KASHMIR INTELLIGENCE

India's Refinery Landscape: Key Metrics and Emerging Trends

Introduction

The Indian oil and gas industry is rapidly evolving, driven by technological advancements and a growing focus on sustainability. To understand the shifting priorities within this dynamic sector, we conducted a targeted survey exclusively among professionals working in downstream operations. Our objective was to capture the latest trends, key focus areas, and emerging technologies influencing the industry's direction.

Survey Overview

This report presents a detailed analysis based on insights from professionals in the downstream Indian Oil and Gas market. The survey responses provide a comprehensive view of the industry's current landscape, focusing on critical trends and strategic priorities. The participants, including divisional heads, project managers, and production managers, represent a diverse cross-section of the downstream sector, offering valuable perspectives on the challenges and opportunities shaping the future of refining operations in India.

Respondents from the following organisations

(and their affiliated refining operations)

Report Summary

Within the downstream sector, there is a strong emphasis on enhancing operational metrics such as Operational Availability (OA), Energy Efficiency, and Refinery Yield. These metrics are crucial as companies work to improve performance while reducing costs and minimising environmental impact. Notably, there is widespread confidence in the transformative potential of AI, with a majority of respondents indicating that AI will significantly impact their roles within the next three years. This finding underscores the growing importance of AI-driven technologies in refining operations, particularly in areas like predictive maintenance and energy intensity mapping.

Key Trends

Industry Metrics

What specific metrics is your site prioritising this year?

■ Standard Performance Metrics	■ Sustainability Related Metrics
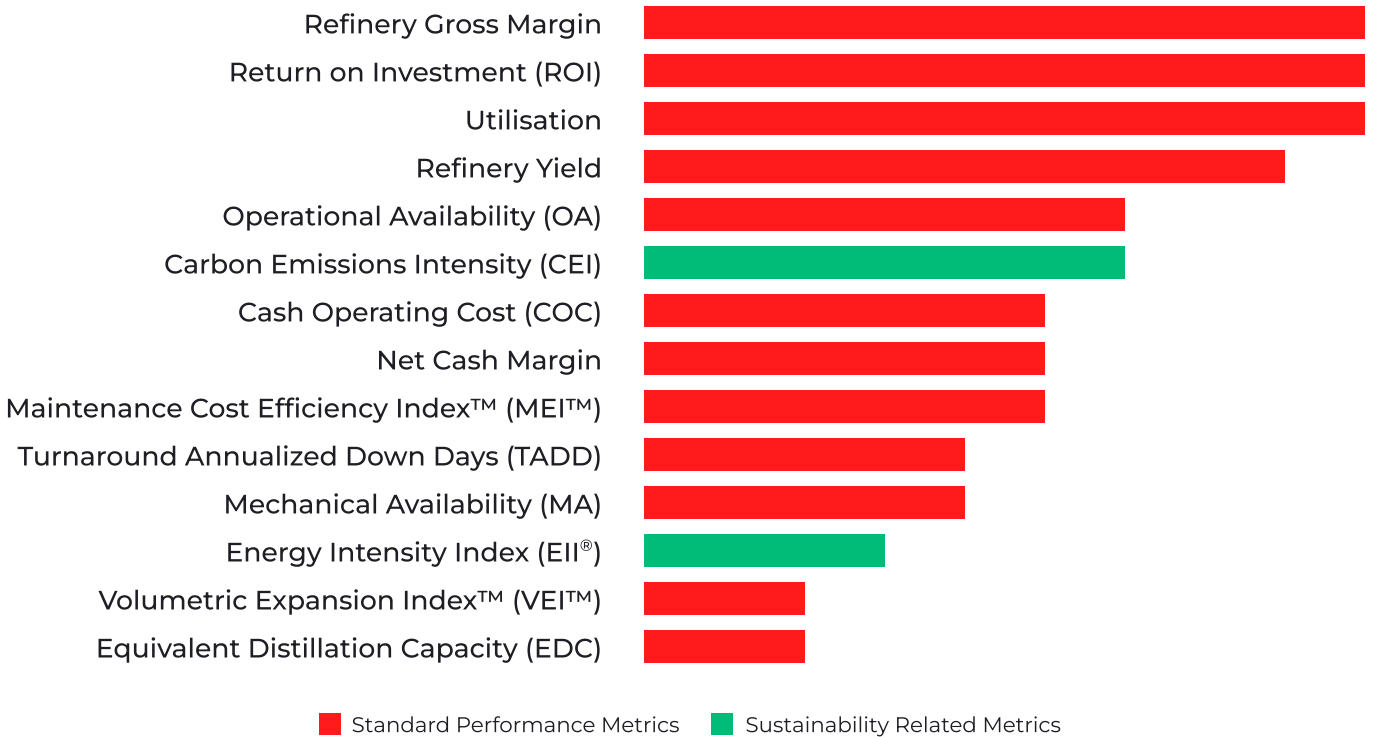
Metrics such as **Energy Intensity Index (EII®)** and **Carbon Emissions Intensity (CEI)** are gaining prominence as companies strive to balance profitability with environmental responsibility. This shift indicates a broader industry commitment to integrating sustainability into performance assessments, reflecting the growing importance of reducing the carbon footprint while maintaining operational excellence.

50%
of respondents have identified Refinery Gross Margin as a key metric for 2024.

44%
Carbon Emissions Intensity (CEI) is a primary focus for 44% of respondents this year.

28%
of respondents are concentrating on the Maintenance Cost Efficiency Index™ (MEI™) as a key metric on their site

Adoption of AI Tools

The industry is increasingly recognizing the transformative potential of AI and machine learning in refinery operations. With companies integrating advanced platforms and technologies, there's a clear move towards harnessing these tools to optimize processes, enhance decision-making, and drive innovation across the sector.

What are your preferred AI Tools?
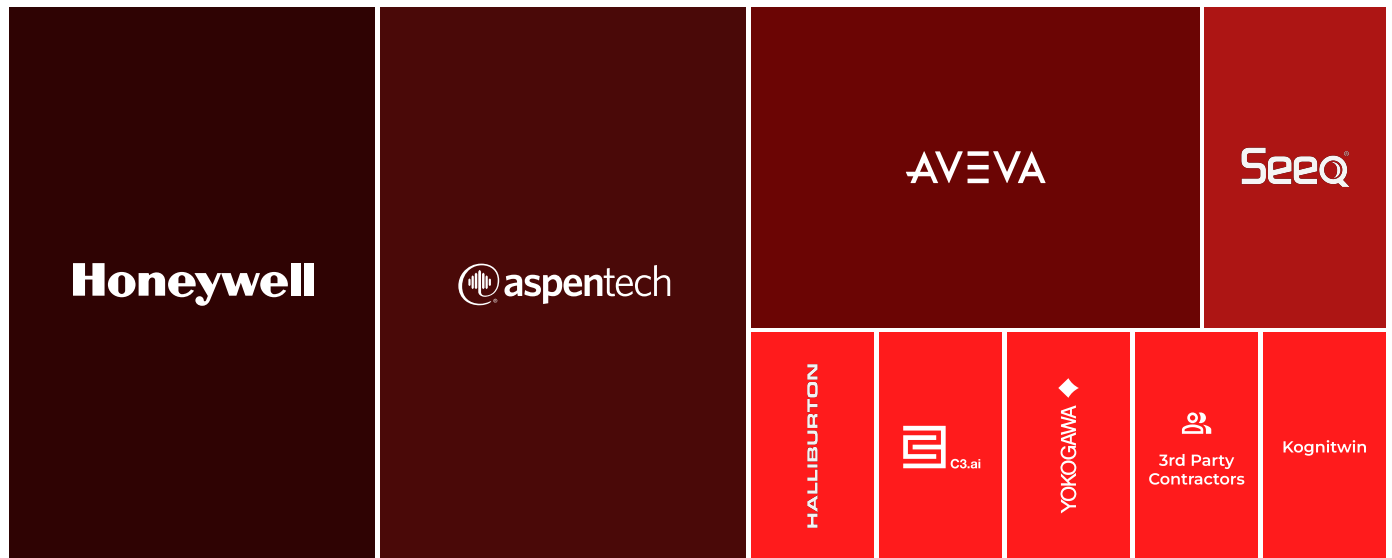
Machine learning and big data analytics are increasingly being integrated into daily operations, highlighting the sector's commitment to using AI for greater efficiency and innovation. However, it's important to note that there isn't a single, unified tool being used across the industry; many organisations are relying on four or more separate platforms to achieve their desired results.
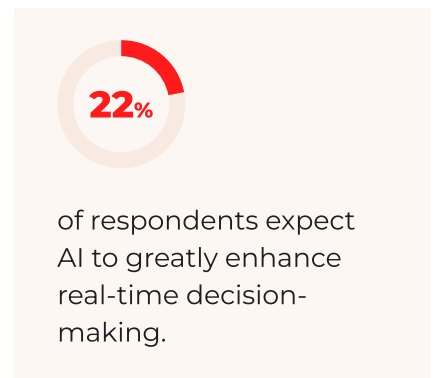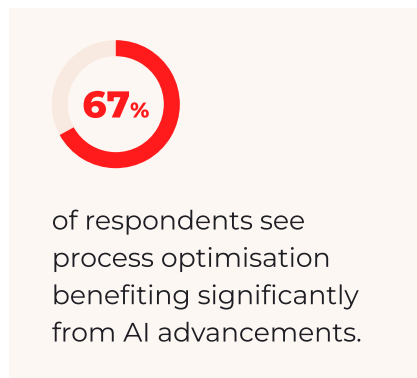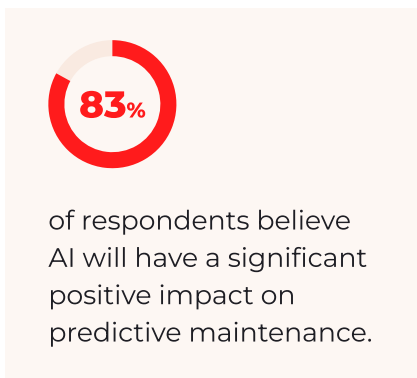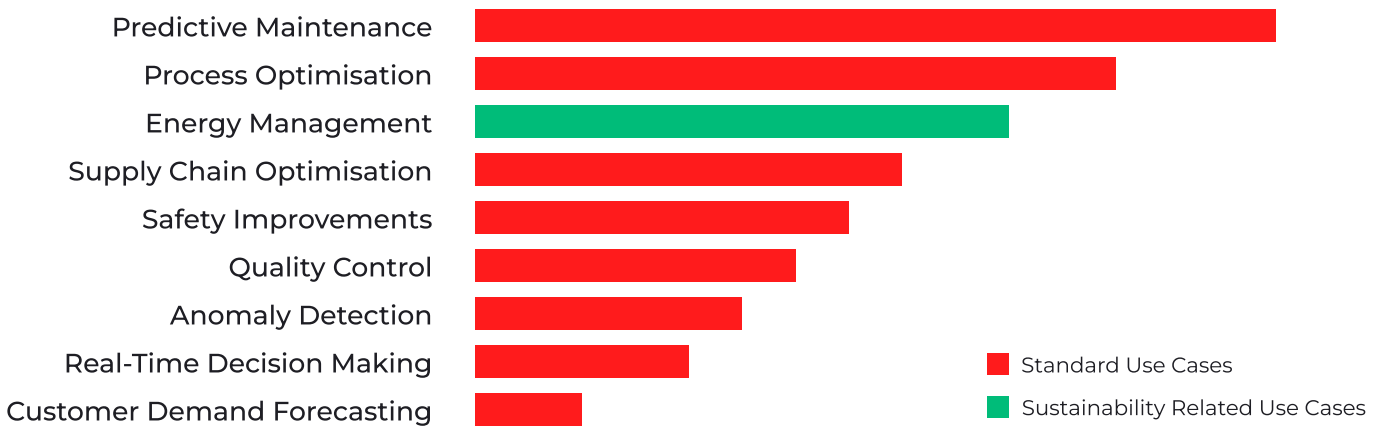
How many paid AI Platforms are you using in your role

Four+ 21%
None 22%
Three 7%
One 21%
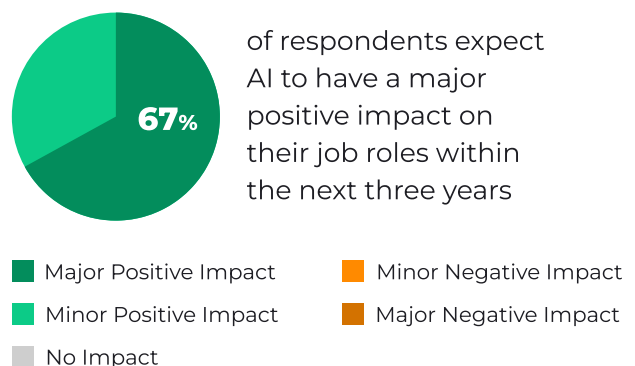Two 29%
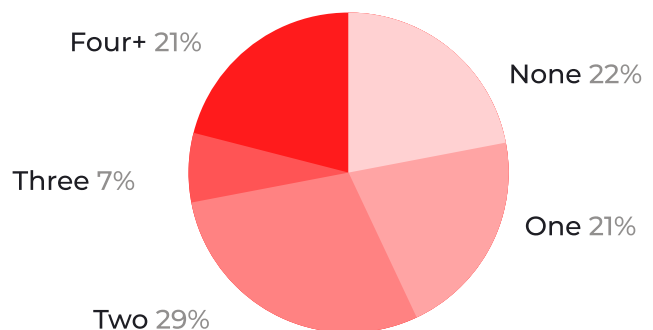
Future of AI in Refining

Looking ahead, the industry is eager to expand its use of AI, recognising the significant potential for improvements across various areas. Survey respondents strongly believe that AI will drive impactful changes, particularly in optimising energy use, reducing emissions, and boosting overall production efficiency.

In which of these use cases do you think advacments in AI will have a signification positive impact?

Predictive Maintenance
Process Optimisation
Energy Management
Supply Chain Optimisation
Safety Improvements
Quality Control
Anomaly Detection
Real-Time Decision Making
Customer Demand Forecasting

■ Standard Use Cases
■ Sustainability Related Use Cases

83%
of respondents believe AI will have a significant positive impact on predictive maintenance.

67%
of respondents see process optimisation benefiting significantly from AI advancements.

22%
of respondents expect AI to greatly enhance real-time decision-making.

As companies continue to invest in AI technologies, there is a strong expectation that these tools will be crucial in shaping the future of refining, delivering both economic and environmental benefits. The industry's enthusiasm for AI highlights its ongoing transformation and commitment to staying competitive in a rapidly evolving market—a sentiment strongly reflected by survey respondents, who overwhelmingly see AI as a positive force for the industry and their roles.

What impact will AI have on your job in the next 3 years

67%
of respondents expect AI to have a major positive impact on their job roles within the next three years

■ Major Positive Impact
■ Minor Positive Impact
■ No Impact
■ Minor Negative Impact
■ Major Negative Impact

Standout Stats

0% Fear AI's Impact

None of the respondents expressed concerns about AI negatively affecting their roles, showing strong confidence in AI as a beneficial tool.

60%+ Adopting Multiple AI Technologies

Over 60% of respondents are implementing multiple AI technologies, reflecting broad acceptance and a commitment to leveraging AI across operations.

Challenges in AI Implementation

35% cited integration with existing systems as a key challenge, with others highlighting data quality and skill gaps, indicating varied obstacles.

50%+ Pursuing Multiple Sustainability Initiatives

More than half are involved in multiple sustainability efforts, such as carbon capture and renewable energy, showcasing a diverse approach to environmental goals.

70% Implementing New Technologies

The majority of respondents have adopted new technologies in the past year, focusing on AI analytics and big data for predictive maintenance, highlighting a commitment to modernization.

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