



Opportunities in Nonmetallics

U.S. – Aramco Supplier Forum

Wednesday, May 4, 2022

Houston, Texas

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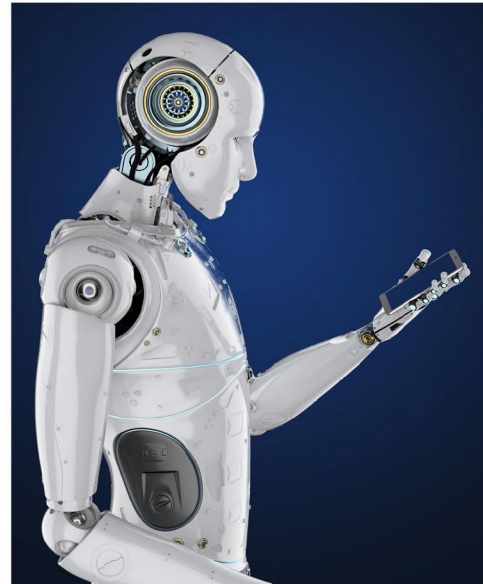


Saudi Aramco Key Strategic Initiatives

focus areas on the corporate roadmap



IKTVA



Digital Transformation



Sustainability



Circular Carbon Economy



Energy Transition



Nonmetallics

Why are Nonmetallic Materials Important

corrosion, a major issue



\$2.5 Trillion Annual Cost of Corrosion



Benefits of Nonmetallic Materials

objectives of Aramco's nonmetallic program



Eliminate

corrosion to enhance safety, integrity and reliability of our operations

Minimize

lifecycle costs by reducing the cost of corrosion, maintenance or replacement

Reduce

the carbon footprint considering the entire lifecycle

Maximize

the value of our resources by converting oil into high-value products

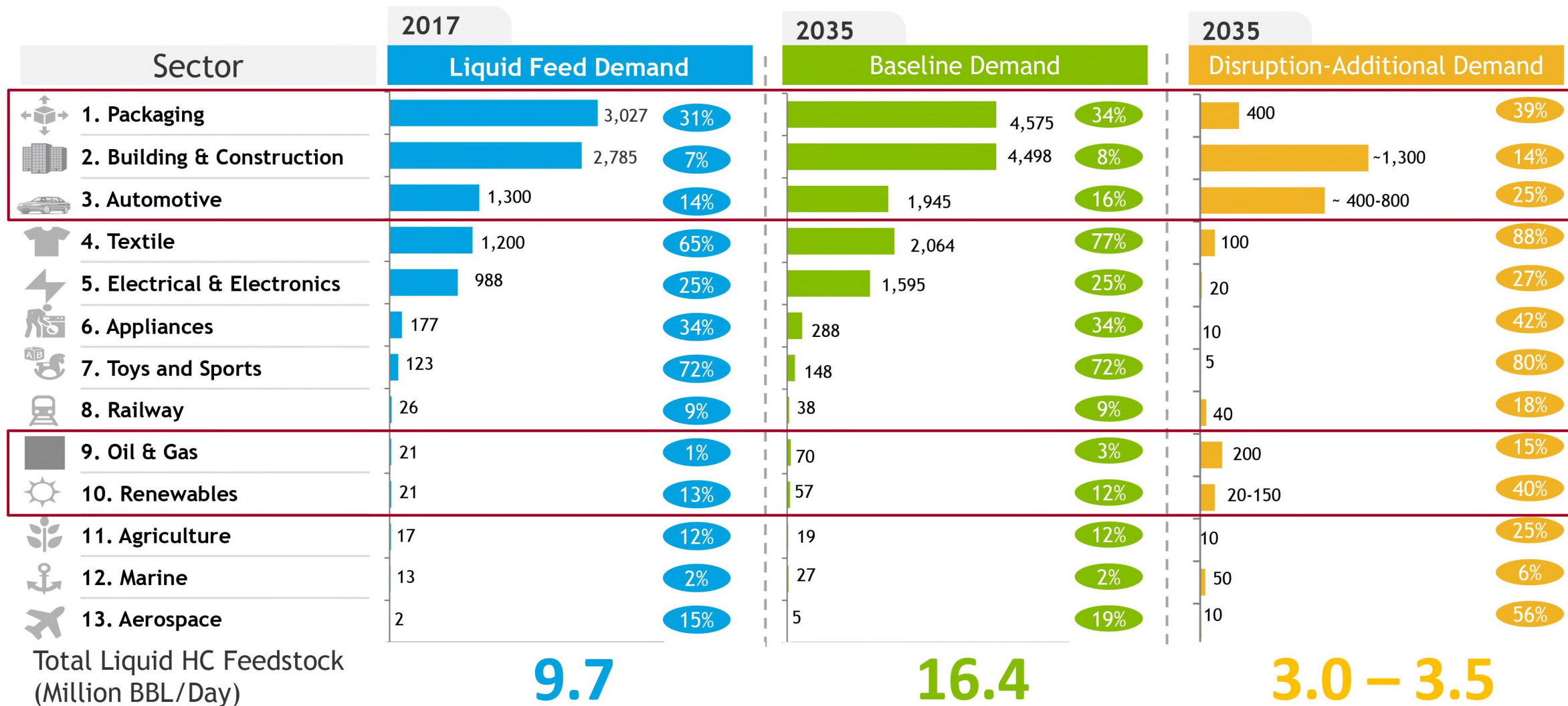
Generate

revenue from new nonmetallic materials manufacturing investments to support job creation

Nonmetallic Growth Opportunities



focused on opportunities across five key industries





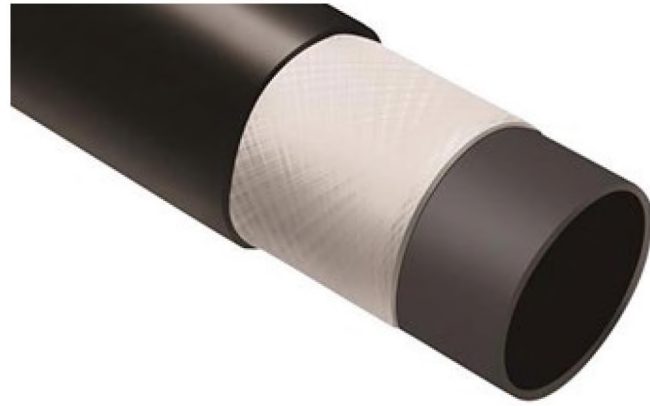
Oil & Gas Sector

- Corrosion Mitigation
- Faster Installation
- Life Cycle Cost Savings
- Over 6200 Miles of Composite Pipeline



Oil & Gas - Nonmetallic Focuses

upstream, midstream, downstream & in-plant



Pipeline



Downhole Casing



Cooling Towers



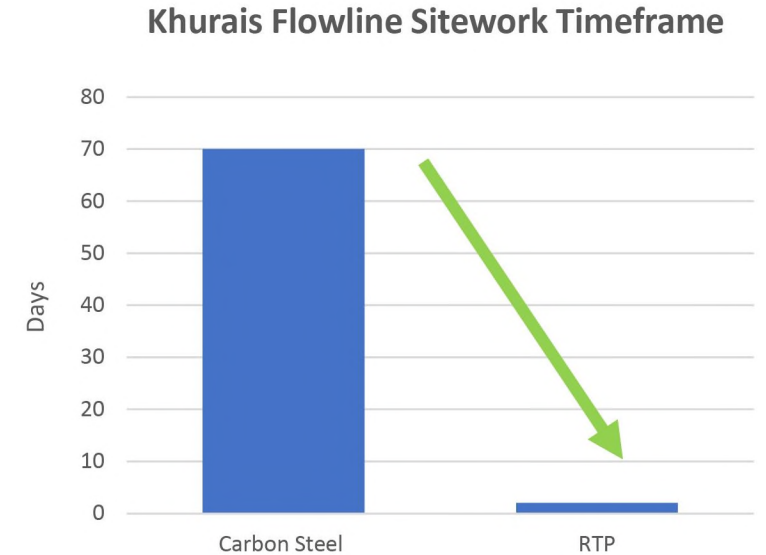
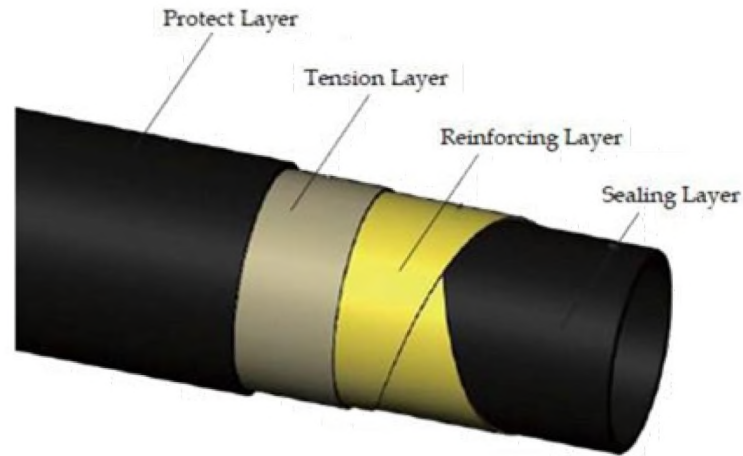
Blower Fan



Tanks

Reinforced Thermoplastic Pipe (RTP)

significant reduction in installation manhours



RTP refers to the high strength and durable synthetic piping that is corrosion-resistant, light weight, and suitable for a wide range of operating temperatures and pressures. It is typically made from high-density polyethylene and polyethylene raised temperature resins and consists of three layers: the inner layer containing the process stream; the intermediate layer reinforcing the pipe; and the outer sheath protecting the pipe from impact and weathering.



Building & Construction

- Longer Lasting
- Corrosion Mitigation
- Life Cycle Cost Savings
- Over 75 Applications



Fiberglass Reinforced Rebar

a move to corrosion-free infrastructure



Jazan Flood Mitigation Channel

Building & Construction

other high potential applications



Composite Bridge Systems



Composite Power Poles



Composite Seawalls



Modular Composite Housing



Laminated Glass

Building & Construction

ITHRA



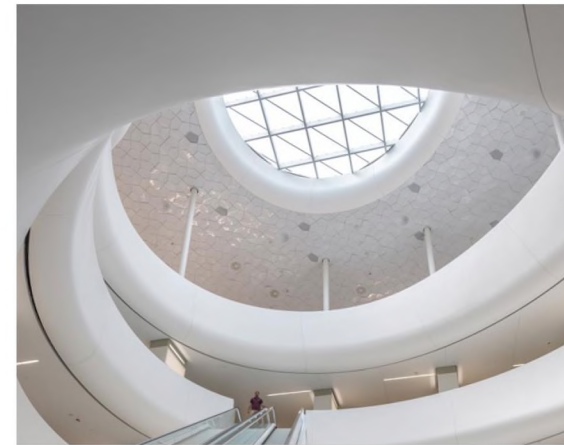
ITHRA



Great Hall



Side Entrance



Interior

Center of Excellence for Nonmetallic Building Materials

founding sustaining member



An ACI Center of Excellence for
Nonmetallic Building Materials



OBJECTIVE

Collaborate globally to drive the adoption of nonmetallic materials & products.

CORE FUNCTIONS

- Standards and Specifications
- Technical Committee Acceleration
- Professional Development
- Certification of Personnel





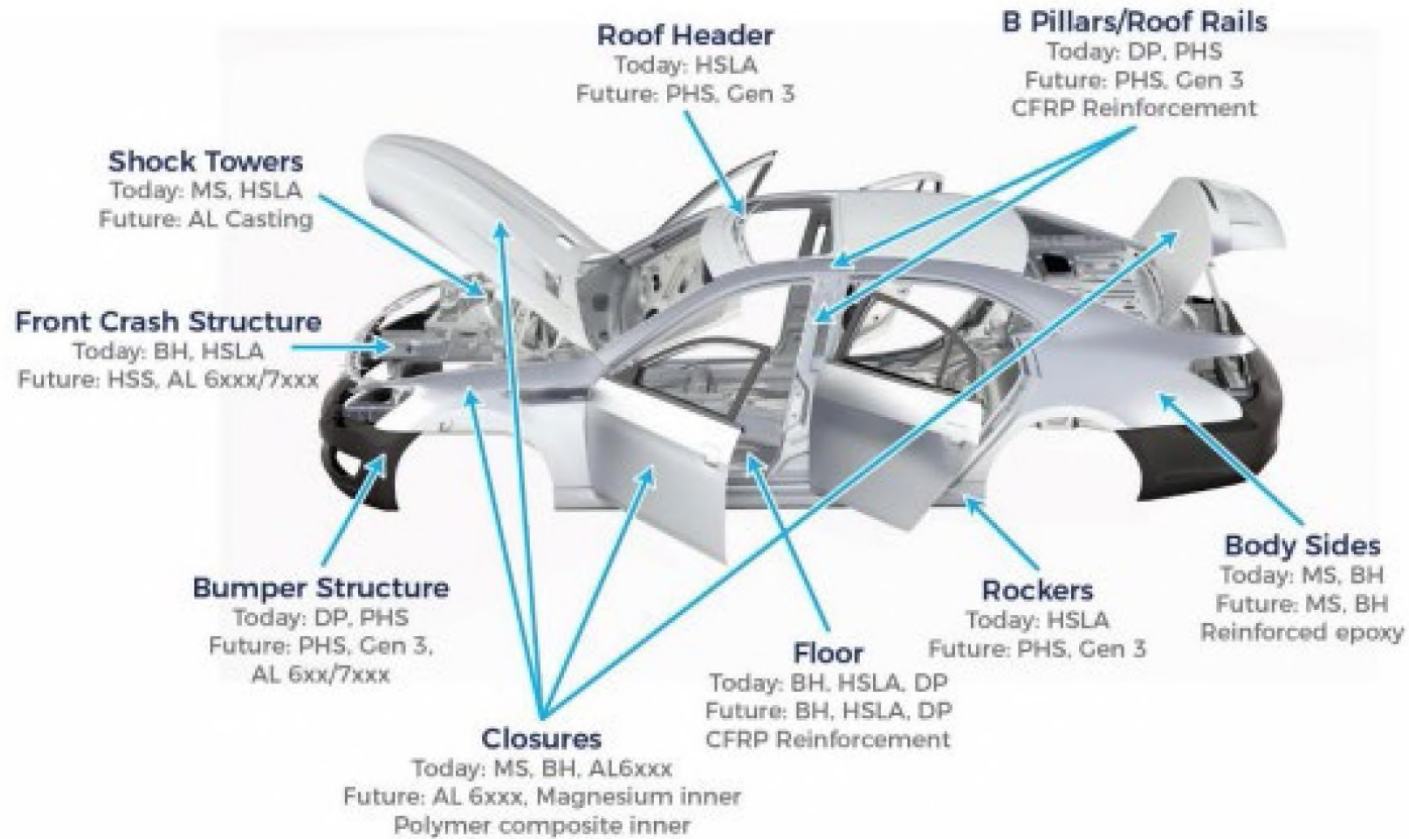
Automotive

- Lighter Weight
- Less Fuel Consumption
- Lower Emissions



Automotive Industry Applications

exploring mass production of carbon fiber





Packaging

- Recycle & Repurpose



Plastic Packaging & Consumer Goods

opportunities in advanced recycling



Hybrid Composite Doors
with intrusion & door opening
detection

**Weldable Composite
Panels** with imbedded
intrusion detection

**Conventional Steel
Casting** perimeter frame
& corners



Renewables

- Lighter Weight
- Faster Installation
- Higher Impact Resistance



Solar Photovoltaic Panels

replacing glass with polymeric materials

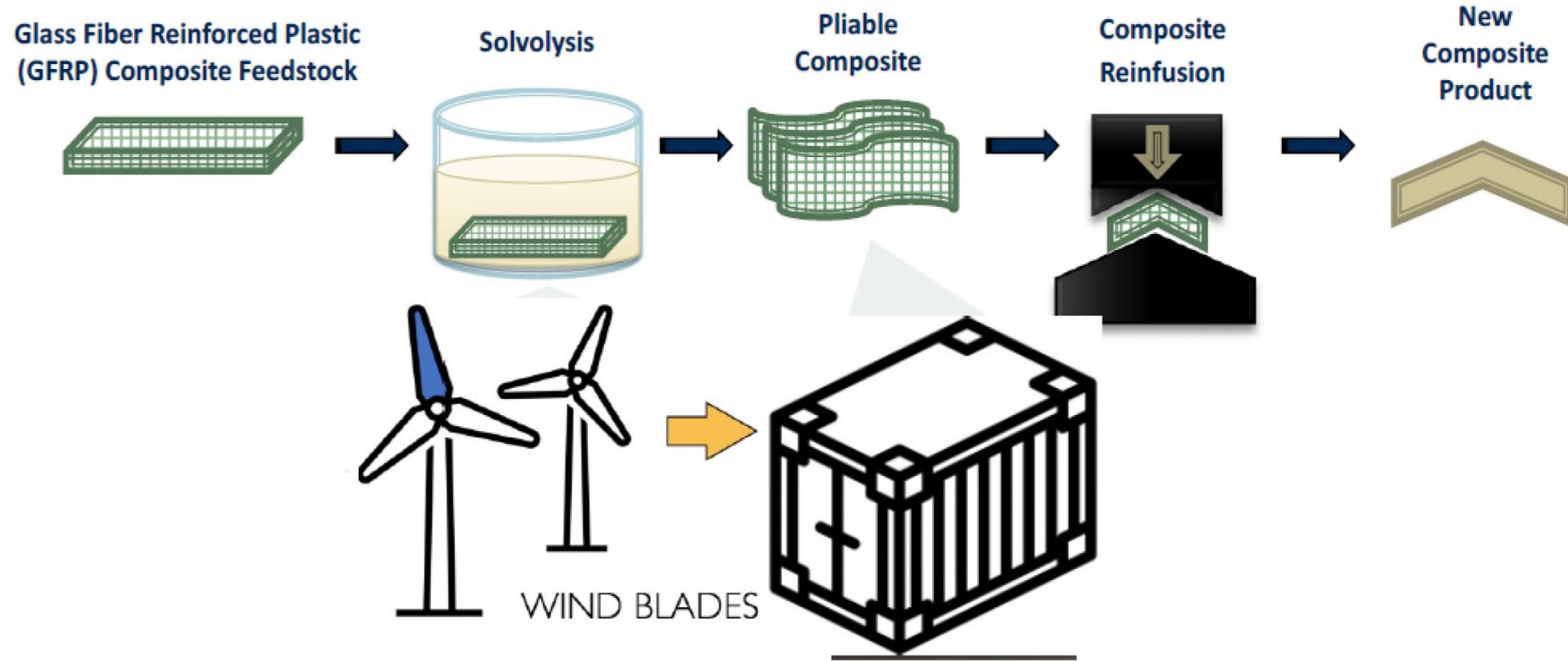


SABIC launches first polycarbonate building-integrated photovoltaic panels for roofing, cladding, and glazing applications.



Project REMADE

remanufacturing of thermoset plastics







* Utility non-provisional patent application number PCT/US21/71488 dated 9/16/2021)

Strategic Collaborations

remanufacturing of thermoset plastics



-  38+ Global Manufacturers
-  40+ Research Projects
-  75+ Industrial Prototypes
-  50+ Granted Patents



Localization

in-Kingdom total value add

iktva Program Overview

The IN-KINGDOM TOTAL VALUE ADD (iktva) Program



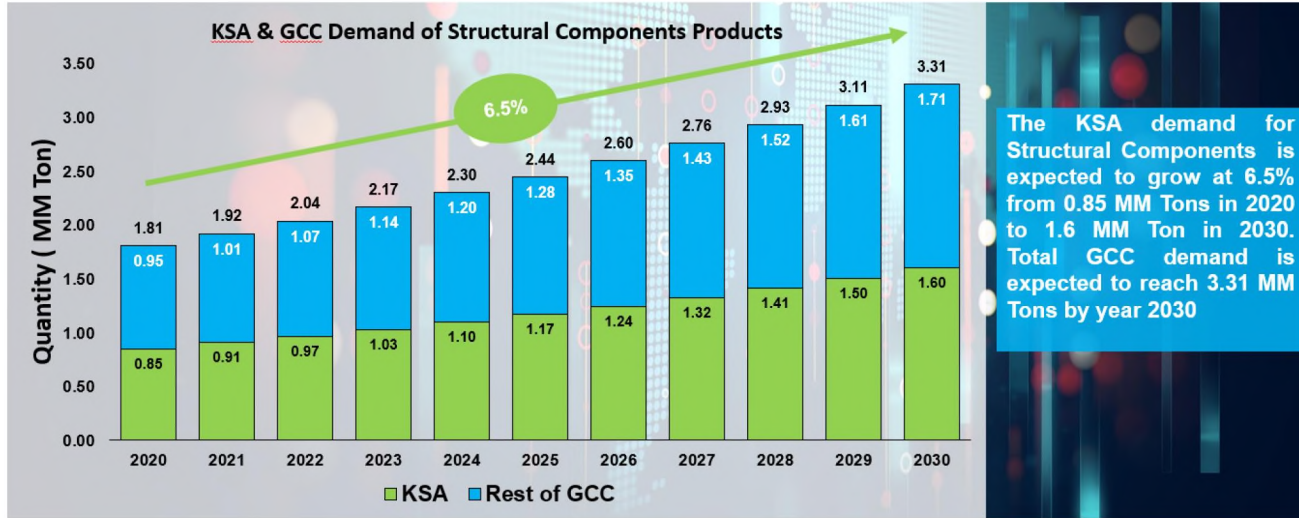
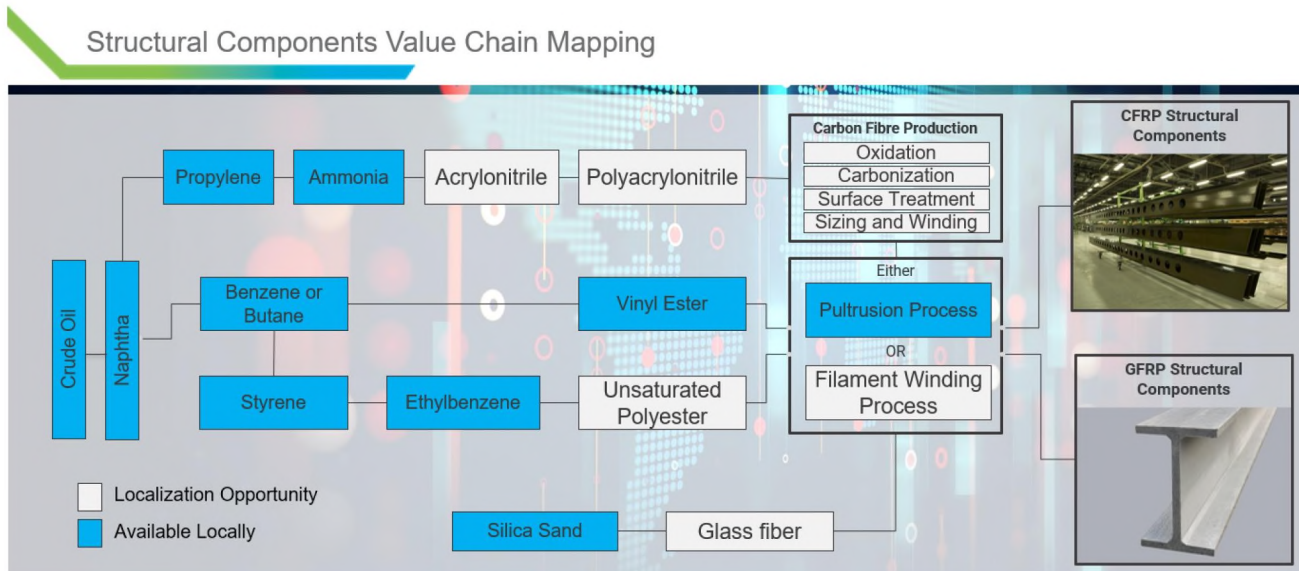
IKTVA is designed to reward Saudi Aramco's suppliers for the use and development of local labor and sub-suppliers

IKTVA Resources

promoting the utilization of local labor sub-suppliers



<https://iktva.sa/>

Aramco Americas Technical Services - Engineering



technology scouting—emerging breakthrough technologies across the five sectors

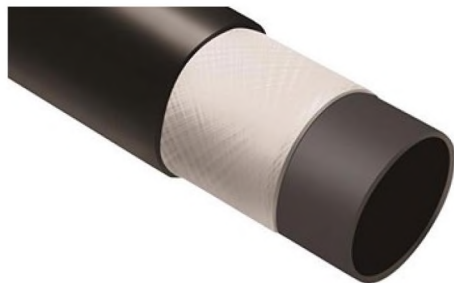


Nonmetallics Target Sectors:

1. Oil & Gas
 - Upstream, Midstream, Downstream & In-Plant
2. Building & Construction
3. Automotive
4. Packaging
5. Renewables

Nonmetallic Materials and the Future

transformational potential



Oil & Gas



Marine



Aerospace



Automotive



Sports Gear



Renewables



Building & Construction

THANK YOU!



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