1. Global Overview
   * 1.1 Introduction
     + 1.1.1. Global Market Size & Growth

Market Worth: USD 400 bn,

CAGR: 6.2%

* + - 1.1.2. History and Milestones

|  |  |  |
| --- | --- | --- |
| Year | Milestone | Owner/Innovation |
| Early 20th C (1900s) | Introduction of Electric Appliances | GE, Westinghouse |
| 1950s | Mass Adoption of Appliances post-WWII | Whirlpool, Electrolux |
| 1970s | Energy Efficiency Standards Introduced | Hitachi, Electrolux |
| 1980s | Automation and Digital Controls | Panasonic, Sharp |
| 1990s | Smart Technology Beginnings | Samsung, LG |
| 2000s | Energy Star Rating and Environmental Regulations | Bosch, Siemens |
| 2010s | Internet of Things (IoT) Integration | General industry-wide shift |
| 2020s | Eco-Friendly and Smart Appliances | Amazon, Broad industry participation |
| Future (2030+) | Fully Integrated Smart Homes | Google, Apple |

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* + - 1.1.3. Sector Segments

|  |  |  |
| --- | --- | --- |
| Application | Share (%) | Details |
| Temperature Control Appliances | 35% | This segment includes refrigerators, freezers, air conditioners, and heaters. Growth is driven by urbanization, climate change, and demand for energy-efficient cooling/heating systems. |
| Washing Appliances | 25% | Comprising washing machines and dryers, this segment benefits from trends in household automation, rising hygiene awareness, and integration of smart wash technologies. |
| Cooking Appliances | 20% | Encompassing ovens, microwaves, induction cooktops, and range hoods, innovation in energy efficiency, smart sensors, and multifunctional designs propels this segment. |

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* + - 1.1.3. Equipment Market Share

|  |  |  |
| --- | --- | --- |
| **Segment Type** | **Share (%)** | **Details** |
| **Refrigerators** | 28% | High demand driven by population growth, urbanization, and a preference for energy-efficient models. Double-door and smart refrigerators are particularly popular. |
| **Washing Machines** | 22% | Growth fueled by rising disposable incomes and urbanization. Energy-efficient and smart models are gaining traction. |
| **Air Conditioners** | 18% | Essential due to the hot climate. Demand is increasing for energy-efficient and smart air conditioning units. |
| **Cooking Appliances** | 15% | Includes ovens, microwaves, and stoves. Growth supported by a rise in home cooking and smart kitchen trends. |
| **Dishwashers** | 8% | Adoption is growing, especially in urban areas, due to increased awareness and convenience. |
| **Other Small Appliances** | 9% | Encompasses coffee makers, food processors, vacuum cleaners, etc. Growth driven by lifestyle changes and the adoption of smart home technologies. |

* + - 1.1.4. Emerging trends and industry insights

|  |  |
| --- | --- |
| Category | Key Points |
| Sustainability Trends | \* Consumers prioritize energy-efficient appliances to lower bills and carbon footprint |
| \* Regulations like Energy Star encourage manufacturers to improve efficiency |
| Technological Advances | \* IoT-enabled smart appliances allow remote monitoring and control |
| \* Enhanced convenience, predictive maintenance, and user experience from tech integration |
| Consumer Behaviour | \* Increased demand for multi-functional and compact appliances due to urbanization |
| \* Customization trends: consumers want personalized colors, textures, and finishes |
| Industrial Shifts | \* E-commerce channels are reshaping how appliances are sold, with emphasis on convenience, variety, and competitive pricing |
| \* Omni-channel strategies are now industry standard |

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* + 1.2. Global Trade
    - 1.2.1. Leading Countries

|  |  |  |  |
| --- | --- | --- | --- |
| Country | Imports (USD) | Exports (USD) | Production (Tonnes pa) |
| China | Data not specified | Over $100 billion (2024) | Approximately 4.8 billion units (2024) |
| South Korea | $779 million (2021) | $176 million (2021) | Data not specified |
| United States | $39.85 billion (2024) | $7.5 billion (2022) | Data not specified |
| Turkey | $560 million (2023) | $190 million (2023) | 32.4 million units (2023) |

* + - 1.2.2. Major country insights

**China:**

* + - * World’s largest producer and exporter of domestic appliances, led by global giants like Haier, Midea, Gree, and Hisense
      * Benefits from massive scale, low-cost manufacturing, and extensive upstream supply chain integration.
      * Government policies (e.g., Made in China 2025) drive automation, smart home integration, and green appliance innovation.

**South Korea:**

* + - * Home to premium global brands Samsung and LG, known for innovation in smart, connected, and energy-efficient appliances.
      * Focus on high-tech features such as AI, IoT connectivity, and eco-friendly design.
      * Strong government support for innovation clusters and smart manufacturing capabilities

**USA:**

* + - * A major importer with strong domestic demand for large and small appliances; brands include Whirlpool, GE Appliances, and KitchenAid.
      * Focuses on high-end, energy-efficient, and smart appliances integrated with home automation platforms.
      * Federal support for advanced manufacturing and reshoring, including incentives under the CHIPS and Science Act and clean energy policies.

**Turkey:**

* + - * Europe’s leading white goods manufacturer with major global brand Arçelik (owner of Beko, Grundig, and Defy).
      * Strategic location allows efficient export to both Europe and MENA regions.
      * Competitive labor costs and deep industrial expertise have fueled growth in OEM and ODM production for global brands.
      * Government backing for exports and industrial modernization, with a growing focus on energy efficiency and smart home integration

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* 1.2.3. Major global suppliers

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Manufacturer | Segment Type | Estimated Global Market Share (2023) | Production Capacity (Units per Year) | Strategic Advantage |
| Haier (China) | Refrigerators, Washing Machines, Air Conditioners | ~14–16% | ~100 million+ | World's #1 in white goods, global acquisitions (e.g., GE Appliances), vast R&D footprint |
| Midea (China) | Air Conditioners, Kitchen Appliances, Washers | ~12–14% | ~90 million | Strength in automation, wide OEM/ODM network, cost efficiency |
| Whirlpool (US) | Washing Machines, Refrigerators, Cooking | ~9–10% | ~70–80 million | Strong North American and European brand presence, innovation in sustainability |
| LG Electronics (South Korea) | Washing Machines, Refrigerators, Ovens, Air Purifiers | ~8–9% | ~65 million | Innovation-driven, leadership in AI and smart appliances |
| Arçelik (Turkey) | Refrigerators, Ovens, Dishwashers, Washers | ~6–7% | ~35–40 million | Strong presence in Europe and MENA, diversified brand portfolio (e.g., Beko, Grundig) |

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* + - 1.2.4. Country analysis case study, 2 countries **[Decision Required]**. Country selection process based on whether said industry is a major export / production in the economy
      * 1.2.4.1. Country GDP and industry contribution
  + Country: China
  + GDP (2023): $17,794 billion (1.5% Apparel industry)))
    - * 1.2.4.2. Workforce in industry

(Employees in Domestic Appliances: 0.9 million (0.12% of labor force)))

* + - * 1.2.4.3. Market size of industry in country

(Example:

Production Capacity (2023): 4.8 billion units

Export Turnover: $98.6 billion

Major OEMs: -500

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* + - * 1.2.4.4. Top Suppliers and Manufacturers in the country

(Example:

OEMs: Haier, Midea, Gree, Hisense, TCL, Galanz, Skyworth

Components Manufacturers: Sanhua Intelligent Controls, Aux Group, Zhejiang Supor, Inovance Technology, Donper Compressor, Hangzhou Hikmicro

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* + - * 1.2.4.5. Milestone Journey
        + Establishment years of suppliers

|  |  |
| --- | --- |
| Year | Milestone |
| 1968 | Midea was established as a small workshop in Guangdong; it grew into a global home appliance leader. |
| 1969 | Hisense was founded, initially producing radios, later expanding into TVs and large home appliances. |
| 1978 | Galanz was founded and became a global leader in microwave ovens and kitchen appliances. |
| 1981 | TCL was established, later diversifying into refrigerators, washing machines, and smart appliances. |
| 1984 | Haier was officially formed in Qingdao, becoming the world’s largest white goods brand. |

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1. KSA Landscape overview
   * 2.1. KSA Market overview
     + 2.1.1. Local Market Segmentation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Equipment Type | Manufacturers | Manufacturers Count | Units Sold 2023 | Imports 2023 (mSAR) |
| Temperature Control Appliances | Samsung, Apple, Huawei, ZTE | ~10 | ~1.2 million units | ~5.3 billion |
| Washing Appliances | HP, Dell, Lenovo, Asus, Acer | ~8 | ~0.9 million units | ~3.9 bilion |
| Cooking Appliances | Samsung, LG, Sony, Hisense, TCL | ~10 | ~0.7 million units | ~2.6 billion |

* + - 2.1.2. Market share

|  |  |  |  |
| --- | --- | --- | --- |
| Company | Temperature Control Appliances | Washing Appliances | Cooking Appliances |
| LG Electronics | 22% | 20% | 18% |
| Samsung | 20% | 18% | 22% |
| Haier | 15% | 12% | 14% |
| Whirlpool | 10% | 16% | 8% |

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* + - 2.1.4. Current and projected demand

**Domestic Appliances Sold and Forecast (thousands of units)**

* **2023:** 1,780 (Actual)
* **2024:** 1,860 (Actual)
* **2035:** 2,720 (Forecast)

**Forecast Increase:** +46.2% from 2024 to 2035)

* + 2.2. Segments Overview
    - 2.2.1. Import dependency of various segments

**Domestic Appliances Import 2023 (mSAR)**

|  |  |  |
| --- | --- | --- |
| Segment | Import Value (SAR million) | % of Total Imports |
| Temperature Control Appliances | ~5,300 | ~50% |
| Washing Appliances | ~3,900 | ~37% |
| Cooking Appliances | ~2,600 | ~13% |

* + - 2.2.2. Market size – Different segments and market size

Temperature Control Appliances: 1,200,000 units units (67.4%)

Washing Appliances: 400,000 units (22.5%)

Cooking Appliances: 180,000 units (10.1%)

* + - 2.2.3. Market trends

(Example:

**Domestic Appliances Import Trend (SARm):**

* **2019:** 9,800
* **2020:** 10,500
* **2021:** 11,200
* **2022:** 12,000
* **2023:** 12,800

**Insights:**

**•** Growth in Trade Deficit:

The Balance of Trade (BOT) for domestic appliances in Saudi Arabia has steadily worsened, rising from SAR 10.1 billion in 2018 to SAR 12.9 billion in 2023.

• Temperature Control Appliances Lead the Deficit:

This segment is the dominant contributor to the trade deficit, increasing from SAR 5.2 billion in 2018 to SAR 8.4 billion in 2023. Its share of the total BOT remains the highest due to the Kingdom's extreme climate, which fuels continuous demand for air conditioners and refrigerators, and a near-total reliance on imports

• Washing Appliances Show Moderate Growth:

Washing appliances have maintained a relatively stable but significant deficit, growing from SAR 1.5 billion in 2018 to SAR 2.3 billion in 2023.

Key Drivers of BOT Increase:

Limited Local Manufacturing & Assembly: Minimal local production and component assembly capabilities result in a high dependency on imported finished goods across all appliance categories.

Housing and Urbanization: Continuous residential development and population growth are expanding household appliance needs, especially for multi-unit dwellings and new homebuyers.

Brand Preference and Retention: Appliances in KSA often remain in use for 10+ years. Brand loyalty and consumer expectations for established international brands further reinforce reliance on imports

* + 2.3. Trade Analysis
    - 2.3.1. Top Exporting countries per segment

(Example:

**Domestic Appliances Categories Top Exporting Countries to KSA**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Category | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| Temperature Control Appliances | China | China | China | China | China | China |
| Washing Appliances | China | China | China | China | China | China |
| Cooking Appliances | Italy | Italy | Italy | Italy | Italy | Italy |

* + - 2.3.2. Top Exporting countries rank

(Example:

**Domestic Appliances Exporting Countries to KSA**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Rank** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** |
| 1 | China | China | China | China | China | China |
| 2 | Italy | Italy | Italy | Italy | Italy | Italy |
| 3 | Turkey | Turkey | Turkey | Turkey | Turkey | Turkey |
| 4 | Germany | Germany | Germany | Germany | Germany | Germany |
| 5 | South Korea | South Korea | South Korea | South Korea | South Korea | South Korea |

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* + - 2.3.3. Trends and insights

(Example: Over x% of KSA’s domestic appliances imports from 2018 to 2023 originated from five key countries:

• China

• Italy

• Turkey

• Germany

• South Korea

* + 2.4. Local Capabilities
    - 2.4.1. Current Local Capabilities

(Example:

**Shaker Group**

* Capabilities: A leading Saudi distributor and assembler of air conditioners, partnered with LG. Shaker Group operates limited local assembly capabilities and a large-scale distribution network across the Kingdom, particularly for temperature control appliances.
* Strategic Partnerships: Strategic Partnerships: Exclusive partnership with LG Electronics for air conditioning solutions, leveraging LG’s global technology and Shaker’s regional market expertise.
* Focus: Enhancing domestic assembly capabilities for climate-specific air conditioning systems and expanding regional distribution coverage, especially in the HVAC segment aligned with sustainability and energy-efficiency priorities.

**Alat (PIF Initiative)**

* Capabilities: Primarily focused on air conditioning and climate control systems, Zamil offers assembled products engineered for Saudi Arabia’s extreme climate. While it lacks full-scale manufacturing, it provides tailored HVAC systems adapted to local conditions.
* Strategic Partnerships: Works closely with international component suppliers to assemble and deliver specialized units for residential, commercial, and industrial applications.
* Focus: Increasing specialization in climate-adaptive air systems, Zamil supports Vision 2030’s goals through localized design and engineering of durable, efficient cooling solutions.
  + - 2.4.2. Upcoming supplier categories

(Example:

Saudi Arabia’s domestic appliances industry is poised for gradual vertical integration as part of the localization goals under Vision 2030. The government is expected to incentivize the development of local component manufacturing and sub-assembly capabilities to reduce the Kingdom’s heavy reliance on imported finished goods. This shift aims to strengthen industrial resilience, boost job creation, and enable technology transfer through global partnerships.

**Supplier Categories**

* **Compressor and Cooling System Manufacturing Units**
* **Plastic Injection Molding & Sheet Metal Fabrication Plants**
* **Wiring Harness & Control Module Assembly Lines**
* **Motor & Drive Unit Assembly Plants**
* **Services IoT Module & Smart Interface Assembly Services**

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1. Associated Industry and Value Chain Analysis
   * 3.1. Associated Industry Analysis
     + 3.1.1. Associated Industry list

(Example:

|  |  |
| --- | --- |
| Associated Industry Number | Associated Industry |
| Associated Industry 1 | Plastic & Non-metallics |
| Associated Industry 2 | Electronic & Semiconductor Components |
| Associated Industry 3 | Fluid Processing Equipment |
| Associated Industry 4 | Power Generation Equipment |
| Associated Industry 5 | Measurement & Control Instruments |
| Associated Industry 6 | Mechanical Components |
| Associated Industry 7 | Mechanical & Static Sealing |
| Associated Industry 8 | Tubes & Pipes |
| Associated Industry 9 | Ventilation & Air Handling Equipment |
| Associated Industry 10 | Thermal Process Equipment |
| Associated Industry 11 | Industrial Gases & Refrigerants |

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* + - 3.1.2. Industry Role

(Example:

|  |  |  |
| --- | --- | --- |
| Associated Industry | Value Chain Role | Contribution to Final Product |
| Plastic & Non-metallics | Core upstream supplier for enclosures and interior structural parts. | Provides external casings, insulation, and user interface components (e.g., knobs, panels). |
| Electronic & Semiconductor Components | Midstream supplier of control boards, sensors, and microchips. | Enables automation, smart features, and energy efficiency in appliances like washers and ovens. |
| Fluid Processing Equipment | Midstream integrator of water and air flow systems. | Supports performance in washing machines, dishwashers, and HVAC systems via pumps and valves. |
| Power Generation Equipment | Midstream supplier of compressors and motor systems. | Powers key appliance functions like cooling (refrigerators) and spinning (washers). |
| Measurement & Control Instruments | Midstream provider of sensors, thermostats, and control units. | Ensures precise temperature, timing, and safety regulation in ovens, ACs, and water heaters. |
| Mechanical Components | Midstream fabricator of fans, pulleys, and drum motors. | Drives mechanical operation in appliances like dryers, ACs, and range hoods. |
| Mechanical & Static Sealing | Midstream supplier of seals and gaskets. | Maintains containment of heat, water, and air in appliances, ensuring energy and water efficiency. |
| Tubes & Pipes | Midstream supplier of piping systems and channels. | Critical for air and water circulation in refrigerators, HVACs, and washers. |
| Ventilation & Air Handling Equipment | Midstream component supplier for airflow systems. | Delivers ventilation performance in cooking hoods, dryers, and air conditioners. |
| Thermal Process Equipment | Midstream producer of heating elements, coils, and thermal sensors. | Enables cooking, heating, and drying functions in stoves, ovens, and water heaters. |
| Industrial Gases & Refrigerants | Core upstream input for cooling systems. | Enables refrigeration and air conditioning functions via chemical cooling cycles. |

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* + - 3.1.3. Supplier Tiers

(Example:

|  |  |  |  |
| --- | --- | --- | --- |
| **Associated Industry** | **Tier 1 Suppliers** | **Tier 2 Suppliers** | **Tier 3 Suppliers** |
| **Plastic & Non-metallics** | * LG Chem * BASF * SABIC | * Covestro * DuPont * Asahi Kasei | * Solvay * Evonik * Formosa Plastics |
| **Electronic & Semiconductor Components** | * Panasonic * LG * Samsung | * Foxconn * Emerson * Honeywell | * TE Connectivity * Molex * STMicroelectronics |
| **Fluid Processing Equipment** | * Grundfos * Danfoss * Emerson | * SKF * Flowserve * Wilo | * Xylem * SPX FLOW * Pentair |
| **Power Generation Equipment** | * GMCC * Panasonic * LG | * Emerson * Honeywell * Mitsubishi Electric | * Copeland * Tecumseh * Daikin |
| **Measurement & Control Instruments** | * Siemens * Honeywell * Emerson | * Danfoss * Schneider Electric * ABB | * Azbil * Yokogawa * Delta Controls |
| **Mechanical Components** | * SKF * Timken * Bosch | * HIWIN * NSK * THK | * INA * NTN * FAG |
| **Mechanical & Static Sealing** | * DOW * BASF * Saint-Gobain | * Trelleborg * Freudenberg * Garlock | * Parker Hannifin * James Walker * Chesterton |
| **Tubes & Pipes** | * CODELCO * BAOSTEEL * Outokumpu | * JFE Steel * Tata Steel * Tenaris | * Vallourec * Nippon Steel * POSCO |
| **Ventilation & Air Handling Equipment** | * TOSHIBA * GMCC * Emerson | * Johnson Controls * EBM-Papst * Ziehl-Abegg | * Twin City Fan * Greenheck * Systemair |
| **Thermal Process Equipment** | * ArcelorMittal * Daikin * Emerson | * Midea * Honeywell * GMCC | * Sandvik * Bosch Thermotechnology * Ferroli |
| **Industrial Gases & Refrigerants** | * Linde * Air Liquide * Daikin | * Arkema * Honeywell * Chemours | * Mexichem * Solvay * SRF Ltd |

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* 3.1.4. Cost Contribution

(Example:

|  |  |  |
| --- | --- | --- |
| Associated Industry | % Cost Contribution | Insights |
| Plastic & Non-metallics | 10%–15% | * - Forms the bulk of external housings, control panels, and internal chassis. * - Material type (ABS, polypropylene) affects heat and impact resistance. * - Aesthetic finishes and insulation performance influence cost. |
| Electronic & Semiconductor Components | 15%–20% | * - Includes control boards, timers, microcontrollers, and sensors. * - Smart features (IoT, Wi-Fi, touch panels) significantly increase cost. * - High integration in smart appliances (e.g., smart ovens, washers). |
| Fluid Processing Equipment | 10%–15% | * - Key for washing machines, dishwashers, and HVAC systems. * Pumps, valves, and fluid sensors are critical to water/air management. * - Cost scales with automation level and efficiency. |
| Power Generation Equipment | 15%–25% | * - Includes compressors, motors, fans, and inverters—vital for fridges, ACs, and dryers. * - Efficiency class (e.g., inverter motors) is a key cost driver. * - Typically the largest mechanical cost component. |
| Measurement & Control Instruments | 8%–12% | * - Comprises thermostats, humidity sensors, timers, and user interface controls. * - Higher accuracy and digital integration increase costs. * - Important for energy regulation and safety compliance. |
| Mechanical Components | 5%–10% | * - Covers internal moving parts: belts, pulleys, drums, hinges. - Performance, noise insulation, and material durability influence price. - Heavily used in laundry and cooking appliances. |
| Mechanical & Static Sealing | 3%–6% | * - Includes gaskets, seals, vibration dampers. - Essential for maintaining energy and water efficiency in washers, ovens, and AC units. - Quality seals reduce leakage and noise, boosting performance. |
| Tubes & Pipes | 2%-5% | * - Applied in refrigerators, dishwashers, and ACs for coolant and water flow * - Material (copper, plastic, stainless steel) affects cost and longevity. * - Pipe integration affects space and thermal management. |
| Ventilation & Air Handling Equipment | 3%–6% | * - Involves heating coils, igniters, and heat shields used in ovens, dryers, and cooktops. * - Quality and safety regulations (e.g., auto shutoff) drive up cost. * - Crucial for performance and energy rating. |
| Thermal Process Equipment | 2%–4% | * - Hinges, fans, screws, and heat dissipation hardware. * - Premium devices with foldable screens or advanced cooling require precise, durable mechanical parts. * - Typically a small share but critical to functionality. |
| Industrial Gases & Refrigerants | 5%-10% | * -Used in air conditioners and refrigerators for cooling cycles. * - Refrigerant type (e.g., R-32 vs. R-410A) impacts efficiency, regulatory compliance, and cost. * - Subject to strict environmental regulations. |

* + 3.2. Value Chain Analysis
    - 3.2.1. 6-step value chain analysis

(Example:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Associated Industry | Insight Topic | Raw Material | Manufacturing Industries | Assembly | Distribution & Sales | Aftermarket | Consumers |
| Plastic & Non-metallics | Structural Integrity & Insulation | * Plastics, fiberglass, hydrocarbon derivatives | * Molded into housings, panels, trays, buttons, and internal structures | * Assembled as casings and frames for refrigerators, washers, ACs, and ovens | * Product differentiation by finish, color, and brand styling; affects packaging and marketing | * Replacement of panels, buttons, and covers in service; recyclable polymers in newer models | * Households, offices, hospitality requiring durable & aesthetic appliances |
| Electronic & Semiconductor Components | Control & Smart Features | * Copper, silicon, rare metals | * Used in control boards, timers, sensors, display panels, and touch controls | Integrated into smart features like Wi-Fi control, temperature regulation, and digital displays | * Retail appeal through "smart" and "connected" marketing (e.g., app-controlled ovens) | * Firmware updates, control panel repair, IoT module servicing | * Smart home adopters, energy-conscious users, tech-forward consumers |
| Fluid Processing Equipment | Water & Air Flow Efficiency | * Rubber, steel, aluminum, copper | * Pumps, valves, hoses, compressors, and fans produced for use in washers and ACs | * Installed in washer drums, ACs, dishwashers; regulate movement of fluids and air | * Promoted via energy efficiency labels and performance stats (e.g., airflow, water use) | * Pump repair, hose replacements, compressor recharges | * Users of HVACs, washing systems, dishwashers, healthcare and hospitality facilities |
| Power Generation Equipment | Cooling, Heating & Motion Power | * Copper, steel, permanent magnets | * Motors, inverters, and compressors built for core operations (e.g., cooling, spinning) | Placed at the heart of appliances: compressors in fridges, motors in washers, fans in ovens | Emphasized in branding (e.g., inverter motor, low-noise tech); shipping weight consideration | * Motor repairs, compressor swaps, inverter diagnostics | * All segments; especially relevant in high-use and climate-intense regions |
| Measurement & Control Instruments | Precision & Safety Regulation | * Thermistors, bimetals, copper wires | * Sensors, thermostats, pressure regulators, timers | * Installed to maintain safe operation and user-defined cycles (e.g., dryer timer, AC thermostat) | * Advertised via features like precise cooking, moisture sensors, child locks | * Thermostat replacement, timer recalibration, sensor updates | * Residential users, food service, healthcare (e.g., sterilization cycles) |
| Mechanical Components | Mechanical Operation & Load Transfer | * Steel, aluminum, fasteners | * Includes drums, hinges, shock absorbers, belts, screws | * Built into structural movement (e.g., washer rotation, oven doors, dryer drums) | * Durability claims in marketing (e.g., 10-year motor warranty, drum durability) | * Belt replacement, hinge tightening, vibration correction | * High-volume users, laundromats, family households |
| Mechanical & Static Sealing | Efficiency & Environmental Sealing | * Gaskets, elastomers, silicon-based rubbers | * Gasket cutting, seal molding, thermal/pressure seals | * Ensures airtight and watertight closures in washers, fridges, ovens | * Efficiency rated via leakage prevention; marketing of "airtight," "quiet-close" seals | * Door gasket replacement, leak inspection and sealing services | * Sustainability-conscious consumers, energy auditors, health-sensitive environments |
| Tubes & Pipes | Flow Management & Durability | * Stainless steel, rubber, polyvinyl chloride (PVC) | * Manufactured into drainage, inlet, coolant pipes and condensate ducts | * Assembled in washing, cooking, and cooling appliances for fluid/gas flow | * Marketed via material durability and hygiene properties (e.g., anti-bacterial hoses) | * Pipe flush, hose swaps, blockage removals | * Households, hotels, industrial kitchens |
| Ventilation & Air Handling Equipment | Air Quality & Comfort Delivery | * Sheet metal, fans, filters, aluminum | * Production of blowers, ducts, air purifiers, air filters | * Fitted in range hoods, ACs, dryers, and air purifiers | * Marketed with air quality/odor-removal claims; energy class labels for HVAC systems | * Filter replacement, fan motor servicing, duct cleaning | * Restaurants, medical facilities, home kitchens |
| Thermal Process Equipment | Heat Generation & Control | * Steel, mica, heating coils | * Manufacture of elements for stoves, dryers, ovens, and water heaters | * Built into heating zones, insulated compartments, ignition systems | * Labeled with features like rapid heat-up, even heating, and energy efficiency | * Heating element replacement, coil re-installation, insulation patching | * Consumers, food service, energy-conscious buyers |
| Industrial Gases & Refrigerants | Cooling Performance & Regulation | * Hydrofluorocarbons (R-134a, R-410a, R-32), isobutane | * Refrigerants stored and filled into sealed systems | * Injected during final stages of refrigerator and AC assembly | * Branded based on eco-rating, low-GWP (global warming potential), and regulatory compliance | * Recharge, leak detection, gas conversion/upgrades | * Commercial cooling (supermarkets), residential air conditioning |

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* + - 3.2.2. Value chain supplier landscape

(Example:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Industry | Global vs Local Suppliers | Raw Material Suppliers | Manufacturing Industries Suppliers | Assembly Suppliers | Distribution & Sales | Aftermarket | Consumers |
| Plastic & Non-metallics | Global Suppliers | * LG Chem * BASF * SABIC | * GRONBACH, Whirlpool, LG | * GRONBACH, Whirlpool, LG | * Midea, LG, Samsung, Al Jomaih | * Extra, Al Assayeh, Best Buy | * Commercial, Hospitality, Consumers |
| Electronic & Semiconductor Components | Local Suppliers | * BAOSTEEL * CODELCO * Alcoa | * Panasonic, Foxconn, Infineon | * Panasonic, LG, Whirlpool | * LG, Samsung, Haier | * Exact Replacement Parts, Almanea | * Smart Home, Office, Consumer |
| Fluid Processing Equipment | Global Suppliers | * SABIC * BAOSTEEL | SKF, Freudenberg, LG | * LG, Whirlpool, Bosch, Askoll | GREE, Carrier, Zamil Industrial | * Best Buy, Al Assayeh | * Residential, Healthcare, Commercial |
| Power Generation Equipment | Local Suppliers | * CODELCO * BAOSTEEL * Nippon Steel | TECO, Siemens, SKF, Askoll, Midea | * TECO, LG, Whirlpool | * Samsung, LG, Carrier | * Authorized repair services | * Residential, Commercial |
| Measurement & Control Instruments | Global Suppliers | * SABIC * VALE, CODELCO | Emerson, Honeywell | * Emerson, Honeywell, LG | * LG, Midea, GREE | * Maintenance and tuning | * Smart Devices, Office, Healthcare |
| Mechanical Components | Local Suppliers | * SABIC, Alcoa, BAOSTEEL | Samsung, Whirlpool, LG | * LG, Samsung, Whirlpool | * Haier, Whirlpool, B/S/H/ | * Cable and part replacement | * Industrial, Residential, Hospitality |
| Mechanical & Static Sealing | Global Suppliers | * DOW, BASF, SABIC | * Freudenberg, Cooper Standard | * Samsung, LG, Bosch | * LG, Midea, GREE | * Seal/gasket service shops | * Residential, Healthcare, Appliances |
| Tubes & Pipes | Mixed (Local: SABIC) | * SABIC, BASF, LG Chem | * Röchling, Toray, BASF | * LG, Whirlpool, Bosch | * Samsung, Al-Futtaim | * Spare pipe vendors, repairmen | * All households, commercial users |
| Ventilation & Air Handling Equipment | Global Suppliers | * CODELCO, BAOSTEEL | * Toshiba, GMCC, Emerson | * Midea, GMCC, Panasonic, Honeywell | * Carrier, LG, GREE | * Filter and airflow repair centers | * Hospitality, Healthcare, Residential |
| Thermal Process Equipment | Mixed (Ma’aden, SABIC local) | * Ma’aden, Alcoa, SABIC | * Emerson, Panasonic, Whirlpool | * Whirlpool, LG, Bosch | * B/S/H/, Haier, Al Assayeh | * Fan/coil service providers | * Consumers, Commercial Kitchens |
| Industrial Gases & Refrigerants | Global Suppliers | * Linde, Daikin, Air Liquide | * Honeywell, Daikin, Chemours | * GMCC, Panasonic, Daikin | * Carrier, GREE, Zamil | * Refill, gas leak inspection | * Refrigeration users, AC owners |

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* + - 3.2.3. Supplier Case Study

(Example:

|  |  |
| --- | --- |
| Supplier Name | Apple Inc. |
| Headquarter Location | * Cupertino, California, USA |
| Founding Year | * 1976 |
| 2023 Revenue (USD) | * USD 394 bn |
| Top global operating location | * USA (R&D and Design) * China (Manufacturing with Foxconn, Pegatron) * India * Vietnam * UK * Germany * UAE * Australia |
| Number of Employees | * 161,000 |
| Product Portfolio | * Communication Devices: iPhone (20% Global Market Share) * Personal Computers: MacBook, iMac (10%) * TV & Multimedia: Apple TV, iPad * Smart Home Ecosystem: HomePod, Apple Watch, accessories |
| Service Offering | * End-to-end integration of hardware, software, and cloud services * Revenue from iCloud, Apple Music, App Store, AppleCare * Direct retail and e-commerce network across 175+ countries |
| Global Value Chain Contribution | * Innovation-Led Design: Apple leads in product development, custom chip (M-series) integration, and vertical ecosystem design * Strategic Manufacturing Footprint: Relies on partners in China, Vietnam, and India for assembly, reducing geographic risk * Retail and Aftermarket: Owns a robust global distribution and repair network that strengthens customer loyalty and service consistency |

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* + - 3.2.4. Value chain localization opportunities

(Example:

Opportunity 1: Establish strategic assembly partnerships with global OEMs (e.g., Lenovo, Apple) to develop local assembly capacity in KSA for key product categories: Communication Devices, Personal Computers, TV & Multimedia, and Gaming Equipment. These partnerships can accelerate localization, access to IP, and downstream manufacturing readiness.

Opportunity 2: Create a shared assembly and manufacturing hub that services both consumer electronics and domestic appliances. This approach leverages common component needs (e.g., electronics, plastics, mechanical parts), enabling economies of scale, streamlined supply chains, and reduced complexity across both industries.

Opportunity 3: Support contract manufacturing agreements by local KSA players with global OEMs like Apple and Amazon, enabling them to scale operations through partnerships with major EMS providers (e.g., Foxconn, Flex, etc.). This would strengthen KSA’s role in the global electronics value chain, especially in components and systems assembly.

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* + 3.3. Raw Material Analysis
    - 3.3.1. 5-step value chain analysis

(Example:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Associated Industry | Insight Topic | Raw Material Extraction Insight | Material Processing Insight | Manufacturing Insight | Industry Specific | Manufactured Parts |
| Steel | Limited downstream applicability for electronics | * Iron ore sourced globally; local mining and processing focused on construction needs with limited grade flexibility | * DRI and EAF dominate; alloying and retaining capacity exists but geared toward basic steel applications | * Limited capability in precision machining and coating for electronics components | * Low specialization in stainless and galvanized steels needed for electronics; current grades serve basic industrial needs | * Screws, frames, structural mounts, enclosures |
| Plastics (Polymers) | Potential for value-added polymer specialization | * Strong upstream base with Aramco and SABIC; local feedstock available for scalable polymer production | * Advanced polymer production (e.g., PC, PMMA) already in place; limited focus on conversion for electronics | * Underutilized capacity for molding and component assembly relevant to devices | * Polymer expertise can support parts like optical lenses, casings, and insulators with focused investment | * Device shells, screen covers, interior insulation components |
| Copper | Growing domestic capability in high-purity copper | * Local mining and new exploration efforts underway (e.g., Ma’aden); current reliance on imports for refined material | * Blister and cathode copper refinement exists abroad; new refineries planned in Yanbu | * Opportunities in ETP and OFHC copper for wiring and PCB supply | * Copper grades required for PCBs, connectors, and battery modules can be produced locally with strategic investment | * PCB traces, wiring, power terminals, grounding plates |
| Silicon | Critical gaps in semiconductor-grade infrastructure | * Quartz reserves are abundant in KSA but not yet industrialized for electronics-grade silicon | * No current capacity for MG-Si or EG-Si processing; reliance on imports for polysilicon and wafer supply | * No local manufacturing for wafers, polycrystalline silicon, or electronic-grade components | * Electronics and display segments cannot currently source base silicon locally; full dependency on imports persists | * Silicon wafers, transistors, microchips, LCD panel substrates |
| Lithium Compounds | Strategic opportunity for battery value chain | * Brine-based lithium explored by Albemarle, Ma’aden, and Aramco; large regional reserves remain untapped | * No current refining of lithium hydroxide or carbonate; entirely dependent on international processors | * High potential for establishing refining and cathode production through partnerships with global battery manufacturers | * Could support consumer electronics and EV-grade battery cell production with proper infrastructure and policy incentives | * Battery cells, wearable power units, smart device battery modules |

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* + - 3.3.2. Supplier Landscape

(Example:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Associated Industry** | **Insight Topic** | **Raw Material Extraction Insight** | **Material Processing Insight** | **Manufacturing Insight** | **Industry Specific** | **Manufactured Parts** |
| **Steel** | Limited industrial-grade steel for electronics | * Vale (Global) * CODELCO (Global) * LKAB (Global) | * Hadeed (Local – SABIC) * ArcelorMittal (Global) * Beshay Steel (Regional) | * Posco (Global) * SiCast (Local) * Tata Steel (Global) | * Posco (Global) * Outokumpu (Global) * Acerinox (Global) | * Fasteners, structural frames, screws, metal brackets |
| **Plastics (Polymers)** | Underutilized potential for component molding | * Aramco (Local) * SABIC (Local) * ExxonMobil (Global) | * PetroRabigh (Local) * Sadara (Local) * Sipchem (Local) | * TASNEE (Local) * Borouge (Regional) * LyondellBasell (Global) | * TASNEE (Local) * SABIC (Local) * Advanced Petrochem (Local) | * Casings, insulation, lenses, button assemblies |
| **Copper** | Strengthening local capacity for electronics | * Ma’aden (Local) * Ivanhoe Electric (Global) * Glencore (Global) | * Gulf Copper (Local) * Grupo México (Global) * BHP (Global) | * Aurubis (Global) * Mitsubishi Materials (Global) * Nexans (Global) | * ETP Copper (Grupo México) * DHP Copper (Glencore) * OFHC Copper (Aurubis) | * PCB traces, wiring, connectors, copper heat sinks |
| **Silicon** | No local electronic-grade capability | * Sibelco (Global) * Ma’aden (Local – quartz exploration)  • Daqo New Energy (Global) | * Wacker Chemie (Global) * Hemlock Semiconductor (Global)  • OCI (Global) | * REC Silicon (Global) * HSC (Global) * SMIC (Global) | * Shin-Etsu (Global) * SUMCO (Global) * GlobalWafers (Global) | * Semiconductors, display TFTs, solar cells |
| **Lithium Compounds** | High potential through brine-based reserves | * Albemarle (Global) * SQM (Global) * Ma’aden (Local) | * Albemarle (Global) * Ganfeng Lithium (Global) * FMC Corp (Global) | * Tianqi Lithium (Global) * POSCO Chemicals (Global) * TDS Lithium (Global) | * Albemarle (Global) * Ganfeng (Global) * Lithium Americas (Global) | * Battery cells, power modules, energy storage systems |

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* + - 3.3.3. Supplier Case Study

(Example:

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| --- | --- |
| Supplier Name | SQM (Sociedad Química y Minera de Chile S.A.) |
| Headquarter Location | * Santiago, Chile |
| Founding Year | * 1968 |
| Revenue (USD) | * USD 7.5 billion (FY 2023) |
| Top global operating location | * Chile * Australia * China |
| Number of Employees | * 6,200 |
| Product Portfolio | * Lithium Compounds (lithium carbonate, lithium hydroxide) * Specialty Plant Nutrition * Iodine, Nitrates, Potassium |
| Service Offering | * Integrated mining and refining of lithium brine and other minerals * Sustainable resource extraction practices * Downstream lithium partnerships |
| Global Value Chain Contribution | * SQM is one of the world's leading producers of lithium compounds for batteries and energy storage. It specializes in lithium brine extraction, a process that aligns well with Saudi Arabia’s untapped lithium reserves. * The company’s expertise in low-emission, sustainable lithium production and its global joint ventures (e.g., with Codelco and Wesfarmers) position it as a strategic enabler for battery ecosystems. * Its investments in refining capabilities and circular battery economy projects (e.g., with AltLithium Metals) enhance its downstream integration. |

* + - 3.3.4. Value chain localization opportunities

(Example:

Opportunity 1: Expand Domestic Production of Specialized Steel Grades

KSA can localize production of stainless steel (304, 430), galvanized steel (DX51D, A755), and electrical steel (M400-50A) to meet the demands of consumer electronics and related industries. This would reduce dependency on imports and support sectors like automotive, fluid processing, and home appliances.

Opportunity 2: Develop Polymer Conversion Capabilities for Electronics Components

KSA’s strong upstream polymer base enables the development of local molding and conversion facilities to produce electronics-specific parts such as device casings, internal frames, cable insulation, and compact housings — enhancing vertical integration in the plastics value chain.

Opportunity 3: Establish Copper Smelting and Refining Plants to Produce Electronics Grades

To support PCB, cable, and connector manufacturing, KSA can invest in plants to refine Grade A (C11000), OFHC, and DHP copper. Local copper recycling from industrial and electronic