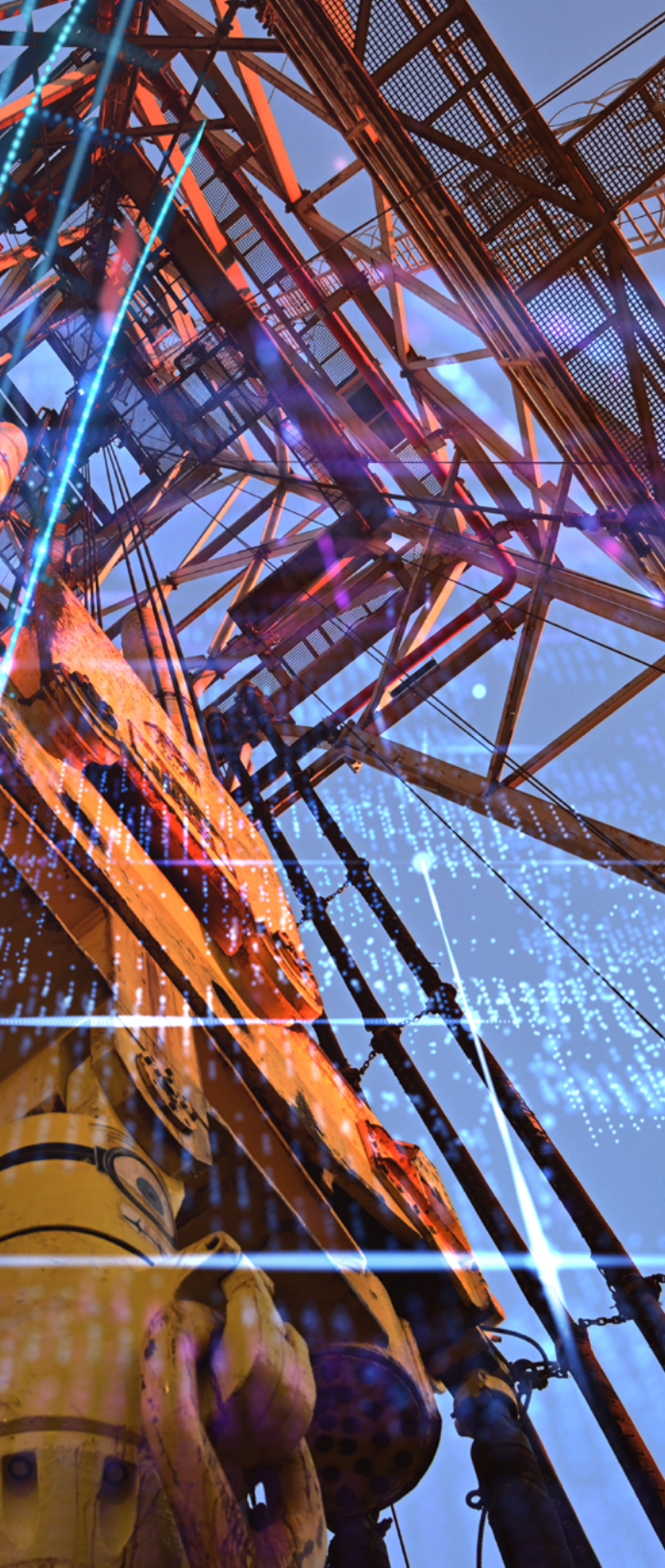




AI Delivers Upstream Decision-Making, Capital Allocation and Production

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Aspen Technology, an Emerson Business



Upstream Industry Pivot

Amid today's geopolitical shocks and shifting energy economics, the upstream industry is pivoting. Companies are under intense pressure to invest faster and more effectively while maintaining capital discipline. Confronted by profit volatility, capital constraints and energy transition pressures over the past decade, upstream companies have shed an estimated 40% of their workforce.¹ Those jobs are not returning.

An industry that just months ago expected to scale back investment in traditional energy sources now faces urgency to invest once again—this time to build a more resilient energy future with fewer experts and skilled workers. Globally, energy affordability and security have become overriding drivers of change.

Upstream companies have relentlessly improved efficiency by optimizing how people are deployed across drilling and production, especially in unconventional and extreme environments. The next wave of gains will hinge on technology—particularly AI, high-performance and quantum computing, and data fabrics—to enable continued progress with a diminished workforce.

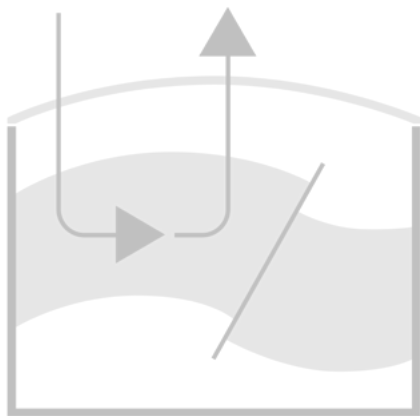
The AI Opportunity and Challenge in Upstream

Over the past four years, leading upstream operators have invested heavily in AI. Yet for most, scalable and sustained business impact has proven difficult to achieve. Early results from top performers indicate that the real breakthrough comes from combining domain-specific, first-principles AI agents with agentic AI, unlocking faster decision-making, greater operational agility and materially reduced risk.



¹U.S. Bureau of Labor Statistics, All Employees, Oil and Gas Extraction, CES1021100001, 2026

Consistently converting this potential into enterprise-level value depends on three critical enablers. **First**, AI must be focused on the highest-value, mission-critical business processes—not isolated or peripheral use cases. **Second**, data foundations must be dramatically improved. Industry leaders consistently cite two challenges: achieving consistent, high-quality data and metadata and embedding sufficient domain context, without which AI outputs are of less value and may degrade quickly. Increasingly, these challenges can be mitigated by applying AI itself to data screening, validation and curation. **Third**, success hinges on usability and workforce transformation. AI must be designed to augment human judgment, supported by systematic upskilling, strong governance and clear human oversight. Trust is essential, and it is built by keeping people in the loop as AI reshapes how decisions are made.



Enter AspenTech Subsurface Intelligence™ (ASI)

To address this challenge, AspenTech has launched **AspenTech Subsurface Intelligence (ASI)**, a next-generation technology environment purpose-built for upstream decision-makers.

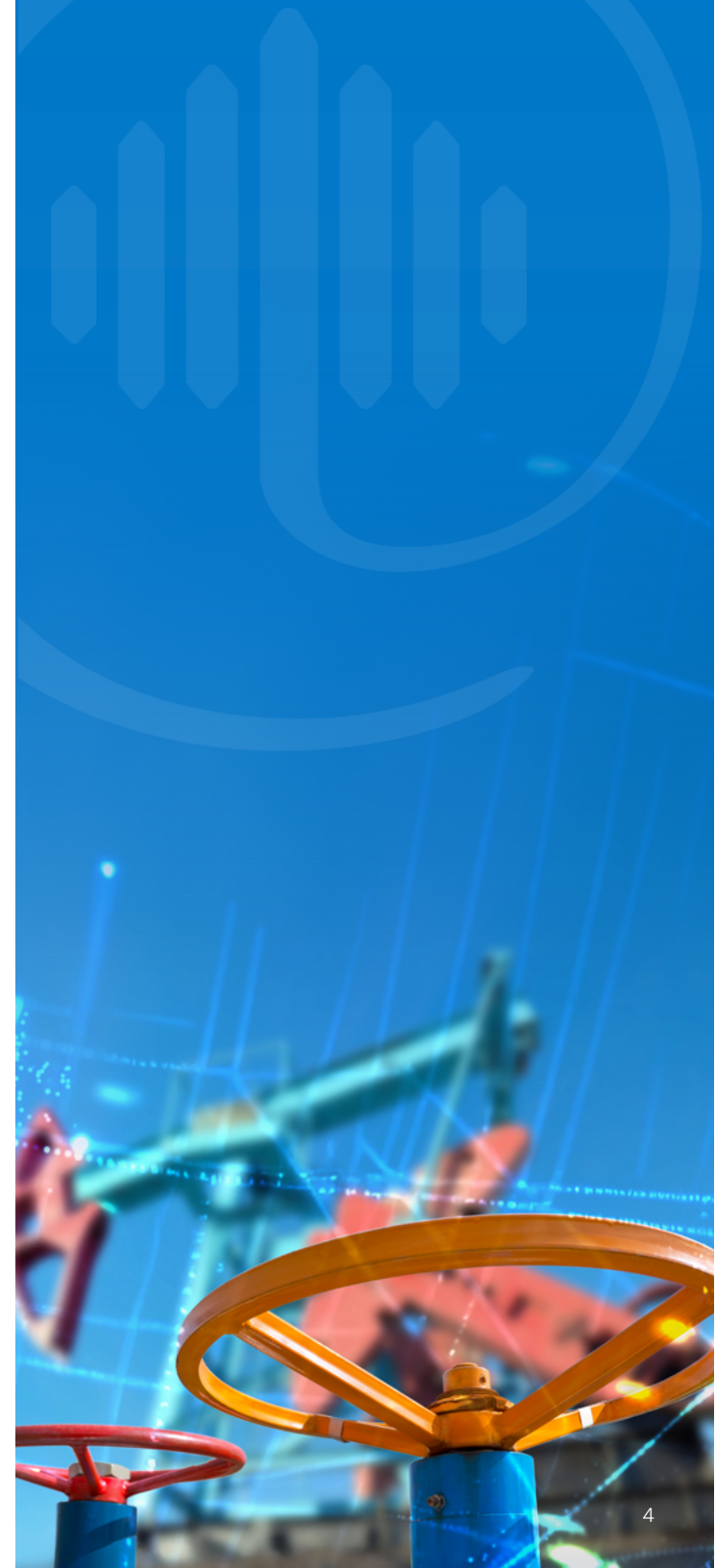
The result of over five years of software design and innovation, ASI is a disruptive, AI-powered collaborative platform that integrates domain-specific agents with agentic and generative AI (GenAI), anchored by proven subsurface algorithms. Operating natively on OSDU data,² ASI automates high-value, strategic workflows and transforms complex subsurface data into actionable insights. All of this enables faster, higher-confidence decisions across the subsurface lifecycle.

Early feedback from upstream executives who have engaged with ASI has been overwhelmingly positive. A senior leader at a top-ten global upstream producer commented, "AspenTech Subsurface Intelligence directly addresses the challenges we face in applying AI at scale. ASI is at least one to two years ahead of the competition in delivering a truly usable environment for real upstream AI value creation."

Several core principles of AspenTech's subsurface software strategy are embodied in ASI and in its integrated role within an operator's subsurface ecosystem.



² ASI is OSDU agnostic and compatible with any CSP-hosted OSDU deployment.



Thriving in a Multi-Vendor Environment

Nearly every upstream organization today relies on multiple strategic software platforms to support mission-critical workflows. Speed and agility in deploying agentic and generative AI depend on seamless integration with existing technology stacks. AI solutions that operate in isolation cannot deliver enterprise value. ASI is purpose-built to function natively within heterogeneous software environments, enabling companies to introduce advanced AI capabilities without disrupting established workflows.

As proof of this approach, AspenTech has successfully tested and implemented bidirectional data exchange (such as petrophysical and well information) between domain-specific tools, including **AspenTech Geolog®** and **SLB Techlog®**, as well as the ASI multidisciplinary collaboration environment.

Incorporated in this strategy is integration of proprietary AI agents and GenAI apps that upstream companies are developing in-house. ASI is explicitly designed to be an inclusive and open collaboration environment. Our discussions with several companies have verified that the architecture of ASI is extremely conducive to connecting to in-house, proprietary AI and data contextualization applications. Furthermore, since AspenTech has anticipated and addressed a number of architectural and technology stack challenges involved in providing our revolutionary, cloud-native, agentic environment, ASI provides added value by solving AI adoption challenges that upstream companies are facing.

AspenTech Subsurface Intelligence Integrates Seamlessly, Complementing Our End-to-End Portfolio

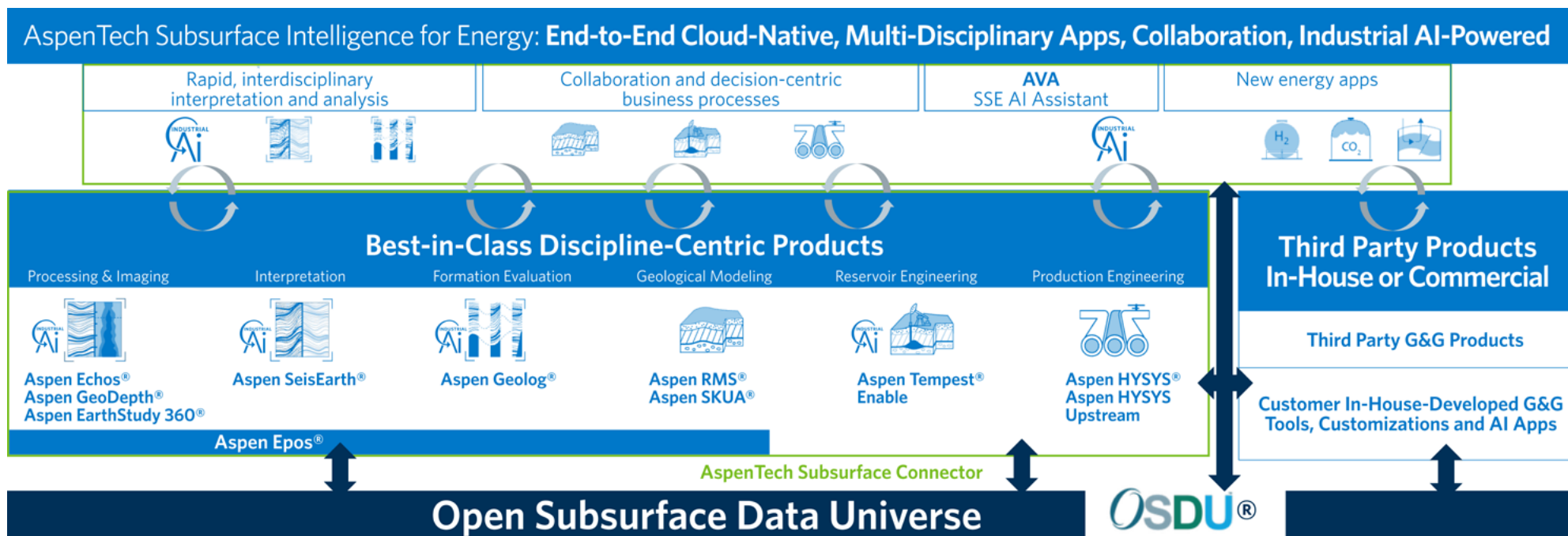


Figure 1. How ASI fits into the AspenTech portfolio, third-party geosciences technology and proprietary in-house applications.

Leveraging and Contextualizing Subsurface Data

The upstream industry possesses vast volumes of exploration, development and production data, yet the quality, accessibility and contextual integrity of that data within a company remains a significant barrier to AI adoption. Data is generated and managed across many applications, disciplines and service providers, resulting in fragmentation and inconsistency.

AspenTech is a strong proponent and active leader in the **OSDU subsurface open data initiative**, which is critical to unlocking AI-driven insights at scale. ASI is built natively on OSDU, and AspenTech has invested heavily to ensure its flagship subsurface applications—including **Aspen Geolog**, **Aspen RMS®**, **Aspen SKUA®** and **Aspen EPOS®**—connect seamlessly to OSDU based architectures. Working with operators such as **TotalEnergies**, **ExxonMobil**, **Equinor** and **Petrobras**, AspenTech has demonstrated both the technical and commercial value of OSDU in materially improving the actionability of subsurface data.

Intuitive Onboarding and Collaboration

A critical question facing upstream leaders today is: What is the on-ramp for our next generation of technical leaders? Over the past several years, 20–30% of technical experts were moved out under the assumption that work could be automated, while an additional 10–15% of subsurface expertise was lost through accelerated retirements. Those capabilities are unlikely to return.

At the same time, companies are under increasing pressure to accelerate projects and decisions with a smaller, less-experienced workforce. These new professionals expect the intuitiveness, accessibility and collaboration of a native cloud environment—paired with embedded guidance that helps them build expertise quickly.

AVA™, AspenTech's agentic and generative AI platform, addresses this challenge directly within ASI. **AVA** is powered by large language models enriched with best-in-class, domain-specific AspenTech Subsurface Science & Engineering (SSE) applications to provide just-in-time coaching and embedded guidance within daily workflows. The result is faster onboarding, incorporation of company standards, more confident decision-making and a workforce that scales capability as well as capacity.





Value-Creating Use Cases

Project and Data Screening and Validation

ASI's agentic, OSDU native environment enables seamless ingestion of subsurface data from disparate applications and databases. Data generated by multiple vendors across well logging, production analysis, geomodeling and well servicing can be rapidly loaded, validated and standardized within OSDU.

Domain-specific agents then execute AI-facilitated workflows to validate data against company standards and geoscience plausibility, making trusted datasets immediately available for uncertainty analysis and visualization. Through this interdisciplinary, automated approach, **time to first insight can be reduced by up to 80%.**

Fast-Track Resource Estimation

As operators seek to maximize returns from existing assets through infill drilling and near field expansion, the primary constraint is no longer data availability—it is time. Reduced technical staffing and serial workflows limit the ability to perform rigorous, quantitative evaluations early enough to influence capital decisions.

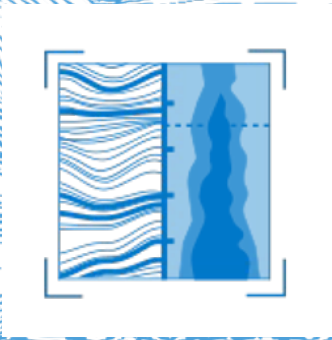
ASI addresses this challenge by applying agentic AI and collaborative workflows to existing datasets, enabling rapid “first look” screening and quantitative risk assessment. Concurrent evaluation of multiple scenarios allows teams to identify the highest-probability targets for detailed capital planning earlier in the decision cycle. The outcome is faster prospect evaluation, early hydrocarbon volume estimation with uncertainty quantification, a **50% improvement in technical productivity and a 50% reduction in execution time**, with downstream gains in well performance.

Accelerated Interdisciplinary Workflows

Subsurface execution has traditionally been constrained by sequential, discipline-specific workflows. Specialized teams often wait for upstream outputs before proceeding, slowing decision cycles and increasing risk. Limited visibility into work in progress, driven by the complexity and siloed nature of subsurface tools, has been a persistent barrier to true collaboration.

Value-Creating Use Cases

Use Case	Business Value
Project and data screening and validation	80% reduction in time to first insight
Fast-track resource estimation	50% productivity improvement 50% shorter execution time
Accelerated interdisciplinary workflows	50% faster execution Better decisions and insights



AI-powered ASI fundamentally changes this model. ASI makes subsurface information accessible across disciplines in intuitive, role-appropriate formats, enabling teams to operate concurrently rather than serially. For example, geophysicists can interact directly with geomodeling outputs, while geomodelers gain earlier access to well and seismic-derived properties.

The result is faster alignment, improved insight quality, more confident decisions across the full exploration, development and production lifecycle, and **50% faster execution.**

Cybersecurity and Intellectual Property Protection

Upstream geoscience and engineering data represent critical corporate assets. Protecting customer intellectual property and high-value data is foundational to AspenTech's application architecture and innovation strategy.

At the core of ASI is AVA, which employs an LLM enriched by subsurface business context and domain-specific guardrails. AVA delivers agentic AI capabilities purpose-built for subsurface analysis and is tightly integrated within the AspenTech SSE portfolio. It is designed to interact with an operator's proprietary datasets, geological knowledge and intelligence, and reservoir models—while ensuring that all data and derived intelligence remain fully contained within the operator's secure environment. This includes strict controls preventing any data leakage beyond the company's boundaries. The choice of the model and the guardrails that are applied ultimately remain under the full control of the operator and their agreement with their cloud provider (such as Azure).

AVA can be configured to incorporate an operator's datasets and their corporate-approved public or private LLMs, and uses an operator-determined deployment model. It also supports logical



partitioning of data and models, enabling protection of intellectual property across assets, partnerships and joint ventures.

Cybersecurity is embedded at every level of AspenTech software development, ensuring enterprise-grade resiliency, compliance and trust.

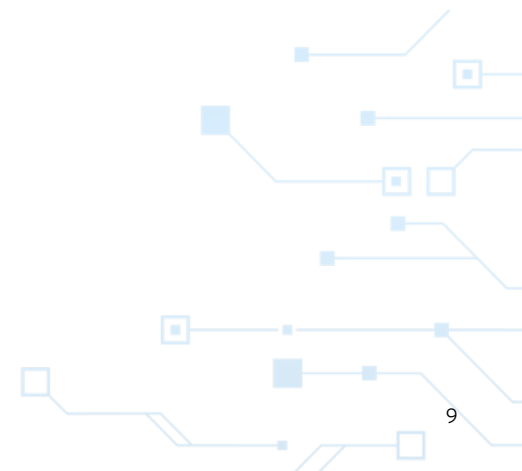
How Agentic AI Captures Value in Upstream

AspenTech Subsurface Intelligence represents a step-change in how AI creates value for upstream organizations. ASI delivers measurable impact in five core areas:

- **Accelerated returns on capital** by reducing the time from data creation and processing to insights and decisions
- **Higher-quality decisions** through unprecedented transparency and multidisciplinary collaboration
- **Increased productivity** enabled by faster onboarding, simplified user experiences and “just-in-time” skill augmentation

- **Greater decision confidence** through traceability, trust and a comprehensive view of uncertainty
- **Solutions to previously intractable challenges** by applying AI to more complex analyses within fixed timeframes

These benefits translate directly into business outcomes: increased production, lower cost of supply, improved capture of market opportunities and reduced financial and operational risk.





Conclusion

The upstream industry has reached an inflection point. Capital discipline, workforce constraints, geopolitical volatility and the imperative for energy security are converging to reshape how decisions are made, and value is created. Traditional approaches, which rely on serial workflows, fragmented data and scarce expertise, are no longer a winning strategy for the future.

AI represents a powerful lever for addressing these challenges, but only when it is applied deliberately: embedded in the most value-creating workflows, grounded in trusted and contextualized data, and delivered through environments that augment human expertise rather than replace it. AspenTech Subsurface Intelligence embodies this next generation of upstream AI. By combining domain-specific intelligence, agentic AI, open data architectures and enterprise-grade security, ASI enables upstream organizations to move faster, decide with greater confidence and extract more value from every barrel of capital deployed.

As early adopters are already demonstrating, companies that successfully operationalize AI at the subsurface decision level will gain a durable competitive advantage, achieving

higher returns on capital, improved production performance and reduced risk in an increasingly complex and constrained energy landscape.

AspenTech Subsurface Intelligence is a revolutionary approach to getting the most from your company's assets, data and people, harnessing agentic AI to position your company to thrive and win in the next decade of energy supply and demand turbulence.



About Aspen Technology

Aspen Technology, now part of Emerson, is a global software leader helping industries at the forefront of the world's dual challenge meet the increasing demand for resources from a rapidly growing population in a profitable and sustainable manner. AspenTech solutions address complex environments where it is critical to optimize the asset design, operation and maintenance lifecycle. Through our unique combination of deep domain expertise and innovation, customers in asset-intensive industries can run their assets safer, greener, longer and faster to improve their operational excellence.

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