



Our Take

Unlocking sustainable value in the oil and gas sector

September 2024




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A recent roundtable organised by PwC India with global capability centre (GCC) leaders in the oil and gas (O&G) industry brought to light the value GCCs could unlock in this sector through centralisation, consolidation and automation. **Rajesh Ojha** and **Deepak Mahurkar** provide the lowdown.

Overview: GCCs as value drivers

The O&G sector is up against several challenges today: supply chain and technological disruptions, uncertain macroeconomic conditions, and the most pressing one – the urgency to go green.¹ Sustainability has taken centre stage in discussions within the O&G sector, prompted by the need to accelerate transition to renewables, ensure energy security and keep up with evolving regulations on carbon emissions. For O&G companies, navigating these difficulties requires innovative solutions and enhanced operational efficiencies. This has led major players in the sector to set up or expand their GCCs in India. With their expertise and cost-effective solutions in analytics, technology and process optimisation, O&G GCCs are uniquely positioned to help the parent organisations and, at times, also their clients to address these challenges effectively.

Today, there are around 20 O&G GCCs in India – employing 50,000 people² – that are fast making their presence felt in the carbon-intensive industry, be it through adopting emerging technologies such as artificial intelligence (AI) to track emissions or to lead advancements via research and development (R&D)-driven innovations. They play their part through centralisation, consolidation and automation, unlocking value in terms of significant cost savings, enhanced operational efficiency and data-driven decision making across the entire value chain.

1. PwC, Outlook: An industry reinventing itself

2. PwC analysis



Centralised IT environments and data storage and processing power enable faster software delivery cycles and reduced failure rates, adoption of cloud computing that offers economies of scale and agility, and advanced analytics that help optimise production processes and identify new revenue opportunities. Consolidated infrastructure and operations (I&O) functions within GCCs help streamline IT management, optimise resource utilisation (hardware, software, personnel), and enhance security through centralised controls. Automation technologies offer significant cost-saving opportunities, accurate data interpretation and predictive maintenance to minimise downtime, reduce repair costs, and enhance overall operational safety, in the process freeing up employees to focus on higher-value activities.

Figure 1: Journey of O&G GCCs

Functional path

Journey	Transition	Use cases	Maturity timeline
Global support to global transformation	<ul style="list-style-type: none"> Support for the projects being run by parent organisations Focus on the execution of simpler and smaller tasks Transitioning to being E2E process owners from just support systems 	<ul style="list-style-type: none"> Initial focus: Cloud support, back-office automation, smart contracts among others Current focus: Embedded systems, cybersecurity, data analytics, P2P, H2R 	4-5 years
Single focus to multifunctional focus	<ul style="list-style-type: none"> Kick off with one focus function Expand to a multifunctional GCC 	<ul style="list-style-type: none"> Beginning with ER&D Expanding to shared services Transforming with a mix of ER&D, shared services and innovation hubs 	2-3 years
Prove local - move to global	<ul style="list-style-type: none"> Focus on building capabilities for the Indian market Prove competency to global stakeholders Win global and E2E projects 	<ul style="list-style-type: none"> Designing and testing for local products Transitioning to global E2E development, including simulation, software design, modelling equipment behaviour and reservoir management platforms 	5-7 years
Pure E2E development	<ul style="list-style-type: none"> Primary focus on value generation and not cost-arbitrage Creating end-to-end competency and capabilities High focus on innovation 	<ul style="list-style-type: none"> Building new age technological competencies like AI/ML, blockchain, data analytics, cybersecurity, salesforce, cloud migrations, production forecasting tools, drilling optimisation software among others 	3-5 years

Source: PwC analysis

E2E: End to end

P2P: Peer to peer

ER&D: Engineering research and development

GCC: Global capability centre

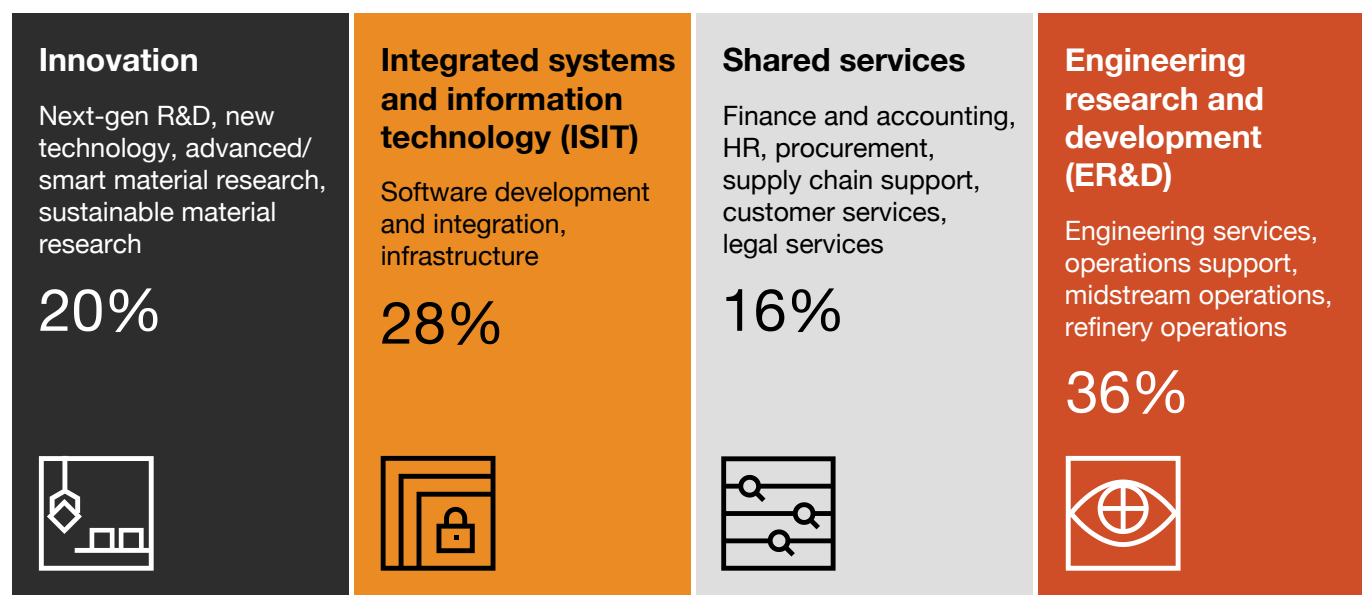
H2R: Hire to retire

AI/ML: Artificial intelligence/machine learning



Figure 2: Functions of an O&G GCC

GCC functions



Note: The percentages above are based on estimated averages and show that 36% of an O&G GCC's functions in India are dedicated to ER&D, 28% of its functions to ISIT, 20% to innovation and 16% to shared services.

Capabilities

<ul style="list-style-type: none"> Clean hydrogen integration Commercial fleet tracking Enabling distributed fuel consumption Hydrocarbon tracking Remote equipment monitoring 	<ul style="list-style-type: none"> Near-time visualisation Accurate exploration using analytics Predictive maintenance Drone inspected data analysis
<ul style="list-style-type: none"> Data analytics and tools Internet of things and cloud Enabling secure downstream B2C payments Enterprise resource planning Customer relationship management implementation 	<ul style="list-style-type: none"> Disaster recovery services Data security Network infrastructure services Data centre operations and management
<ul style="list-style-type: none"> Exploration accounting (upstream) Talent acquisition Payroll and compensation support Service delivery 	<ul style="list-style-type: none"> Enabling procure-to-pay and source-to-contract processes Contact centre services Global IT support Property/asset management
<ul style="list-style-type: none"> Subsurface data management Production optimisation Hydrocarbon accounting Demand planning Inventory management 	<ul style="list-style-type: none"> Climate and sustainability Cleantech integration Quality assurance Auxiliary operations

Source: PwC analysis



Our take

Key focus areas

GCCs in the O&G space focus on maximising value, strengthening collaboration and standardisation, and enhancing regulatory compliance. This article – based on PwC India’s roundtable discussion with relevant stakeholders – narrows down on four key areas where GCCs serve as significant value drivers. These include helping:

1. meet sustainability expectations
2. ensure supply chain transparency
3. enable digital transformation
4. enhance cybersecurity.



1. Meet sustainability expectations

Many O&G companies that use outdated, manual methods for energy management to comply with stringent environmental regulations run the risk of being penalised for excessive emissions. O&G companies' chief technology officers (CTOs) are required to optimise operating expenses while improving environmental performance, rendering energy management essential.

Moreover, oil refineries often struggle to accurately monitor and reduce methane emissions across multiple sites. Downstream operations – which include converting O&G into the final product – contribute significantly to methane emissions. Advancements in AI vision technology can allow refiners to detect leaks and methane emissions in real-time using visual and infrared video data.

GCCs in India are anchoring the environmental, social and governance (ESG) agenda for their parent companies. As global regulatory bodies and governments push for transparent reporting of carbon emissions, O&G companies are increasingly depending on their GCCs in India to fulfil these requirements. GCCs, too, are equipping themselves with advanced analytics and predictive capabilities, aiming to provide accurate insights into their parent company and clients' carbon footprint and facilitate alignment with net-zero goals. They could prove to be crucial allies as they leverage AI algorithms to detect and address energy loss caused by asset flaws or process anomalies with real-time monitoring.

The IT departments of GCCs therefore play a crucial role in ensuring seamless integration of AI platforms with diverse data sources while addressing security and compliance concerns associated with sensitive emissions and financial data.

Additionally, GCCs in India could drive hydrogen adoption for O&G companies, leveraging financial incentives the Government of India is providing for production of green hydrogen under the Strategic Interventions for Green Hydrogen Transition (SIGHT) programme, a part of the National Green Hydrogen Mission (NGHM).³ This shift has its challenges though as it would involve significant process adaptation and machinery retrofitting, along with costs associated with infrastructure development, technological innovation and regulatory compliance. Integrating green hydrogen into supply chains and value chains would also require coordination among stakeholders and clear policy frameworks to incentivise and facilitate adoption, and GCCs could help by facilitating collaboration among the industry, the Government and technology providers.



Vikas Kalucha

Managing Director – GCC Markets

“ The O&G sector is rapidly adopting clean energy technologies and sustainability initiatives, with AI revolutionising carbon capture and emissions management. The industry must navigate market volatility, ensure efficient operations amalgamated with supply chain resiliency, and comply with ESG (guidelines). GCCs are crucial for cost optimisation and automation, and to drive secure operations, demonstrating a commitment to reducing carbon footprints. ”

3. National Green Hydrogen Mission



2. Ensure supply chain transparency

O&G GCCs are increasingly focusing on supply chain transparency as a key priority. By enhancing visibility and traceability throughout the supply chain using technologies like blockchain and the internet of things (IoT), GCCs can ensure ethical sourcing practices and reduce carbon emissions. This integrated approach enables GCCs to meet regulatory requirements, align with stakeholder expectations, and drive sustainability across the entire supply chain.

O&G operations often span vast geographical distances, making supply chain management inherently complex. GCCs, positioned as centralised hubs of technical expertise and collaboration, can significantly enhance supply chain efficiency, and ensure consistency and operational resilience by establishing standardised procurement and logistics processes across the organisation. They can foster collaboration between geographically dispersed teams, facilitate information sharing and coordinated responses to supply chain disruptions, and offer cost-effective solutions to optimise complex order-to-cash (OTC) to source-to-pay (STP) processes.

An O&G GCC was looking to optimise its purchasing process. It also sought to place bulk purchase orders and process sales orders with limited manual intervention. PwC India developed a solution to automate the sending and processing of invoices along with a single application to automate both purchase order (PO) and sales order (SO) creation. This engagement led to fewer data quality issues and improved efficiency.

GCCs also optimise processes by deploying robotic process automation (RPA) to automate repetitive back-office tasks associated with procurement and logistics, and integrating AI algorithms in the supply chain processes to enable demand forecasting, proactive inventory management, and route optimisation. Further, they are equipped to establish and manage relationships with key suppliers on a global scale, negotiating better pricing and ensuring consistent quality standards.



Sumit Srivastav

Partner and Leader, Intelligent Automation

“

In today's evolving business landscape, for companies in the O&G sector, cost reduction, productivity enhancement, revenue growth and sustainability are paramount. Faced with economic and operational challenges, GCCs have emerged as strategic enablers, prioritising business growth. Through business integration and automation, GCCs are able to streamline operations, minimise downtime, and optimise resources, driving digital transformation and reshaping the sector.

”



3. Enable digital transformation

Digital transformation of asset-heavy industries such as O&G is only possible with appropriate IT strategies in place. There is now a significant impetus for O&G industries to invest in emerging digital technologies like AI, augmented and virtual reality, cloud, edge computing, and IoT to generate higher revenue.⁴ The industry, as the roundtable indicated, is leveraging AI and data science to enhance operations across upstream (exploration, drilling and extraction), midstream (processing, storing, transporting and marketing) and downstream sectors. Data management can be especially challenging in the upstream segment due to the sheer volume of data generated, including seismic data, geochemical data, reservoir models, well logs, and drilling logs. The need to analyse and integrate this data adds to the complexity. There is also the need to automate repetitive and labour-intensive tasks in this segment, such as extensive documentation.

GCCs therefore have a role to play. They offer robust solutions for data storage and analysis. Their advanced analytics capabilities can harness vast datasets to optimise production processes, predict equipment failures and identify new revenue opportunities. IoT sensors integrated with automation software enable real-time monitoring of pipelines and wells. Predictive maintenance algorithms analyse sensor data to identify potential equipment failures before they occur. This proactive approach minimises downtime, reduces repair costs and enhances overall operational safety.



Dheeraj Gangrade

Partner and Leader – Consulting, GCC

“ The O&G industry is undergoing a significant transformation, driven by technological advancements, a push for sustainability and an evolving geopolitical landscape. As GCCs become increasingly integral to this sector, they are poised to lead the way in innovation, efficiency and cost-effectiveness. At PwC India, our consulting services are designed to support the growth of O&G GCCs. We help GCCs optimise operations, enhance digital capabilities, and navigate the complexities of the global market, ensuring they remain at the forefront of industry advancements and are well-positioned for future success. ”

An O&G GCC that wanted to establish an integrated data and digital capability for various lines of business faced the uphill task of coordinating between cross-geographical teams. PwC India built a comprehensive suite of digital products capturing and automating the business processes involved and created a centralised data lake to accommodate multiple data systems as a single data source platform for all required applications.

Another focus area for chief information officers (CIOs) is enhancing business processes using intelligent automation (IA) which includes adding AI capabilities to RPA. IA has already transformed back- and front-office processes for O&G companies. Democratising automation by empowering non-technical workers with low-code/no-code platforms is crucial for maximising benefits, anticipating steady growth in IA adoption across the oil value chain and business lines.

4. PwC, Oil and gas: Digital transformation using edge computing



An O&G GCC which had started its automation journey sought an RPA centre of excellence (CoE) maturity assessment, as well as a roadmap for sustainable, scalable growth of the CoE. PwC India led the seamless transition from RPA to IA, and identified and bridged the gaps within the GCC that were getting in the way of large-scale automation. The GCC was therefore able to achieve increased return on investment in automation.



Himanshu Ghawri
Partner, Data and Analytics



The O&G sector relies heavily on the data generated from various sources across the value chain, and organisations need to continuously manage these different datasets. Therefore, the need for robust data management and advanced analytics capabilities is paramount to drive comprehensive analyses, informed decision making, identification of improvement areas and cost reduction initiatives.

Data and analytics leverages technologies such as AI/ML/GenAI to extract actionable insights. These insights can be used to optimise the exploration and production process, predict equipment maintenance needs, enhance safety protocols, improve supply chain management, and validate various emission factors for an organisation's ESG goals.





4. Enhance cybersecurity

The digital transformation of the O&G industry is bringing about significant cyber vulnerabilities. Traditional, fragmented approaches to third-party risk management are passé. GCCs are frontrunners here, having become bastions of cybersecurity excellence for their parent organisations.⁵ Top multinational companies are choosing to set up their cyber CoEs in India due to cost efficiency, proximity to key markets, and availability of IT talent.

GCCs significantly strengthen the industry's collective cyber resilience by establishing standardised frameworks and a centralised knowledge repository to store and share threat intelligence, and develop and implement an industry-specific zero-trust framework to accelerate zero-trust adoption. This proactive approach safeguards critical infrastructure and ensures operational continuity.

GCCs are also investing in advanced threat detection, continuously evaluating and implementing cutting-edge threat detection and prevention technologies, fostering collaboration for an exchange of best practices with industry peers and external cybersecurity experts, developing training programmes for employees to equip them to identify and report suspicious activity, and leveraging automation tools to streamline routine tasks within the security operations centre, allowing personnel to focus on more strategic initiatives.

An O&G GCC aspiring for carbon neutrality by 2050 acquired several clean energy companies but struggled with cybersecurity alignment among the acquired companies. PwC India conducted an organisational compliance assessment to identify gaps, drafted cybersecurity policies, and carried out cybersecurity risk assessment and information security awareness training for the acquired companies.

Housing both cyberattack and defence experts, GCCs can serve as central hubs for managing global cyberthreats. This fosters a more coordinated and efficient response to security incidents. GCCs also need to iron out discrepancies arising out of engaging third-party vendors, over-reliance on whom can result in a wastage of resources and a complex risk landscape, including redundancy and inconsistency. Besides, the sheer volume of data from third-party assessments could overwhelm companies, hindering the identification of critical vulnerabilities. As a central repository for storing and sharing threat intelligence across the industry, GCCs facilitate a collaborative approach to cybersecurity. Moreover, new modes of working, such as remote work setups, demand additional cybersecurity guardrails. GCCs can offer support here as well.

An O&G GCC which employed a remote working model wanted to build a stronger team of security assessors. PwC India helped the GCC streamline risk identification and risk mitigation workflows while also incorporating robust controls to safeguard the GCC's assets and information.

5. PwC, Tracing the rise of cyber GCCs in India as cybersecurity powerhouses



Manu Dwivedi

Partner and Leader, Cybersecurity and Risk Consulting, GCC

“ In today’s business landscape, the O&G GCC sector is witnessing remarkable growth, propelled by technological innovations, rising efficiency requirements and a substantial move towards sustainable energy practices. As the industry undergoes these transformative changes, PwC India’s Risk Consulting services offer essential experience and value addition. By employing thorough risk management strategies, providing regulatory compliance guidance, and utilising cutting-edge technological solutions, PwC India aids GCCs in optimising operations, reducing potential risks by #RethinkingRisk, and seizing future opportunities, ensuring robust growth and resilience in this shifting environment. ”





Navigating challenges

The workforce in the GCCs within the O&G sector is undergoing a profound transformation driven by digitalisation, automation, and the need for sustainability. To adapt to these changes, there's a growing demand for skilled labour across various disciplines, necessitating investments in training, recruitment and talent development initiatives.



Talent development and upskilling

GCCs have ramped up hiring and have overtaken IT services for the first time in India to become the top hirers of technology talent in the first quarter of FY25.⁶ The demand for skilled tech professionals is continuously growing with the widespread use of emerging technologies like AI, ML, data analytics, IoT and cloud computing. And India is equipped to cater to this demand – not only in terms of talent skilled in emerging technologies but also those with expertise in renewable energy technologies, environmental engineering, and sustainable practices. Besides, many existing employees too require reskilling or training in new technologies, processes and methodologies to remain relevant in their roles or transition to new ones. Generative AI (GenAI), already being used by O&G GCCs to drive efficiency, productivity and safety, can be an enabler used to capture and transfer knowledge from retiring experts to new hires, facilitating faster and more efficient onboarding and training.



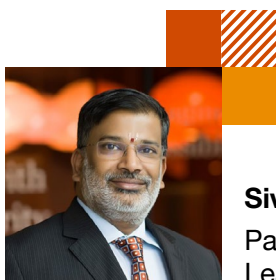
Market volatility

Market volatility is a chronic problem for the O&G industry. In 2024 alone, several factors broadly affected the O&G market. International crude prices, which had jumped to a five-month high of over USD 92 a barrel in April 2024, slumped to below USD 81 in August, after concerns over demand strength and worsening conflict in the Middle East.⁷ Global gas prices dropped to record lows in Q1 2024, while global liquefied natural gas (LNG) production underperformed in the second quarter as geopolitical upheavals fuelled price volatility.⁸ Such fluctuations driven by factors such as geopolitical tensions, supply-demand dynamics and economic conditions could impact a GCC's performance. To tackle geopolitical risks such as trade disputes, sanctions, political instability and regulatory changes, GCCs require a comprehensive risk management strategy and proactive engagement with relevant stakeholders.

6. The Economic Times, How GCCs raced to pole position in hiring stakes

7. Mint, OPEC+ sticks to output policy of 5.86 million barrel pullback per day, hints at unwinding cuts from October

8. IEA, Gas Market Report, Q3-2024



Sivarama Krishnan

Partner and Leader - Risk Consulting, and
Leader of APAC Cybersecurity and Privacy

“ The O&G industry is exposed to a multitude of risks arising in the wake of the changing regulatory landscape, geopolitical developments, economic volatility, technological disruptions and climate change. Organisations in these sectors need a robust, proactive risk management plan that is aimed at building long-term resilience and value creation. It is also imperative that business leaders in these organisations rethink risks to identify the opportunities and harness the possibilities for transformation that they present, to build fit-for-future organisations. ”



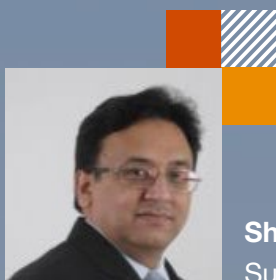
Complex regulatory compliances

GCCs also need to ensure regulatory compliance for the O&G industry, which is subject to complex frameworks at local, national and international levels. Ensuring compliance with regulations related to environmental protection, safety standards, labour laws and taxation requires significant resources and expertise. GCCs can leverage automation and data analytics to streamline compliance processes and minimise the risk of regulatory violations.

Looking ahead

As the world strives to enhance global energy security, achieve affordability and reduce emissions, India's dynamic O&G sector is showing promise. Supported by a robust network of GCCs, the industry is poised to generate new opportunities and position India as a key player in the global energy landscape. The support from GCCs in India is helping bring digital technology prowess to the parent company's operations spread globally while managing risks and centralised functions of operations. This paves the way to more connected, cost-efficient and data-driven operations for the O&G industry.





Shailesh Monani

Subject matter expert

“ The future of GCCs in the O&G sector is poised for transformation, driven by technological advancements and the need for cost optimisation. As the industry navigates the energy transition, GCCs are expected to play a pivotal role in fostering innovation, managing complex supply chains and enhancing operational efficiencies. Tax considerations for these centres are critical, with implications on cross-border transactions, transfer pricing, permanent establishment, global mobility compliances, withholding tax, and the OECD BEPS project. The evolving tax landscape will require GCCs to maintain agility in their tax planning and reporting strategies to mitigate risks. ”





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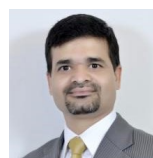
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Contact us



Rajesh Ojha

Partner and Leader, GCC Market Segment
rajesh.ojha@pwc.com



Deepak Mahurkar

Leader, Oil and Gas
deepak.mahurkar@pwc.com

Also contributing to this article were **Vishnupriya Sengupta, Ruchika Uniyal, Jhanvi Sharma, Megha Adhikari** and **Aayush Misra**.

Editorial

Dion D'Souza

Design

Kirtika Saxena

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