

# Drilling

*Oilfield Services Workshop*

## Business Opportunities

13th January 2025

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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# 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% local content




**iktva in Procurement**

<b>2000+</b> Service Contracts	<b>290+</b> Corporate Purchase Agreements
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**Business Opportunities**

<b>12</b> Sectors	<b>210</b> Business Opportunities	<b>\$28 bn</b> Annual Market Size
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**Anchor Projects**

 IMI	 SPARK	 Tuwaiq
<b>6</b> Anchor projects		



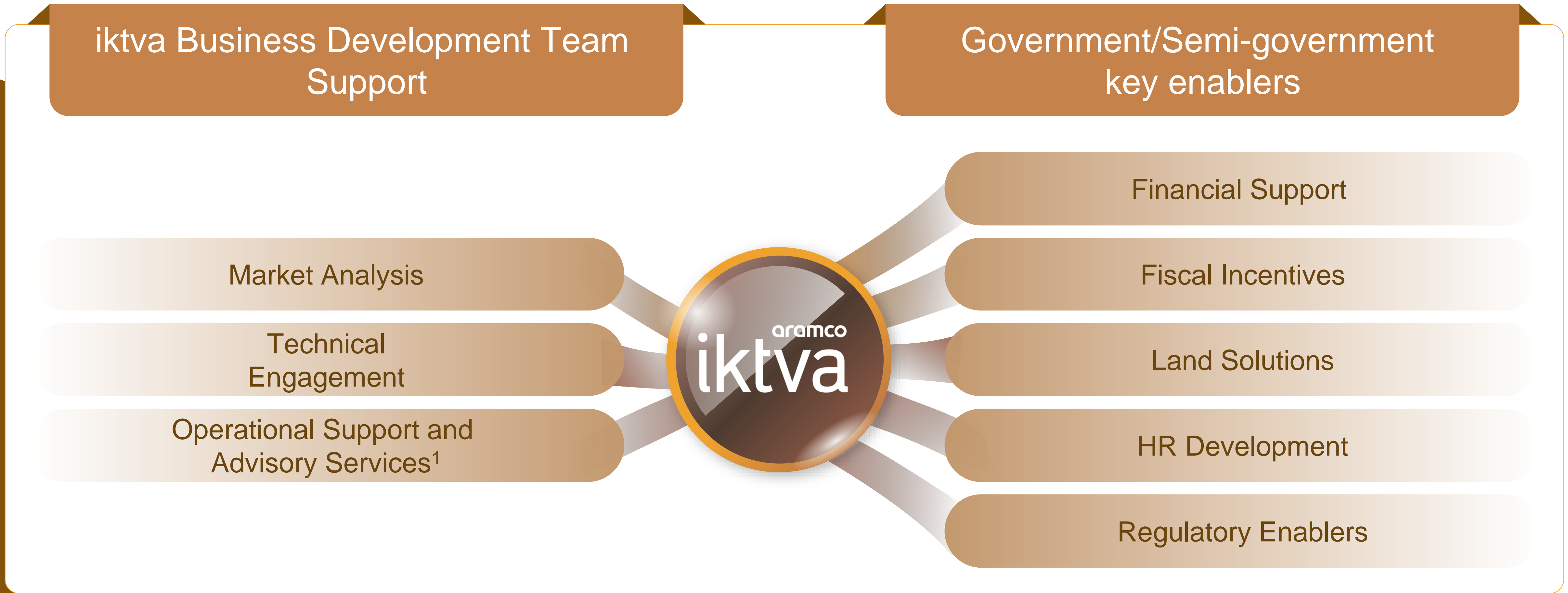
**Local Workforce Development**

<b>16</b> National Training Centers	<b>90+</b> Programs
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Catalyzing Supply Chains

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

Downhole Completions & Supply Chain Ecosystem Workshop




### Catalyzing Supply Chains

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.

# Oilfield Services Market Overview

## KSA oilfield services market snapshot



**\$1903MM**  
7% CAGR<sup>1</sup>

2024 KSA market size for opportunities  
in today's workshop

## Eight opportunities to be discussed today

- 1 Underbalanced Coiled Tubing Drilling
- 2 Coiled Tubing
- 3 Directional Drilling
- 4 Tubular Running Services
- 5 Wellbore Cleanout
- 6 Mud Engineering Services
- 7 Artificial Lift Systems
- 8 Artificial Lift Systems Cable

## Underbalanced Coiled Tubing Drilling (UBCTD)

*Abdulrahman Al Mudhafar*

# Opportunity profile – Underbalanced Coil Tubing Drilling (UBCTD)

1

KSA in high need of UBCTD to realize ongoing O&G expansion

2

UBCTD is a growing service subset of the overall Coiled Tubing market

3

Attractive investment opportunities for the UBCTD value chain

## Key categories



Brief

- Drilling with coiled tubing in a pressure-controlled environment where wellbore pressure is maintained lower than formation pressure
- Surface flow package to handle hydrocarbon at surface

**560**

Estimated 2024 KSA market size (\$MM)

**12%**

Forecasted 5-year CAGR

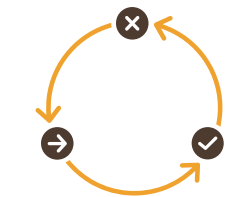
## KSA value chain opportunities



R&D



Ecosystem  
Mfg.



Lifecycle  
Mgmt.

## KSA enablers

- Preference for local manufacturing supporting local content goals
- Saudization and tax benefits in special economic zones
- Favorable labor and utilities rates
- Competitive taxes

## Catalyzing Supply Chains

Note: \$MM = USD Millions; SIDF = Saudi Industrial Development Fund  
Source: Aramco; EMIS; Press releases; Team analysis

# Underbalanced Coiled Tubing Drilling Technical Overview

## UBCTD Rig



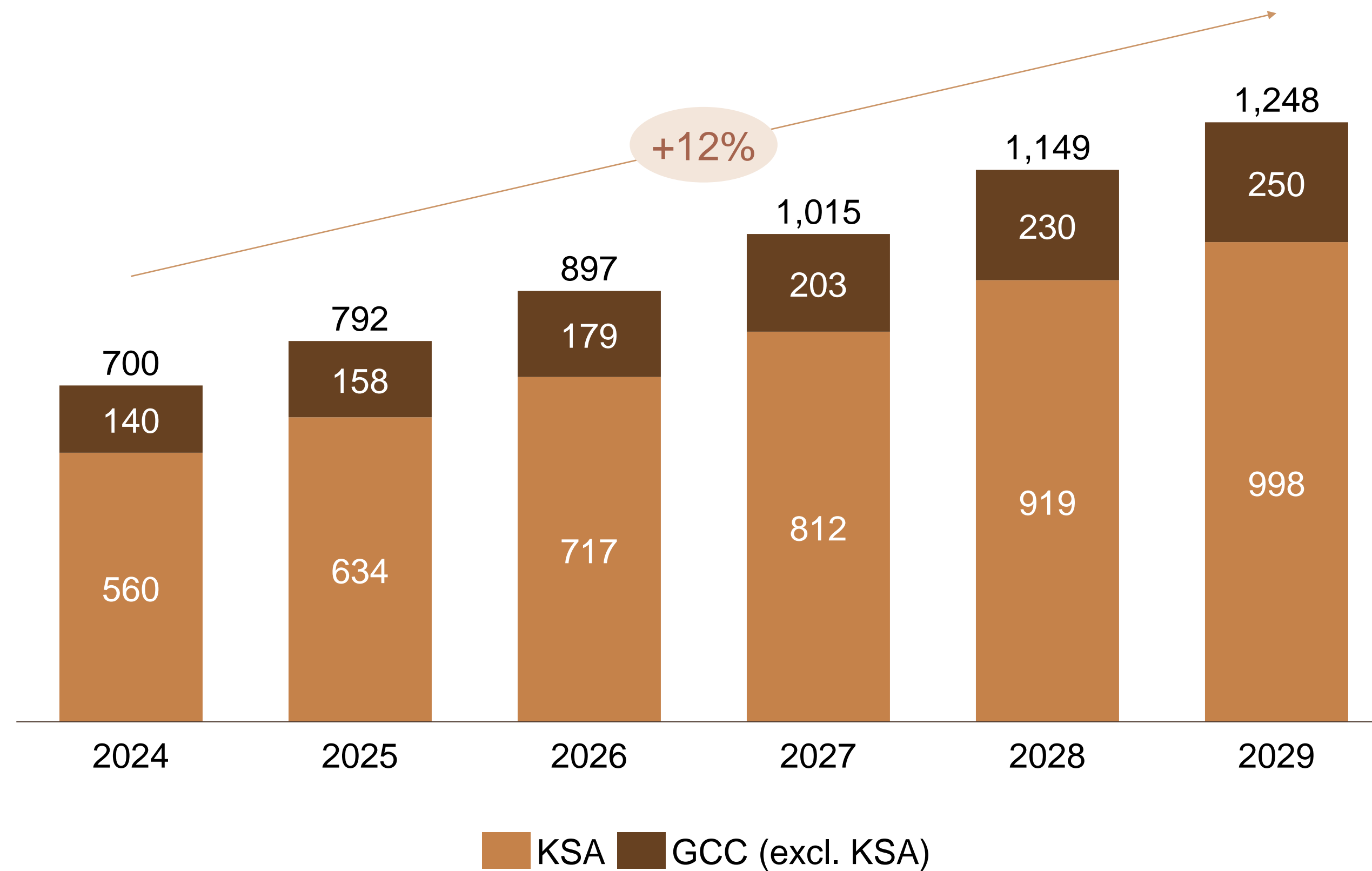
## UBCTD component examples:

- 2-3/8" Coiled Tubing Reel
- HP Separator
- LP Separator
- Fluid Pumps
- Condensate Vessels
- Production Lines and Choke Lines

- UBCTD Service provider to drill under-balance wells
- Manufacturing components of UBCTD rig

# Underbalanced Coiled Tubing demand, customers, and drivers

Forecasted KSA and rest of GCC UBCTD market 2024-2029 (\$MM)



## Typical UBCTD customers in KSA



Gas producers

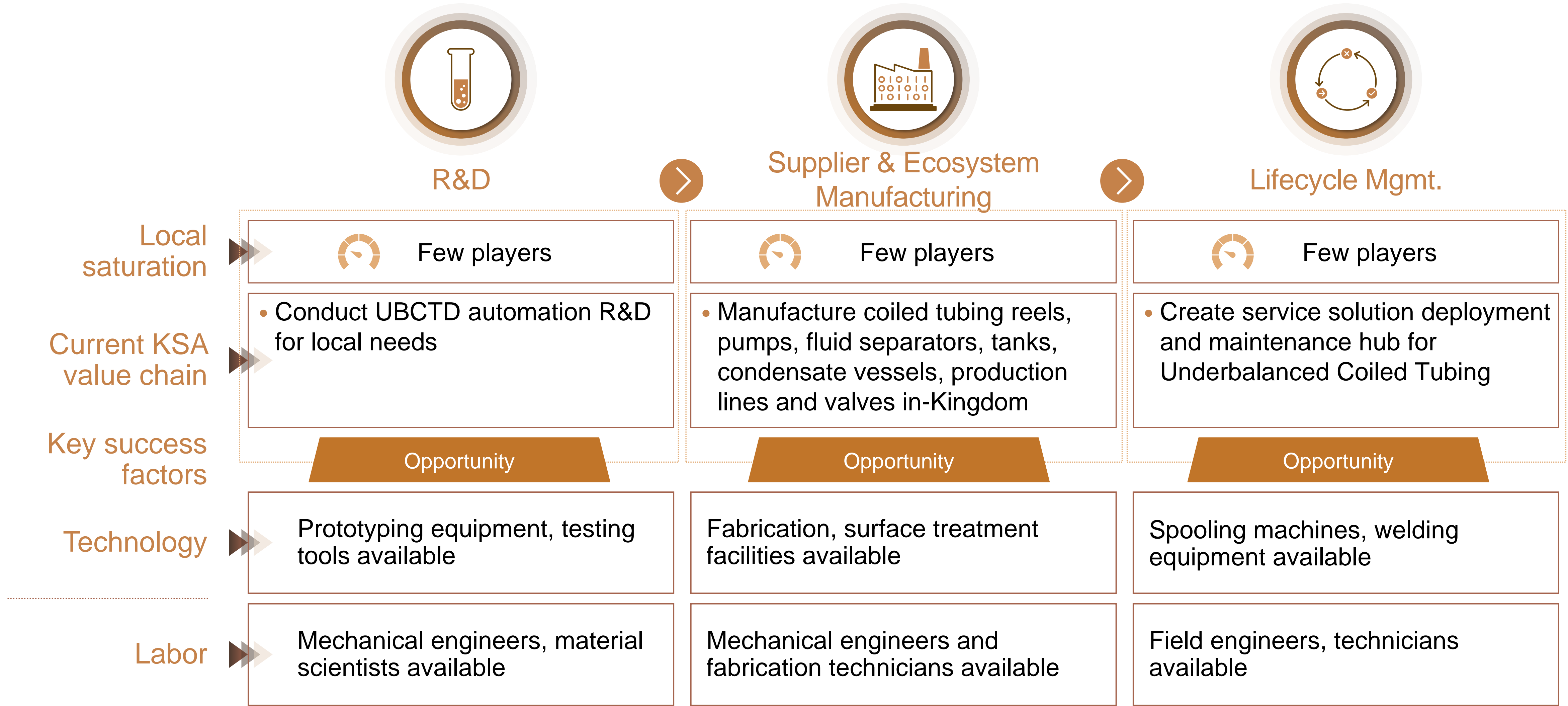
## Key KSA demand drivers

- **Rise in upstream activity:** Bolstered upstream activities requires additional UBCTD implementations
- **Completions complexity increase:** Boost in complex well completions increases need for UBCTD to preserve formations and maximize productivity

### Catalyzing Supply Chains

Note: \$MM = USD Millions  
Source: Aramco; Industry data; Press releases; Team analysis

# Value chain and key localization opportunities



Catalyzing Supply Chains

Oilfield Services Workshop

## Coiled Tubing

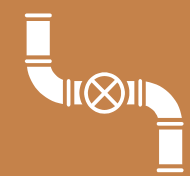
*Abdulrahman Al Mudhafar*

# Opportunity profile – Coiled Tubing

1

KSA in high need of Coiled Tubing to realize ongoing O&G expansion

### Key specifications



Tubing diameter

1-1/4", 1-1/2", 1-3/4", Up to 2-7/8"



Work pressure

5,000 PSI, 10,000 PSI, 15,000 PSI

2

Coiled Tubing is a growing market, KSA has the largest regional share

59

Estimated 2024 KSA market size (\$MM)

3%

Forecasted 5-year CAGR

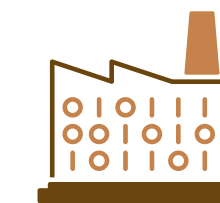
3

Attractive investment opportunities for the Coiled Tubing value chain

### KSA value chain opportunities



R&D



OEM Mfg.

### KSA enablers

- Preference for local manufacturing supporting local content goals
- Saudization and tax benefits in special economic zones
- Favorable labor and utilities rates
- Competitive taxes

### Catalyzing Supply Chains

Note: \$MM = USD Millions  
 Source: Aramco; Grandview; Press releases; Team analysis

# Coiled Tubing technical overview

## Tubing diameter



1-1/4", 1-1/2", 1-3/4", Up to 2-7/8"

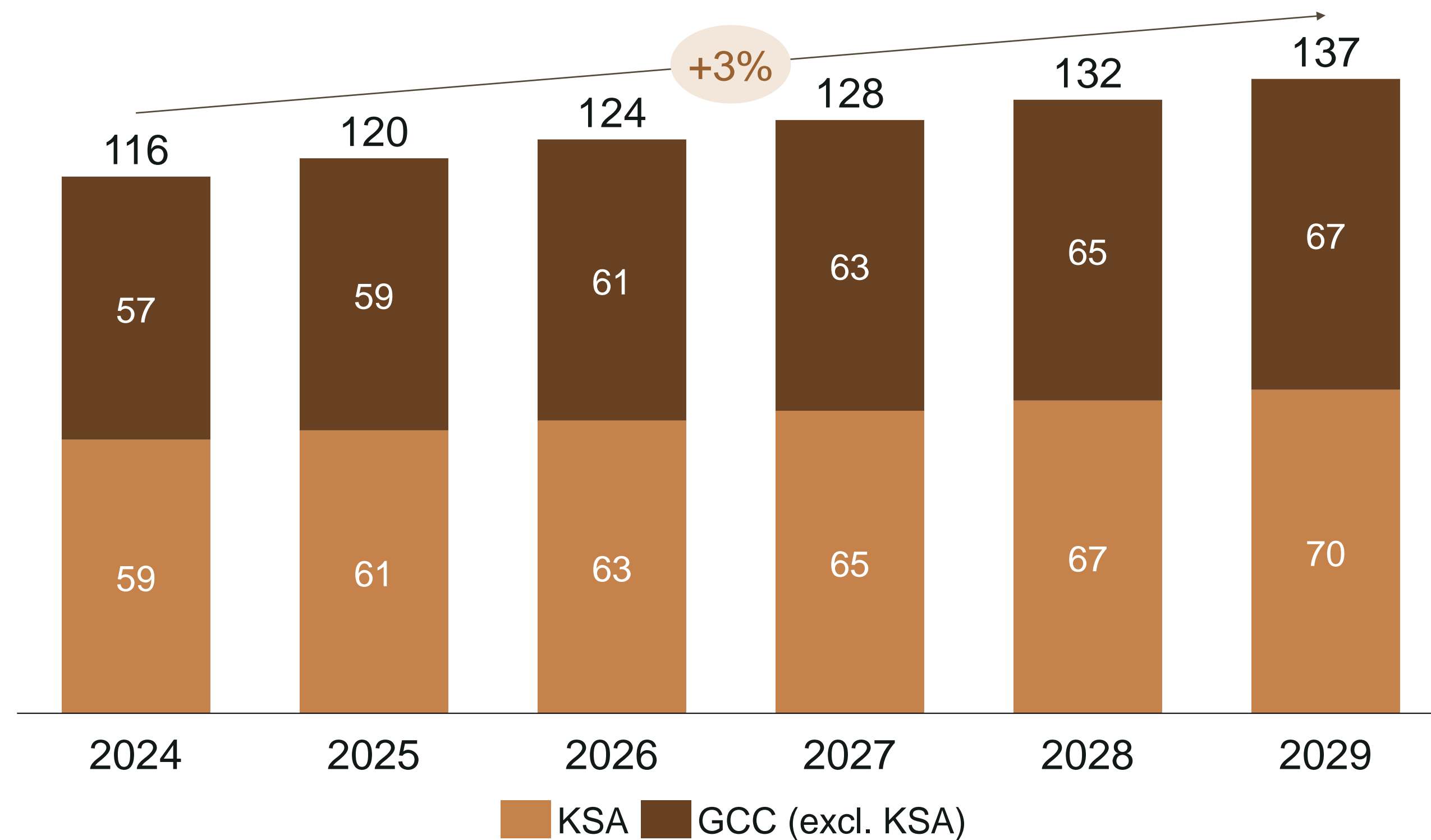
## Work pressure



5,000 PSI, 10,000 PSI, 15,000 PSI

# Coiled Tubing demand, customers, and drivers

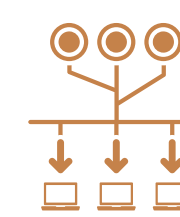
Forecasted KSA and rest of GCC Coiled Tubing market 2024-2029 (\$MM)



## Typical Coiled Tubing customers in KSA



Coiled Tubing Service providers



Underbalanced Coiled Tubing (UBCTD) Service providers

## Key KSA demand drivers

- **Rise in gas & upstream activities:** Rise in gas & upstream activities require further use of coiled tubing
- **Increase in UR drilling and longer laterals:** Rise in UR drilling and longer laterals requires use of coiled tubing for increased flexibility in complex well geometries

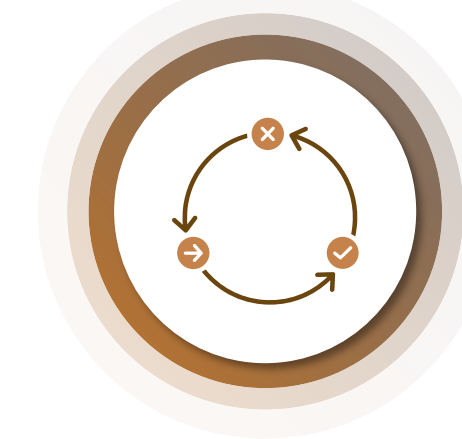
### Catalyzing Supply Chains

Note: \$MM = USD Millions  
Source: Aramco; Grandview; Press releases; Team analysis

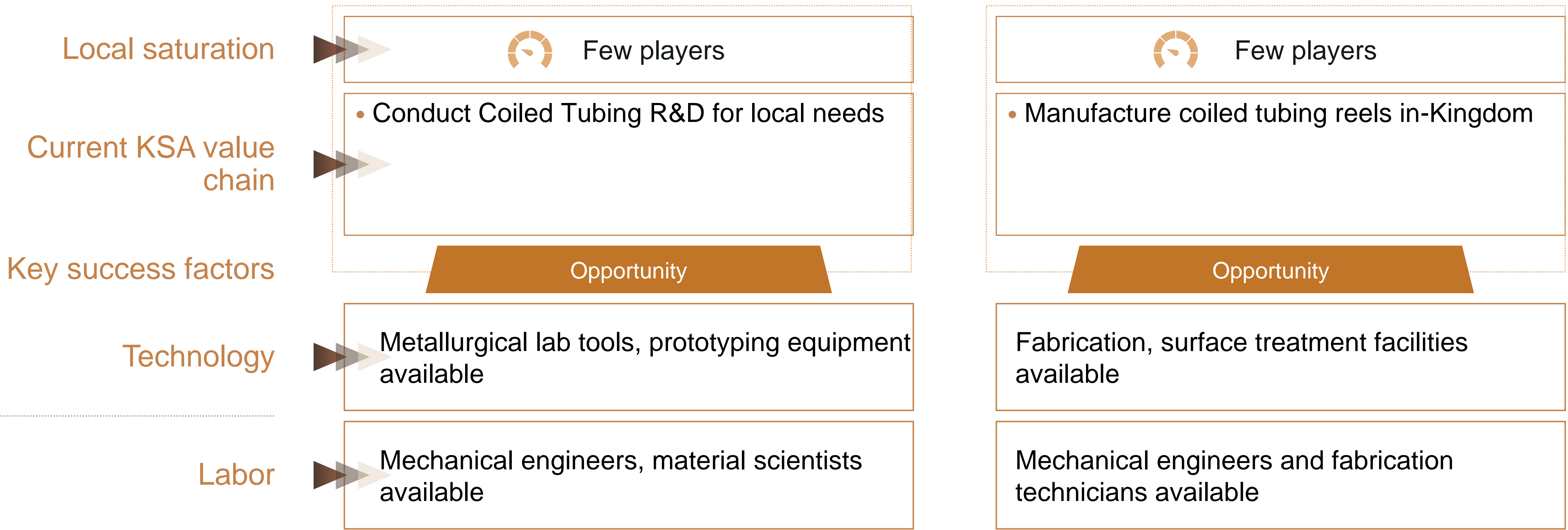
# Value chain and key localization opportunities



R&D



Lifecycle Mgmt.



Catalyzing Supply Chains

## Directional Drilling

*Abdullah Al Dossary*

# Opportunity profile – Directional Drilling

1

KSA in high need of Directional Drilling to realize ongoing O&G expansion

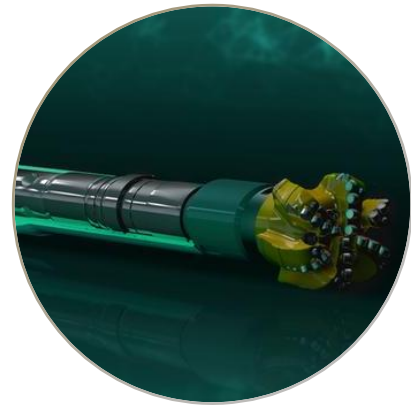
2

Directional Drilling is a growing market, KSA has the largest regional share

3

Attractive investment opportunities for the Directional Drilling value chain

## Key categories



Mud Motors



Rotary Steerable System (RSS)



Logging While Drilling (LWD)



Measurement While Drilling (MWD)

**880**

Estimated 2024 KSA market size (\$MM)

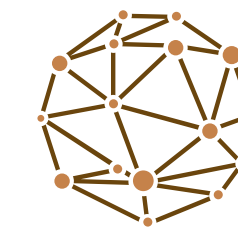
**5%**

Forecasted 5-year CAGR

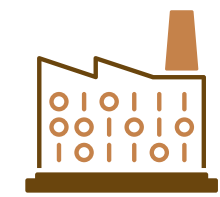
## KSA value chain opportunities



R&D



Ecosystem Mfg.



OEM Mfg.

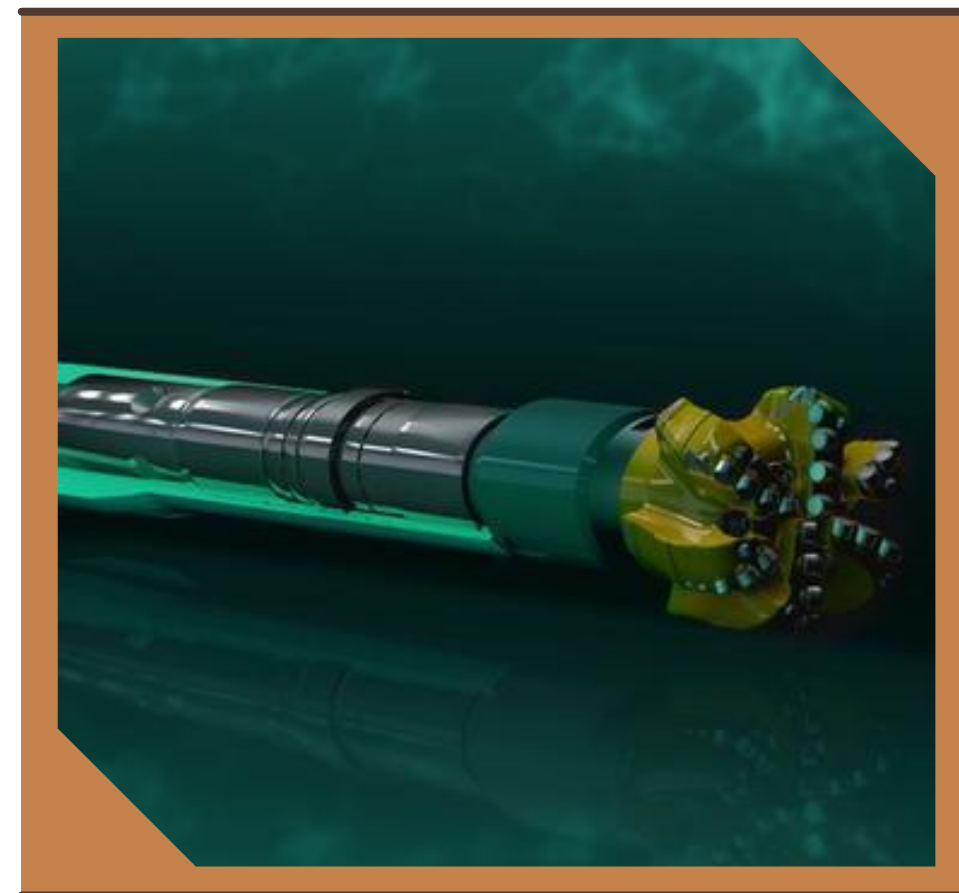
## KSA enablers

- Financing available (SIDF)
- Competitive taxes
- Benefits in industrial parks with OSS services access, Saudization waivers
- Skilled labor for component manufacturing from SADA

### Catalyzing Supply Chains

# Potential Directional Drilling localized components

Mud Motors



Rotary Steerable System (RSS)



Logging While Drilling (LWD)



Measurement While Drilling (MWD)



## Applications

- Wellbore deviation
- Sliding drill mode
- Kick-off operations

- Continuous rotation & steering
- Extended-reach, horizontal, and multilateral wells

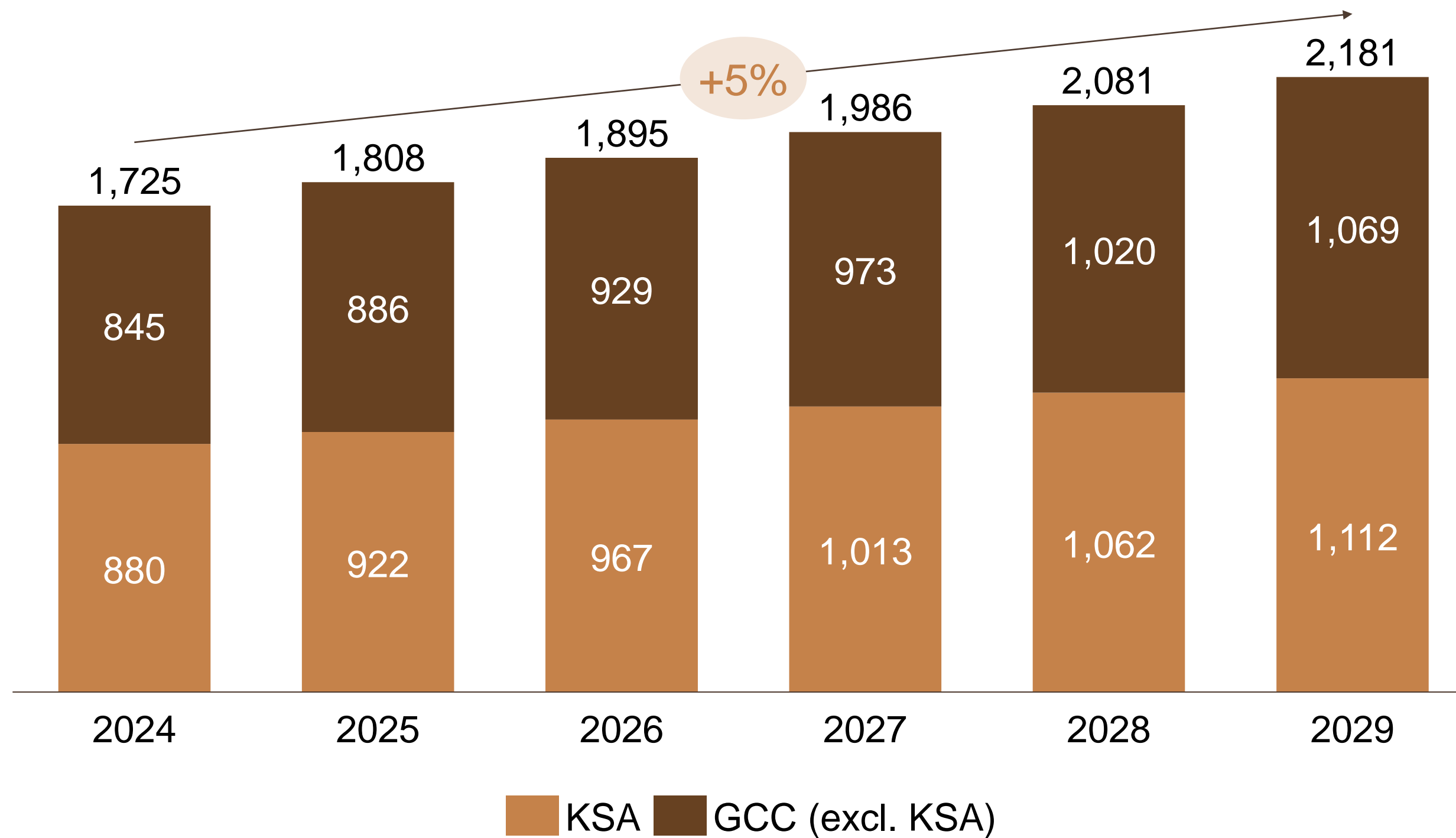
- Formation evaluation
- Geo-steering & well placement

- Real-time trajectory monitoring
- Tool-face orientation & real-time communication

### Catalyzing Supply Chains

# Directional Drilling demand, customers, and drivers

Forecasted KSA and rest of GCC Directional Drilling market 2024-2029 (\$MM)



## Directional Drilling customers in KSA



Oil producers



Gas producers

## Key KSA demand drivers

- **Enhancing Production Efficiency:** A clean wellbore allows for smoother flow of oil and gas, which can significantly improve production rates - removing debris and other impediments ensures that the well operates at its optimal capacity
- **Preventing Equipment Damage:** Debris and scale can cause wear and tear on downhole equipment, leading to costly repairs and downtime. Regular cleanouts help protect these tools and extend their lifespan.

### Catalyzing Supply Chains

Note: \$MM = USD Millions; UR = Unconventional Resources  
Source: Aramco; Mordor Intelligence; Press releases; Team analysis

# Value chain and key localization opportunities



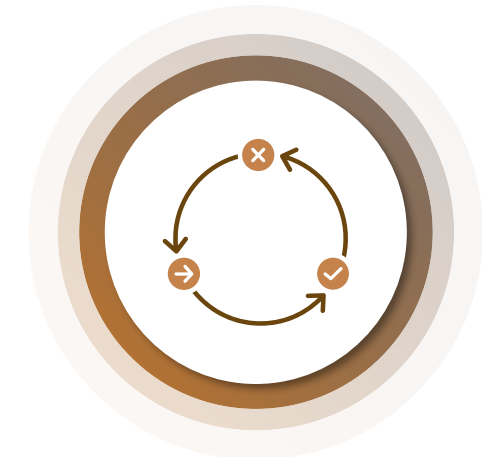
R&D



ESP Components



OEM Manufacturing



Lifecycle Mgmt.

Local saturation	Few players	Few players	Few players	Many players
Current KSA value chain	<ul style="list-style-type: none"> <li>Conduct Directional Drilling component R&amp;D for local needs</li> </ul>	<ul style="list-style-type: none"> <li>Produce high-grade alloys and electronic components incl. 3D printed components</li> </ul>	<ul style="list-style-type: none"> <li>Manufacture directional drilling equipment</li> </ul>	<ul style="list-style-type: none"> <li>Maintain and repair directional drilling components</li> </ul>
Key success factors	Opportunity	Opportunity	Opportunity	
Technology	Prototyping tools, corrosion and HPHT chambers available	VIM, ESR, & EAF units available for import	5-axis CNC devices, EDM equipment available for import	Installation, NDT, and pressure test systems available
Labor	Mechanical engineers, material scientists available	Metallurgists & elastomer chemists available	Machinists & laser welding specialists available	Field service engineers, technicians available

**Catalyzing Supply Chains**

Note: VIM = Vacuum induction melting furnace; ESR = Electroslag remelting; EAF = Electric Arc Furnace; CNC = Computer numerical control; EDM = Electrical discharge machining; NDT = Non-Destructive Testing; HPHT = High Pressure, High Temperature  
Source: Aramco; Mordor Intelligence; Press releases; Team analysis

## Tubular Running Services (TRS)

*Jasem Al Moyaibed*

# Opportunity profile – Tubular Running Services (TRS)

1

KSA in high need of TRS to realize ongoing O&G expansion

2

TRS is a growing market, KSA has the largest regional share

3

Attractive investment opportunities for the TRS value chain

## Key categories



Running tools



Automation and analytics



Pipe handling equipment

120

Estimated 2024 KSA market size (\$MM)

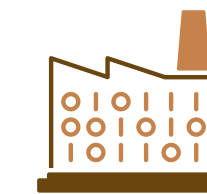
5%

Forecasted 5-year CAGR

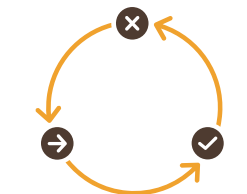
## KSA value chain opportunities



R&D



Service Equipment Mfg.



Lifecycle Mgmt.

## KSA enablers

- Financing available (SIDF)
- Competitive taxes
- Benefits in industrial parks with OSS services access, Saudization waivers
- Skilled labor for component manufacturing from SADA

### Catalyzing Supply Chains

Note: \$MM = USD Millions; SIDF = Saudi Industrial Development Fund  
 Source: Aramco; Press releases; Mordor Intelligence; Team analysis

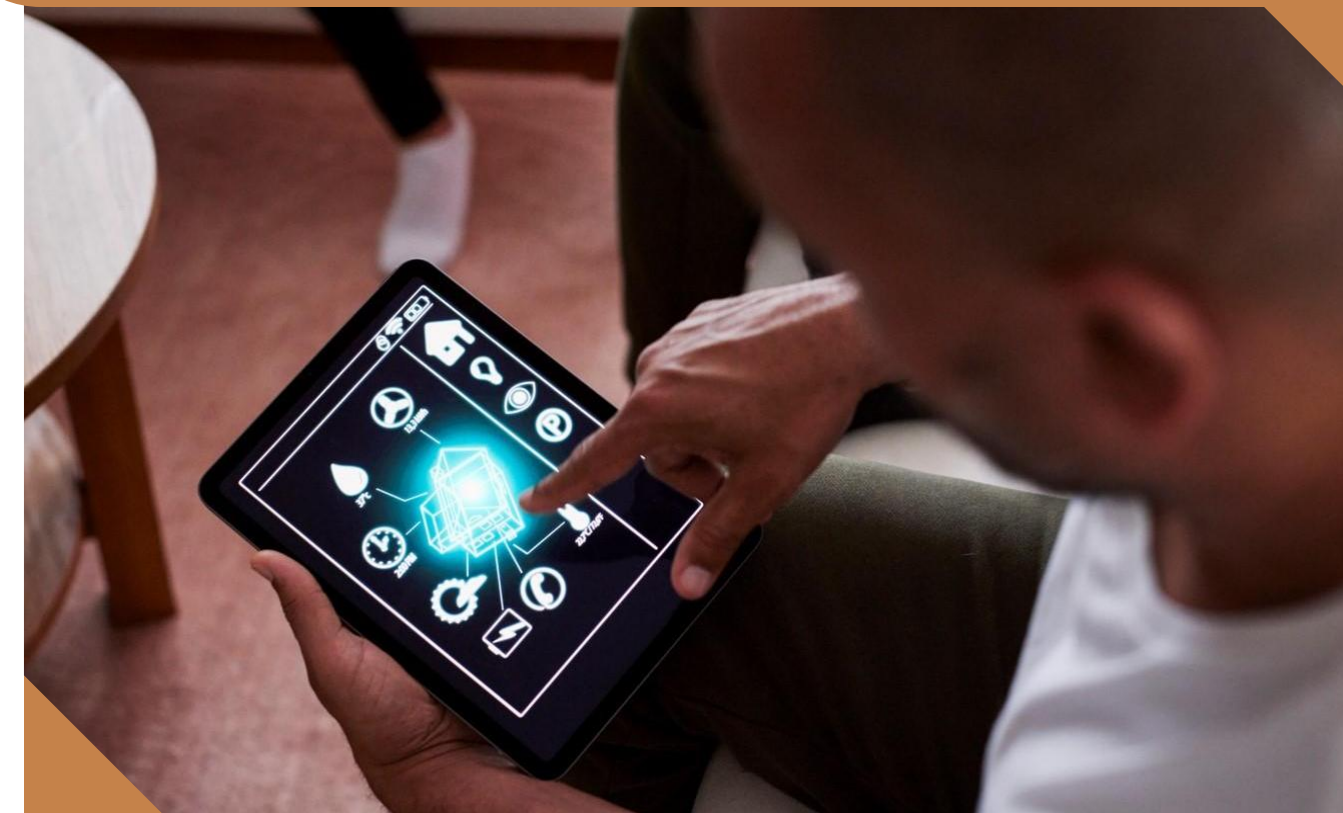
# Potential Tubular Running Services localized categories

## Running Tools



- Casing Running Tool (CRT)
- Casing Drive System (CDS)
- Flush-Mounted Spider (FMS)
- Make-up tongs

## Automation and Analytics



- Torque-turn recorder
- AI-backed data collection system

## Pipe Handling Equipment

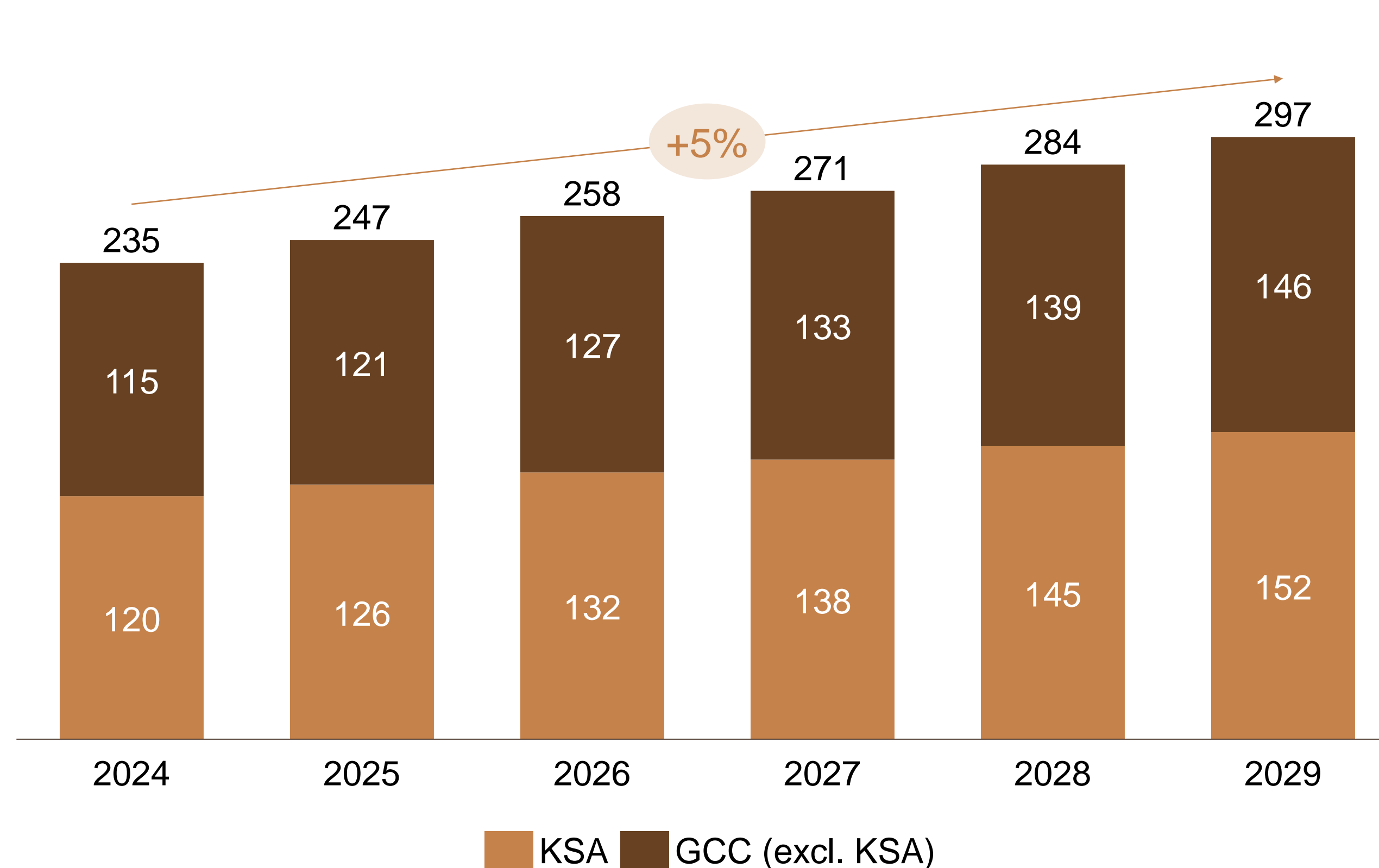


- Pipe elevators
- Pick-up slings
- Safety nubbins

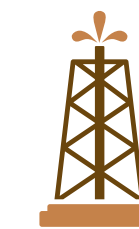
Catalyzing Supply Chains

# Tubular Running Services demand, customers, and drivers

Forecasted KSA and rest of GCC TRS market 2024-2029 (\$MM)



## Typical TRS customers in KSA



Oil producers



Gas producers

## Key KSA demand drivers

- **Rise in deep well drilling:** Rise in deeper well drilling requires additional tubular running services
- **In-Kingdom digitalization drive:** Increase in use of AI and operations digitalization to prevent business disruptions bolsters need for automation and analytics components and services

### Catalyzing Supply Chains

Note: \$MM = USD Millions  
Source: Aramco; Press releases; Mordor Intelligence; Team analysis

# Value chain and key localization opportunities



R&D

Service Equipment Manufacturing

Lifecycle Mgmt.

Local saturation	Few players	Few players	Few players
Current KSA value chain	<ul style="list-style-type: none"> <li>Conduct TRS automation R&amp;D for local needs</li> </ul>	<ul style="list-style-type: none"> <li>Manufacture service equipment incl. running tools, pipe handling equipment, and automation and analytics hardware</li> </ul>	<ul style="list-style-type: none"> <li>Service opportunity for TRS automation</li> </ul>
Key success factors	Opportunity	Opportunity	Opportunity
Technology	Prototyping tools and digital labs available	5-axis CNC devices and testing equipment available for import	Installation and machining equipment available
Labor	Software engineers, mechanical engineers, technicians available	Machinists and electronic engineers available	Field engineers, technicians available

Catalyzing Supply Chains

Note: VIM = Vacuum induction melting furnace; ESR = Electroslag remelting; CNC = Computer numerical control; HPHT = High pressure, high temperature  
Source: Aramco; Press releases; Mordor Intelligence; Team analysis

## Wellbore Cleanout

*Atallah Al Harbi*

# Opportunity profile – Wellbore Cleanout

1

KSA in high need of Wellbore Cleanout to realize ongoing O&G expansion

### Key required tools<sup>1</sup>



Negative Test Packer



Circulation Sub



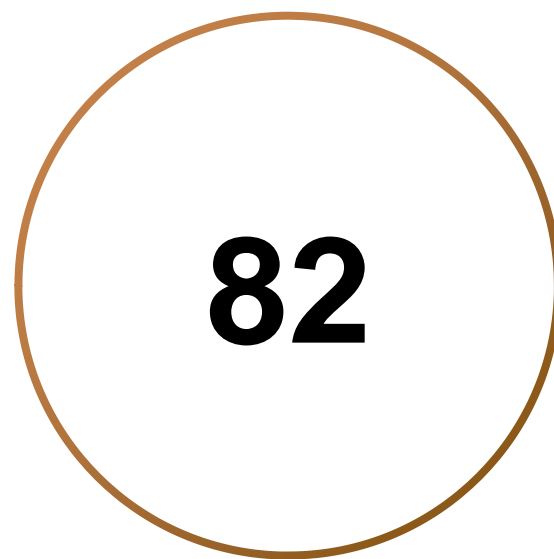
BOP Jetting Tools



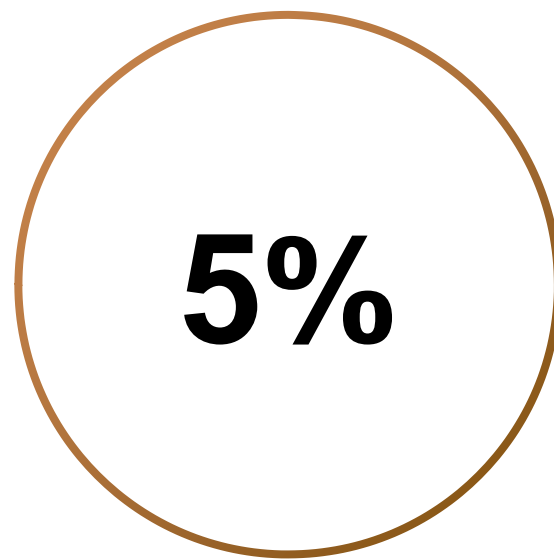
Scrapers

2

Wellbore cleanout is a growing market, KSA has leading regional share



Estimated 2024 KSA market size (\$MM)



Forecasted 5-year CAGR

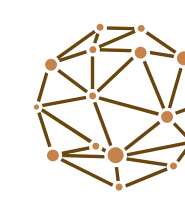
3

Attractive investment opportunities for the Wellbore Cleanout value chain

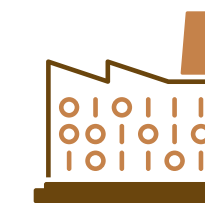
### KSA value chain opportunities



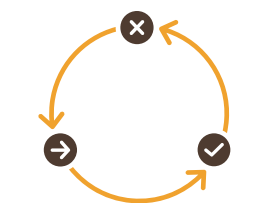
R&D



Ecosystem Mfg.



OEM Mfg.



Lifecycle Mgmt.

### KSA enablers

- Preference for local manufacturing supporting local content goals
- Available financing (SIDF)
- Benefits in industrial parks
- Competitive taxes

### Catalyzing Supply Chains

1. Additional tools listed on technical overview slide; Note: \$MM = USD Millions; SIDF = Saudi Industrial Development Fund  
 Source: Aramco; Data Bridge; Press releases; Team analysis

# Wellbore Cleanout technical overview

## Negative Test Packer



- Isolate sections of wellbore to perform negative pressure tests

## Circulation Sub



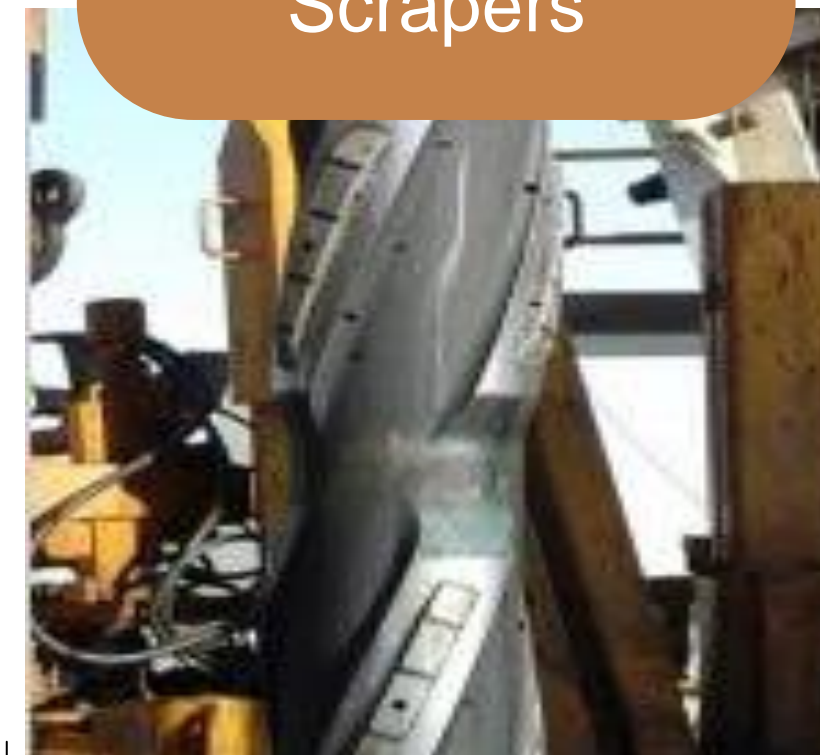
- Facilitate fluid circulation during wellbore cleanout

## BOP Jetting Tools



- Clean the blowout preventer stack (especially after extended drilling operations)

## Scrapers



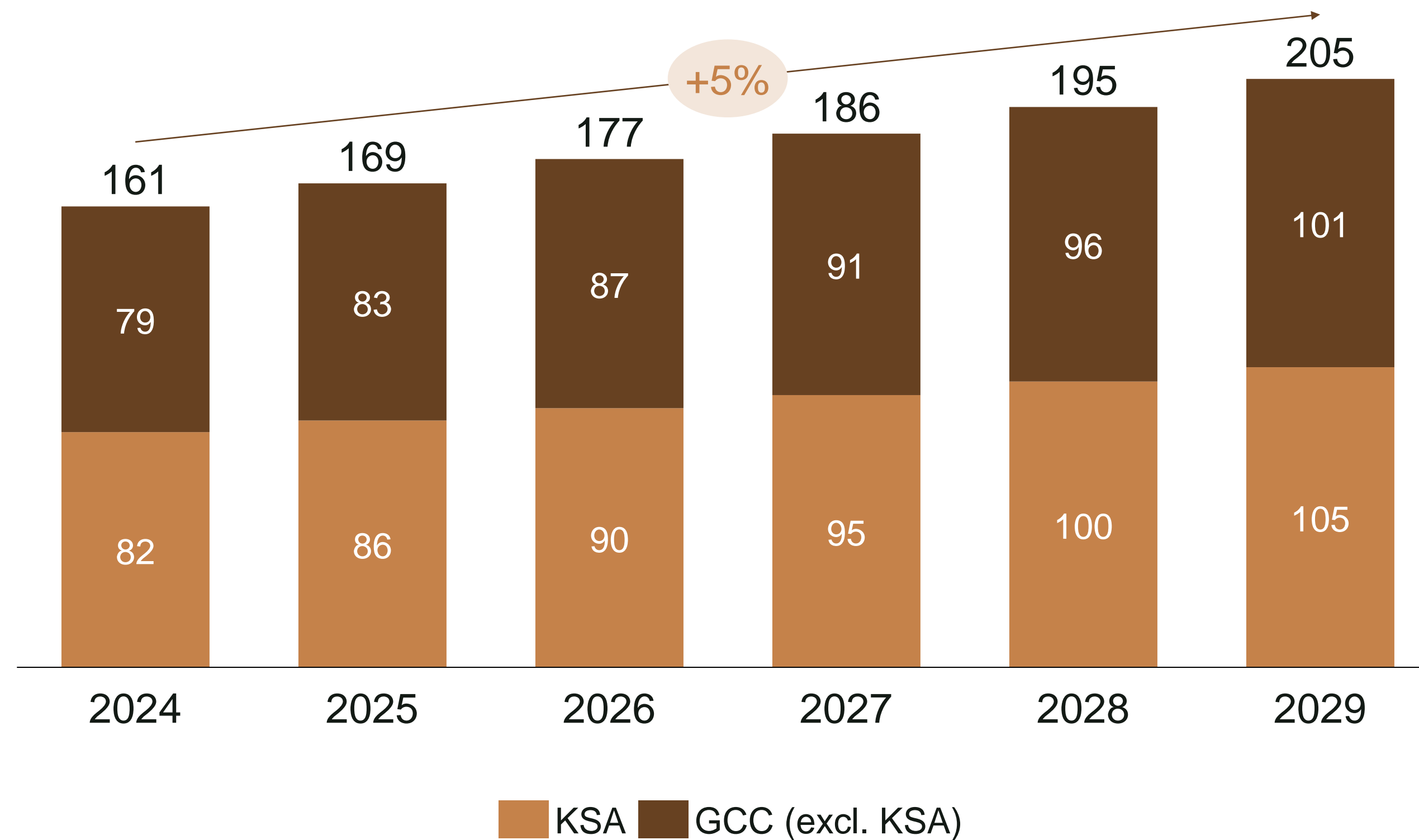
- Mechanically remove debris, scale, rust, or residual from casing or tubing

## Additional supporting component examples

- 1 String magnet
- 2 Brushes
- 3 Junk basket
- 4 Flat bottom magnet

# Wellbore Cleanout demand, customers, and drivers

Forecasted KSA and rest of GCC Wellbore Cleanout market 2024-2029 (\$MM)



## Wellbore Cleanout customers in KSA



Oil producers



Gas producers

## Key KSA demand drivers

- **Enhancing Production Efficiency:** Clean wellbore allows for smoother flow of oil and gas, which can significantly improve production rates - removing debris and other impediments ensures that the well operates at its optimal capacity
- **Preventing Equipment Damage:** Debris and scale can cause wear and tear on downhole equipment, leading to costly repairs and downtime - regular cleanouts protect these tools and extend lifespan

### Catalyzing Supply Chains

Note: \$MM = USD Millions  
Source: Aramco; Data Bridge; Press releases; Team analysis

# Value chain and key localization opportunities



R&D

Supplier & Ecosystem Manufacturing

OEM Manufacturing

Lifecycle Mgmt.

Local saturation	Few players	Few players	Few players	Few players
Current KSA value chain	<ul style="list-style-type: none"> <li>Conduct Wellbore Cleanout R&amp;D for local needs</li> </ul>	<ul style="list-style-type: none"> <li>Produce precision components for wellbore cleanout tools</li> </ul>	<ul style="list-style-type: none"> <li>Manufacture wellbore cleanout tools for service providers</li> </ul>	<ul style="list-style-type: none"> <li>Establish service hub for wellbore cleanout</li> </ul>
Key success factors	Opportunity	Opportunity	Opportunity	Opportunity
Technology	Material testing equipment available for import	Precision CNC machines, coating equipment available for import	Precision CNC machines, heat treatment furnaces available for import	Ultrasonic inspection, reconditioning equipment available for import
Labor	Mechanical engineers, materials scientists available	Mechanical engineers, machinists available	Production engineers, technicians available	Field engineers, technicians available

**Catalyzing Supply Chains**

Note: CNC = Computer Numerical Control  
Source: Aramco; Data Bridge; Press releases; Team analysis

## Mud Engineering Services

*Tulio Olivares Antunez*

# Opportunity profile – Mud Engineering Services

1

KSA in high need of Mud Eng. Services to realize ongoing O&G expansion

2

Mud Eng. Services is a growing market, KSA has leading regional share

3

Attractive investment opportunities for the Mud Eng. Services value chain

## Key supporting elements



Mud Engineers



Field supervisors



Testing Equipment

46

Estimated 2024 KSA market size (\$MM)

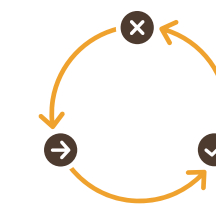
4%

Forecasted 5-year CAGR

## KSA value chain opportunities



R&D



Lifecycle Mgmt.

## KSA enablers

- Financing available (SIDF)
- Competitive taxes
- Benefits in industrial parks with OSS services access, Saudization waivers
- Skilled labor from SADA

### Catalyzing Supply Chains

1. Additional tools listed on technical overview slide; Note: \$MM = USD Millions; SIDF = Saudi Industrial Development Fund  
 Source: Aramco; Grandview; Press releases; Team analysis

# Mud Engineering Services technical overview

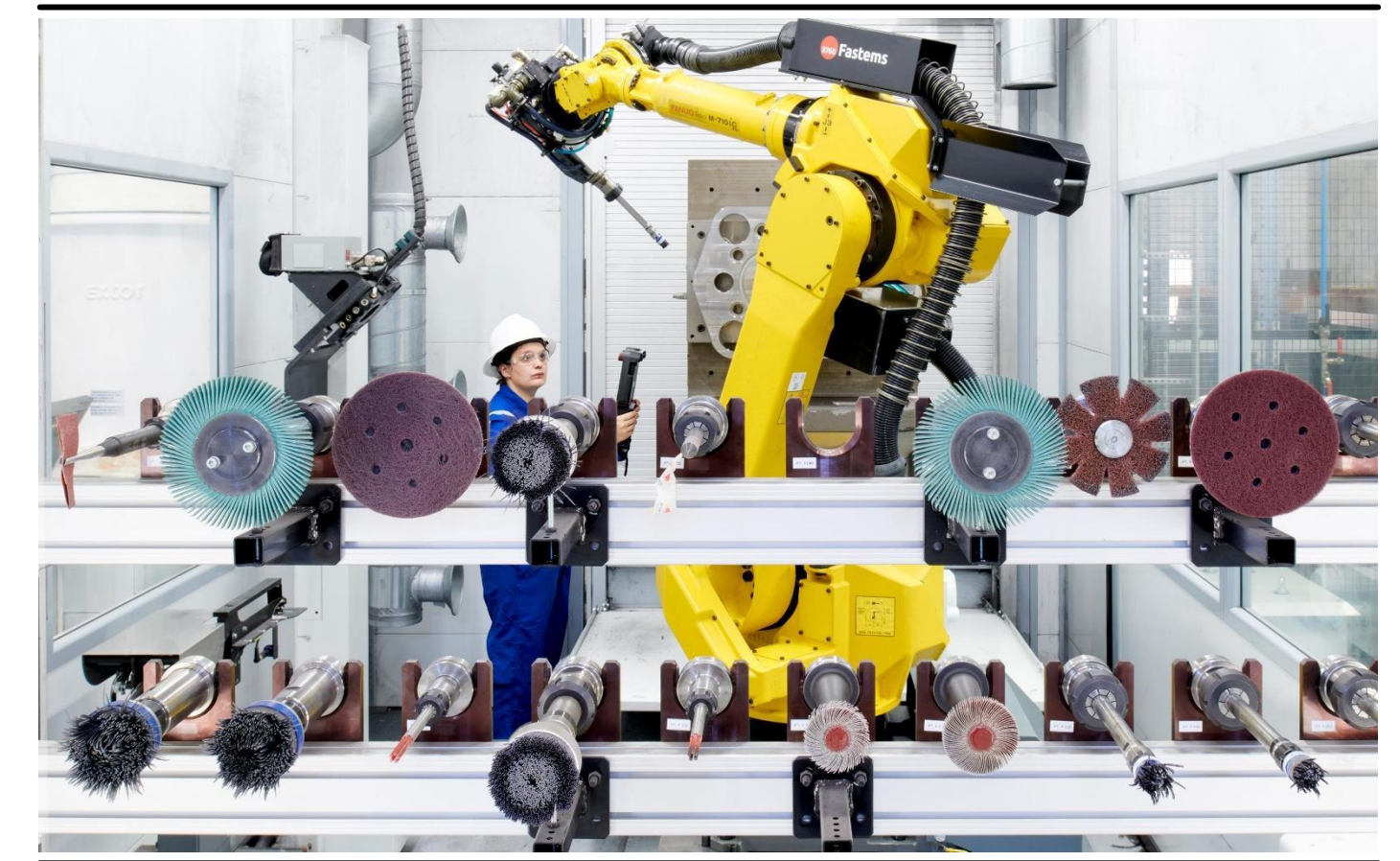
## Mud engineers



## Field supervisors



## Testing equipment



- Support services in critical and non-critical wells – e.g., HPHT deep water services, underbalanced drilling, workovers

- Local laboratory services support in troubleshooting field concerns, testing water base mud, oil base mud, and brines

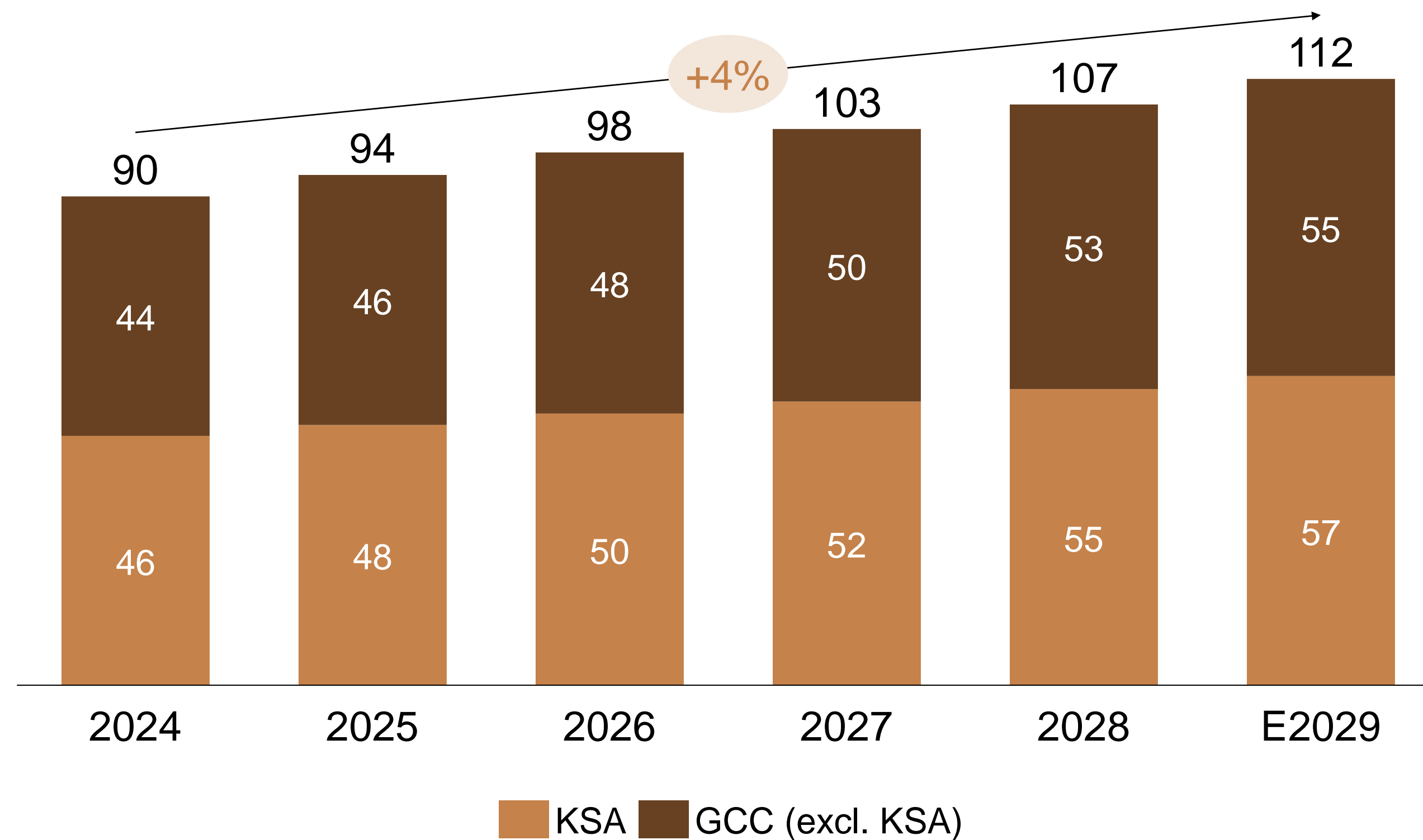
- Aid field mud engineers in organization and problem solving

### Catalyzing Supply Chains

Note: HPHT = High pressure, high temperature  
 Source: Aramco; Grandview; Press releases; Team analysis

# Mud Engineering Services demand, customers, and drivers

Forecasted KSA and rest of GCC Mud Engineering Services market 2024-2029 (\$MM)



## Mud Engineering Services customers in KSA



Oil producers



Gas producers

## Key KSA demand drivers

- **Rise in gas & upstream activities:** Further demand for mud engineering services due to rise in gas & upstream activities
- **Increase in well complexity:** Additional use of mud engineering services needed due to rise in complexity for drilled wells

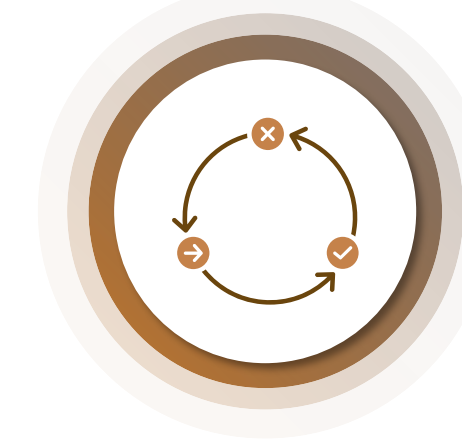
### Catalyzing Supply Chains

\$MM = USD Millions  
Source: Aramco; Grandview; Press releases; Team analysis

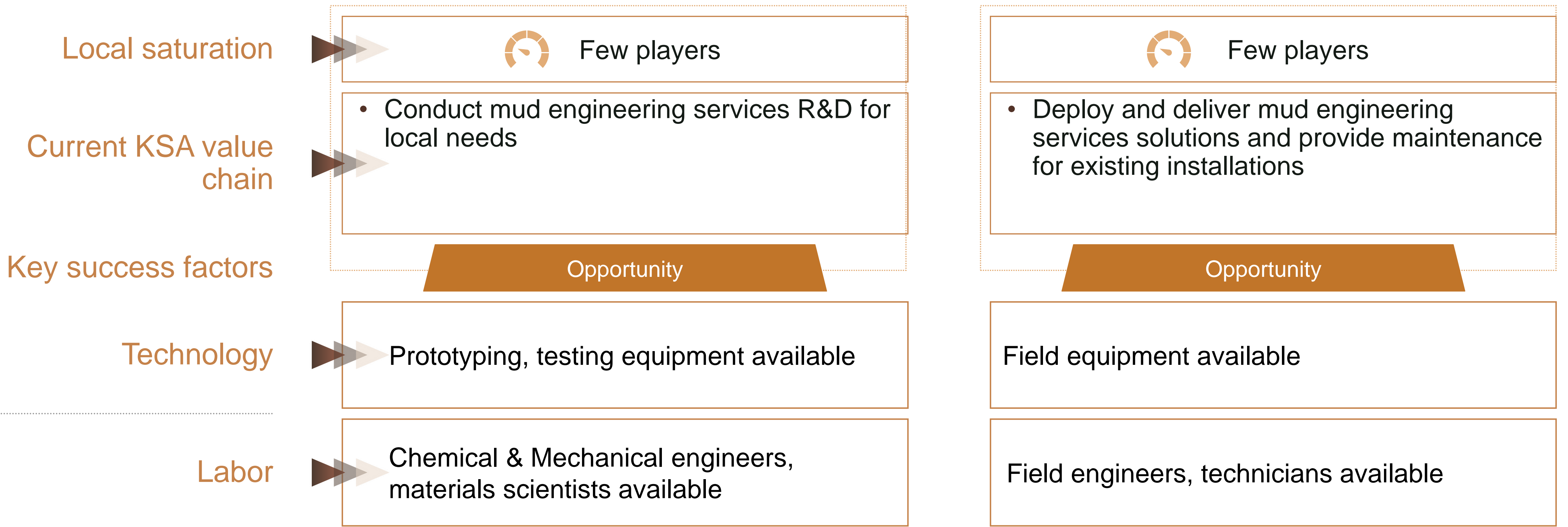
# Value chain and key localization opportunities



R&D



Lifecycle Mgmt.



Catalyzing Supply Chains

## Artificial Lift Systems

*Jawad Al Zayer*

# Opportunity profile – Artificial Lift Systems (AL Systems)

1

KSA in high need of AL Systems to realize ongoing O&G expansion

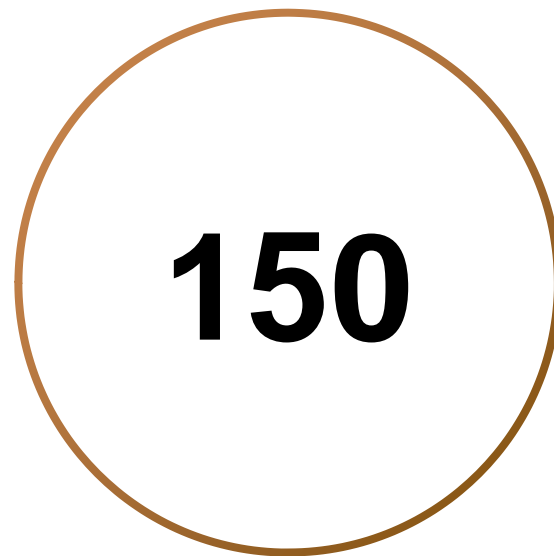
Key equipment category



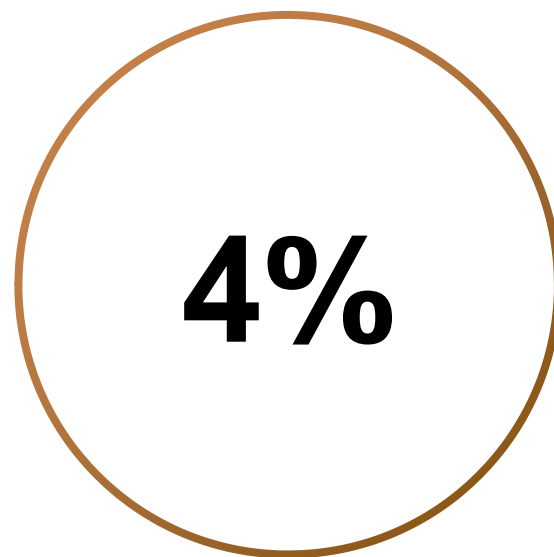
Electric Submersible Pumps (ESP)

2

AL Systems are a growing market, KSA has the largest regional share



Estimated 2024 KSA market size (\$MM)



Forecasted 5-year CAGR

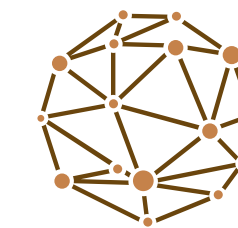
3

Attractive investment opportunities for the AL Systems value chain

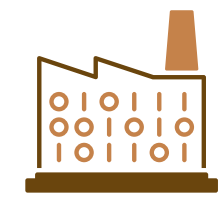
KSA value chain opportunities



R&D



Ecosystem Mfg.



OEM Mfg.

KSA enablers

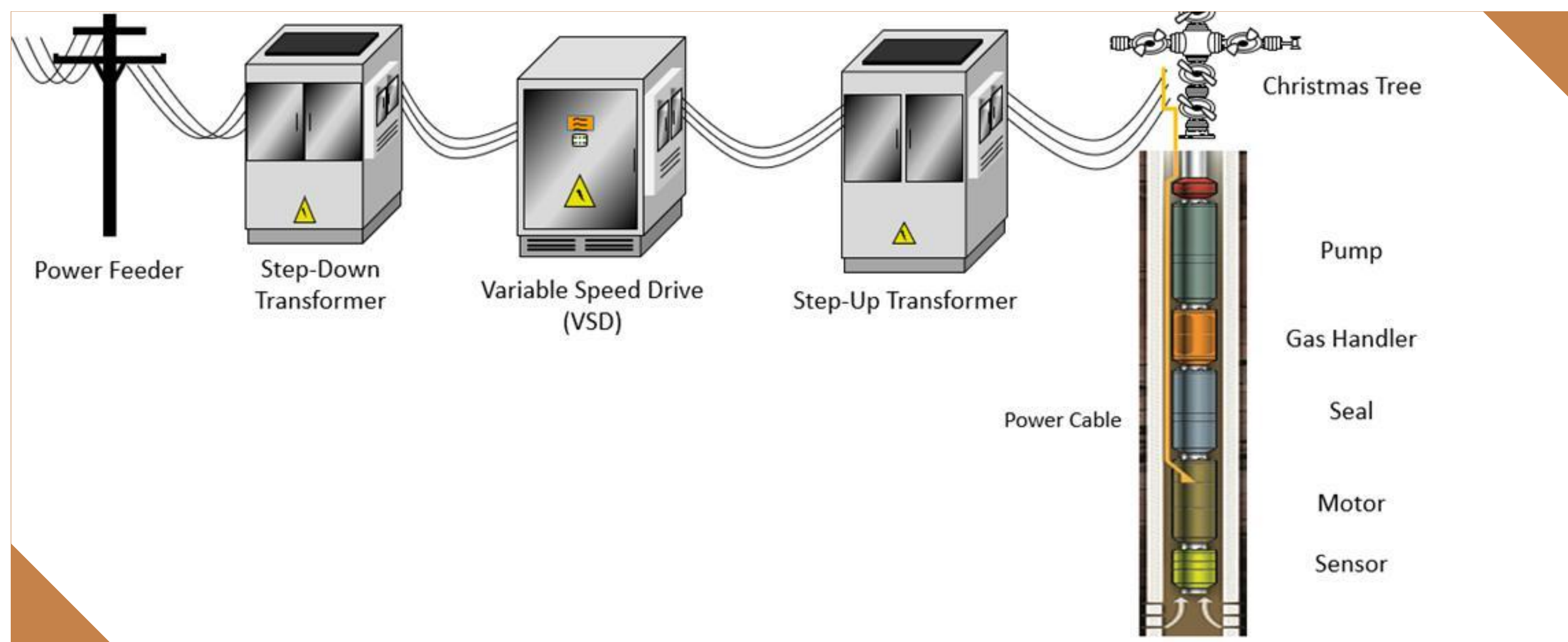
- Financing available (SIDF)
- Competitive taxes
- Benefits in industrial parks with OSS services access, Saudization waivers
- Skilled labor for component manufacturing from SADA

Catalyzing Supply Chains

Note: \$MM = USD Millions; SIDF = Saudi Industrial Development Fund  
 Source: Aramco; TechSci Research; Press releases; Team analysis

# Artificial Lift Systems Technical Overview

## Electric Submersible Pumps

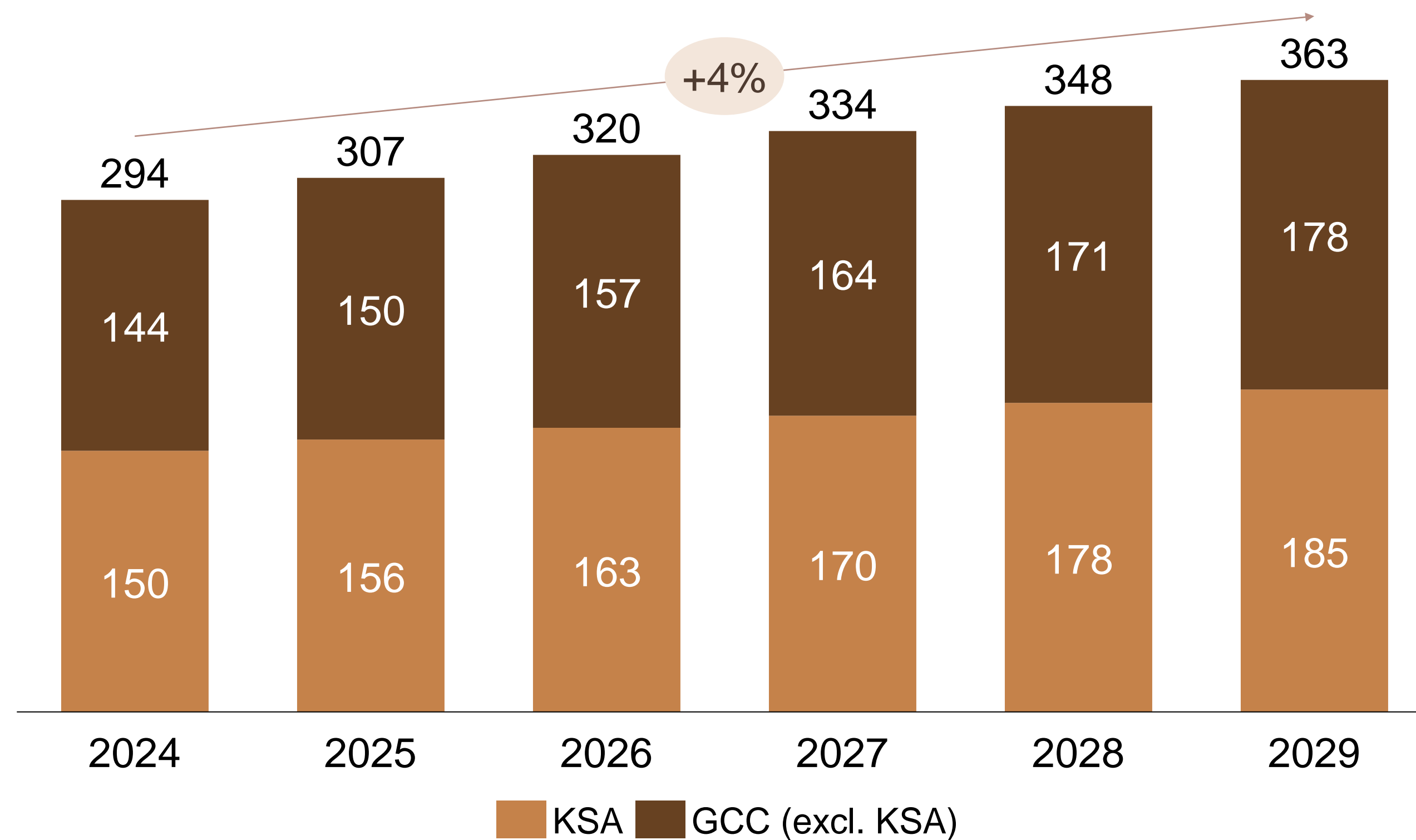


- AL systems supplement reservoir natural drive
- ESP systems are most commonly used AL systems

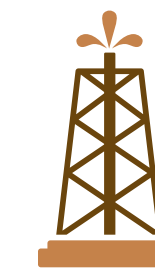
### Catalyzing Supply Chains

# Artificial Lift Systems demand, customers, and drivers

Forecasted KSA and rest of GCC AL Systems market 2024-2029 (\$MM)



## Typical AL Systems customers in KSA



Oil producers

## Key KSA demand drivers

- **Rise in upstream activities:** Rise in upstream activities require further use of AL systems
- **Increasing oil recovery efforts from mature fields:** mature fields requires AL systems to improve production

### Catalyzing Supply Chains

Note: \$MM = USD Millions  
Source: Aramco; TechSci Research; Press releases; Team analysis

# Value chain and key localization opportunities



R&D



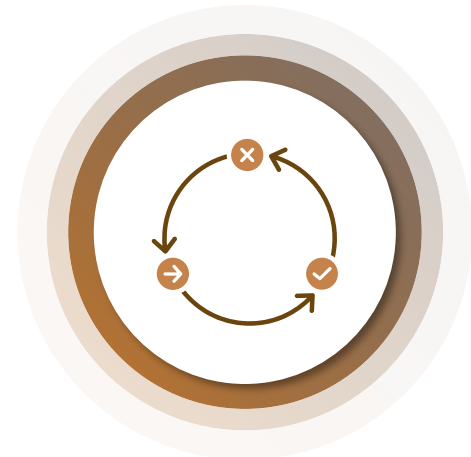
ESP Components



OEM Manufacturing



Lifecycle Mgmt.



Local saturation	Few players	Few players	Few players	Many players
Current KSA value chain	<ul style="list-style-type: none"> <li>Conduct ESP R&amp;D for local needs</li> </ul>	<ul style="list-style-type: none"> <li>Manufacture ESP impellers, diffusers, and other ESP components</li> </ul>	<ul style="list-style-type: none"> <li>Manufacture full ESP systems (pumps, motors, seal)</li> </ul>	<ul style="list-style-type: none"> <li>Offer services for ESP &amp; component maintenance</li> </ul>
Key success factors	Opportunity	Opportunity	Opportunity	
Technology	Prototyping tools and polymer processing equipment available	Casting and furnaces available	Insulation and precision CNC machines available for import	Installation & testing equipment available
Labor	Mechanical engineers, material scientists available	Machinists and casting technicians available	Electrical engineers and motor assembly technicians available	Field engineers, technicians available

Catalyzing Supply Chains

Note: ESP = Electric submersible pumps; CNC = Computer Numerical Control  
Source: Aramco; TechSci Research; Press releases; Team analysis

# Workshop Agenda

A	Title of the Investment Opportunity	Presenter
-	Introduction	Abdullah Al Ghamdi
1	Underbalanced Coiled Tubing Drilling	Abdulrahman Al Mudhafar
2	Coiled Tubing	Abdulrahman Al Mudhafar
3	Directional Drilling	Abdullah Al Dossary
4	Tubular Running Services	Jasem Al Moyaibed
5	Wellbore Cleanout	Atallah Al Harbi
6	Mud Engineering Services	Tulio Olivares Antunez
7	Artificial Lift Systems	Jawad Al Zayer
8	Artificial Lift Systems Cable	Jawad Al Zayer
-	Closing remarks	Abdullah Al Ghamdi