Nonmetallic Investment Opportunities

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iktva Program Overview

The IN-KINGDOM TOTAL VALUE
ADD (iktva) Program

- Drives domestic value creation by working with suppliers for mutual benefits
- Envisions to improve investment, and maximize long term economic growth and diversification
- Focuses on delivering quality jobs, advancing innovation and enhancing global competitiveness

IKTVA is designed to reward Saudi Aramco’s suppliers for the use and development of local labor and sub-suppliers
Glass Fiber Investment Opportunity Summary

The opportunity

- Great potential to establish state of the art manufacturing facility for glass fiber to meet growing demand in the kingdom
- Opportunity also exist to supply raw materials and finished products to various growing sectors including Oil and Gas, Building and Construction and others.

The business case

1. Global demand on glass fiber is growing at 5% CAGR and will reach 8 MM Tons by year 2030
2. Localization has the potential to significantly reduce KSA's imports while facilitating the opportunity to export glass fiber to Europe and middle East
3. Kingdom demand will reach 250 K Tons. 37% will be used in Pipes and tanks applications

Source: Future Materials Group
Glass Fiber Applications

**Oil & Gas**
- RTP piping
- RTR piping
- FRP tanks

**Civil & Construction**
- Manholes
- Rebar
- Cladding
- Furniture

**Renewables**
- FRP blades for wind mill and other products
Glass Fiber Product Benefits

**Cost**
- Significant potential for cost saving
- Cost-effective manufacturing processes
- Low-to-moderate tooling costs

**Light weighting**
- Light weight
- Ability to build in, ex-mold, both color and texture

**Durability**
- High tensile strength at low weight
- Excellent environmental resistance
- Wide resin compatibility
The global demand on Glass Fiber is expected to grow at 5% from 4,997 K Tons in 2020 and will reach 8,139 K Tons year 2030.

Source: Saudi Aramco Internal Analysis
Global End-use Glass Fiber Roving by Application [K Tons]

- Automotive & Transportation: 23%
- Construction & Infrastructure: 17%
- Electrical & Electronics: 8%
- Pipe & Tank: 13%
- Tanks: 5%
- Marine: 7%
- Aerospace & Defence: 15%
- Wind Energy: 1%
- Other: 0%

- Automotive represents 23% of the total consumption of glass fiber among other applications.
- Rebar have the highest growth rate of 9.5%

Source: Saudi Aramco Internal Analysis
Saudi Aramco's Demand of Glass Fiber

- The Saudi Aramco demand on the end products is expected to grow at 3% from 13.9 K Tons to reach 18.6 K Ton in 2030.

Source: Saudi Aramco Internal Analysis

Saudi Aramco: Public
Key ingredients are available locally and in GCC region.

- Silica Sand
- Limestone
- Soda Ashlica

Calcined alumina, borax, feldspar, nepheline

Syenite, magnesite, and kaolin clay, among others

Processing Chemicals

Glass Fiber

Localization Opportunity
Available Locally
Structural Components Investment Opportunity Summary

The opportunity

- Potential exist to establish world class manufacturing facility for structural component to meet the growing demand in the kingdom and GCC
- The Saudi structural component market will grow at the finished product step in the value chain through the diversification from other material to nonmetallic alternatives

The business case

1. Global demand is reaching 86 MM Ton global and forecasted to grow at 5.6% CAGR
2. Localization has the potential to significantly reduce KSA’s imports, while facilitating the opportunity to export composite structure materials to the GCC
3. GCC market size on structural component will grow at 6.8% and will reach 2.9 MM Ton in 2030

Source: Future Materials Group

Saudi Aramco: Public
Structural Component Applications

Structural members

Offshore structure

Roof Framing
Structural Component Products Benefits

**Corrosion Resistant**

Composite structures are an alternative to structural steel specially when corrosion resistance is a must for the structure.

**Strength**

Composite structures has a very high tensile strength when compared to steel.

**Cost Effective**

Reduce maintenance costs for structures exposed to the environment.

**Light Weight**

Composite structure weighs only 25% of comparable steel sizes.

**Variety of Shapes**

Composite structure shapes are widely available around the world and can replace structural steel for many lightly loaded structural applications.

**Durable**

Eliminates the need for galvanizing or corrosion repair during the life cycle of most structures.
The global demand on Structural Components is expected to grow at 5.6% from 86 MM Ton in 2020 and will reach 147 MM Ton year 2030.

Source: Future Materials Group
The KSA demand on Structural Components is expected to grow at 6.5% from 0.85 MM Ton in 2020 and will reach 1.6 MM Ton in 2030. Total GCC demand is expected to reach 3.31 MM Ton by year 2030.

Source: Future Materials Group

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Construction Chemicals Investment Opportunity Summary

The opportunity

- Good potential for further localization to boost the existing production to serve the wider GCC market

The business case

1. Global demand is estimated at 41 million ton global forecast to grow at 5.9% CAGR
2. Localization has the potential to significantly reduce KSA’s imports, while facilitating the opportunity to export construction chemicals materials to the GCC
3. KSA demand 0.43 MM Tons and GCC demand will reach 1.6 MM Ton by 2030

Source: Future Materials Group
Construction Chemicals Applications

Concrete Buildings

Roads

Soil Stabilization
Construction Chemical Products Benefits

**Workability**
Place the product with ease with minimum manpower effort

**Strength**
Achieve higher material strength while maintaining the same construction material quantities

**Cost Effective**
Overall it is cheaper in life cycle cost due to reducing material ingredients quantities for the design mix and provide low maintenance

**Water Saving**
Reduce the amount of water consumption to maintain the desired properties in construction material such as concrete

**Reachability**
Reach out further distance while maintaining desired properties

**Durable**
Produce durable less permeable construction product therefore increasing the lifespan of the material
The global demand of Construction Chemicals is expected to grow at 5.9% from 41 MM Ton in 2020 and will reach 73 MM Ton year 2030.
The KSA demand on Construction Chemicals is expected to grow at 6.8% from 0.43 MM Ton in 2020 and will reach 0.83 MM Ton in 2030. Total GCC demand is expected to reach 1.61 MM Ton by year 2030.
Construction Chemicals Value Chain Mapping

Localization Opportunity
Available Locally

Crude Oil
Naphtha

Benzene
Cumene
Phenol/Acetone
Bisphenol-A production
Epoxy

Pygas
Toluene
TDI
PU

Propane
Propylene
Polyols

Acrylic Acid
Polyethylene Glycol
Butane
Maleic Acid
Rock Salt
Sodium Hydroxide

Polycarboxylate Ether
Polyether Carboxylates

Melamine
Formaldehyde
Melamine Sulphonates
Naphthalene sulphonates
By-product Paper Process

Cement

Admixture Formulation Centre
Superplasticizers

Coating & Adhesives Formulation centers
Epoxy/PU-based Adhesives
Epoxy/PU-based Protective Coating
Concrete Admixtures

Available Locally

Localization Opportunity

Rock Salt
Sodium Hydroxide

Polycarboxylate Ether
Polyether Carboxylates

Melamine
Formaldehyde
Melamine Sulphonates
Naphthalene sulphonates
By-product Paper Process

Cement

Admixture Formulation Centre
Superplasticizers

Coating & Adhesives Formulation centers
Epoxy/PU-based Adhesives
Epoxy/PU-based Protective Coating
Concrete Admixtures

Available Locally

Localization Opportunity

Rock Salt
Sodium Hydroxide

Polycarboxylate Ether
Polyether Carboxylates

Melamine
Formaldehyde
Melamine Sulphonates
Naphthalene sulphonates
By-product Paper Process

Cement

Admixture Formulation Centre
Superplasticizers

Coating & Adhesives Formulation centers
Epoxy/PU-based Adhesives
Epoxy/PU-based Protective Coating
Concrete Admixtures

Available Locally

Localization Opportunity
Insulation Investment Opportunity Summary

The opportunity

- Good potential for localization to boost current existing production to serve the wider GCC market
- Significant partnership opportunities with global players looking to establish a GCC-base and potential opportunity of technology transfer
- Opportunity to become global raw material supplier for key ingredients polystyrene and polyurethane

The business case

1. A large 25 million ton global and 0.6 million ton GCC market, growing at 7% CAGR
2. Significant energy conservation opportunity as HVAC accounts for approximately 70% of electricity consumption in KSA
3. Given insulation’s low cost per volume, transport costs can make up a comparatively large portion of the cost, thereby reducing the ability for foreign competitors to export competitive products versus locally sourced alternatives

Source: Future Materials Group
Insulation Applications

- Walls & foundations
- Roofs
- Structural insulated panels
- Insulated concrete forms
Insulation Products Benefits

**Energy savings & environmental protection**
Prevents the transmission of heat from exterior building walls and increases energy efficiency while reducing CO2 emission by keeping energy consumption and costs down.

**Control condensation and moisture**
Reduces condensation while improving comfort and preventing costly moisture damage to building materials and mould growth.

**Life cycle cost**
Significant potential for government and treasury cost savings through reduced public energy costs.
The global demand on Insulation products is expected to grow at 7.2% from 27 MM Ton in 2020 and will reach 54 MM Ton year 2030.

Source: Future Materials Group

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The KSA demand on insulation products is expected to grow at 8% from 0.26 MM Ton in 2020 and will reach 0.56 MM Ton in 2030. Total GCC demand is expected to reach 1.23 MM Ton by year 2030.
Insulation Value Chain Mapping

- Ethylene
- Propylene
- Propylene
- Polyols
- Toluene
- TDI
- XPS
- EPS
- PU Rigid

- Extrusion Process
- Expansion Block Moulding Process
- Continuous Slab Process

Localization Opportunity
Available Locally
Unidirectional Tape Manufacturing Represent an Attractive Opportunity

**The opportunity**

**Establish multiple state of the art manufacturing facilities of Unidirectional Tape to serve growing local and international demand**

**The business case**

1. Global demand is expected to grow at 40% annually for the next 10 years
2. New applications are going to utilize UD Tape including **Oil & Gas, Automotive and Marine**.
3. Attractive **cost base** including low logistics, land, utilities, and labor costs
UD Tape Applications

- Oil & Gas
- Marine
- Aerospace
- Automotive
- Sports Gears
- Wind Turbines
- Building & Construction

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The global demand on UD Tape is expected to grow at 40% from 21 Tons in 2020 and will reach 5,500 Tons year 2030.
The KSA demand on UD Tape is expected to grow at 40% from 2 Tons in 2020 and will reach 550 Tons by 2030.
Value Chain Mapping

Key ingredients are available locally and in GCC region.

- Glass Fiber
- Ethylene
- Polyethylene
- UD Tape

The resins required to make UD tape are available locally.
Please Direct All Inquiries To:

In case you are interested in discussing these opportunities further, please contact

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