

REVIEWER'S REPORT

Manuscript No.: IJAR-59350

Title: Localization of Industrial Lubricants and Petroleum Product Supply Chains in Saudi Arabias Oil and Gas Sector under Vision 2030.

Recommendation:

Accept as it is
 Accept after minor revision.....
 Accept after major revision
 Do not accept (*Reasons below*)

Rating	Excel.	Good	Fair	Poor
Originality	✓			
Techn. Quality		✓		
Clarity		✓		
Significance	✓			

Reviewer Id: JPR-284

Reviewer's Comment for Publication.

Saudi Arabia's Vision 2030 aims to strengthen industrial localization, diversify the economy, develop local suppliers, and reduce unnecessary dependence on imports. Within the oil and gas sector, industrial lubricants and petroleum products provide an important opportunity for localization because they are essential for the operation of compressors, turbines, pumps, drilling systems, gearboxes, hydraulic equipment, and transport fleets. This report reviews 30 peer-reviewed studies published between 2020 and 2025 to examine the potential for localizing lubricant and petroleum-product supply chains while maintaining reliability, quality, resilience, and sustainability. The findings indicate that localization should be implemented gradually across the value chain rather than through complete import substitution. Short-term opportunities include packaging, filling, warehousing, distribution, laboratory testing, field technical services, and used-oil collection, while medium-term opportunities include local blending, advanced quality-control laboratories, selected base-oil integration, and re-refining. Advanced additive manufacturing and specialty lubricant formulations represent longer-term opportunities because they require specialized chemistry, intellectual property, technology transfer, large-scale production, and highly skilled personnel. Successful localization also requires strong qualification and quality-control systems because unsuitable lubricants can cause equipment damage, increased maintenance, downtime, and higher lifecycle costs. Digitalization can strengthen the supply chain through batch traceability, electronic certificates, demand forecasting, inventory visibility, and supplier-risk monitoring. Resilience should also be supported through dual sourcing, strategic inventories, supplier diversification, and continuity planning so that localization does not create dependence on a single domestic supplier. Sustainability provides another important localization opportunity through used-oil collection, segregation, re-refining, longer lubricant life, and appropriate use of renewable or bio-based lubricants. Based on the reviewed evidence, a four-stage localization pathway is proposed: first,

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supply assurance through local storage, packaging, and distribution; second, qualified local blending, testing, and technical services; third, advanced formulation, engineering, and selected high-value manufacturing; and fourth, an integrated circular and export-oriented ecosystem supported by digital traceability and technology partnerships. Oil and gas companies should classify products according to criticality, technical complexity, demand, import dependence, and circular potential, while suppliers should invest in laboratories, technical expertise, digital systems, and workforce development. Policymakers should support certification, shared testing facilities, technology transfer, industrial clusters, and circular-economy infrastructure. Overall, the study concludes that Saudi Arabia should focus not simply on increasing the percentage of local procurement but on developing genuine domestic capabilities in manufacturing, testing, engineering, digitalization, innovation, and recovery. A qualified, resilient, and sustainable local lubricant ecosystem can therefore contribute significantly to Vision 2030 while maintaining access to international technologies and expertise.