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Supply Chain and Raw Material Sovereignty in GCC Countries within the Oil and Gas Sector: Challenges, Strategies, and the Case of Oman

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Abstract

In the global oil and gas industry, the GCC countries hold about 511.9 billion barrels of proven crude oil reserves and 44.3 trillion cubic meters of natural gas reserves in 2024. However, the GCC countries are very vulnerable in the supply chain and raw materials sovereignty as they are very dependent on importation of equipment, specialty chemicals and technology for their upstream and downstream activities. The purpose of this paper is to explore the notion of supply chain and raw material sovereignty in the oil and gas industry in the countries of the Gulf Cooperation Council and focus on the structural dependencies, geopolitical risks and economic consequences of dependence on external sources of critical resources. The study utilizes the latest data from OPEC, IMF, World Bank and national statistical agencies until 2025 and applies a comparative analytical approach to all six member nations of the GCC, with a specific case study of Oman. The In-Country Value (ICV) strategy of Oman, the economic diversification strategy of Vision 2040 and the imminent green hydrogen transition in the GCC are explored as examples of more general strategies for achieving greater raw material and supply chain sovereignty across the GCC. The findings indicate that while much progress is being made – especially via the IKTVA initiative in Saudi Arabia and the ICV framework in Oman – the GCC is still short of achieving the ambitious 2030 goals that have been set. The paper concludes with policy suggestions for speeding up the process of raw material sovereignty by investment in local production, inter-regional coordination and technology transfer.

Keywords: supply chain sovereignty; raw material sovereignty; GCC; oil and gas; In-Country Value; Oman; local content; IKTVA; Vision 2040; energy transition

1. Introduction

Saudi Arabia, the United Arab Emirates (UAE), Kuwait, Qatar, Bahrain and Oman, the members of the Gulf Cooperation Council (GCC), have long been the mainstay of global hydrocarbon supply. The total volume of crude oil production in the GCC in 2024 is about 21.8% of global crude oil production, while the total volume of natural gas reserves in the GCC in 2024 is about 44.3 trillion cubic meters and total volume of crude oil reserves in 2024 is 511.9 billion barrels (GCC-STAT, 2025). In the Middle East, the oil and gas industry is a major contributor to government revenue, which makes up around 60% of government revenues in Saudi Arabia and around 33% of GDP in Oman (Oxford Business Group, 2025). Yet the critical inputs, technologies and raw materials needed to extract, process and export their hydrocarbon wealth are paradoxically dependent on outside supply chains in the GCC nations.

The concept of supply chain sovereignty—the ability of a country or region to own, protect and manage the movement of critical commodities, services and raw materials through the strategic industries in which it operates—has become a prime issue in the new geopolitically divided, post-pandemic global economy (Schneider, 2025). The idea isn't limited to independence, but extends to the resilience and diversity and strategy of supply networks. Within the oil and gas industry, raw materials sovereignty is the capacity to produce or obtain local resources or develop strategic partnerships to obtain the equipment, chemicals, steel, pipes, valves, control systems and other materials needed for upstream exploration, midstream transportation and downstream refiners.

In 2020, the COVID-19 pandemic hit the Gulf Cooperation Council (GCC) region, highlighting the fragility of the global supply chain, with delays in delivery of essential drilling equipment and specialty chemicals leading to postponed maintenance and production slowdowns throughout the GCC countries (Al-Rashdi & Al-Mandhari, 2024). The geopolitical tensions caused by the Russia-Ukraine conflict, disruptions to shipping through the Red Sea and growing trade rivalry between the United States and China have all reinforced the strategy of GCC countries to minimize their reliance on imported raw materials and boost their local industrial capabilities.

This paper aims to fill a major research gap in the academic literature by offering a broad data-based examination of raw material and supply chain sovereignty in the oil and gas industry in the GCC. There is not yet adequate scholarship combining the concepts of supply chain sovereignty and raw material sovereignty in a single analytical framework, while the existing literature has focused on individual elements of the themes, such as local content policies (Al-Yahyaoui & Al-Maawali, 2023) and economic diversification (IMF, 2025). The main contributions of this study are: (a) to map the structural dependencies of the oil and gas supply chains of the member countries of the GCC; (b) to compare the local content strategies of the six member countries; (c) to conduct a detailed case analysis of Oman as an example of a medium-sized hydrocarbon producer that is striving for supply chain autonomy; and (d) to offer evidence-based policy recommendations for enhanced raw material autonomy.

2. Literature Review

2.1 Conceptual Framework: Supply Chain Sovereignty

The notion of supply chain sovereignty draws upon multiple lines of academic research. Firstly, it uses supply chain resilience theory (Christopher & Peck, 2004), secondly, strategic trade theory (Brander & Spencer, 1985) and thirdly, resource-based views of the firm (Barney, 1991). The concept of supply chain sovereignty has been extended with the concept of national strategic autonomy, which is intrinsic to the ability of a country to guarantee the continuity of supply flows without excessive reliance on actors outside its country that it does not control. The concept has become more relevant in the oil and gas sector after the disruptions of global supply chains for critical industrial goods in 2020-2022 (Ivanov & Dolgui, 2021).

Sovereignty over the inputs needed for industrial production is Raw Material sovereignty, a subcategory of supply chain sovereignty. This includes drilling equipment and rigs, wellhead and Christmas tree assemblies, subsea production systems, specialty chemicals for EOR and well stimulation, seamless steel pipes and tubular goods, pumps, compressors and valves, industrial control and automation systems, and cement and cement additives for well completion materials in the GCC oil and gas sector. The ability of GCC nations to produce or strategically procure these materials within the country significantly impacts on their operational resilience, cost dynamics and geopolitical power.

2.2 GCC Economic Diversification and Local Content

Since the release of Saudi Arabia's Vision 2030 and other national vision plans by the other GCC countries, the number of studies in academic circles related to economic diversification has grown substantively. In his study, Hvidt (2015) analysed the early diversification initiatives of the GCC countries and found that although they have ambitious goals, they have not succeeded to break away from the hydrocarbon-driven economy because of the lack of deep industrial base. In more recent research, the IMF (2025) and the World Bank (2025) have highlighted the progress being made in the non-oil sectors, with non-hydrocarbon growth in the GCC projected to be around 4.0% in 2024, with further acceleration to 4.4% in 2025. UAE has already experienced significant structural transformation with the non-oil sector accounting for 75% of GDP, while Saudi Arabia is on a similar trajectory, with the sector accounting for 71% of GDP (S&P Global, 2026).

Local content policies have been one of the main instruments in GCC diversification policies. The most comprehensive program is Saudi Arabia's In-Kingdom Total Value Add (IKTVA) program which aims to reach 70% local content in the energy sector by 2021 and 75% by 2025 (Saudi Aramco, 2024). The percentage of Aramco's procurement expenditure that is local content is 67% according to framework IKTVA in 2024 (LinkedIn, 2025). The ICV strategy in Oman, managed by the Ministry of Energy and Minerals, has also progressed, and Omani SMEs are benefiting from USD 1.8 billion in energy sector contracts in 2024 alone (Oman Observer, 2025). The UAE, Qatar, Kuwait and Bahrain have had similar but not so quantitatively ambitious programmes, with the current local content in the sub-sectors between 20% and 45%.

2.3 Supply Chain Vulnerabilities in Oil and Gas

The research literature on supply chain vulnerabilities in the oil and gas industry has revealed a number of common themes. Al-Rashdi and Al-Mandhari (2024) used the Failure Mode and Effects Analysis (FMEA) method when analyzing the Omani oil and gas supply chain in order to identify the riskiest activities and found that the drilling activities and transportation logistics were the most dangerous activities with high risk priority numbers that are far higher than the acceptable value. Their findings showed that high transportation costs, regulatory restrictions and reliance on imports were results that had a cumulative impact on the operational performance. Likewise, ResearchGate (2024) published a study which highlighted the vulnerability of the Oman's supply chain for several critical inputs such as drilling equipment, specialty chemicals, and control systems, with import dependency ratios of 72% and 68% respectively, and 78% for control systems, indicating systemic risks to production continuity and cost management.

Deloitte (2025) reported that oil and gas companies faced a complicated environment of OPEC+ supply management and fluctuating demand in 2024 and that supply chain disruptions continued to impact project timelines and cost structures across the globe. The IEA's Oil 2025 report also highlighted that "facing structural vulnerabilities, producing countries are especially vulnerable to the "concentrating of manufacturing capability for critical oilfield equipment in a small number of supplier countries, particularly those in the Middle East without diversified industrial bases" (IEA, 2025).

3. Methodology

This study uses a mixed method - comparative analytical approach which is quantitative data analysis and qualitative policy evaluation. The quantitative component is based on secondary data sources from the national statistical agencies, the OPEC's Annual Statistical Bulletin (2025), IMF Article IV

Consultation reports for the Gulf countries (2024-2025), the World Bank's Gulf Economic Update (2025), GCC-STAT publications and industry reports from leading consultancies such as Deloitte, PwC and S&P Global. The data are available for the period 2019-2025, with 2025 data being a mixture of actual reported data (where available) and projections based on long-term trends and institutional forecasts.

The qualitative aspect is a comparative policy analysis of local content strategies in the six GCC member countries with a special focus on the ICV strategy in Oman as an illustrative case study. The methodology adopted in this case study is known as the single case embedded designs, which are used by Yin (2018) to discuss a representative or typical case, in this instance the mid-sized hydrocarbon-producing GCC country that actively strives to make its entire supply chain 'sovereign'. The reasons for choosing Oman as the focal case are: (a) Located between the two extreme cases of the hydrocarbon-rich and the hydrocarbon-poor states, it is not an outlier; (b) it has an advanced and well-documented ICV framework; (c) it is actively exploring green hydrogen as a strategic complement to the hydrocarbon supply chain; and (d) extensive and recent data from the Ministry of Energy and Minerals, OQ Group and Energy Development Oman (EDO) is available.

The quantitative findings have been synthesized and structured into six analytical tables and six data visualization charts. Unless specified otherwise, all money values are in United States dollars (USD). The OMR/USD conversion rate (1 OMR equals 2.597 USD) has been used for conversion where OMR is used. It is important to note that some of the data used for 2025 are projections and estimates, and the restrictions that are inherent in such forward-looking data are noted throughout the analysis.

4. GCC Oil and Gas Sector: Current Landscape

4.1 Production and Reserve Overview

The hydrocarbon potential in the Gulf Cooperation Council (GCC) countries is one of the world's most concentrated. According to the country's Central Bureau of Statistics (GCC-STAT) and Zawya (2025), the total proven crude oil reserves in the GCC region stood at around 511.9 billion barrels as of 2024, which accounted for approximately 29.5% of global proven crude oil reserves, while the proven natural gas reserves totalled approximately 44.3 trillion cubic metres, representing around 20.7% of the total proven natural gas reserves in the world. Saudi Arabia has the largest amount of proven oil reserves with about 267 billion barrels, equivalent to more than 52% of the proven oil reserves in the GCC, while Qatar is the dominant country in its natural gas reserves with proven reserves of 24.7 trillion cubic meters, most of which are from the North Field, which is the largest OPEC natural gas field.

OPEC+ production management agreements have had a remarkable impact on production trends in the GCC region. Saudi Arabia's production averaged at a rate of about 9.75 mb/d in 2024 compared with 10.46 mb/d in 2023, which is due to the voluntary production cuts agreed by OPEC+ countries (Enerdata, 2025). The UAE's output is about 3.42 mb/d in 2024, compared to roughly 3.65 mb/d in 2023, while the output of the Kuwait is reduced to about 2.49 mb/d from 2.68 mb/d in 2023. Oman, is a non-OPEC member of the OPEC+ cooperation framework, its average daily crude production declined by 5.4% to around 992,600 bpd in 2024 (AGBI, 2025), although the production level was increased to 768,000 bpd in May 2025 under revised OPEC+ agreements (Oman Petroleum & Energy Show, 2025).

Table 1
GCC Oil and Gas Key Indicators (2024)

Country	Oil Reserves (Billion bbl)	Gas Reserves (tcm)	Oil Production (Thousand bpd, 2024)	Gas Production (bcm, 2024)	Oil & Gas % of GDP
Saudi Arabia	267.0	9.4	9,750	118.0	~42%
UAE	97.8	6.1	3,420	67.5	~30%
Kuwait	101.5	1.8	2,490	19.3	~45%
Qatar	25.2	24.7	530	177.0	~38%
Oman	5.4	2.5	993	34.2	~33%
Bahrain	0.2	0.2	170	16.5	~25%
GCC Total	497.1*	44.7*	17,853	432.5	—

Note: *GCC total differs from 511.9 billion bbl cited by GCC-STAT due to differing reserve classification methodologies. Sources: OPEC ASB 2025; GCC-STAT 2025; CEIC Data; Enerdata Yearbook 2025; national statistical agencies.

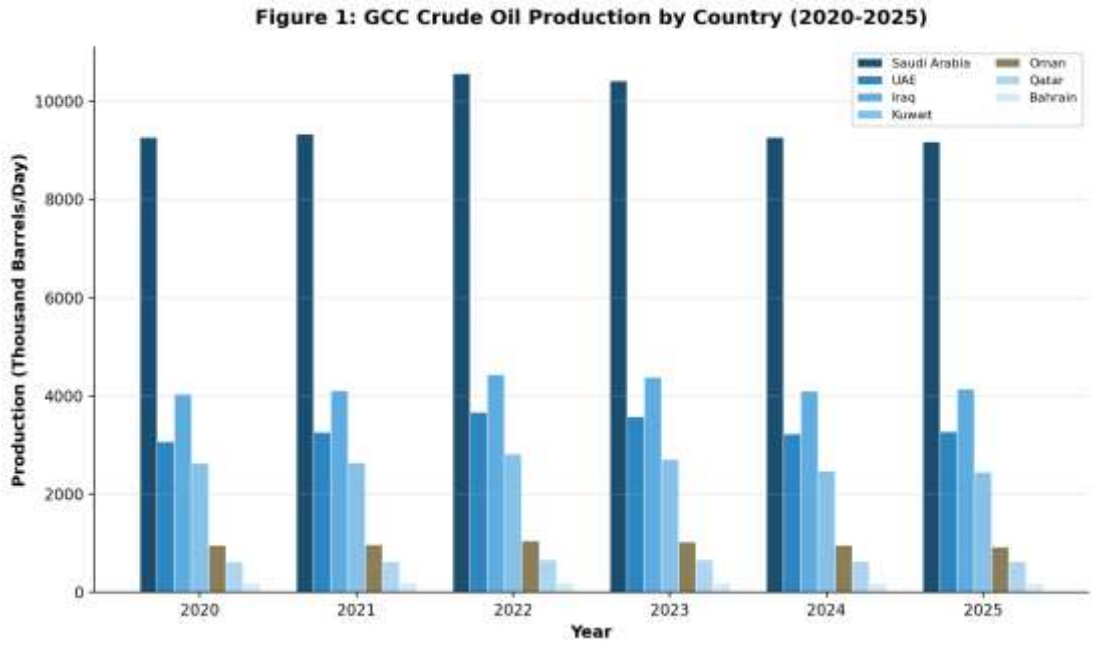


Figure 1: GCC Crude Oil Production by Country (2023–2025). Source: OPEC ASB 2025; IEA Oil Market Report Dec 2025.

4.2 Natural Gas Dynamics and the LNG Expansion

The increasing strategic role of natural gas has been brought to the fore by the increase in domestic power generation demand, the development of petrochemical industries and the global LNG market. According to Future Market Insights, the value of the GCC natural gas market was estimated to be around USD 60.3 billion in the year 2025, and is expected to reach USD 91.9 billion by the year 2035 at a compound annual growth rate (CAGR) of 4.3% (2025–2035) (FMI, 2025). Qatar continues to be the major player, with its North Field Expansion project expected to expand LNG production from 77 million tonnes per annum (mtpa) to 126 mtpa by 2027, keeping it the largest LNG exporter in the world (IEA, 2025).

In 2024, Oman's natural gas production was about 34.2 billion cubic meters (bcm), which is a slight increase from the previous year, marking a 0.3% growth (Arabian Stories, 2025). The gas reserves of 2.5 tcm are low in comparison to the GCC nations, but they would have been adequate for the country's industrial use and for the ambitious transition to green hydrogen. Oman aims to produce 1.25 million tons of green hydrogen a year by 2030 and 8.5 million tons by 2050, with 2,000 km of hydrogen pipeline infrastructure (Nature, 2025). This strategic shift in energy supply chains toward hydrogen is an important diversification of the nation's energy supply chain and could one day become a source of raw material independence in the new hydrogen economy.

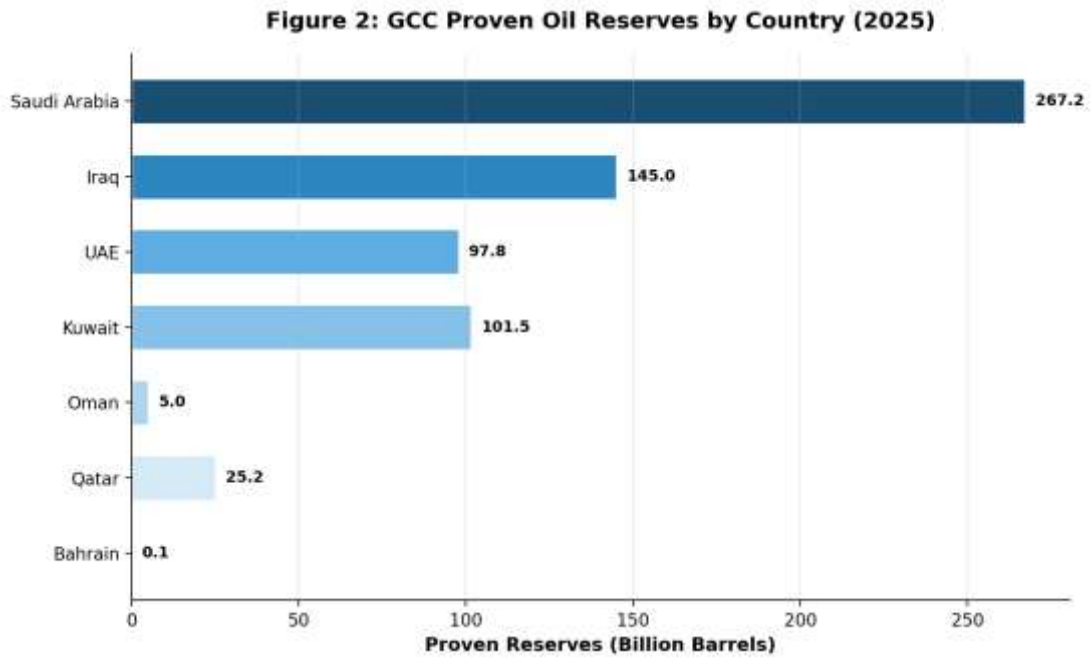


Figure 2: GCC Natural Gas Proven Reserves by Country (2024). Source: GCC-STAT (2025); OPEC ASB 2025.

4.3 Macroeconomic Context

In the macroeconomic environment, the oil and gas sectors in the Gulf Cooperation Council are expected to see a steady recovery from the production reductions of 2023-2024 in 2024-2025. The IMF (2025) forecasts a rebound in output growth for the GCC region from 1.7% in 2024 to an average of 3.3% in 2025, as growth in hydrocarbon production turns positive after being hampered by OPEC+ production constraints. The World Bank's latest Gulf Economic Update (December 2025) predicted real GDP growth of 3.2% in the GCC region in 2025, with continued expansion in non-oil activity, around 4.0%, and oil continuing to grow at 2.8% (Arab News, 2025). The regional median fiscal breakeven oil price is expected to drop from around USD 70 per barrel in 2025 to USD 62 per barrel by 2030, as a result of fiscal consolidation and diversification efforts (EFG International, 2025).

The economy has shown strong resilience, buoyed by positive hydrocarbon revenues and the reform process, particularly in Oman. As revealed by the IMF's 2024 Article IV Consultation, Oman's economy is still growing despite the slight inflation, with real GDP growth of around 2.5% expected to reach 3.0% in 2025 (IMF, 2025). The United States was the second largest foreign direct investor in Oman with a total of USD 13.6 billion of FDI stock in the quarter of 2024 Q4 (U.S. State Department, 2025), reflecti-

reflecting increasing confidence in the country's economic future.

5. Supply Chain and Raw Material Sovereignty: Structural Analysis

5.1 Dependency Mapping Across the GCC

A systematic mapping exercise on the dependencies of the oil & gas supply chain in the GCC demonstrates a multi-layered dependency on imports. The GCC countries are particularly reliant on imported drilling rigs and equipment; it is estimated that 65-75% of the rigs' equipment is imported from the United States, China, and European manufacturers. The specialty chemicals used for enhanced oil recovery (EOR), well stimulation and corrosion inhibitors are primarily made by multinational chemical firms primarily based in the United States, Germany and Switzerland, with import dependency ratios in the range of 60 to 80 percent in the GCC. Another critical dependency is seamless steel pipes and oil country tubular goods (OCTG), which have an average of 50-65% of their needs imported, mostly from China, South Korea and Japan (Al-Rashdi & Al-Mandhari, 2024).

Compressor stations, pipeline coating materials, and LNG liquefaction technology are other import critical components that midstream companies rely upon. Imported catalyst systems, process control instrumentation and special maintenance equipment are critical to downstream refining and petrochemical businesses. These interdependencies create a structural vulnerability that makes GCC producers susceptible to supply interruptions, input market price fluctuations and geopolitical leverage of suppliers. The COVID-19 pandemic itself was a stark reminder of these risks, as logistics delays of 3–6 months are reported for delivery of equipment, leading to delayed maintenance schedules and estimated losses in production of 2–5% across the GCC (Deloitte, 2025).

Table 2
GCC Oil & Gas Supply Chain Import Dependency by Category (2024)

Supply Chain Category	Import Dependency (GCC Average %)	Top Source Countries	Criticality Level	Domestic Substitutability
Drilling Equipment & Rigs	72%	USA, China, Norway	Critical	Low
Specialty Chemicals (EOR)	68%	USA, Germany, Switzerland	Critical	Low–Medium
Seamless Steel Pipes / OCTG	55%	China, S. Korea, Japan	High	Medium
Pumps, Compressors & Valves	60%	USA, Germany, UK	High	Low–Medium
Control & Automation Systems	78%	USA, Germany, Japan	Critical	Very Low
Cement & Well Completion Additives	40%	UAE, India, China	Medium	Medium–High
Subsea Production Systems	85%	Norway, UK, USA	Critical	Very Low
LNG Liquefaction Technology	80%	USA, France, Japan	Critical	Very Low

Sources: Al-Rashdi & Al-Mandhari (2024); Deloitte Oil & Gas Outlook 2025; IEA Oil 2025; industry estimates.

5.2 Geopolitical Risks and Supply Chain Vulnerabilities

GCC oil and gas producers are now facing additional geopolitical risks to their supply chain in 2024–2025. The Red Sea crisis, which began in response to attacks by the Houthis on commercial shipping navigating the strait of Bab al-Mandeb, caused one of the world's most vital shipping routes to be cut, forcing many shipping firms to reroute around the Cape of Good Hope, thereby adding 10-14 days to voyages to Europe and freight costs by 150-200% during peak disruption periods (MEC, 2025). The disruption had a direct impact on the inbound flow of essential equipment and chemicals from European and Asian manufacturers that travel via the Red Sea route, although at least partly offset by pipeline supply alternatives and export terminals being located in the Arabian Gulf.

The competition between the United States and China in technology represents other challenges, especially for the control systems and digital oilfield technologies. The UK government has expressed concern about the availability of some of these control and automation systems for advanced semiconductors in oil and gas operations in the GCC for the foreseeable future following the imposition of export controls in the United States. In addition, the changing trade patterns of the GCC countries indicate a strategic realignment, as the region is expected to import about 80% of its crude oil from Asian markets, with the majority of imports coming from China, India, Japan, and South Korea, as well as more than 90% of crude imports from the UAE and Kuwait (World Bank, 2025). There has been a similar shift in the exports to the east but it has not been followed by a shift in the origin of supply chains, thus creating an asymmetry that can be leveraged in future geopolitical contingencies.

6. Local Content and Industrialization Strategies Across the GCC

6.1 Saudi Arabia: The IKTVA Framework

Saudi Aramco's In-Kingdom Total Value Add (IKTVA) program, which was launched in 2015, is the most comprehensive and well-structured local content program in the GCC. It was planned to achieve 70% local content in Aramco's procurement spending by 2021 and 75% by 2025. In 2024, Saudi Aramco's local content spend was 67%, up from the 35% base when the program was launched (Saudi Aramco, 2024). IKTVA is based on a mandatory reporting system for suppliers that rates them according to their local value contribution in five areas: manufacturing, employment, training, research and development, and commercial investment. The suppliers with higher IKTVA scores will be preferred during the procurement process and this will provide a strong market-based incentive for localization.

IKTVA has spurred the growth of a local oilfield equipment and services manufacturing industry, and considerable investments have been made in industrial cities like Jubail, Yanbu and the King Salman Energy Park (SPARK). The schemes have brought in more than USD 10 billion in manufacturing investments and are estimated to have generated 50,000 direct jobs in the energy supply chain sector. This is not the case in the most technology intensive categories, though, as with control systems, subsea equipment and advanced drilling technologies, the import dependency ratios are over 70%.

6.2 UAE, Qatar, Kuwait, and Bahrain: Comparative Approaches

The UAE has been promoting local content since the introduction of the UAE Industrial Strategy 'Make it in the Emirates', which seeks to boost the share of the industrial sector in GDP from AED 133 billion in 2020 to AED 300 billion by 2031. Specifically in the oil and gas industry, the Abu Dhabi National Oil

Company (ADNOC) has instituted a Local Content (ICV) programme that specifies local content requirements for all suppliers. Current local content in oil and gas procurement in UAE is estimated to be around 45% (LinkedIn, 2025) and the target is 60% by 2030. Unlike the other GCC countries, the UAE has a more diversified industrial base, offering a solid basis for supply chain localization.

The local content strategy is based on the Qatar Energy's Ta'aziz (Sustainability) program that is targeting to raise the level of local content in the energy sector to 50% by 2030, up from the current estimated 35%. The North Field Expansion project has been used as a means of technology transfer and development of in-country skills, and Qatar Energy has asked for the international contractors to form companies with local partners and to provide specific levels of localization. However, Kuwait's local content framework, run by Kuwait Petroleum Corporation (KPC), has adopted more modest targets that aim to reach 40% by 2030, a target that is more appropriate for the country, which has a relatively underdeveloped industrial base and a larger contribution of the public sector to economic activity. Industrial capacity to supply to local demand in Bahrain is estimated at around 20%, the lowest among GCC states, but the country's other economic diversification efforts in the fields of financial services and aluminum smelting, provide alternative industrial capabilities that can help maintain supply chain localization in the longer term.

Table 3
GCC Local Content Policy Comparison in Oil & Gas Sector (2024)

Country	Policy Framework	Year Launched	Current Local Content (%)	2030 Target (%)	Key Instruments
Saudi Arabia	IKTVA	2015	67%	75%	Mandatory ICV scoring; supplier preferences; industrial zones
UAE	ICV/Make it in Emirates	2018	45%	60%	ICV certification; industrial licenses; technology zones
Oman	ICV Strategy	2018	29%	50%	ICV certification; MAJD program; SME procurement mandates
Qatar	Ta'aziz	2019	35%	50%	JV requirements; localization milestones; training mandates
Kuwait	KPC Local Content	2020	25%	40%	Procurement preferences; industrial partnerships
Bahrain	National Content	2021	20%	35%	Sector-specific targets; SME support programs

Sources: Saudi Aramco IKTVA Report 2024; Oman Observer (2025); ADNOC ICV Program; Qatar Energy; KPC; LinkedIn (2025).

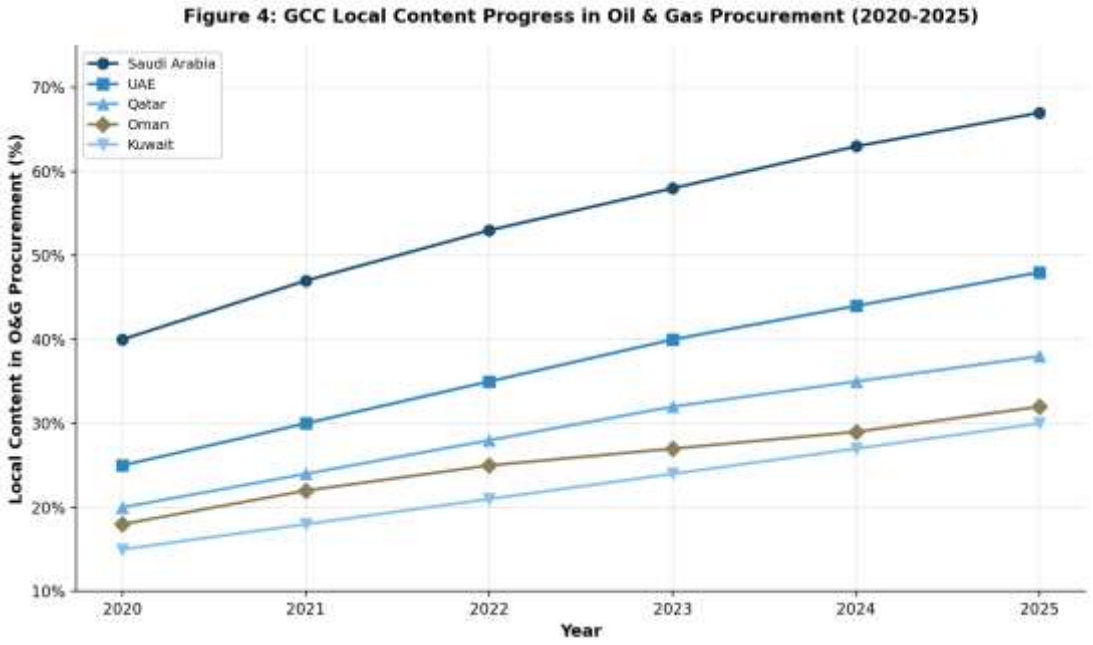


Figure 4: GCC Local Content Performance vs. 2030 Targets in Oil & Gas Sector. Source: Compiled from national and industry reports.

7. Case Study: Oman

7.1 Oman's Oil and Gas Sector Profile

There is a unique feature of Oman as one of the oil and gas producing countries of the GCC. Oman does not form part of OPEC, and it only joins the OPEC+ cooperation framework by will. Proven oil reserves of around 5.4 billion barrels and gas reserves of 2.5 trillion cubic meters are relatively low in comparison with the other GCC countries, but the industry continues to be the biggest contributor to the national economy as it provides around 33% of GDP, 60% of government revenue, and 70% of export earnings (Oxford Business Group, 2025). In 2024, Oman produced an average of 992,600 barrels per day, a decrease of 5.4% from the previous year as a result of cooperation commitments made by OPEC+ (AGBI, 2025). Under revised agreements, production will be increased to 768,000 bpd in May 2025 and to 821,000 bpd in May 2026 (Oman Petroleum & Energy Show, 2025).

Capital expenditures increased by 24% year-on-year to USD 12.5 billion in the first quarter of 2025 alone in the Omani oil and gas sector (Oman Petroleum & Energy Show, 2025). This investment wave comes as a result of new fields being developed, especially in the southern and offshore blocks, as well as continued expansion of India's gas production capability to meet the country's industrial and hydrogen ambitions. In 2024, with Energy Development Oman (EDO) becoming the state-owned successor to Petroleum Development Oman's (PDO) assets, 886 oil and gas wells were drilled and more than 24,000 well-related activities were completed, highlighting the extensive activity still taking place (EDO, 2025).

Table 4
Oman Oil & Gas Key Statistics (2019–2025)

Indicator	2019	2020	2021	2022	2023	2024	2025*
Oil Production (Thousand bpd)	970	950	970	1,050	1,050	993	960
Gas Production (bcm)	31.5	32.0	32.8	33.5	34.0	34.2	35.0

Oil Revenue (USD Billion)	18.5	11.2	17.8	26.4	22.1	20.3	21.5
Gas Revenue (USD Billion)	3.2	2.8	3.5	5.8	5.2	4.9	5.4
Oil & Gas % of GDP	38%	30%	34%	40%	35%	33%	32%
Omanisation Rate (Oil & Gas)	75%	77%	79%	82%	85%	89%	91%
Local Procurement (%)	18%	20%	18%	22%	25%	29%	33%

Note: *2025 figures are projected estimates. Sources: IMF Article IV Oman 2025; NCSI Oman; AGBI (2025); EDO Sustainability Report 2024; OQ Gas Networks AR 2024.

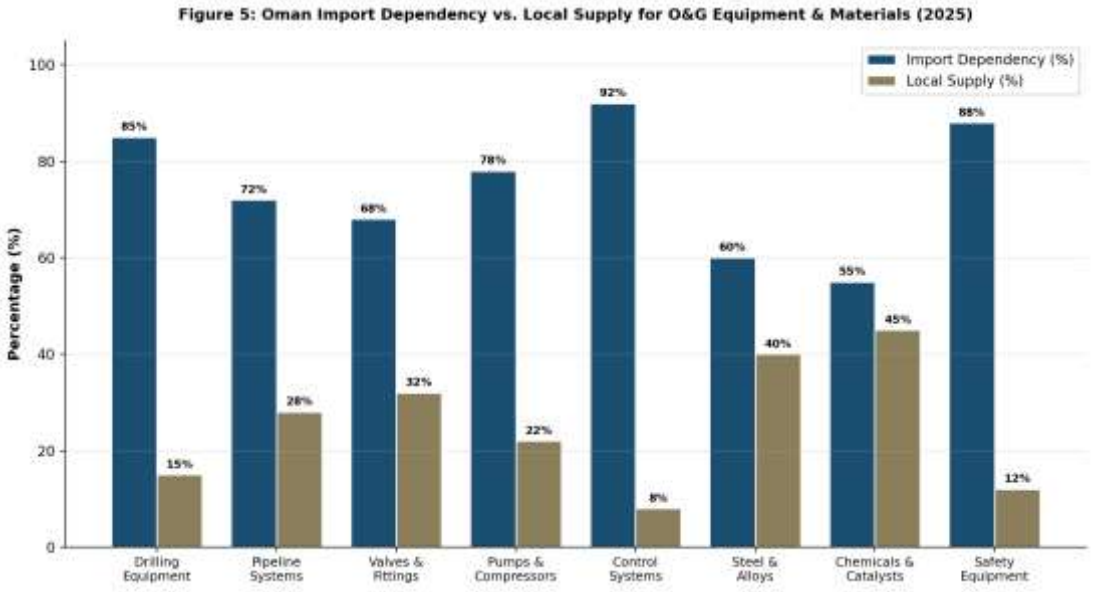


Figure 5: Oman Oil & Gas Revenue Trends (2019–2025). Source: IMF; NCSI Oman; AGBI Reports.

7.2 Oman's In-Country Value (ICV) Strategy

Oman's ICV strategy is the foundation of the country's efforts on supply chain and raw material sovereignty. The ICV framework was launched in 2018 by the Ministry of Energy and Minerals and applies to all companies in the energy industry. The strategy is implemented using a certification-based system, which assesses suppliers based on five dimensions: Omani workforce employment, local manufacturing and services, local procurement, training and development and research and innovation. Governments and energy sector procurement benefit the companies with the highest ICV score and incentivize localization.

Results from the ICV strategy have improved over time and have become quite remarkable. Between 2024, 2023 and 2022, the total value of energy sector contracts awarded to Omani SMEs increased by USD 1.8 billion, USD 1.4 billion and USD 1.1 billion respectively (Oman Observer, 2025). The oil and gas industry recorded a national Omanisation rate of 89% in 2024, having employed more than 17,900 Omanis, including the leaders, such as Petroleum Development Oman (now EDO) and OQ Group. In 2024, OQ Gas Networks (OQGN), the country's biggest gas transmission company, purchased OMR15.43 million of local procurement (LPO), accounting for 29% of the total procurement spend (OQ Gas Networks, 2025). The Ministry also introduced the 'MAJD' ICV programme in 2024, issuing the first certificate in the energy and minerals industry, thus strengthening the local content framework (Ministry of Energy & Minerals, Oman, 2024).

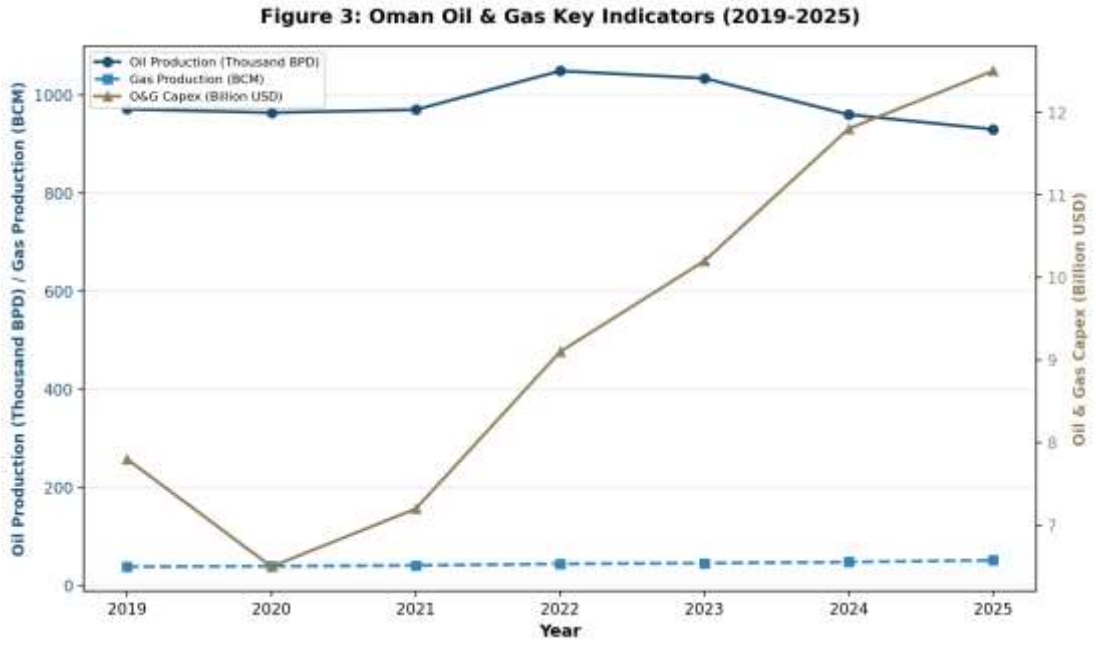


Figure 3: Oman In-Country Value (ICV) Strategy Progress (2021–2025). Source: Oman Observer; OQ Gas Networks; Ministry of Energy & Minerals.

7.3 Oman's Supply Chain Import Dependency Analysis

Although the ICV approach has yielded good results, the oil and gas industry is still highly reliant on imported raw materials and equipment in Oman. Further breakdown of import dependency by category shows that the majority of dependency is on control and automation systems (78%), drilling equipment (72%) and specialty chemicals for enhanced oil recovery (68%). These are the most technologically advanced input areas in the oil and gas supply chain, and all these areas still have a limited manufacturing capacity. Well completion additives, the other way around, have the lowest import dependency rate at 40% reflecting the development of the cement industry in Oman, with Oman Cement Company and Raysut Cement.

These dependencies have been formally evaluated using Failure Mode and Effects Analysis (FMEA) which revealed drilling operations and transportation logistics as the most critical links in the oil and gas supply chain in Oman (ResearchGate, 2024). The FMEA analysis confirmed that operational impacts would be the greatest for disruption of drilling equipment and specialty chemicals, because there are no good substitutes readily available and domestic supplies are either not available or available in small quantities. Transportation of imported materials via the Strait of Hormuz and, in some cases, the Bab al-Mandab strait will also bring additional geopolitical risk to the transportation chain.

Table 5
Oman Oil & Gas Supply Chain Import Dependency by Category (2024)

Category	Import Dependency (%)	Local Manufacturing Capacity (%)	Primary Source Countries	Risk Level	ICV Impact Potential
Drilling Equipment	72%	28%	USA, China, Norway	Critical	Medium-Term

Specialty Chemicals	68%	32%	USA, Germany, Switzerland	Critical	Medium-Term
Steel Pipes & OCTG	55%	45%	China, S. Korea, Japan	High	Short-Term
Pumps & Valves	60%	40%	USA, Germany, UK	High	Medium-Term
Control Systems	78%	22%	USA, Germany, Japan	Critical	Long-Term
Cement & Additives	40%	60%	UAE, India	Medium	Achieved

Sources: ResearchGate FMEA Study (2024); EDO Sustainability Report 2024; OQ Gas Networks AR 2024; industry estimates.

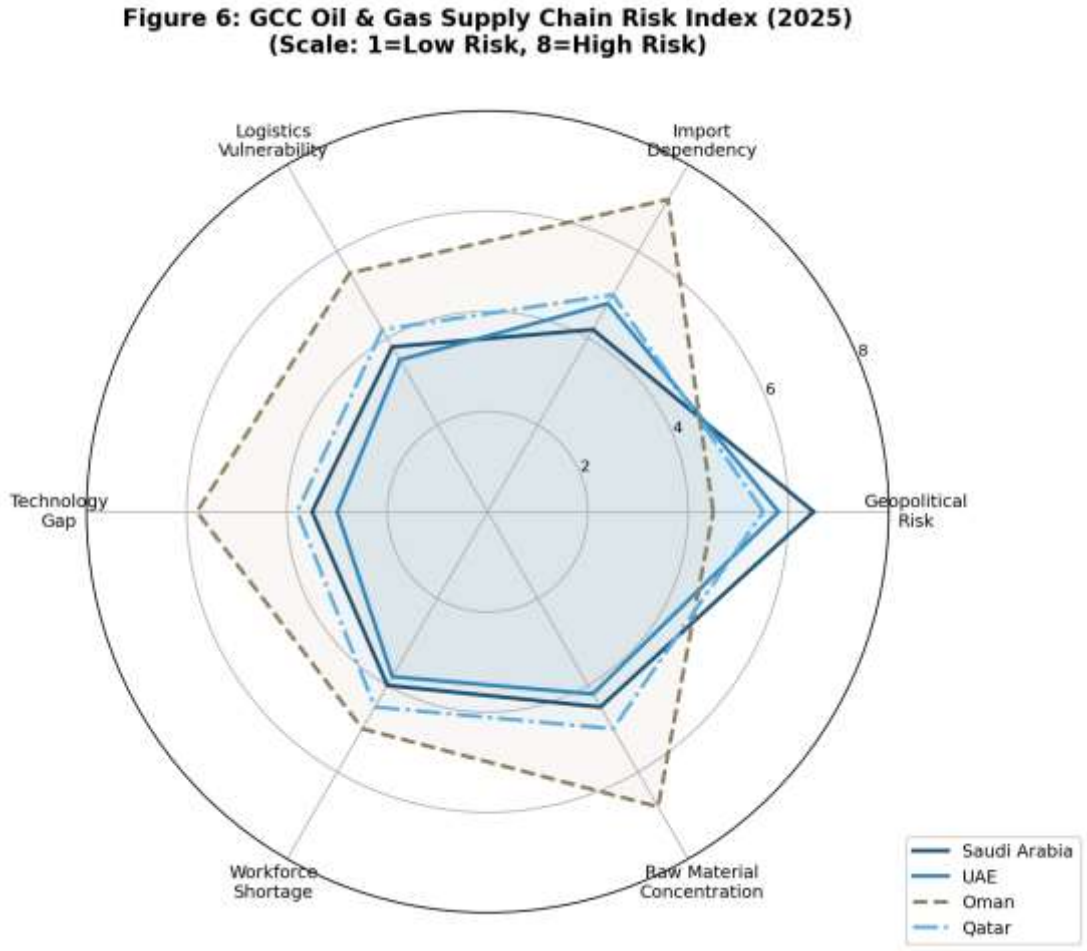


Figure 6: Oman Oil & Gas Supply Chain Import Dependency vs. Local Capacity (2024). Source: Compiled from industry and research data.

7.4 Oman Vision 2040 and the Hydrogen Transition

Economic diversification, industrialization and resiliency in supply chains are at the heart of the Sultanate's national development agenda, as outlined in Oman Vision 2040, Oman's national development strategy for the years 2021–2040. The vision focuses on a number of non-oil sectors for

foreign capital investment, such as logistics and transport, manufacturing, tourism and fisheries (Oman Vision 2025, 2040). In energy, Vision 2040 has set bold goals to move away from dependence on hydrocarbons towards a diversified energy mix, with a substantial role for renewable energy and green hydrogen.

Oman's green hydrogen strategy is one of the most ambitious in the world, with a long-term goal of 8.5 million tons of annual production by 2050, and 2,000 km of hydrogen pipelines (Nature, 2025). The opportunity and challenge to the hydrogen economy to supply chain sovereignty is a developing aspect. On the other hand, it establishes a completely new industrial ecosystem and the manufacturing of electrolyzers, pipeline construction, storage facilities, and export terminals can all be designed from the beginning considering domestic content. However, the global supply chain for electrolyzer technology is also highly fragmented, with significant shares in China, Europe and North America, and the potential for becoming as reliant as the oil and gas industry on imports.

The Oman Energy Master Plan 2040 has clearly identified the importance of having a 'competent and integrated localized supply chain' to support the country's efforts to speed up its energy transition (Gulf Intelligence, 2025). The Energy Master Plan process survey results show a strong consensus within the industry that local energy supply chains are critical to success in the transition to low-carbon energy. Oman is also a smart opportunity in developing domestic manufacturing capabilities for equipment and infrastructure for hydrogen, which will enable it to move towards more raw material self-sufficiency than it has had in the oil and gas sector.

Table 6
Oman Vision 2040: Energy Supply Chain Sovereignty Targets

Target Area	Baseline (2021)	2025 Target	2030 Target	2040 Target	Status
Local Content in Oil & Gas (%)	18%	29%	40%	55%	On Track
Omanisation in Energy Sector (%)	79%	89%	93%	95%	Exceeding
Green H2 Production (mtpa)	0	0.1	1.25	5.0	Early Stage
Domestic Electrolyzer Manufacturing (%)	0%	5%	25%	50%	Planned
Local Pipeline Manufacturing (%)	30%	45%	60%	75%	On Track
Renewable Energy in Mix (%)	2%	10%	30%	40%	On Track

Sources: Oman Vision 2040 Implementation Follow-up Unit; Ministry of Energy & Minerals; Nature (2025); Gulf Intelligence Energy Master Plan 2040.

8. Discussion

8.1 The Sovereignty Gap: Ambitions vs. Reality

The research findings of this paper highlight a major ‘sovereignty gap' in the GCC between the desire for sovereignty over the supply chains of raw materials and their dependency on imports of the same. The percentage of local content has reached 67% of Aramco's procurement spending in 2024, while the remaining 33% is a significant amount of imported inputs, especially in the most technology-driven categories, despite the success of Saudi Arabia's IKTVA program. Oman's performance in ICV has shown remarkable progress on the Omanisation and local procurement front, but still has some way to go to meet the leaders of the GCC countries, with local procurement accounting for only 29% of the total expenditure in 2024. There is a significant disparity between the current rate of localization, and

what is needed to be achieved by 2030, from around 8 percentage points in Saudi Arabia, to more than 20 in Oman and Bahrain, indicating a need to ramp up localization efforts in the second half of the decade.

One of the key results of this study is that the sovereignty gap is not the same for all the types of supply chains. In the relatively low technology sectors like cement, basic structural steel, and conventional maintenance service, domestic capacity has been well developed and dependency on imports is under control. But there's a significant and enduring divide in high-tech areas like control systems, subsea equipment, drilling automation, and specialty chemicals. It indicates that sovereignizing supply chains in the GCC is not possible by solely implementing incremental procurement measures but by making strategic investments in advanced manufacturing capabilities, technology transfer partnerships, and research and development ecosystems that can facilitate indigenous innovation in key technologies.

8.2 Regional Coordination and the GCC Common Market

The quest for supply chain sovereignty has largely happened on the national level, and each Gulf Cooperation Council member state has been creating its own local content policy, industrial enclaves and strategic ties. Such a nationwide strategy will be based on the sovereign interests and competition of individual states and may lead to duplicated investments, disjointed markets and economies of scale untaken. The GCC Common Market, which was established in 2008, is a theoretical framework for the free movement of goods, services, capital and labour between member states and its implementation in the industrial supply chain domain is not complete yet.

A more synergic and deliberate strategy towards supply chain sovereignty, within the GCC, could have tremendous benefits. For instance, the construction of the same type of equipment may be performed in a regional specialization mode, with each state specializing in a specific type of equipment, depending on its comparative advantages. Saudi Arabia has a large local market and existing industrial base, so it might specialise in upstream drilling equipment and large diameter pipes; UAE has a developed logistics industry and economy, and could focus on control systems and digital oilfield technologies; Oman has strategic port positions and a growing hydrogen economy and could specialise in hydrogen-related equipment and midstream infrastructure. Such an integrated strategy would need to bring together local content certification standards, mutual recognition of ICV scores, and create a GCC-wide procurement platform to facilitate the integration of the supply chain.

8.3 The Green Transition as a Sovereignty Opportunity

The energy transition is an opportunity and a challenge to the GCC energy supply chain sovereignty. Traditional oilfield equipment demand will slowly begin to get reduced as the world transitions to a decarbonized future and demand for renewable energy equipment, hydrogen production systems, CCS, and energy storage systems will gradually grow. GCC countries which can be at the leading edge of manufacturing these next generation energy technologies will have more sovereignty over their supply chains than they do in the traditional oil and gas sector.

The green hydrogen strategy in Oman is an example of this. Oman is establishing a new industrial segment with an annual production of 1.25 million tons in 2030 and 8.5 million tons by 2050, which calls for an entirely new supply chain, from manufacturer of electrolyzers to production of renewable energy, construction of pipelines to delivery at export terminals. The ability to produce domestically a substantial amount of this supply chain will grant Oman significantly more raw material independence than has been the case in the oil and gas industry in the energy transition to hydrogen. The biggest hurdle will be the process of making sure that substantive aspects for domestic capability building are built into

technology transfer agreements with international partners, rather than simply importing equipment.

9. Conclusion and Recommendations

This paper has focused on the condition of supply chain and raw material sovereignty in the GCC framework of oil and gas industry, and used the example of Oman. The analysis has shown that the GCC countries have the world's most abundant hydrocarbon resource endowments, but are structurally dependent on imported inputs for critical operations, ranging from 40% for cement and additives to 85% for subsea production systems. Significant progress has been made towards supply chain sovereignty through local content policies, most notably in Saudi Arabia's IKTVA program (67% local content in 2024), Oman's ICV strategy (29% local procurement, 89% Omanisation in 2024), although the progress from current to target is significant.

The following policy recommendations are provided based on the results of this study for the GCC countries aiming to improve their supply chain and raw material sovereignty:

Concentrate on technology-intensive categories: Supply chain sovereignty efforts should be directed toward the categories where the import dependency level is highest and the criticality level is highest, and the sovereignty gap is widest, such as control systems, drilling equipment and specialty chemicals.

Build on regional specialization: The member states of the GCC should plan their industrial development in a coordinated way to realize industrial specialization and economies of scale, with harmonized ICV standards and frameworks for mutual recognition.

The energy transition towards renewable energy and green hydrogen creates a once-in-a-lifetime window to develop domestic manufacturing capabilities in next-generation energy technologies, thus lowering the dependency on imported equipment in the future and enabling new export-focused industries.

Improve technology transfer arrangements: Technology transfer aspects should be explicitly incorporated in local content policies, such as inclusion of joint ventures, sharing provisions for IP rights, and progressive localisation benchmarks that are linked to contract renewals and extensions.

R&D ecosystems: An indigenous R&D capability is needed as well as manufacturing capacity to build supply chain sovereignty in high technology categories. GCC governments need to invest much more in R&D in energy technology, with a 1.5% of GDP by 2030 target, and have innovation clusters, that link universities, national oil companies and international technology partners.

Strategic reserves: GCC countries should think about maintaining strategic reserves of critical raw materials and equipment in those categories where domestic production is not possible in the medium term, similar to the conventional strategic petroleum reserves of importing countries, in order to protect themselves against disruptions in supply.

To sum up, supply chain and raw material sovereignty is a big challenge for the oil and gas sector in the GCC in the next ten years. This shift from hydrocarbons to a more diversified and self-reliant industrial base will take time to come about and will need continued political backing, strategic investment and regional coordination. Oman's experience shows that even a medium-sized hydrocarbon producer can achieve reasonable progress towards supply chain sovereignty by adopting appropriate local content policies, well-planned industrial investments, and forward-thinking energy transition planning. Lessons learned from Oman's journey along ICV and the hydrogen path are applicable to the other GCC countries and would be useful for policy makers and industry leaders in the region to take note of..

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