Sector

Hydrocarbons and Chemicals Business Review

The Hydrocarbons and Chemicals Business Unit at Tata Consulting Engineers continues to play a pivotal role in supporting industrial growth, energy transition, and sustainability aspirations across India and global markets. With an extensive portfolio that spans oil and gas, refining, petrochemicals, speciality chemicals, fertilisers, and emerging fuels, the business delivers comprehensive engineering solutions from concept to commissioning. It serves as a key enabler in helping clients navigate industry transformations, enhance operational performance, and achieve sustainable development goals.

2024-25 Performance Highlights

18% share in total revenue

16% share in total acquisition

872 workforce on 31st March 2025

202 crore worth value engineering for customer

Industry Trends and Market Outlook

The hydrocarbons and chemicals sector is at a pivotal moment, driven by three powerful forces: the global energy transition, the demand for sustainable fuels, and the shift towards high-value chemicals and advanced manufacturing. This convergence is reshaping the sector's priorities and presenting engineering firms with opportunities to lead transformative change.

Globally, sustainability has moved to the forefront. Governments and industries are accelerating investments in green fuels like green hydrogen, green ammonia, and green methanol, which are now central to decarbonisation strategies. Green ammonia is emerging as a game-changer, projected to grow at a remarkable compound annual growth rate of over 60 per cent between 2025 and 2035, as it becomes an essential carrier for renewable energy, a sustainable marine fuel, and a key feedstock for steel, fertilisers, and chemicals. Green methanol is also rapidly gaining ground, with its market size expected to grow from USD 2.6 billion in 2024 to over USD 11 billion by 2030.

The semiconductor industry is another major driver. Fueled by artificial intelligence, electric vehicles, data centres, and advanced electronics, the global semiconductor market is forecast to hit USD 755 billion in 2025 and exceed USD 2 trillion by 2032. This surge is creating demand for semiconductor assembly and testing facilities, electronics-grade chemicals, and specialty glass and silicon manufacturing, where engineering expertise plays a critical role.

Battery and Battery Energy Storage Systems (BESS) are also evolving rapidly, with technologies such as solid-state batteries promising higher energy densities, greater safety, and faster charging. These advances are redefining energy storage for electric vehicles, aerospace, and grid-scale applications. Meanwhile, the chemicals sector, including specialty and performance chemicals, continues to grow at a healthy pace (over 12 per cent CAGR), supported by demand from pharmaceuticals, agriculture, and consumer goods, and reinforced by a strong push towards bio-based and sustainable chemical processes.

For TCE, these global shifts create significant opportunities. As industries decarbonise, diversify, and digitise, they require trusted partners who can deliver integrated solutions for the next generation of plants, fuels, and materials.

Key Areas of Expertise

TCE's Hydrocarbons and Chemicals Business Unit (HCBU) combines decades of multidisciplinary engineering expertise with a forward-looking approach to innovation. Its scope spans traditional hydrocarbons to cutting-edge sustainable technologies, allowing the team to support clients across the full spectrum of the energy and chemicals landscape.

- **Sustainable Fuels:** HCBU has built deep expertise in the engineering of green hydrogen, ammonia, and methanol projects. The team delivers end-to-end services, from feasibility studies and front-end engineering design (FEED) to detailed engineering, EPC support, and commissioning. Projects include biomass-to-hydrogen conversion and biofuels, supporting the transition to low-carbon energy systems.
- **Semiconductors and Advanced Manufacturing:** The business has entered the semiconductor domain, providing specialised engineering for outsourced semiconductor assembly and testing (OSAT) facilities and fabrication units. It also designs electronics-grade silicone and advanced glass manufacturing facilities for solar and display applications.
- **Chemicals and Speciality Chemicals:** The team supports the entire value chain for petrochemicals, speciality chemicals, and fertilisers, with a strong focus on process safety, operational reliability, and environmental compliance.
- **Batteries and BESS:** HCBU has delivered engineering, procurement, and construction management (EPCM) services for some of India's largest lithium-ion battery gigafactories, providing solutions for manufacturing, storage, and integration into energy systems
- **Dedicated Engineering Centres (DECs):** The unit operates DECs for global clients, offering integrated engineering and programme management support that fosters long-term partnerships and operational excellence.

Across all these domains, the team leverages digital tools, simulation technologies, and knowledge-driven frameworks to ensure every solution is future-ready, efficient, and sustainable.

Business Performance and Capabilities

FY25 marked a landmark year for HCBU, with major strides across sustainable fuels, advanced manufacturing, and chemicals.

- The unit secured and delivered some of its largest-ever projects, including a strategic EPCM contract for one of India's biggest lithium-ion battery manufacturing plants, a cornerstone in India's ambition to lead in battery and energy storage production.
- HCBU entered the semiconductor space in a significant way, winning a major contract for an advanced OSAT facility, a strategic breakthrough that positions TCE as a partner of choice for the electronics manufacturing ecosystem.
- Internationally, the unit was appointed as engineering consultant for a large-scale green ammonia plant in the Middle East. This facility will produce ammonia from renewable sources for marine fuel and industry use, demonstrating TCE's role in global decarbonisation efforts.
- The team also delivered FEED services for an innovative chemical recycling plant in India, designed to convert waste plastics into chemical feedstock, reinforcing the circular economy.

HCBU's strong project pipeline, client trust, and ability to handle complex assignments in EPCM and OEPC roles underline its versatility and scalability. Importantly, over 70 per cent of new business came from repeat clients, a testament to the quality and reliability of its delivery.

Key Initiatives

During the year, HCBU pursued initiatives that strengthened its capabilities and market position:

- **Expansion into Future Technologies:** By securing strategic projects in semiconductors, batteries, and green fuels, the unit expanded into high-growth, future-facing sectors.
- **Digital Engineering and Productivity:** The Accelerate Delivery Centre (ADC) was leveraged to improve project timelines, reduce engineering hours, and enhance productivity across assignments.
- **Strategic EPC Partnerships:** HCBU forged deeper ties with EPC contractors in international markets, especially in the Middle East, creating a stronger service offering in operational expenditure (OPEX) and project execution.
- **Knowledge and Talent Development:** The business empanelled external industry experts and collaborated closely with TCE's technology teams to enhance internal knowledge, support innovation, and maintain high technical standards.
- **Innovation in Circular Economy:** The team took on chemical recycling projects and explored innovative applications for carbon capture, positioning itself as a solutions provider for clients seeking sustainable, circular operations.

Future Priorities

HCBU is poised for accelerated growth and its strategic priorities include:

- **Scaling Sustainable Fuels:** Continue leading in green hydrogen, ammonia, and methanol projects, building on proven experience to deliver larger and more complex facilities.
- **Deepening Semiconductor and Battery Capabilities:** Strengthen engineering expertise in OSAT, fabrication, and battery manufacturing to support India's ambitions in electronics and energy storage.
- **Digital Integration:** Embed digital engineering tools like digital twins, AI-assisted design, and advanced simulation even more deeply into workflows for faster, more predictable, and cost-effective delivery.
- **Global Expansion:** Build on its foothold in the Middle East, Europe, and North America with strategic project wins and long-term collaborations, while supporting India's domestic industrial growth.
- **Innovation and Partnerships:** Collaborate with research institutions, global technology providers, and industry bodies to stay ahead of emerging trends and co-create innovative solutions.

Through these priorities, HCBU will continue to deliver on TCE's vision of Engineering Excellence, Enabling Growth, helping clients embrace energy transition, adopt future-ready manufacturing, and drive sustainable development.

"The hydrocarbons and chemicals sector is standing at the crossroads of transformation, where sustainability, innovation, and digitalisation are shaping the future. At TCE, we are not just responding to these changes, we are enabling them. By combining deep domain expertise with cutting-edge technologies, we are delivering solutions that drive decarbonisation, accelerate the energy transition, and create enduring value for our clients and communities worldwide."

Mozammel Biswas
Business Head - HCBU

Projects 2024-25