity to manufacture cable bus enclosures, assemble conductors, and production of ancillary components such as cable clamps and mounting brackets.

Source: Expert interviews; Team analysis

06

Diesel generator

Presented by: Faten Abusaeed

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Diesel Generator
Opportunity Profile

1

Diesel Generator present an attractive investment opportunity

Type

Diesel generator

- 9COM 6000000964: GENERATOR: DIESEL, 35-10000 KW

Diesel Generator is the combination of a diesel engine with an electric generator where it converts mechanical energy obtained from an engine into electrical energy as the output.

2

Diesel Generator market is moderately growing

1,080 Estimated 2024 KSA market size (Million USD)

10% Forecasted 5-year CAGR

3

Attractive investment opportunities for diesel generator value chain

KSA value chain opportunities

Raw materials

Manufacturing & Assembly

Installation & Maintenance

KSA enablers

- Financial support including low interest loan programs
- Tax exemption from earnings and customs duty for exports
- Subsidized training programs

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Catalyzing Supply Chains

Source: Databridge; Grandview research; Mordor Intelligence; Saudi Aramco, Team analysis

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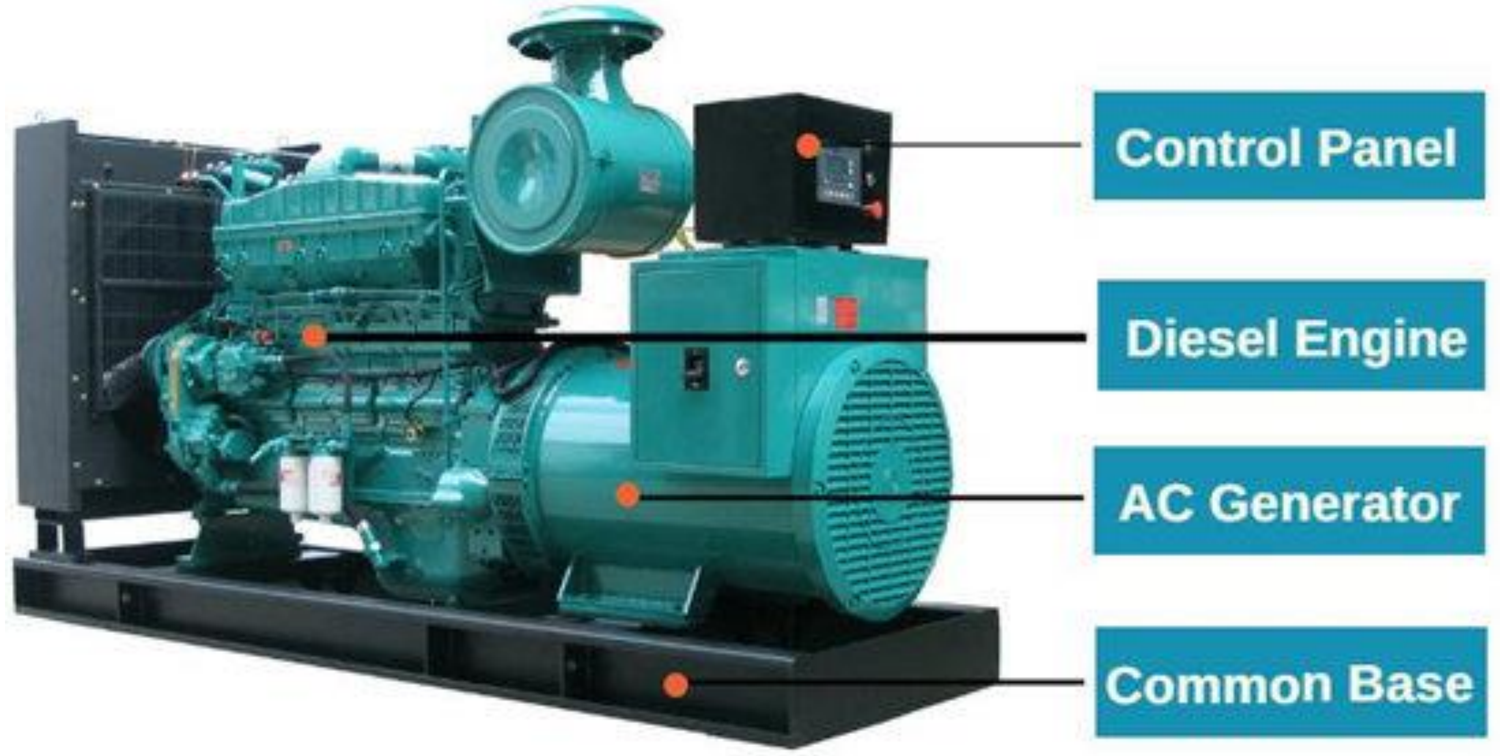
Diesel Generator
Technical overview

Type(s)

Diesel Generator



Applications

- Backup power supply for commercial and industrial buildings
- Primary power source for off grid locations and construction sites
- Grid stabilization
- Emergency disaster management

Key technical specifications

- Saudi Aramco engineering standards SAES-P-113
- Saudi Aramco material specifications 17-SAMSS-518
- 9COM: 6000000964

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Source: Expert inputs; Team analysis

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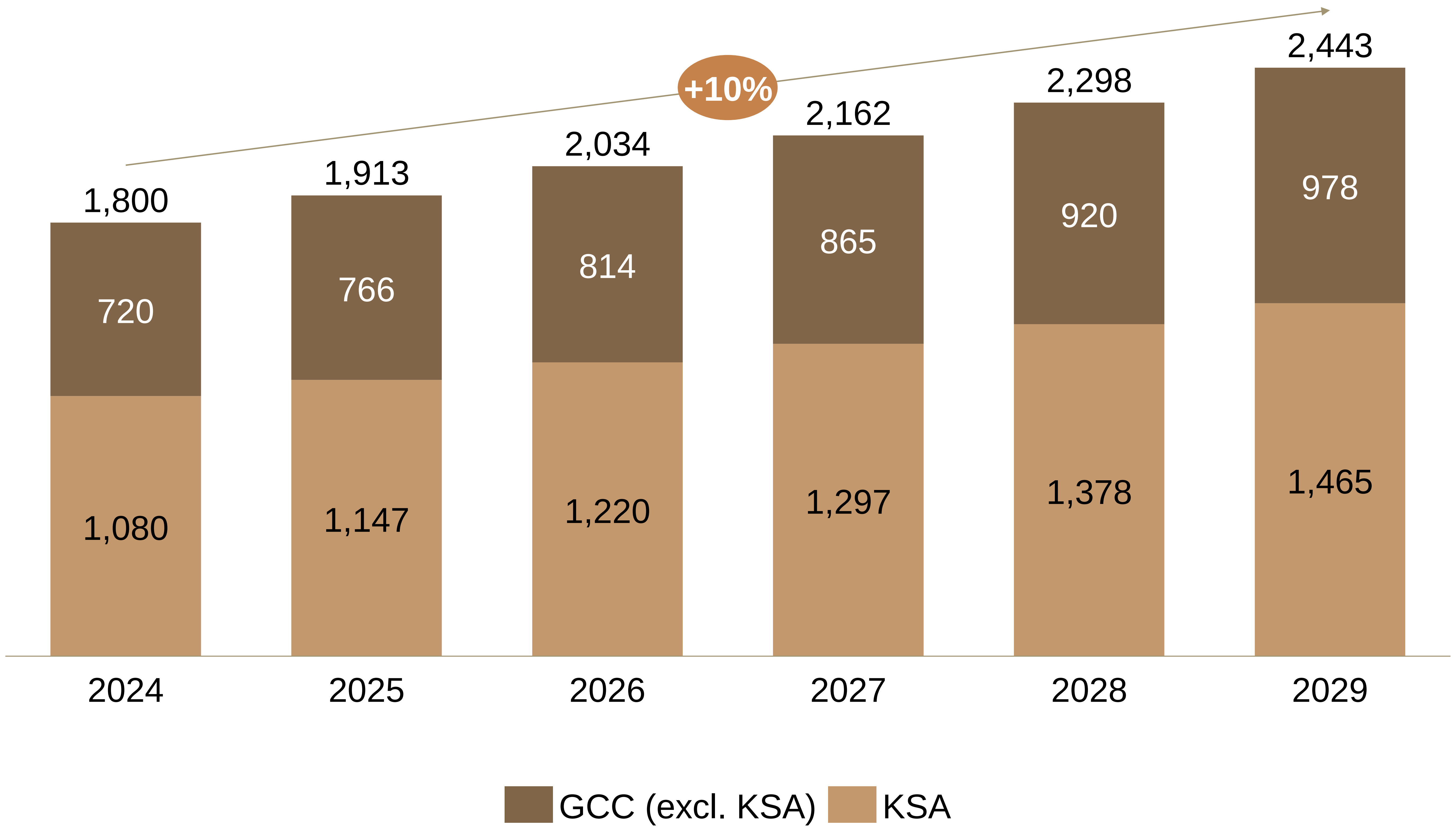
Diesel Generator
Demand, Customers & Drivers

Forecasted KSA and rest of GCC diesel generator market 2024-2029 (Million USD)



Diesel generator customers in KSA

- Oil & gas
- Industrial & manufacturing
- Critical Infrastructure[1]
- Real estate

Key KSA demand drivers

- Sector expansion: Increasing offshore and upstream activities leads to rising demand for diesel generators used as backup power for uninterrupted operations
- Industrial expansion: Additional diesel generators needed to support rising demand for reliable power backup for industrial infrastructure – 36,000 plants expected by 2035

1. Hospitals, airports, transportation hubs, and megaprojects

Source: Databridge; Grandview research; Mordor Intelligence; Saudi Aramco, Team analysis

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Diesel Generator
Value Chain and Key Localization Opportunities

	Raw materials	Manufacturing & Assembly	Installation & Maintenance
Local saturation	Some players	Few players	Few players
Current KSA value chain	• High-grade materials domestically available[1] with opportunity to localize copper refining and production Opportunity	• Opportunity to **manufacture diesel generators** in the Kingdom • SME opportunities: Manufacturing **cylinder heads, engine blocks, and cooling systems, assembly of ignition system, fabrication of generator frames and cases** Opportunity	• Generator installation and maintenance services and offering spare parts Opportunity
Key success factors			
Technology	Advanced refining and extrusion technology	Precision engineering tools like CNC machining for engine blocks, casting and forging technologies	
Labor	Skilled in process and quality control	Engineers with expertise in precision machining, component manufacturing and electrical system assembly	

Catalyzing Supply Chains

1. Stainless steel; aluminum;

Source: Expert inputs; Team analysis

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Diesel Generator
Investment Opportunity and Enablers

Key enablers in KSA to drive success

Financial support: Access to subsidized capital and financial support from SIDF (e.g., WC loans, 'Afaq' program)

Export enabler: Financing, insurance, and trade facilitation support to ease procedural hurdles for UPS exports

Workforce development: Subsidized training programs for Saudi nationals by HRDF

Where is the opportunity

Raw materials
Establish facilities for production and refining of copper in the Kingdom

Manufacturing & Assembly
Expand localization for diesel generators

For SMEs: opportunity to manufacture cylinder heads, engine blocks, and cooling systems as well as assembly of ignition systems and fabrication of generator frames and cases

Note: MRO = Maintenance, repair, overhaul
Source: Expert interviews; Team analysis

07

Industrial Battery Charger

Presented by: Faten Abusaeed

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Industrial Battery Charger (IBC)
Opportunity Profile

1
Industrial Battery Chargers present an attractive investment opportunity

Types

Constant Voltage

Constant Current

Battery charger is a charging device that stores energy in an electric battery by running current through it.

2
IBC market is rapidly growing; KSA has largest share in GCC

175 Estimated 2024 KSA market size (Million USD)

8% Forecasted 5-year CAGR

3
Attractive investment opportunities for IBC value chain

KSA value chain opportunities

- Raw materials
- Manufacturing & Assembly
- Installation & Maintenance

KSA value chain opportunities

- Financial support
- Regulatory incentives
- Technical enablers

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Catalyzing Supply Chains

Source: Credence Research; Team analysis

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Industrial Battery Charger (IBC)
Potential Localized Categories

Type(s)

Constant Voltage	Constant Current
	

Applications

Constant Voltage
- UPS systems
- Telecommunication equipment
- Emergency lighting systems

Constant Current
- Electric vehicle batteries
- Renewable energy storage
- Stationary industrial ESS

Key technical specifications

Saudi Aramco 9COM Numbers:
- 6000000947: BATTERY CHARGER/ RECTIFIER MORE 100 ADC
- 6000010332: BATTERY CHARGER/ RECTIFIER LESS 100 ADC

- Saudi Aramco Engineering Standards (SAES-P-107)
- Saudi Aramco Material Specifications (17-SAMSS-514)

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Catalyzing Supply Chains

Note: UPS = Uninterrupted power supply; ESS = Energy Storage System
Source: Credence Research; Team analysis

Industrial Battery Charger (IBC)
Potential Localized Categories

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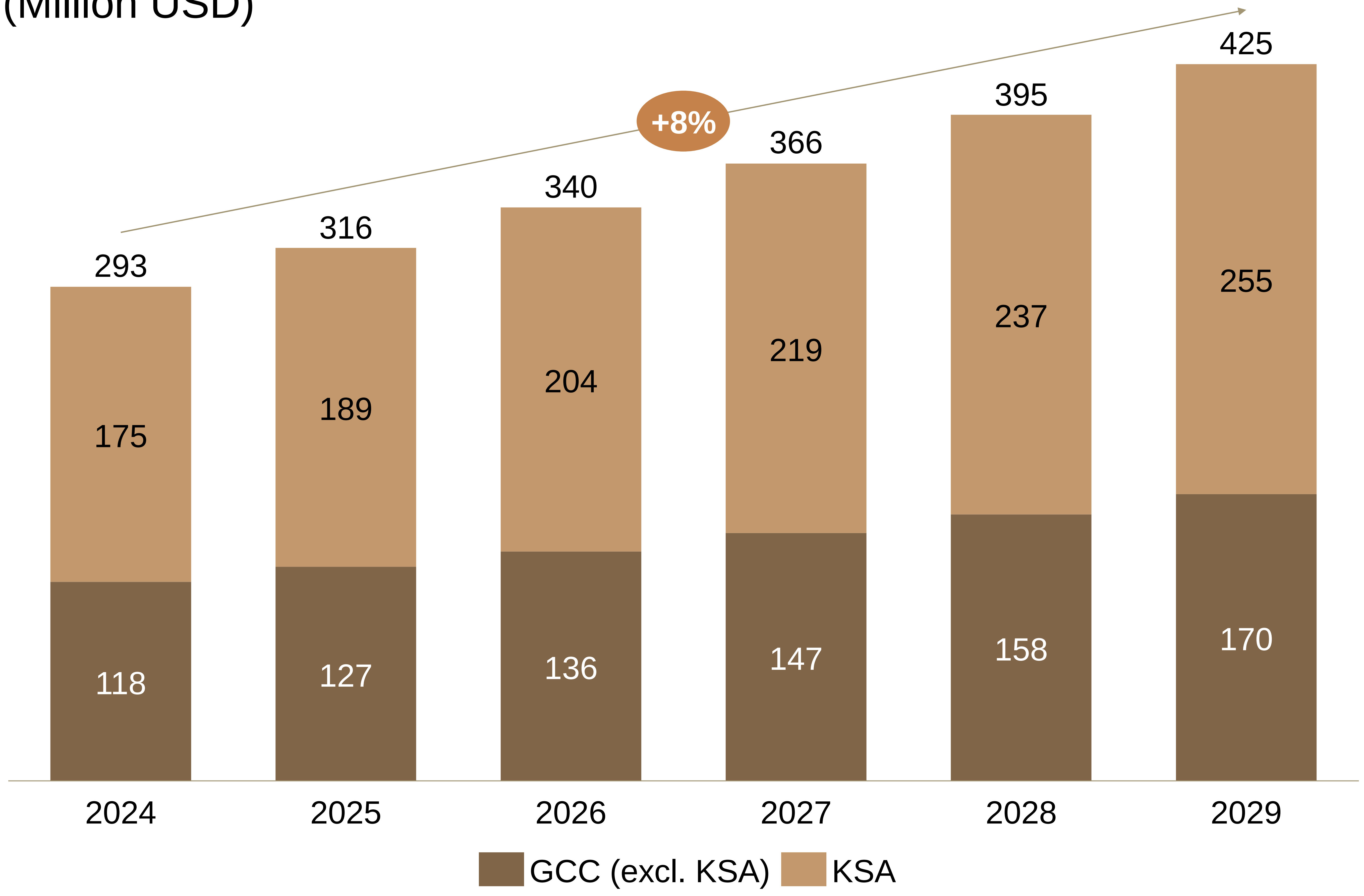
Industrial Battery Charger
Demand, Customers, & Drivers

KSA and rest of GCC Industrial Battery Charger market 2024-2029 (Million USD)



Catalyzing Supply Chains

Industrial Battery Charger customers in KSA

- Oil & gas
- Utilities & energy
- Transportation and logistics

Key KSA demand drivers

- Industrial expansion: Additional IBCs needed to support expansion of KSA industrial infrastructure – 36,000 plants expected by 2035
- EV adoption: IBCs required to support EV charging needs to match 500,000 EV manufacturing target in 2030

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Source: ReutersCredence Research, Team analysis

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Industrial Battery Charger (IBC)
Value Chain and Key Localization Opportunities

	Raw materials	Manufacturing & Assembly	Installation & Maintenance
Local saturation	Few players	Few players	Few players
Current KSA value chain	• Produce industrial battery charger components domestically[1] Opportunity	• Opportunity to increase localized manufacturing • SME opportunities: manufacture PCBAs, capacitors, inductors Opportunity	• Opportunity to provide installation and maintenance services Opportunity
Key success factors			
Technology	CNC machines, curing tools	Fabrication, testing equipment	
Labor	Chemical engineers, technicians	PCB designers, process engineers, machine operators	

1. E.g., heat sinks, diodes, and thermal interface materials

Source: Credence Research; Expert inputs; Team analysis

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Industrial Battery Charger (IBC)
Investment Opportunity and Enablers

Key enablers in KSA to drive success

Financial support: Access to subsidized capital and financial support from SIDF (e.g., WC loans, 'Afaq' program)

Export enabler: Financing, insurance, and trade facilitation support – includes exemption from taxes on export revenues

Workforce development: Subsidized training programs for Saudi nationals by HRDF

Where is the opportunity

Raw materials
Produce industrial battery charger components domestically[1]

Manufacturing & Assembly
Opportunity to diversify localized Industrial Battery Charger manufacturing
For SMEs: manufacture PCBs, capacitors, inductors

Catalyzing Supply Chains

1. Heat sinks, diodes, and thermal interface materials; Note: SIDF = Saudi Industrial Development Fund; HRDF = Human Resources Development Fund
Source: Credence Research; Expert inputs; Team analysis

08

UPS System

Presented by: Norhan Khoja

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UPS System
Opportunity Profile

1
UPS System present an attractive investment opportunity

Types

Online UPS

Line interactive UPS

Modular UPS

2
UPS system market is sizeable showing moderate growth

369 Estimated 2024 KSA market size (Million USD)

12% Forecasted 5-year CAGR

3
Attractive investment opportunities for UPS system value chain

KSA value chain opportunities

- Raw materials
- Manufacturing & Assembly
- Installation & Maintenance

KSA enablers

- Financial support including low interest loan programs
- Tax exemption from earnings and customs duty for exports
- Subsidized training programs

Source: Mordor Intelligence; TechSci; Expert inputs; Team analysis

UPS System
Potential Localized Categories

Type(s)

Online UPS – Double Conversion	Line interactive UPS	Modular UPS
		

Applications

Online UPS – Double Conversion:
- High precision manufacturing lines
- Hospitals and life - supporting systems
- Critical systems such as radar, and flight control systems

Line interactive UPS:
- HVAC systems
- POS systems, inventory tracking and security cameras in retail shops

Modular UPS:
- Scalable industrial operations
- Facilities with rapidly growing or changing power needs
- Substation control and SCADA systems

Key technical specifications

- Saudi Aramco engineering standards SAES-P-107
- Saudi Aramco material specifications 17-SAMSS-516
- 9COM: 6000011555 (UPS system above 200KVA for plants) and 6000001012 (UPS systems above 10 TO 200KVA for plants)

Source: Expert inputs; Team analysis

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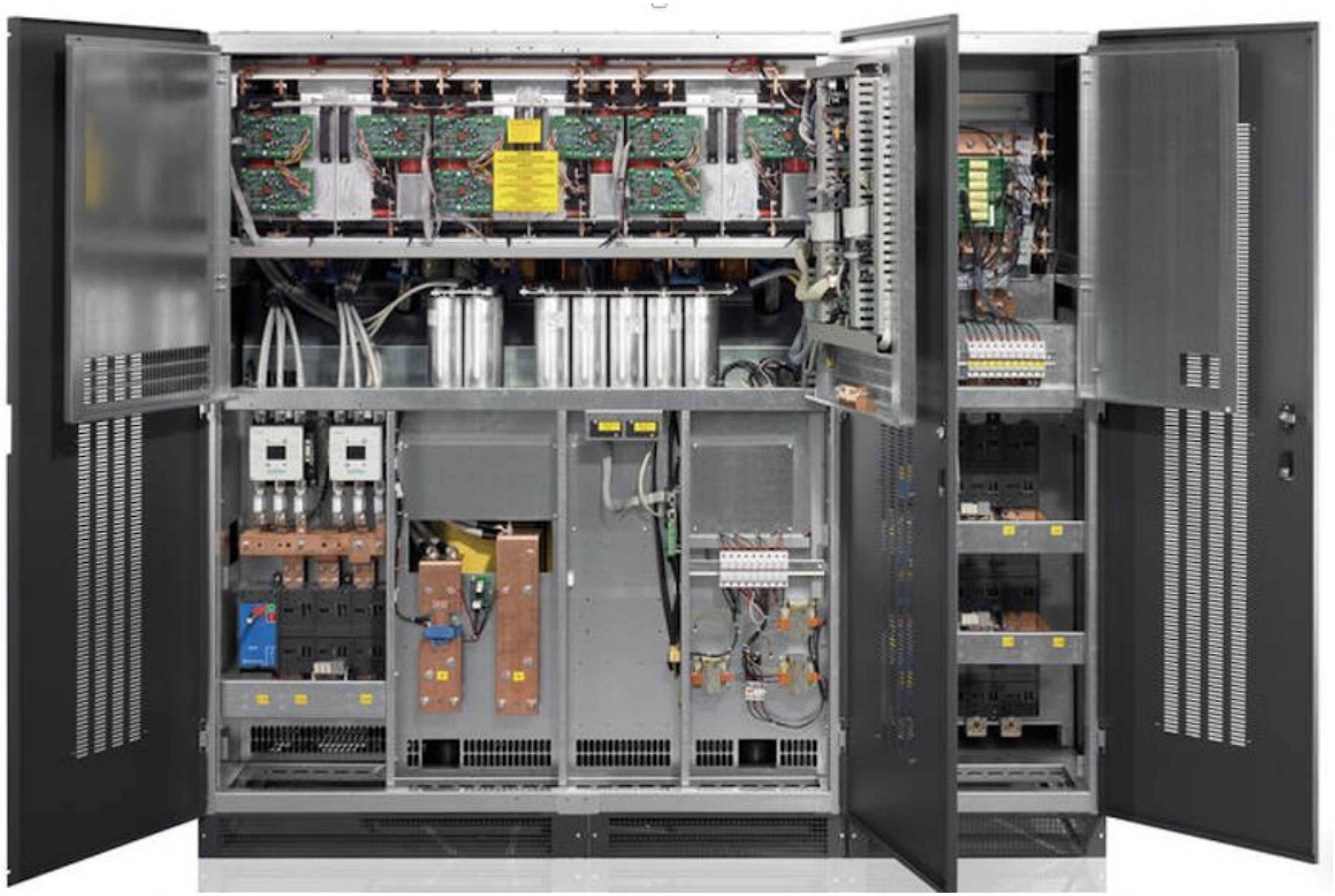
Key components for UPS



Catalyzing Supply Chains

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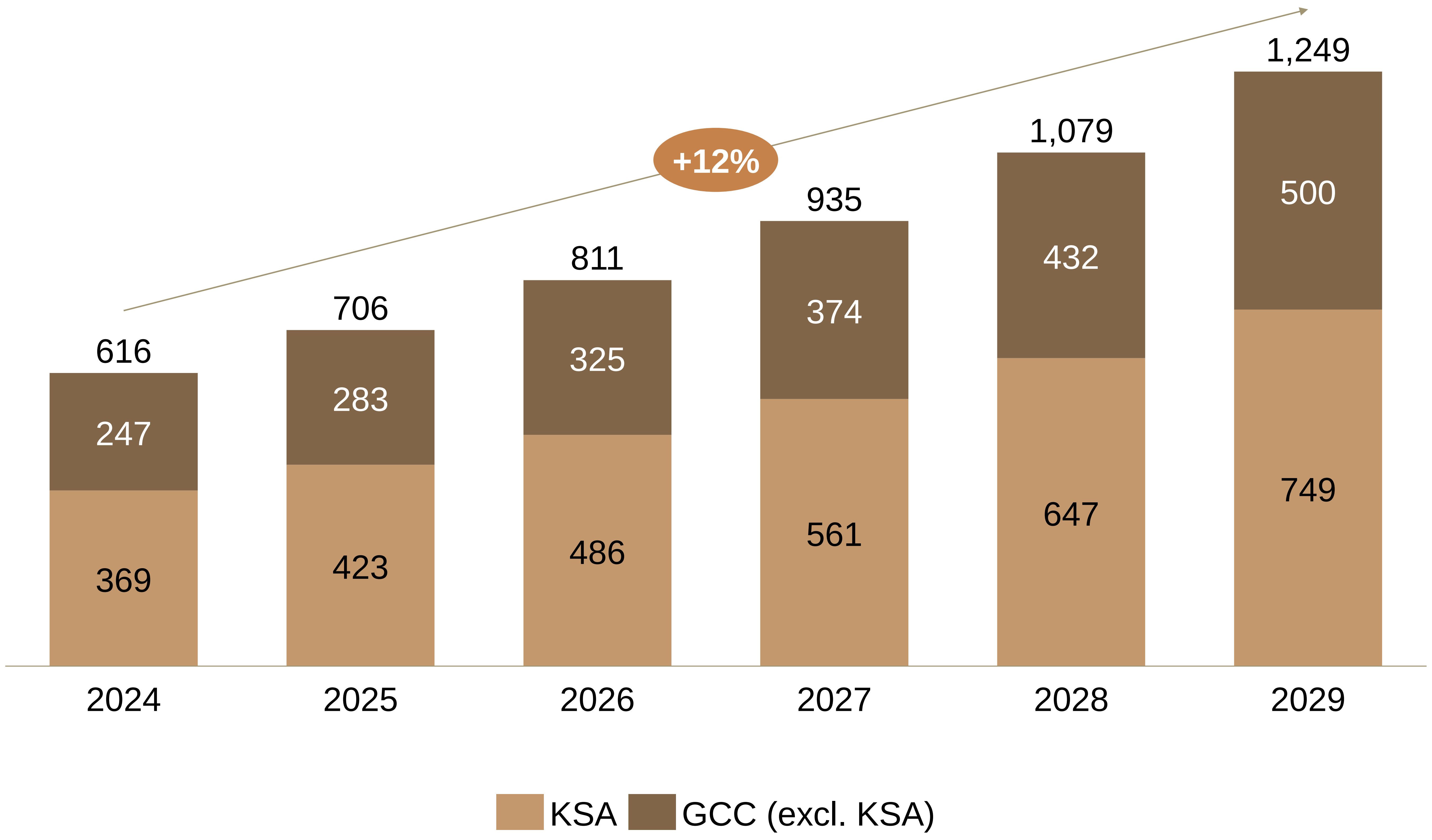
UPS System
Demand, Customers & Drivers

Forecasted KSA and rest of GCC UPS system market 2024-2029 (Million USD)



UPS system customers in KSA

- Oil & gas
- Utilities, Industrial & manufacturing
- Critical Infrastructure[1]

Key KSA demand drivers

- Industrial expansion: By 2035, Saudi Arabia plans for 36,000 factories, requiring uninterrupted power for essential operations
- Infrastructure development: Megaprojects like NEOM, Red Sea Project, and Qiddiya require uninterrupted power solutions for data centers, commercial establishments, and residential areas

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Catalyzing Supply Chains

1. Hospitals, airports, transportation hubs, and megaprojects;
Source: Mordor Intelligence; TechSci; Team analysis

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UPS System
Value Chain and Key Localization Opportunities

	Raw materials	Manufacturing & Assembly	Installation & Maintenance
Local saturation	Few players	Few players	Few players
Current KSA value chain	• Localizing battery production facilities Opportunity	• Opportunity to increase localized manufacturing & E2E assembly • SME opportunities: assembling sub-components, testing and compliance of manufactured models Opportunity	• Opportunity to provide installation and maintenance services Opportunity
Key success factors			
Technology	Thermal management systems	Automated testing rigs, flexible conveyor systems	
Labor	Engineers with battery production expertise	Precision assembly technicians	

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Catalyzing Supply Chains

Source: Databridge; Expert inputs; Team analysis

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UPS System
Investment Opportunity and Enablers

Key enablers in KSA to drive success

Financial support: Access to subsidized capital and financial support from SIDF (e.g., WC loans, 'Afaq' program)

Export enabler: Financing, insurance, and trade facilitation support to ease procedural hurdles for UPS exports

Workforce development: Subsidized training programs for Saudi nationals by HRDF

Where is the opportunity

Raw materials
Establish facilities for battery production and semi conductor fabrication

Manufacturing & Assembly
Opportunity to localize manufacturing of different UPS systems in KSA

For SMEs - opportunity to provide sub-components, and compliance testing

1. Heat sinks, diodes, and thermal interface materials; Note: SIDF = Saudi Industrial Development Fund; HRDF = Human Resources Development Fund
Source: Credence Research; Expert inputs; Team analysis

09

Protective relays

Presented by: Norhan Khoja

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Protective Relays
Opportunity Profile

1

Protective Relays present an attractive investment opportunity

Function

Protective Relays is a relay device designed to trip a circuit breaker when a fault is detected to either eliminate or significantly reduce damage to personnel and/or equipment.

Catalyzing Supply Chains

2

Protective relays market is moderately growing

267 Estimated 2024 KSA market size (Million USD)

6% Forecasted 5-year CAGR

3

Attractive investment opportunities for protective relays value chain

KSA value chain opportunities

Raw materials | Manufacturing & Assembly | Installation & Maintenance

KSA enablers

- Financial support including low interest loan programs
- Tax exemption from earnings and customs duty for exports
- Subsidized training programs

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Source: Grand view research; Research news today; Saudi Aramco; Team analysis

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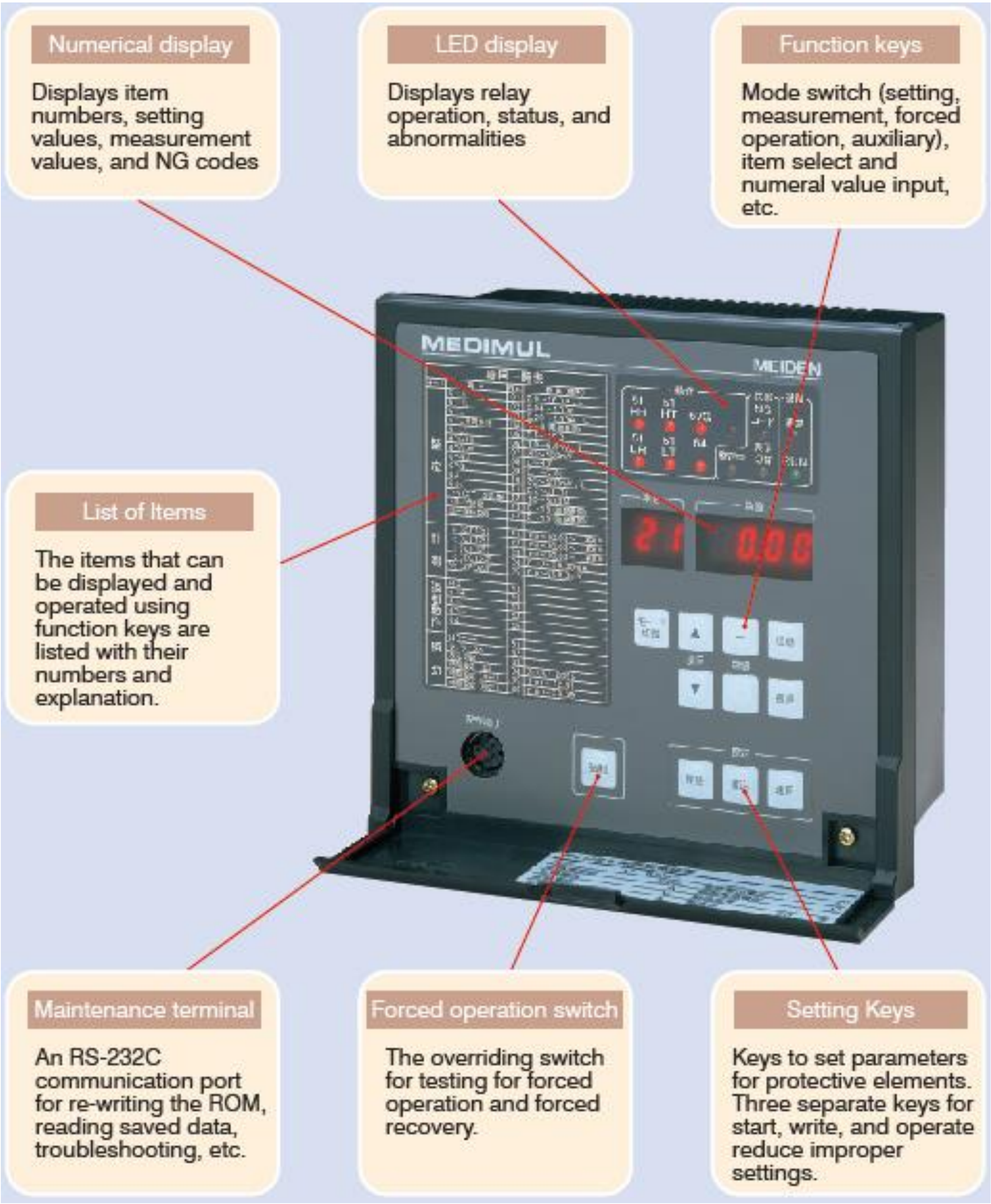
Protective Relays
Components & Applications

Components

- LED display
- Numerical Display
- Function Keys
- Setting Keys
- Forced Operation Switch
- List of Items
- Maintenance Terminal



Applications

- Transmission lines
- Transformers
- Generator
- Switchgear
- Busbar

Key technical specifications

- Saudi Aramco engineering standards: SAES-P-114, SAES-P-126
- Saudi Aramco material specification: 16-SAMSS-514
- Saudi Aramco 9COM number: 6000000845

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Source: Expert inputs; Team analysis

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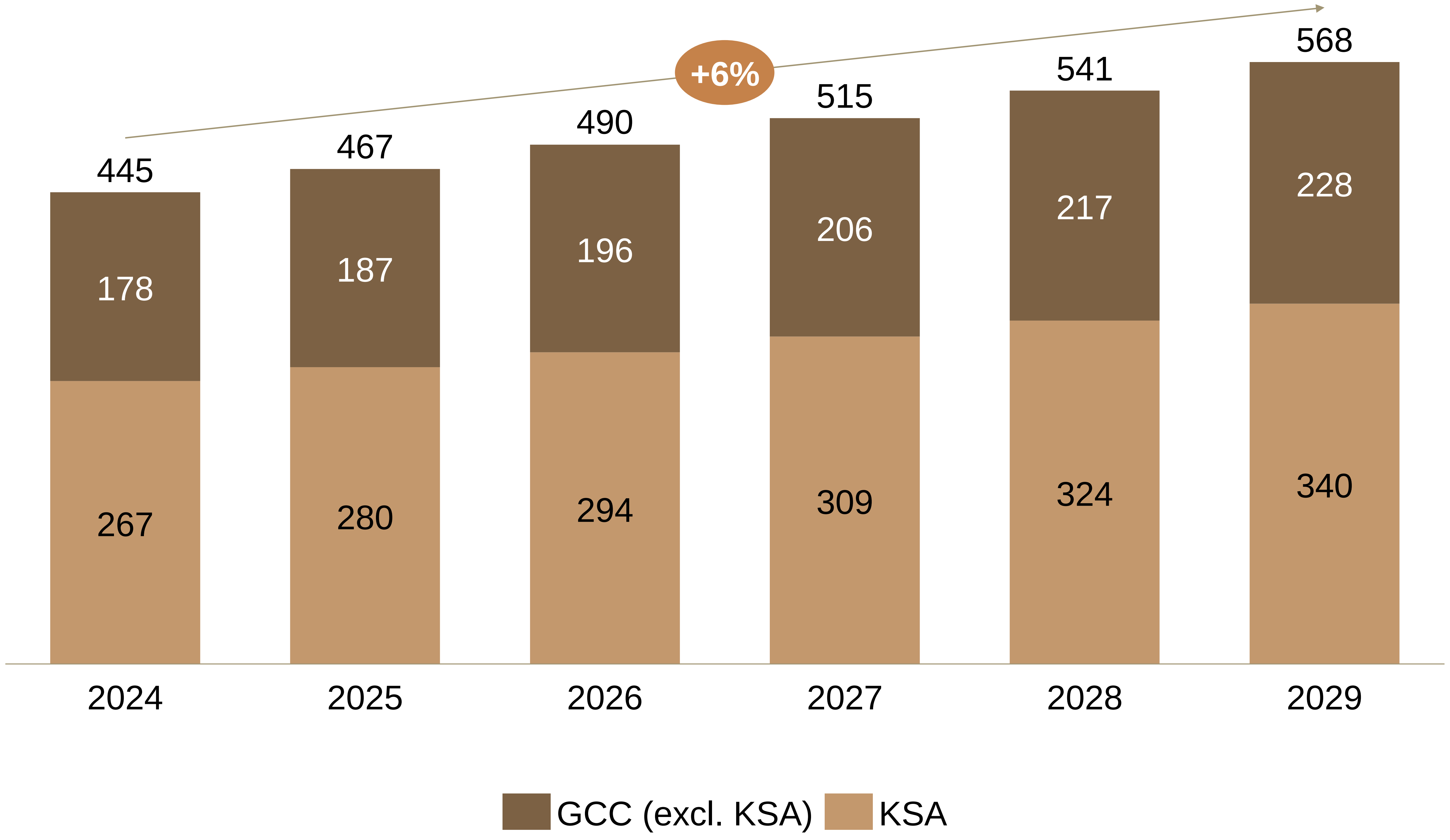
Protective Relays
Demand, Customers & Drivers

Forecasted KSA and rest of GCC protective relays market 2024-2029 (Million USD)



Protective relays customers in KSA

- Oil & gas
- Industrial & manufacturing
- Critical Infrastructure[1]
- Commercial developers

Key KSA demand drivers

- Industrial expansion: KSAs goal of 36,000 factories by 2035 highlights need of stable power supply to support essential operations
- Infrastructure development: Ongoing megaprojects such as NEOM require robust power solutions for data centers, commercial establishments, and residential areas

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Catalyzing Supply Chains

1. Hospitals, airports, transportation hubs, and megaprojects

Source: Grandview research; Research news today; Saudi Aramco, Team analysis

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Protective Relays
Value Chain and Key Localization Opportunities

	Raw materials	Design & Manufacturing	Installation & Maintenance
Local saturation	Few players	Few players	Few players
Current KSA value chain	• Opportunity to source protective relay components in the Kingdom such as silicon steel, insulations material, and amorphous alloys Opportunity	• Opportunity to localize design and increase manufacturing & assembly of protective relay • SME opportunities: manufacture PCBAs, assemble small to medium voltage protective relays Opportunity	• Opportunity to provide installation and maintenance services Opportunity
Key success factors			
Technology	Precision molding, coating lines	High precision manufacturing, integration of IoT for smart relays	
Labor	Electronics technicians	Relay design engineers, PCB designers	

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Catalyzing Supply Chains

Source: Allied Market research; Expert inputs; Team analysis

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Protective Relays
Investment Opportunity and Enablers

Key enablers in KSA to drive success

Financial support: Access to subsidized capital and financial support from SIDF (e.g., WC loans, 'Afaq' program)

Export enabler: Financing, insurance, and trade facilitation support to ease procedural hurdles for UPS exports

Workforce development: Subsidized training programs for Saudi nationals by HRDF

Where is the opportunity

Raw materials
Establish facilities for sourcing of raw material components for protective relays in the Kingdom[1]

Manufacturing & Assembly
Expand localization for protective relays

For SMEs: opportunity to provide cable bus enclosures and assemble small to medium voltage protective relays

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1. Such as silicon steel and amorphous or nanocrystalline alloys

Note: MRO = Maintenance, repair, overhaul

Source: Expert interviews; Team analysis

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Thank You

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