LEC PARTNERS

Case Study

Client
Clean Energy Consortium, Middle East

Project Number
21033

Guiding SAF Pathway Selection and Commercialization in the Middle East

Client Overview

A leading clean energy consortium in the Middle East, including major regional energy and infrastructure players, set out to evaluate and launch one of the region's first sustainable aviation fuel (SAF) projects. With global aviation under mounting pressure to decarbonize and regional demand for low-carbon fuels increasing, the consortium needed a structured pathway to identify viable feedstocks, assess SAF production technologies, and chart a roadmap from demonstration to commercial-scale deployment.

The Challenge

Developing SAF in the Middle East presented unique hurdles: biomass resources are scarce, infrastructure is optimized for fossil fuels, and few regional precedents exist.

The consortium required independent expertise to:

- Identify viable carbon and feedstock sources suitable for SAF production.
- Assess SAF production technologies for readiness, cost, and compatibility with local resources.
- Map out a phased deployment pathway from demonstration to a 30,000 t/y commercial plant.

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LEC's Approach

LEC delivered a holistic Phase 0 feasibility study:

- Carbon Source Prioritization: Evaluated Energy-from-Waste (EfW) flue gas, cement process CO_2, and ammonia production CO_2. EfW-derived CO_2 emerged as the strongest near-term option.
- Pathway Evaluation: Benchmarked 12 SAF technologies, from Fischer-Tropsch to Alcohol-to-Jet, against readiness and scalability.
- Commercialization Roadmap: Modeled a demo plant sized to Siemens' electrolyzer output, with a clear path to scale.
- Risk & Policy Review: Considered certification, global SAF incentives, and regional decarbonization targets.

Results & Findings

- ✓ Identified EfW-derived CO_2 as the best near-term carbon source.
- ✓ Shortlisted three SAF pathway configurations.
- ✓ Developed a roadmap for demo-scale and 30,000 t/y commercial rollout.

Impact

The consortium gained a credible, stepwise plan for SAF deployment, positioning the Middle East as an emerging player in global aviation decarbonization. LEC's work reduced uncertainty and laid the foundation for investment and strategic partnerships.