INNOVATION-LED GROWTH IN INDIA'S CHEMICAL INDUSTRY

"A NATIONAL IMPERATIVE FOR GLOBAL COMPETITIVENESS"

D. SOTHI SELVAM
Director General - ICC

Dear Readers, as we welcome the New Year, I extend my warmest wishes to all of you. May the year ahead bring clarity of purpose, renewed optimism, and meaningful progress.

India's chemical industry, valued at over **$ 220 billion** -and expected to touch the $ 1 trillion mark by 2040, is a cornerstone of the national manufacturing ecosystem and a critical contributor to exports, employment, and downstream industrial growth.

India ranks 6th in the World and 4th in Asia in Chemicals sales, 4th largest globally & 2nd largest in Asia in Speciality Chem, 3rd largest exporter of agrochemicals, 2nd largest exporter of dyes and 3rd Largest Consumer of Polymers globally.

However, global competitive dynamics are undergoing a structural shift. The chemical industry worldwide is rapidly moving from scale- and cost-based competition to **technology, sustainability, and IP-driven leadership.** Major economies-China, the European Union, Japan and the United States, are investing aggressively in research, innovation, and commercialization of advanced chemical technologies.

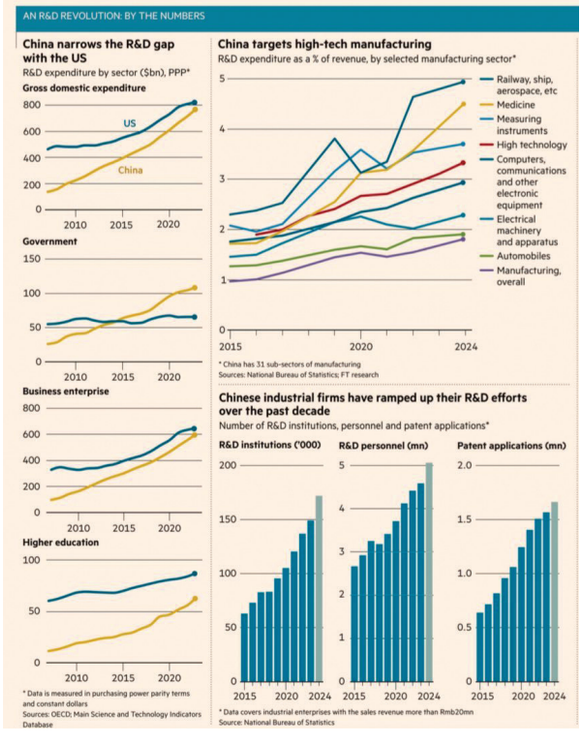
India's chemical industry currently invests only **0.5–0.8% of turnover in R&D,** significantly below the global average of approximately **2.5%.** This innovation deficit poses a strategic risk to India's long-term competitiveness and threatens to erode the perceived advantages of the "China+1" opportunity.

It is high time we understand that **innovation-led growth is no longer optional-it is existential.**

GLOBAL CONTEXT: THE NEW CHEMISTRY OF COMPETITIVENESS

China: Strategic Scale and Technology Control: China has emerged as the most aggressive global investor in chemical innovation. Its chemical R&D expenditure has grown at **over 18% CAGR,** accounting for **nearly half of global chemical patents.** Under **the Made in China 2025** framework, China targets **70% self-sufficiency in critical new materials,** with focused investments in EV battery materials, specialty polymers, electronic chemicals, and advanced intermediates. Technology Policy in China drives R&D Strategy, wherein they follow 50:50:50; **paper: patents: pilot - products rule** in China. It dictates that 50% of research papers published should translate into patents and 50% patents into products.

Academic research is made to connect to industry through a mechanism of interdependence and vice



versa, industry funds research as they find value through academic research.

In India the lack of industry Connect and support is due to the fact that academic research stops with a publishable paper in most situations. Hence, to build capabilities for technology driven innovation India's R&D policy must link lab to field. Also, Science & Technology R&D is not enough. To operationalise technology driven product innovations into scalable business models a strong system of Quality and Reliability to back up R&D is a must for sustainability. A similar model is followed in Germany. The Fraunhofer Institute for applied research and Max Planck Institutes who excel in fundamental research work in tandem.

EUROPEAN UNION: SUSTAINABILITY AS A COMPETITIVE LEVER

Europe leads in specialty chemical manufacturing, driven by advanced technological innovation and a focus on green innovation. The European Union invests approximately **$11 billion annually** in chemical R&D, largely aligned with decarbonization and circular economy objectives. China still leads globally, but Europe remains a major investor. A separate industry analysis shows European chemical companies allocate about 1.6% of sales to R&D. As Europe's largest chemical producer, Germany plays a leading role in chemical R&D in Europe; many of the top global chemical R&D spenders (e.g., BASF, Covestro) are German. Their R&D intensities often fall in the ~2–3% of sales range based on company reports.

UNITED STATES: DEEP-TECH COMMERCIALIZATION ECOSYSTEM

The United States combines **high corporate R&D intensity (4–5% of sales)** with a robust venture capital ecosystem. In 2024 alone, **USD 15.1 billion** was invested in Chemical Business. This integrated system efficiently converts academic research into scalable commercial enterprises. The U.S. chemical industry has evolved from post-war dominance in petrochemicals to a leader in specialty chemicals driven by sustained R&D along with growing energy self-sufficiency (from Shale). U.S. chemical companies are significant R&D investors. U.S. chemical firms also show R&D intensity generally around 0.8–1.5% of chemical sales for large publicly traded firms — but specialty and innovation-focused companies may exceed this.

INDIA'S CURRENT POSITION: STRENGTHS AND STRUCTURAL GAPS

India's chemical industry benefits from:

- A large domestic market
- Cost-efficient manufacturing capabilities
- A strong scientific and engineering talent base
- Established institutions such as **IITs, NITs, CSIR laboratories**

Despite these strengths, India faces critical structural gaps:

- India lags other major countries on key R&D measures; India's overall R&D spend is dominated by Govt. (unlike US, EU, S Korea which are private sector led)
- Low R&D intensity (0.5–0.8% of sales)
- Limited development of proprietary molecules and processes
- Weak industry–academia collaboration beyond transactional engagements
- Insufficient focus on translational research and commercialization

Unless addressed urgently, these gaps risk locking India into a low-margin, commoditized position in global chemical value chains.

INDUSTRY–ACADEMIA COLLABORATION: UNLOCKING INDIA'S INNOVATION POTENTIAL

Globally, chemical innovation is increasingly driven by mission-oriented collaboration between industry, academia, and government. In India, however, industry–academia engagement remains largely confined to short-term problem-solving, consultancy, and talent recruitment. There is an urgent need to shift from consultancy-led engagement to **co-creation and co-ownership of innovation.**

A CALL TO COLLECTIVE ACTION: A NATIONAL INNOVATION AGENDA

India's chemical industry stands at a defining juncture. Global competitors are investing with speed, scale, and strategic clarity. For India, maintaining the status quo is no longer viable. It is necessary that leading Indian chemical companies progressively increase R&D intensity to 2–3% of sales within the next five years. R&D investments should be focused, outcome-oriented, and aligned with long-term strategic capabilities rather than incremental improvements. Readers will be pleased to know that ICC has submitted a white paper to DCPC, GoI emphasising on the following recommendations.

1. Restore R&D Incentives: Given the significant impact of research and development (R&D) on innovation, it's imperative to reinstate the 200% weighted tax deduction for R&D investments in the chemical sector. This measure will not only stimulate innovation but also encourage companies to invest in R&D, thereby fostering technological advancement and competitiveness. For instance, China offers a super deduction policy, allowing companies to deduct more than 100% of their R&D costs. Recently, China expanded this super deduction from 175% to 200% of R&D costs for most businesses, representing a significant subsidy. While China is not alone in offering such incentives—most OECD countries provide

R&D subsidies, including the United States—the magnitude of the Chinese super deduction underscores the importance of reinstating R&D incentives in India to maintain competitiveness and spur innovation in the chemical sector.

2. "First in India" Scheme: Introduce incentives for developing indigenous technologies, offering financial support equivalent to 5% of sales for the first five years for products not produced in India for the last decade.
3. Technology Upgradation Fund: Implement a scheme (Capital Investment Subsidy @ 15%) akin to ATUFS in the textile industry to support technology upgrades in chemical manufacturing, enhancing productivity, quality, and exports.
4. BIRAC has enabled over 5,000 biotech startups through funding, mentoring, and incubation-support which is largely missing in the chemical sector. A similar incubator fund is needed to address R&D and early-stage funding challenges.
5. The chemical sector needs a strong branding push-like IT in the 2000s-highlighting its role in innovation, sustainability, and national growth. A coordinated effort by government and industry bodies is essential to promote success stories, support emerging chemistries, and drive investment and talent.
6. A taskforce comprising the Ministry, ICC, and key stakeholders should define 5–10-year innovation funding priorities-focusing on green chemistry, clean energy, frugal R&D, TRL 4+ tech transfer, talent development, and stronger linkages across academia, industry, and IP ecosystems.
7. There is a need for a centralized, user-friendly platform to track TRL 4+ technologies from government and academic institutions. Key actions include improving access through a central database, building on existing platforms, and ensuring industry can easily find and adopt market-ready solutions.
8. Programs like We-Chemie, Course on Wheels, CSDC, by equipping students with practical skills and exposure. There's a pressing need to create and expand such initiatives to build a future-ready workforce for the chemical sector.

ICC calls upon industry leaders, policymakers, financial institutions, and academia to collectively commit to an innovation-led growth agenda.

The next decade will determine India's position in global chemical value chains for generations to come. The time for decisive action is now.

ICC'S REVAMPED WEBSITE

It is my pleasure to inform that Indian Chemical Council has launched its redesigned website, marking an important step in strengthening our digital presence. The

Scan the QR Code to visit our Revamped Website

new website offers a modern, user-friendly, and mobile-responsive interface, providing easier access to ICC's initiatives, services, knowledge resources, events, and industry updates.

I invite all our readers to visit the website and explore its enhanced features and improved navigation.

Moving onto other activities by ICC...

TWO-DAY REFRESHER COURSE ON "REACTION ENGINEERING FOR PLANT PERSONNEL"

ICC organised a **Two-day Refresher Course on "Reaction Engineering for Plant Personnel"** on 27 and 28 November 2025 at Hotel VITS Shalimar, Ankleshwar, under the

auspices of the Technology & Energy Expert Committee. This programme is part of ICC's long-established and highly regarded series of refresher courses in chemical engineering, designed to support continuous learning for plant professionals.

The objective of the course was to reinforce the essential principles of Reaction Engineering and Reactor Operations. Refresher training helps bridge this gap by linking practical experience with scientific understanding, enabling participants to enhance their knowledge, sharpen their skills, and address industry challenges more effectively.

This year's programme offered a comprehensive overview of key areas in Reaction Engineering, including Homogeneous and Heterogeneous Reactions, Reactor Types, Dynamic and Static Reactors, AI-based simplification tools, and Coalescers. The course attracted eighty participants representing more than thirty organisations from Gujarat and across India.

TWO-DAY TRAINING COURSE ON "SAFETY AND ENVIRONMENT IN THE CHEMICAL INDUSTRY" AT ROHA INDUSTRIES ASSOCIATION

Indian Chemical Council (ICC) in collaboration with

the Institute of Chemical Technology (ICT), Mumbai successfully organized a Two-day Training Course on "Safety and Environment in the Chemical Industry" on 4 and 5 December 2025 at Roha Industries Association, Roha, Maharashtra. The programme focused on building an understanding of potential workplace hazards, systematic risk assessment, emergency preparedness, and compliance with applicable safety and environmental regulations. Emphasis was also placed on fostering a proactive safety culture that encourages hazard identification, near-miss reporting, and responsible behaviour at all organizational levels. The programme witnessed participation from industry professionals, safety experts, academicians, and regulatory authorities.

ICC ERO'S INDUSTRY INTERFACE SESSION

The Indian Chemical Council – Eastern Region (ICC) organised an Industry Interface Session with Asia Law Offices as the Knowledge Partner on Thursday, 11 December 2025, at The Westin, Kolkata. The session aimed to share updates on new policy changes introduced by government agencies, create a platform for interaction with industry stakeholders and brief participants on the activities and forthcoming initiatives of ICC.

The two-hour-long session was conducted in two segments focusing on Legal Update: Implementation of India's Four Labour Codes (2025), Global & Indian Chemical Industry Landscape, ICC's Activities & Initiatives on Chemical Safety and Responsible Care.

20TH NATIONAL CONVENTION ON "FINANCING A SUSTAINABLE FUTURE: ALIGNING CAPITAL WITH CLIMATE, EQUITY, AND GROWTH

The Indian Chemical Council (ICC) joined as the **Industry Association Partner** for the **20th National Convention** titled *"Financing a Sustainable Future: Aligning Capital with Climate, Equity, and Growth"*, organised by the **United Nations Global Compact (UNGC)** on **12 December 2025** at **The Westin, Kolkata.** I had the opportunity to speak on Responsible Care underscoring how the Indian chemical sector is advancing sustainability through the Responsible Care framework—strengthening safety, environmental stewardship, and SDG-aligned growth. The opportunity was utilised to present, responsible care as the industry's cornerstone for measurable sustainability performance and environmental leadership, positioning India's chemical sector as a critical contributor to the country's broader green transformation.

ICC also had an exhibition stall at the convention, which served as an important platform for direct interaction with delegates, investors, and policymakers.

ICC'S PARTICIPATION IN THE SIDE EVENT OF CSP-30 OF OPCW HAGUE

The Indian Chemical Council took part in a side event during the 30th Conference of States Parties of the Organization for the Prohibition of Chemical Weapons, held in November 2025 at The Hague. The invitation came through the National Authority for the Chemical Weapons Convention, Government of India, and reflected the growing recognition of ICC's work on chemical safety, security and responsible industry practices.

ICC was represented by Dr. Pranav Tripathi, Head of Responsible Care and Sustainability Initiatives, who shared India's experience on strengthening chemical safety in industry.

ICC NRO ACTIVITIES:

- ICC NRO officials attended the stakeholder consultation meeting on the **Export Promotion Mission (EPM)** held in hybrid mode on November

19, 2025, at Shastri Bhawan, chaired by the Joint Secretary, DCPC. The meeting discussed the Union Cabinet–approved EPM, a flagship initiative under the Union Budget 2025–26 aimed at enhancing India's export competitiveness, particularly for MSMEs, first-time exporters, and labour-intensive sectors. Stakeholders reviewed the Mission's comprehensive and digitally enabled framework, supported by an outlay of ₹25,060 crore for FY 2025–26 to FY 2030–31. During the interaction, departments and industry bodies were encouraged to share relevant MSME-related data and suggestions to support the Mission's effective rollout.

- The National Industrial Corridor Development Corporation (NICDC), on the directives of the Hon'ble Commerce & Industry Minister (HCIM), conducted a meeting to explore the feasibility of reserving land close to the shore in the Krishnapatnam Industrial Area (KIA) for the development of a Chemical and Petrochemical Cluster, including tankages and allied facilities. In this regard, a stakeholder consultation meeting was held on 19 November 2025 to seek insights from leading industry associations on the proposed initiative. The points discussed during the meeting included Investment potential, Technical specifications, Infrastructure requirements, Enabling policy measures, Industry perspectives on feasibility and planning and Guidance for feasibility assessment and cluster planning.
- **'ZED Manthan',** was held on November 20, 2025, in New Delhi, which focused on enhancing awareness and wider adoption of the ZED scheme and encouraging MSMEs to pursue higher-level certifications such as Silver and Gold. The event was attended by ICC NRO officials. The discussions referred to the ZED framework developed by the Quality Council of India (QCI), highlighting its role in guiding MSMEs toward improved quality standards. The event also underscored the important role of industry chambers and associations in promoting greater participation and strengthening the overall implementation of the scheme, including quality upgradation, resource efficiency, environmental compliance practices for MSMEs.
- A virtual meeting was held on December 3, 2025, under the Chairmanship of the Joint Secretary (Chemicals) at Shastri Bhawan to discuss NITI Aayog's recommendations under the **OPEX framework.** ICC NRO officials attended the meeting, which centered on identifying priority chemicals based on import dependence, domestic production gaps, export potential, and their strategic importance for key sectors. The framework offers a systematic approach for assessing critical chemicals by examining supply-chain gaps, demand trends, and policy considerations. The insights shared during the meeting will support further detailed analysis and guide future work under the OPEX scheme.
- The **First International Conference on Science & Technology (S&T)** Clusters was held on December 4–5, 2025, at the Dr. Ambedkar International Centre, New Delhi, with participation from about 30 countries. ICC NRO officials also attended the conference. The conference focused on strengthening global partnerships and highlighted the S&T Clusters initiative of the Office of the Principal Scientific Adviser, which brings together academia industry, startups, and government institutions to develop collaborative, region-specific S&T solutions. With themes like EPR, waste management circularity, and emerging S&T interventions relevant to the chemical sector, the session also underscored the importance of shared technological capabilities, knowledge exchange, and coordinated efforts to address national and global challenges. The platform further enabled discussions on emerging areas of science to support India's expanding S&T landscape.

RESPONSIBLE CARE

94 companies have been approved to use the RC Logo, following in-depth RC Audit at their sites and corporate office. The RC activities of December 2025 are as follows:

ATTRIBUTES	NOVEMBER 2025
RC Logo New Audit	01
RC Recertification	02
RC Gap Assessment	01
Security Vulnerability Assessment (SVA)	00
RC Audit Training	00
TOTAL	**04**

- The Indian Chemical Council (ICC) was invited to share its perspectives at Siegwerk's supplier engagement program held on 11 December 2025 at Hilton, Mumbai, focusing on the Responsible Care initiative. As the voice of the Indian chemical industry and the nodal agency for the Responsible Care logo in India, ICC provided valuable insights into how the logo represents a company's sustained commitment to environmental protection, occupational health and safety, and pollution prevention. The session highlighted the tangible benefits of Responsible Care adoption in India, including enhanced trust with customers and partners, alignment with sustainable development goals, and improved HSE performance across industry value chains.

POLICY ADVOCACY AND REPRESENTATION

- **Anti-dumping investigation concerning imports of "Acetone" originating in or exported from Singapore, Korea RP, Taiwan, and Thailand-reg.**
  Date: 19 November 2025
  Context: DGTR initiated an anti-dumping duty investigation on imports of Acetone originating in or exported from Singapore, Korea RP, Taiwan, and Thailand, and sought detailed industry data such as Production, Domestic demand, Domestic Capacity, Imports and Exports for the last three years from stakeholders.
  Action: Available data on imports, exports, domestic consumption, installed capacity, and production of Acetone based on official statistics was submitted to department.

- **Submission of Advance License Details and Request for Clarification - Public Notice 33**
  Date: 19 November 2025
  Issue: One of our esteemed members faced delays in closure of Advance License files pertaining to Public Notice 33, despite submission of all required documents, and sought clarification on the status of file closure and applicability/payment mode of IGST or other dues.
  Action: A detailed Advance License information along with supporting and legal documents to the Office of the Chief Commissioner of Customs, Mumbai Zone-I, and formally requested clarification on pending communications, IGST liability (if any), and permissibility of payment through available GST credit.

- **Imposition of anti-dumping investigation concerning imports of "Phenol" originating in or exported from Singapore, South Africa, Thailand and the United States of America**
  Date: 27 November 2025
  Context: Department of Chemicals & Petrochemicals sought industry data and inputs in connection with the anti-dumping investigation on imports of Phenol originating in or exported from Singapore, South Africa, Thailand, and the United States of America.
  Action: Data on imports, exports, domestic consumption, installed capacity, production, top export and import destinations of Phenol, and shared the list of known Indian producers with the Department of Chemicals & Petrochemicals.

- **Request for Installed Capacity and Production Capacity data for 12 chemicals and petrochemicals - reg.**
  Date: 11 December 2025
  Context: Department of Chemicals & Petrochemicals sought installed capacity and production data for 12 chemicals and petrochemicals (under QCOs) for the period 2017–18 to 2024–25.
  Action: Representation consisting collected inputs from member companies and submitted detailed installed capacity and production data for Caustic Soda and Styrene-Butadiene Rubber (SBR) Latex to the Department.

- **Submission of Data for Review of RoDTEP and RoSCTL Rates 2025**
  Date: 16 December 2025
  Context: Department of Chemicals & Petrochemicals sought export-related data from industry stakeholders for review of RoDTEP and RoSCTL rates for the year 2025.
  Action: Data received from members in the provided format was submitted to the Department.

- **Issues faced by Indian Chemical Industry regarding ChemIndia Portal**
  Date: 17 December 2025
  Context: Indian Chemical Council (ICC), on behalf of the chemical industry, has been engaging with the ChemIndia Portal team to support effective implementation of the portal. Despite industry's willingness to comply, members raised concerns regarding certain information sought on the portal. Legal notices issued for compliance further highlighted the need for clarity. A comparative study conducted by ICC with the help of Product Stewardship Advocacy Expert Committee showed that some parameters requested in the ChemIndia Portal are not required in chemical inventory portals of other countries.
  Action: ICC submitted representations and held meetings with the Department, conducted sensitization workshops with DCPC, and requested review and exemption of the identified parameters while reaffirming industry's commitment to comply with regulatory requirements.

- **Inclusion of Non-Scheduled Precursor Chemicals (Mono Methyl Amine-MMA) under Schedule-A of Regulation of Controlled substances (RCS) Order of NDPS Act**
  Date: 17 December 2025
  Context: The Central Bureau of Narcotics proposed to notify Mono Methyl Amine (MMA) and 2-Bromo-4-Methylpropiophenone as Controlled Substances under the NDPS Act. ICC highlighted that MMA is a critical raw material for multiple key industries and expressed concerns that its inclusion under Schedule-A would disrupt production and supply chains.
  Action: ICC submitted a representation to Department of Chemicals and Petrochemicals and Central Bureau of Narcotics, proposing alternative controls such as end-use certification and strengthened record-keeping instead of Schedule-A notification.

INDIAN CHEMICAL COUNCIL - PLAN OF ACTIVITIES 2025-2026

DATES / MONTHS	EVENT DETAILS
JANUARY 2026	**One Day Course on Achieving Sustainability through Green Chemistry (Virtual)** **Date:** 17 January 2026
	4th Industry Institution Partnership Summit* **Location:** Chennai **Date:** 23 January 2026
	ICC ICT Training Programme on Environment & Safety for MSME in Chemical Industry **Location:** Kolkata University, Rajabazar Science College **Date:** 20 – 21 January, 2026
	Webinar on Cybersecurity focusing on innovative solutions and their cost-effective implementation for industrial protection **Date:** 23 January, 2026
	Workshop on "Chemical Burns Management" in association with HSE Solutions Pvt. Ltd. **Location:** The Bengal Club, Kolkata **Date:** 30 January, 2026
	ICC ICT Training programme on Environment & Safety for MSME in Chemical Industry **Date:** January 2026

DATES / MONTHS	EVENT DETAILS
FEBRUARY 2026	**Webinar on Utilizing AI to Enhance Process Safety** **Date:** 27 February, 2026 **Speaker: Prof. Rahul Nabar,** Adj. Professor, Department of Chemical Engineering , IIT Bombay
MARCH 2026	**19th Annual India Chemical Industry Outlook Conference & Exhibition*** **Location:** Grand Hyatt, Mumbai **Date:** 11-12 March 2026
	Refresher course on "Chemical Engineering for Plant Personnel" **Location:** Northern Region **Date:** March 2026
	Webinar on Digitalization Preparedness **Date:** 23 March, 2026
	ICC ICT Training programme on Environment & Safety for MSME in Chemical Industry **Location:** New Delhi / Chandigarh **Date:** 25 – 26 March 2026
April 2026	**Course on 'Cost optimization of chemical processes'** **Date:** TBD

For Enquiry & Registration: Email: iccmumbai@iccmail.in / trade@iccmail.in, Tel: 61144000

UPCOMING CWC AWARENESS PROGRAMMES AS ON 17 DECEMBER 2025

ICC HELP- DESK	VENUE	DATE
MUMBAI	INDORE	23.12.2025
DELHI	KOLKATA	23.12.2025
	DELHI	08.01.2026
	ITANAGAR	21.01.2026
	BHUWANESHWAR	19.12.2025
VADODARA	VADODARA	18.12.2025
	AHMEDABAD	19.12.2025
HYDERABAD	VIZAG	18.12.2025
	COIMBATORE	19.12.2025