TMETC
15th Thailand Metallurgy Conference

TCPC2025
The 5th International Thailand Corrosion Prevention and Control Conference

The Future of Thai Metallurgy: Synthesizing the Imperatives from TMETC-15 & TCPC 2025

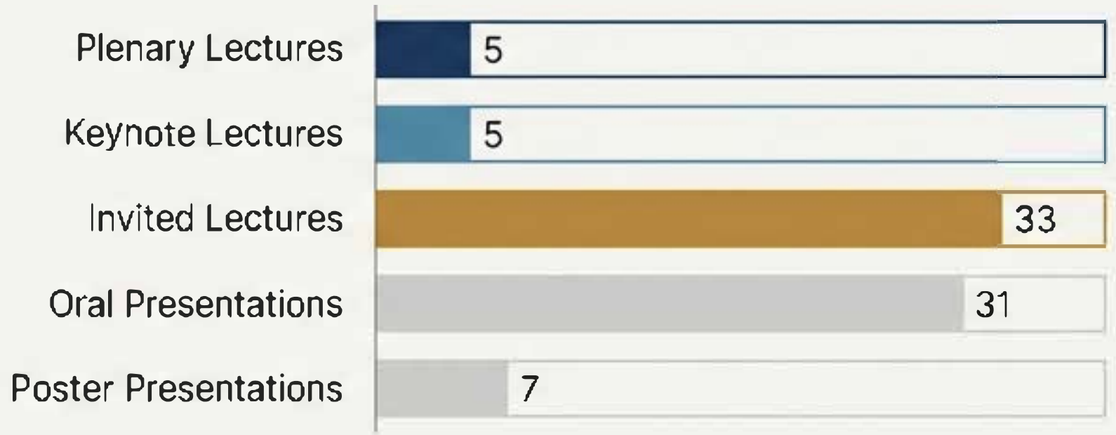
The 15th Thailand Metallurgy Conference and 5th International Thailand Corrosion Prevention and Control Conference crystallized the twin transformations required for future success.

> **"The Thai materials industry is at a critical inflection point. The conference revealed two essential transformations for future success: a digital leap to an AI-augmented paradigm and a strategic pivot to sustainable, high-value industries."**

A Landmark Convergence of Academia and Industry

15th Thailand Metallurgy Conference (TMETC-15) & 5th International Thailand Corrosion Prevention and Control Conference (TCPC 2025)

Dates: November 20-21, 2025
Venue: BITEC, Bangkok, Thailand



302

Total Participants (including 65 sponsor delegates)

Academic-Industrial Linkage Towards Innovative Metallurgy & Emerging Applications

- Energy
- Infrastructure & Construction
- Manufacturing & Process
- Transportation & Logistics

Our Mandate: Forging Academic-Industrial Links for Innovative Metallurgy

The conference was guided by the central theme: **"Academic-Industrial Linkage Towards Innovative Metallurgy & Emerging Applications."** This mission convened leading academics, researchers, and industry professionals to foster collaboration and catalyze advancements across vital sectors.

Organized By:

A Global and Local Ecosystem
Forging the Future Together

The success of the conference was powered by a broad coalition of industry leaders, government agencies, and academic institutions from Thailand and around the world, reflecting a shared commitment to advancing the field.

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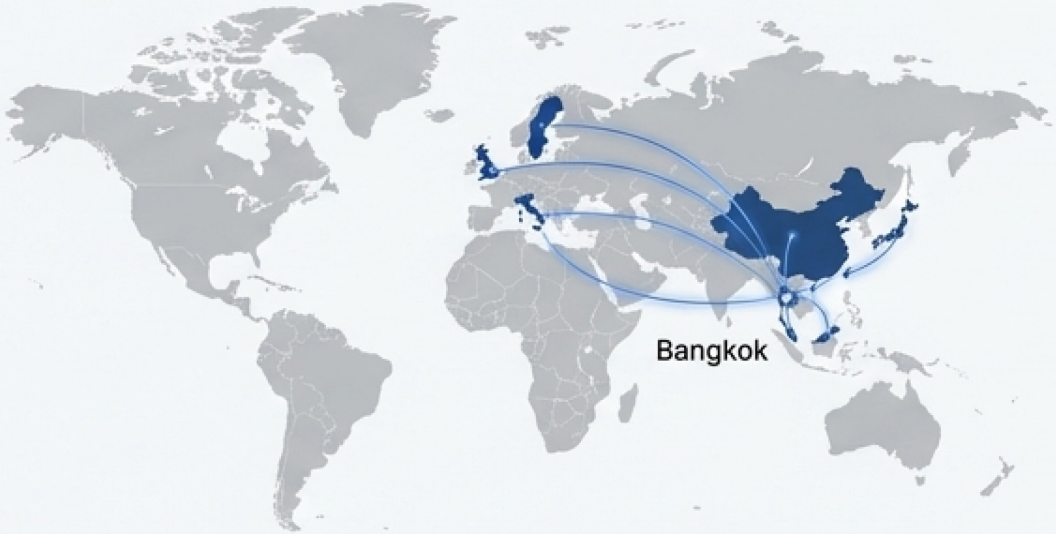


Featured plenary, keynote, and invited speakers from leading institutions and companies in **China, Japan, Sweden, United Kingdom, Malaysia, Taiwan, and Italy.**

A Confluence of Expertise: Where the Community Connects and Collaborates

Over two days, TMETC-15 & TCPC 2025 became a vibrant hub for knowledge sharing, robust debate, and the formation of new partnerships. The event facilitated critical conversations that will shape the industry for years to come.

Celebrating the Vanguard: Recognizing the Leaders of Today and Tomorrow

A highlight of the conference was the presentation of awards recognizing outstanding contributions to the field, from seasoned industry veterans to the next generation of researchers.

Thailand Metallurgist Award 2025

Academic: Asst. Prof. Dr. Songob Khumkoa, Suranaree University of Technology
Industry: Navy Captain Dr. Pinai Mungsantisuk, Thai Marine Protection Co., Ltd.

Young Outstanding Thailand Metallurgist Award 2025

Academic: Dr. Chanun Suwanprecha, National Metal and Materials Technology Center
Industry: Dr. Chaipat Tangpatjarone, Focuz Manufacturing Co., Ltd.

POSCO-Thainox Metallurgy Award

Graduate Level

Winner: Mr. Manusavee Taksadej, Thai Tohken Thermo Co., Ltd. & Chulalongkorn University, Thailand
Runner-Up: Mr. Tanabodee Praditja, Thai Tohken Thermo Co., Ltd. & Chulalongkorn University, Thailand

Undergraduate Level

Co-Winner:
Miss Suphannika Kaewkantha, Chulalongkorn University, Thailand
Miss Phatthira Thammachob, Chiang Mai University & National Metal and Materials Technology Center, Thailand

TCMA Award

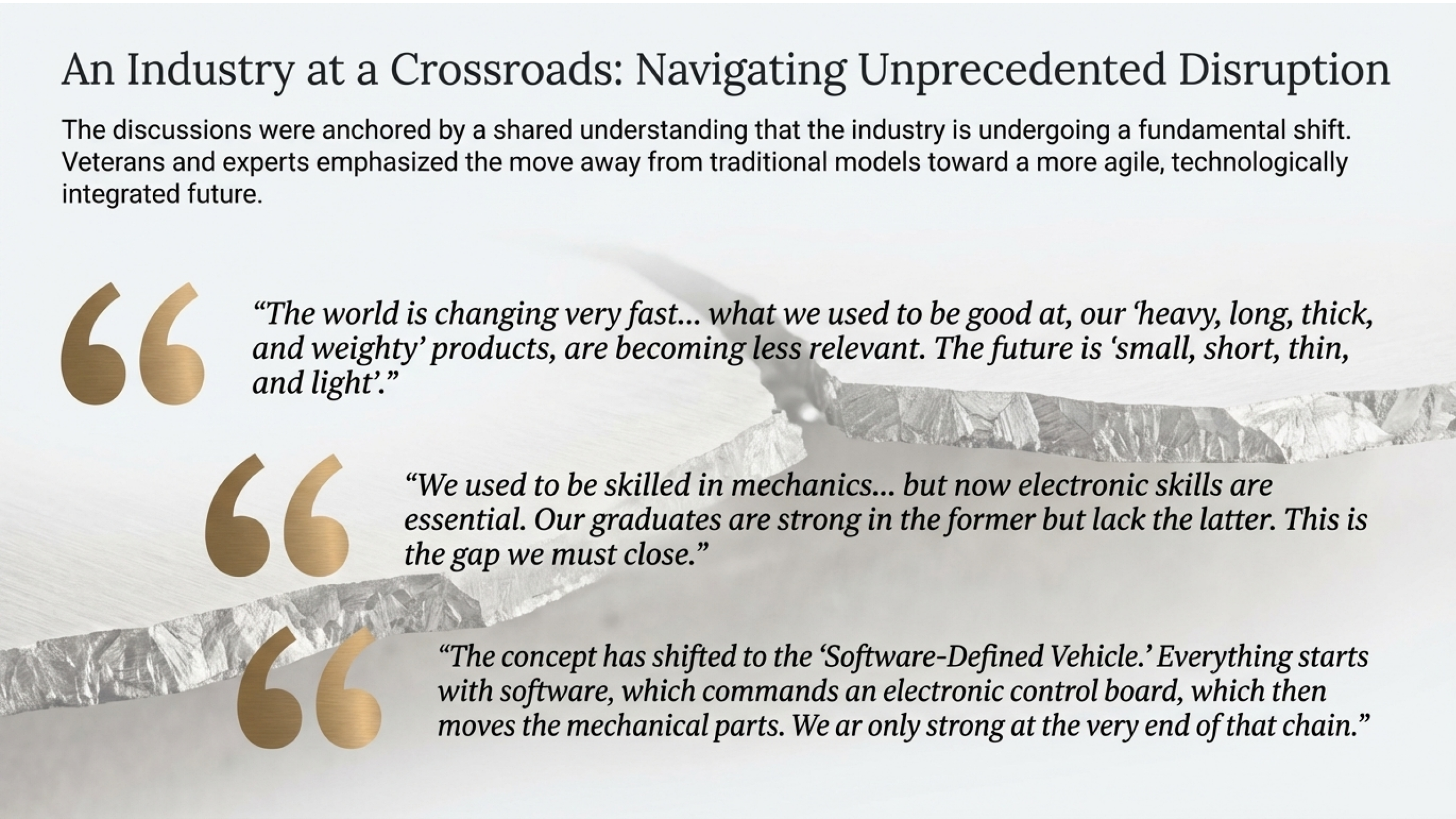
Winner: Yi Qin, University of Science and Technology Beijing, China
1st Runner-Up: S. F. Chou, National Taiwan University of Science and Technology & Industrial Technology Research I nstitute, Taiwan
2nd Runner-Up: Mr. Chanin Tangpongkitjaroen, Chulalongkorn University, Thailand

Poster Presentation Award

Winner: Miss Sumita Chailoi, Suranaree University of Technology, Thailand

An Industry at a Crossroads: Navigating Unprecedented Disruption

The discussions were anchored by a shared understanding that the industry is undergoing a fundamental shift. Veterans and experts emphasized the move away from traditional models toward a more agile, technologically integrated future.



> *"The world is changing very fast... what we used to be good at, our 'heavy, long, thick, and weighty' products, are becoming less relevant. The future is 'small, short, thin, and light'."*

> *"We used to be skilled in mechanics... but now electronic skills are essential. Our graduates are strong in the former but lack the latter. This is the gap we must close."*

> *"The concept has shifted to the 'Software-Defined Vehicle.' Everything starts with software, which commands an electronic control board, which then moves the mechanical parts. We ar only strong at the very end of that chain."*

The AI Imperative (1/2): The Train is Leaving the Station

Dr. Chatchai Somsiri, Advisor, MENAM Stainless Wire Public Co., Ltd.

A special session, "I Am สู่ AI" (From "I Am" to 'AI"), framed the transition from individual expertise to AI-augmented intelligence as the single most critical challenge for the modern metallurgist.

Who will ride, who will be left behind? ...The AI Express train is here. Engineers not equipped with AI will certainly be left behind. Their superiors won't see their value.

The AI Imperative (2/2): From Alloy Design to Quality Control

Beyond a theoretical concept, AI is being actively applied to solve complex metallurgical challenges. The conference highlighted its role in accelerating discovery and enhancing precision.

AI-Driven Alloy Formulation

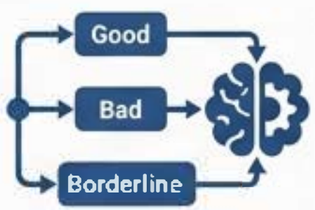
Plenary Lecture (PL-02) explored the role of metallurgists in driving industry from atomic diffusion kinetics to AI and machine learning-driven alloy formulation.

Predictive Analysis

Dr. Chatchai's talk detailed how AI can predict microstructure and mechanical properties, turning weeks of manual calculation into minutes.

Automated Defect Detection

Discussion of using AI-powered visual inspection and eddy current systems to meet 'zero defect' standards that are impossible for human inspectors to achieve at production speeds.



Machine Learning

Case studies showed how machine learning models are being 'taught' to distinguish between good, bad, and borderline products, continuously improving quality control.

The Green Transformation: Driving Innovation Through Sustainability

A central theme was the industry's role in the circular economy and decarbonization. Discussions moved beyond compliance to frame sustainability as a primary driver of innovation and a competitive advantage.

Key Concepts and Technologies Highlighted:

- **Green Transformation (GX):** A recurring term from the panel discussions, positioning environmental strategy alongside Digital Transformation (DX).

- **Circular Economy in Practice:**
  A. **Urban Mining:** Recycling and reusing metals from end-of-life products to reduce reliance on virgin materials. Highlighted presentations include 'Green Synthesis of Tin Oxide Nanoparticles from Soldering Waste' (C-O-20) and 'Dissolution of Valuable Metals from Cathode Active Materials of Li-ion Batteries' (C-O-19).
  B. **Biomass in Steelmaking:** Professor Wikrom's discussion on returning to charcoal (from sustainable forestry) instead of coal for steel production, a state-of-the-art approach rooted in ancient techniques.

Where Research Meets Reality: Applying Metallurgy Across Key Industries

The conference program was intentionally structured to bridge the gap between academic research and industrial application, with dedicated sessions addressing the specific challenges of four critical economic sectors.

Energy Industry

Managing corrosion in pipelines (PTT), improving reliability of asset-critical equipment (IGS), and managing next-gen boiler water (EGAT).

Infrastructure & Construction

Protecting reinforced concrete with galvanized steel (SIIT), innovations in geothermal systems (University of Leeds), and assessing weathering steel (MTEC).

Manufacturing & Process Industries

Advances in shot peening for fatigue life (Sintokogio), optimizing recycled aluminum alloys (KMITL), and emerging DLC coatings (Aurora Scientific).

Transportation & Logistics

Corrosion control for rail vehicles (Aokang Quality Inspection), anti-erosion coatings (Marine Chemical Industry Research Institute), and NDT for public transport safety (Dept. of Land Transport).

Wisdom from the Masters: Advice for the Next Generation

The ‘ล้อมวงสนทนาชาวโลหะ’ (Metallurgists’ Circle Talk) brought together a panel of highly respected industry leaders to share their experience and provide guidance for future career paths.

Embrace a Multidisciplinary Skillset

“

“The future requires a blend of Mechanical and Electronic skills. Combine Green Transformation (GX) and Digital Transformation (DX).”

Develop an Entrepreneurial Mindset

“

“You must have an ‘entrepreneurship’ mindset. Understand business, economics, and accounting, not just the science.”

Cultivate Resilience and Integrity

"Be tough, resilient, and persistent. Your reputation as a good, skilled person is what will ultimately make you successful."

Master the Art of Communication

“Life is sales. From day one until the end, you are selling. Be a good person and a skilled person, and the sales will follow.”

Three Core Takeaways for an Industry in Transformation

The industry's evolution is driven by technology, sustainability, and new partnership models. These are the essential action points for future leadership.

1

AI Integration is No Longer Optional

The transition from "I Am" to "AI" is an immediate imperative. Adopting AI for design, optimization, and quality control is now a baseline for competitiveness.

2

Sustainability is the New Engine of Innovation

The circular economy, decarbonization, and "Green Transformation" are not just regulatory hurdles but are becoming the primary drivers of new materials, processes, and business models.

3

Cross-Sector Collaboration is the Key to Success

The industry's biggest challenges—from EV batteries to aerospace components—cannot be solved in silos. Success requires deep, intentional linkages between academia, industry, and government.

The Journey Continues: Passing the Forge to the Next Generation

The conference concluded with the official flag transfer ceremony, ensuring the continued momentum of this vital platform for collaboration and innovation. The community looks forward to reconvening for the next chapter.

Key Event Highlight: The organizing flag was formally passed from Chulalongkorn University and the TCMA to **Kasetsart University**, the host of the next conference.

> *"We are inspired by the high standard set this year. It has given us a significant challenge, but we will do our best to continue this great work."*
>
> -- Assoc. Prof. Dr. Patiphan Juyjerm, Kasetsart University

Thank you to all sponsors, organizers, speakers, and attendees for making TMETC-15 & TCPC 2025 a landmark event.