

SILVER ARROW OIL & GAS CONSULTANTS SDN BHD

An Energy Advisory Powered by Data, AI, and Experience

CORPORATE BROCHURE & COMPREHENSIVE TECHNICAL CAPABILITY STATEMENT

1. CORPORATE OVERVIEW & STRATEGIC VISION

Silver Arrow Oil & Gas Consultants Sdn Bhd is an elite, independent technical advisory firm providing high-impact subsurface, reservoir management, production engineering, and energy transition solutions. Headquartered in Kuala Lumpur, Malaysia, the firm directly addresses the high-stakes operational and investment challenges faced by National Oil Companies (NOCs), International Oil Companies (IOCs), Joint Ventures, and financial regulators across the Asia-Pacific region. Our core geographic footprint specifically targets the complex geological and regulatory environments of **Malaysia, Brunei, and adjacent Southeast Asian petroleum provinces**.

Our Vision

To be the premier independent technical advisor in the Asia-Pacific region, recognized for executing rapid, high-integrity subsurface evaluations, optimizing recovery factors in complex or aging fields, and enabling commercial operators to bridge the gap between traditional upstream oil and gas excellence and low-carbon energy transition milestones.

Our Mission

To deliver practical, technically rigorous, and commercially grounded consulting services. By deploying advanced analytical workflows and unmatched regional expertise, we accelerate investment-grade Field Development Plans (FDPs), implement top-quartile Well, Reservoir, and Facility Management (WRFM) protocols, and unlock substantial bypass value from mature brownfield assets under compressed corporate timelines.

2. THE QUAD OF EXECUTIVE TECHNICAL LEADERSHIP

The fundamental market differentiation of Silver Arrow Oil & Gas Consultants lies in its senior-led, direct delivery model. Founded and led by Sai Garimella, our strategic engagements are executed directly by our four core industry leaders. Together, they represent **over 145 years of combined global experience** and have held elite Technical Authority (TA), Chief, and Global General Manager positions within the industry's most prominent national and international operators—notably **PETRONAS and Royal Dutch Shell**.

LEADER & CORE DISCIPLINE	DISTINGUISHED PAST LEADERSHIP ROLES	PRIMARY REGIONAL IMPACT TRACK RECORD
1. Sai Garimella Founder, Chief Reservoir Engineer & CTO (Reservoir Engineering & CCUS)	• Group Technical Authority & Custodian (Chief) of Reservoir Engineering, PETRONAS • Senior RE Technical Authority (TA1) & Subsurface Lead, Shell (20 Years)	• Shell-accredited Principal Technical Expert in Waterflood. Delivered full-cycle FDP re-developments for major gas and oil assets (~1,100 MMBOE and high-voidage reservoirs). Led major regional M&A technical due diligence campaigns.
2. Amit Roy Lead Geoscience Advisor & Technical Assurer (Geology & Resource Assurance)	• Lead Resource & Reserves Assurer and Custodian Geologist, PETRONAS Reserves Group • Superintending Geologist, ONGC • Senior Reservoir Characterization Specialist, BAPCO	• Core member of central PETRONAS assurance committees (ITRC, ETRC, ERRC). Formulated the PETRONAS PRIMS guidebook for PRMS compliance. Discovered a major Pre-Cycle 1 play and unlocked 125 MMstb STOIP in key block assets. • Thought leader in Coal Bed Methane (CBM) and Shale Gas. Expert working experience on the GLNG project in the Surat & Bowen basins, Australia, and the Raniganj CBM formation, India.
3. Eric Andersen, P.Geoph. Lead Geophysicist & Subsurface Solutions Advisor (Geophysics & Digital Subsurface)	• Chief Geoscientist & Head Geoscience Solutions, PETRONAS (Overseeing 300+ G&G technical specialists) • Exploration/Development Leadership, Talisman Energy	• Architect of PETRONAS' NexTGEN Exploration technology roadmap. Accelerated basin-to-prospect evaluation times by 60%. Expert in Cloud Computing, AI/ML methods, 4D seismic, and advanced integrated geoscience workflows.
4. Chon Fui Chai Lead PT & WRFM Advisor (Production Technology & Operations)	• Global General Manager of Smart Fields & WRFM Global Deployment Manager, Shell Global Solutions International • Field Development & Integration Manager, Carigali Hess	• Production Technology Technical Authority Level 2. Primary technical architect for the 30-year Malaysia EOR PSC. Managed a \$100M global Smart Field budget. Achieved top-quartile WRFM performance in regional operations, delivering +24,000 boe/d.

3. ELABORATE CAPABILITY STATEMENT

A. Rigorous Reservoir Management & Waterflood Optimization

Optimizing secondary recovery mechanisms is critical to maintaining regional production baselines. Silver Arrow Oil & Gas Consultants brings world-class, operator-certified reservoir engineering oversight to ensure optimal pressure support and sweep efficiency in complex clastic and carbonate structures.

- **Principal Technical Expert Waterflood Oversight:** Led by Sai Garimella, a Shell-accredited Principal Technical Expert (PTE) in Waterflood Development and Surveillance, we diagnose secondary recovery performance to arrest field-wide decline trends and maximize ultimate recovery factors.
- **Advanced Fracture & Containment Modeling:** We deploy specialized workflows, including Actual & Simulated Coreflood Evaluation Tools (ASCET) for leak-off and core-flood constraints, to prevent induced reservoir fracturing in high-voidage injection fields, safeguarding critical reserves from premature water breakthrough.
- **Ensemble Modeling & History-Matching Innovation:** Moving beyond rigid deterministic forecasts, we implement advanced dynamic modeling workflows (including ResX, tNavigator, and SEM). We introduce localized *Areal History Match Quality Indicator Maps* to ensure that dynamic models remain physically and mathematically anchored to actual historical field surveillance data.

B. Accelerated Field Development Planning (FDP)

We possess proven capabilities to execute and secure fast-tracked regulatory approvals for major greenfield and brownfield portfolios across Southeast Asia. We construct robust, audit-ready FDP frameworks that bridge the gap between initial appraisal success and first-commercial production gates.

- **9–12 Month Rapid Subsurface Maturation:** Our integrated workflow eliminates operational silos between advanced geophysics, structural geology, reservoir engineering, and production technology. This enables the delivery of full-scale revised FDPs for mature fields or fast-tracked greenfield discoveries within 9 to 12 months.
- **Value Assurance & Technical Governance Mastery:** With deep, first-hand institutional knowledge of regional value assurance mechanisms—specifically the **PETRONAS Front End Development Management (FEDM)** guidelines and Development Review Board (DRB) milestones—we steer assets seamlessly through opportunity framing, concept selection, and final execution definitions.
- **Mega-Volume FDP Track Record:** Our experts have directly designed, assured, or optimization-steered the development plans for some of the APAC region's most prolific assets, including a massive (~1,100 MMBOE) deepwater gas discovery, major mature oil structures, and complex gas cap reservoirs.

C. Advanced Geophysics & Digital Subsurface Solutions

We leverage cutting-edge seismic and data-driven methods to de-risk exploration targets, map complex structural traps, and optimize well placement in highly compartmentalized basins.

- **Data-Driven Subsurface Infrastructure:** Expert deployment of Cloud Computing, Big Data analytics, and AI/ML methods to compress cycle times. We specialize in transforming vast legacy datasets into agile, predictive subsurface models, reducing basin-to-prospect evaluation timelines by up to 60%.
- **Quantitative Seismic Interpretation & 4D Monitoring:** Comprehensive workflows integrating pore pressure prediction in structured onshore wildcat wells, seismic waveform classification, geomechanical modeling, and 4D microseismic reservoir monitoring to maximize recovery and prevent drilling hazards.
- **Carbonate & Clastic Play De-risking:** Extensive experience managing global technical specialist teams to resolve complex regional imaging challenges, including imaging beneath gas clouds, thin-bed identification, and fractures in carbonate blocks.

D. Production Optimization & Active WRFM

Maximizing short-term barrel delivery while maintaining long-term asset health is achieved through meticulous Well, Reservoir, and Facility Management (WRFM). Silver Arrow Oil & Gas Consultants provides targeted engineering interventions to eliminate backpressure and minimize operational deferrals.

- **Top-Quartile Operational Frameworks:** We design and implement systematic WRFM review cycles—encompassing comprehensive annual field performance reviews, integrated production system modeling, and aggressive artificial lift optimizations—to propel assets into top-quartile global performance rankings.
- **High-Value Production Technology Interventions:** Extensive hands-on capability in designing and optimizing Nodal Analysis, advanced Gas Lift workflows, sand control management, foam acid diversion techniques, and monobore completion strings that significantly reduce capital expenditure per well.
- **Digital Smart Fields & Collaborative Working Environments (CWE):** Direct experience in building and deploying multi-million dollar CWE infrastructure to integrate real-time field surveillance data, enabling operations teams to respond immediately to well-integrity anomalies and fluid-routing bottlenecks.

E. Strategic Brownfield Maturation & EOR

Maturing brownfields requires extracting maximum value from late-life assets where water cuts are high, reservoirs are heavily compartmentalized, and infrastructure is aging.

- **Architects of the Malaysia EOR Framework:** Our core team includes the co-leads of the integrated team that established the structural and technical foundation for the historic **30-year Malaysia EOR Production Sharing Contract (PSC)**, setting the commercial benchmark for chemical and gas EOR implementation in the region.
- **Unlocking Near-Field Exploration (NFE) & Bypass Pay:** We specialize in identifying overlooked low-resistivity low-contrast (LRLC) pay zones and untapped fault blocks via rigorous sequence-stratigraphic re-interpretations. Our leadership previously executed campaigns that deepened mature infill wells to discover entirely new oil-bearing plays in regional provinces, achieving immediate flow rates exceeding 850 bbls/day.
- **Techno-Commercial Due Diligence for M&A:** We blend rigorous subsurface engineering with financial limit testing to support high-stakes asset transactions, including prominent regional divestments such as multinational operator brownfield portfolios and local inboard development projects.

4. VERIFIED REGIONAL PERFORMANCE MATRIX

Our core advisors have spent decades directly managing, de-risking, and troubleshooting assets across the premier hydrocarbon basins of Southeast Asia:

BASIN / ASSET FOCUS	CORE TECHNICAL DISCIPLINE APPLIED	COMMERCIAL & OPERATIONAL IMPACT ACHIEVED
Sarawak Basin (Mature Oil & Gas Fields)	Near-Field Exploration (NFE), Static Reservoir Modeling, & Low-Resistivity Low-Contrast (LRLC) Evaluation.	Rejuvenated 40-year-old mature assets. Discovered a new Pre-Cycle 1 oil play via strategic infill deepening, adding 125 MMstb STOIP and 10.7 MMstb of 2P/2C reserves. Both wells flowed at >850 bbls/day.
Baram Delta & North Sabah (Offshore Clastic & EOR Fields)	EOR Maturation, Chemical ASP Pilot Formulation, & Joint Operator FDP Alignment.	Successfully aligned joint corporate FDP processes for major technical centers. Matured an operator's first offshore Alkaline Surfactant Polymer (ASP) project. Arrested severe production decline via proactive water-injection management.

BASIN / ASSET FOCUS	CORE TECHNICAL DISCIPLINE APPLIED	COMMERCIAL & OPERATIONAL IMPACT ACHIEVED
Brunei West & East Assets (Major Oil & Gas Complexes)	Active WRFM Campaign Execution, Gas Lift Workflows, & Gas Cap Dynamic Simulation.	Managed a \$70M operational budget, delivering +24,000 boe/d of annualized WRFM gains (beating business plan targets by 5,000 boe/d). Reduced well-integrity deviations from 15% to 3% in 10 months. Matured a multi-billion cubic meter Gas Cap Development.
Malay Basin / JDA (Gas & Condensate Fields)	Subsurface Integration, High-Pressure High-Temperature (HPHT) Drilling, & Cloud G&G Implementations.	Led a team of 25 subsurface professionals to mature near-field options, successfully drilling 7 infill wells (including two complex HPHT wells). Deployed data-driven geoscientific platforms to compress prospect generation timelines.
Andaman Sea / Southeast Asia (Regional Gas Asset portfolio)	Compressed-Timeline Subsurface Integration & Infill Drilling Campaign Assurance.	Led the subsurface validation team to design and execute 3 rapid infill wells, ramping up gas production to meet Daily Contract Quantity (DCQ) targets, directly mitigating an immediate contractual supply shortfall and avoiding multi-million dollar joint venture penalty claims.

5. SUBSURFACE TRANSITION SERVICES: CCUS ADVISORY

In addition to maximizing core hydrocarbon assets, Silver Arrow Oil & Gas Consultants provides elite technical advisory services for operators entering low-carbon energy transition projects within the APAC framework, ensuring compliance with evolving Carbon Capture, Utilization, and Storage (CCUS) standards:

- **Depleted Reservoir & Aquifer Suitability Screening:** Rigorous evaluation of depleted regional fields for storage site suitability, caprock seal integrity, and geomechanical subsidence analysis.
- **CO₂ Plume Dynamic Simulation:** Full-cycle compositional modeling and history matching to map dynamic CO₂ injection strategies, plume migration pathways, and long-term trapping efficiency.
- **Advanced Containment Monitoring:** Development of robust, regulatory-compliant MMV (Measurement, Monitoring, and Verification) frameworks, including the commercial optimization and deployment of downhole advanced fiber-optic sensing technologies for long-term CCS containment tracking.

6. TRAINING & CAPABILITY DEVELOPMENT PORTFOLIO

Silver Arrow Oil & Gas Consultants is deeply committed to institutional capability preservation. Leveraging our leadership's background as award-winning, NOC best-in-class, and IOC-certified role-model trainers, we provide elite corporate training programs designed for early to mid-career engineering professionals:

- **Reservoir Mapping & Hydrocarbon Resource Assessment:** Practical, hands-on masterclasses covering classical structural mapping, log correlation, petrophysical parameter integration, and map-based volumetric calculations anchored to SPE/AAPG PRMS compliance.
- **Waterflood Management Masterclass:** Advanced surveillance training covering voidage replacement ratios (VRR), heterogenic sweep optimization, tracer study integration, and conformance monitoring dashboards.
- **Front-End Development Management (FEDM) & Decision Quality:** Seminars focused on subsurface uncertainty management, probabilistic STOIP evaluations via Experimental Design (ED), and risk-based decision-making aligned with regional regulatory gates.

7. TARGET CLIENTS

- **National Oil Companies (NOCs) & Regulators** *(e.g., PETRONAS, MPM, Brunei Petroleum Authority)* seeking independent technical peer reviews, third-party FDP verification, or senior institutional capacity building.
- **PSA Operators & Joint Ventures** needing to fast-track brownfield production maturation, resolve rapid decline rates, or de-risk deepwater water injection projects.
- **Energy Investors & Private Equity** requiring technically rigorous, commercially grounded due diligence for oil and gas M&A and asset divestments in Southeast Asia.

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