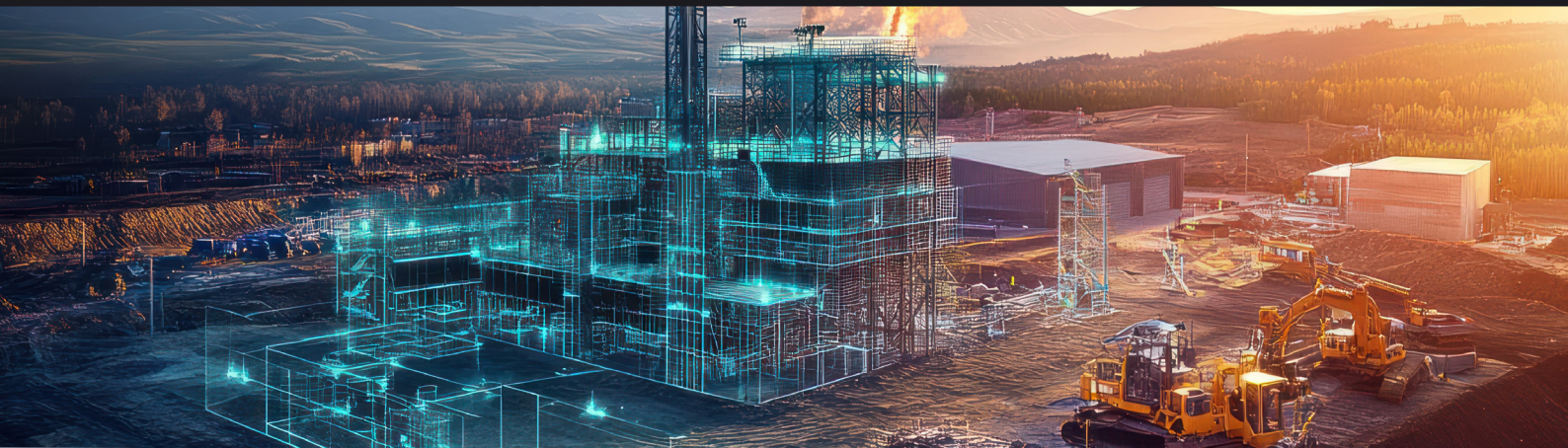




The Middle East's **mining** ambitions test long-standing industry challenges



Global demand for the minerals that power clean energy is rising fast. The IEA projects lithium demand to increase eightfold by 2040, driven by electric vehicle batteries, while copper demand is set to nearly double as grids expand and electrification accelerates.

Gulf states have taken notice and their starting point is significant: Saudi Arabia holds an estimated SR9.4 trillion (approximately \$2.5 trillion) in mineral reserves, spanning phosphate, copper, gold and newly discovered rare earths and lithium. The kingdom targets a rise in mining's contribution to GDP from \$17 billion in 2024 to \$75 billion by 2030, backed by a \$100 billion investment plan targeting critical minerals by 2035. The UAE, Oman, Qatar and Bahrain are pursuing their own approaches, each shaped by distinct priorities and resource capacities.

Across the region, the ambition extends beyond raw extraction. Governments are pushing to capture downstream value through copper smelters, battery chemical complexes and the processing of industrial minerals. The goal is to shorten supply chains and industrialize on the back of resource wealth.

Global challenges: a sector built to overrun

These ambitions encounter a familiar challenge. Globally, mining is being asked to build more of the assets it has historically been worst at delivering: large, complex and with significant unknown at the start. Such projects are precisely the ones with the worst delivery track record.

83%

of major mining projects miss cost or schedule targets

79%

average capex overrun on megaprojects of \$1 billion or more

Why mining projects fail, [according to McKinsey](#)

~2/3

poor initial assessment: bad estimates, optimism bias and technical shortcuts at feasibility stage

~1/3

poor execution: scope creep, supply chain failure, contractor issues and ramp-up underperformance

The project-to-operations value gap

70%

of mines suffer delays of 12 months or more during ramp-up

50%

fail to hit design throughput by year three

25%

of new mines never achieve design capacity at all

Specific challenges for the Middle East

Middle Eastern mining ambitions face headwinds that go beyond the global baseline.

- Geopolitical disruption. Conflict escalation in the region in early 2026 introduced significant new risks. Strait of Hormuz disruptions and damage to metals processing capacity created cascading effects on global supply chains, including seaborne sulphur, LNG and chemical feedstocks.
- Underexplored terrain. Large areas of the Arabian Shield have never been surveyed using modern geophysics, geochemistry or mineral systems frameworks, leaving the true resource picture uncertain.
- Domestic talent gap. The region produces fewer than 800 mining engineering graduates annually, insufficient to meet the demands of expanding operations. This shortage arrives as the global mining profession also faces a structural skills deficit, with experienced professionals retiring faster than they are replaced.

Beating the odds: the capabilities that close the gap

These challenges point to a specific set of capabilities that separate the projects that deliver from those that don't, and they matter all the more where terrain is underexplored, talent is scarce and geopolitical risk is live.

Capital and portfolio discipline	A single thread of engineering truth	Data-driven asset performance
With roughly two-thirds of overruns rooted at the feasibility stage, projects need one source of performance truth across the portfolio, controls that hold at scale, and risks surfaced early before overruns harden	Execution failures and late-stage design clashes trace back to fragmented data. Carrying one consistent, current engineering record from design through operations, supported by digital twins, keeps teams working from fact rather than outdated drawings.	Ramp-up is where most value is won or lost. Predictive maintenance and asset performance management protect availability and control cost across the full asset lifecycle.

Built to deliver: Octave solutions for mining

Designed for asset-intensive industrial operations and proven across the mining sector, the Octave product portfolio connects capital discipline, engineering data, asset performance and operational execution in one coherent solution landscape.

Capital discipline Improve predictability and governance across complex programs

Octave Sequence creates one source of performance truth across a portfolio, standardizes controls at scale and surfaces risks early so that corrective action happens before overruns harden.

Engineering information management Build and maintain a single thread of truth

Octave InConcert Core centralizes engineering, operations and maintenance information and supports digital twins, so teams work from one consistent, current source of truth rather than chasing documents, tags or outdated drawings.

Asset performance and maintenance use data to control costs and maximize availability

Octave Attune EAM and Attune APM work in sync to plan and execute maintenance work, capture asset history and apply predictive analytics to reduce unplanned downtime across the asset lifecycle.

Operational safety and discipline Standardize execution and protect control systems

Octave Tempo Operations Management digitalizes shift handovers, operator rounds and work instructions. Tempo Control System Effectiveness delivers alarm and control loop performance insight. Octave Cyber Integrity provides OT/ICS visibility and protection.

See what they achieved

Vale: managing a major copper mine expansion with engineering data discipline

Vale's Salobo III project expanded one of Brazil's largest copper mines by 12 million tonnes per year of capacity. Without integrated engineering data, design clashes went undetected until construction was underway. Vale deployed Octave InConcert Legacy, Forte 3D and Smart Materials to centralize data and detect clashes at the engineering stage. The project began operations on schedule in November 2022.

AGL Energy Loy Yang mine: real-time production visibility across every shift

At the Loy Yang open-cut mine in Victoria, Australia, AGL Energy needed to combine daily production targets and equipment status with real-time data to evaluate shift performance consistently. AGL deployed Octave Tempo Operations Management across logbooks, shift handovers and work instructions, giving every crew member access to accurate, up-to-date requirements from the start of each shift.

Aktogay copper mine: strengthening shift continuity and operational visibility

Aktogay is KAZ Minerals' largest operation, an open-pit copper mine in Kazakhstan processing over 58 million tonnes of ore annually. As the site scaled following a major expansion, consistent shift-to-shift communication became critical. Octave Tempo Operations Management was deployed to structure handovers and guide operator rounds, ensuring nothing is lost between crews and every shift starts with a clear picture of the operation.

Octave is a leader in enterprise software, turning data into decisive action and intelligence into your edge. Our software solves for and simplifies complexity, from the design and build to operations and protection of people, property, and assets – for any scope, at any scale. For decades, we've partnered with customers to sharpen performance, elevate efficiency, and amplify results. From factory floors to entire cities, our solutions are tuned to scale up what's possible from day one onward.