

Frontiers symposium

**The business case for a
circular economy**

**4 to 6 August 2025
Bangkok, Thailand**



**Royal Academy
of Engineering**

Introduction to Frontiers

The Royal Academy of Engineering's Frontiers programme connects and empowers researchers, innovators and practitioners from the UK and around the world to work together on new ways to solve complex global challenges. The programme hosts thematic symposia events, bringing together around 70 of the best early- and mid-career researchers and practitioners from industry, academia, non-governmental organisations (NGOs), and the public sector in interdisciplinary workshops that address fundamental development challenges.

The symposium's objectives are to encourage collaborative work that addresses international development challenges and to promote cross-disciplinary thinking among the next generation of engineering leaders. Unlike traditional conferences, the Frontiers format is built for peer learning, group-based problem-solving, and long-term collaboration.

The result is not just knowledge-sharing, but partnership-building. Following each symposium, competitively allocated seed funding is available to small groups to strengthen and facilitate continued collaboration and development of ideas from the symposium.



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Symposium

Delegates met for three sessions over two and a half days, which were interspersed with networking opportunities, an external visit to the Bangkok Metropolitan Administration, and dinners. The symposium took place in Bangkok in partnership with Program Management Unit for Competitiveness (PMUC).

Symposium partner

Program Management Unit for Competitiveness (PMUC)

PMUC is a research funding unit that manages a research and innovation fund aimed at enhancing national competitiveness by creating innovations that enable industries to develop high-value goods and services to enter the global market.

PMUC facilitates collaboration between the public and private sectors in Thailand and from abroad and encourages joint investment from firms ranging from SMEs to large corporations.



Symposium participants in front of Wat Suthat Thepwararam in Bangkok, Thailand

Symposium chairs



Dr Debashish Bhattacharjee FREng – Lionstead Ventures LLP, India

Dr Bhattacharjee has over 40 years of experience in materials science, industry, and entrepreneurship. With a PhD from the University of Cambridge, he led global technology at Tata Steel, driving advances in decarbonisation and valorisation technologies. He has been recognised with numerous distinctions, including Fellowship of the Indian National Academy of Engineering and the Government of India's National Metallurgist award.

Dr Bhattacharjee is now Managing Partner at **Lionstead Ventures LLP** and Professor of Practice at **IIT Madras**, focusing on deep-tech innovation and sustainability.



Dr Jintawat Chaichanawong – PMUC and Thai-Nichi Institute of Technology (TNI), Thailand

Dr Chaichanawong is Program Director of the Circular Economy Programme under **PMUC**, and Director of the **Centre of Research Excellence in Material Engineering and BCG Economy** at TNI. He is a leading expert in chemical and materials engineering, with research interests in bio-based materials, waste-to-energy innovation, and carbon-neutral technologies such as biocoke derived from agricultural residues.

With extensive international collaborations and deep experience across academic and policy spheres, he plays a key role in bridging research, industry, and policy to drive innovation in circular economy and sustainable development.

The Bangkok Symposium: The business case for a circular economy

From 4 to 6 August 2025, 64 researchers, practitioners and innovators from over 20 countries gathered in Bangkok to explore the business case for a circular economy. The event brought together a cross-sector group – engineers, entrepreneurs, designers, policy specialists and academics – all working at the intersection of sustainability, innovation and inclusion.

In partnership with PMUC, and chaired by Dr Debashish Bhattacharjee FREng (India) and Dr Jintawat Chaichanawong (Thailand), the symposium combined case studies, critical discussion and group work over three days.

Participants came from Southeast Asia, South Asia, Sub-Saharan Africa, South America and Europe. Many were already advancing circular solutions in e-waste, digital traceability, sustainable packaging, composting and product design, but few had worked across these silos.

With voices and expertise from all around the globe attending, the symposium agenda included three thematic sessions featuring presentations from innovative organisations, addressing the key areas for growing the circular economy, namely **digital solutions and creative design, inclusive systems and policy development, and waste valorisation and financing.**

Dr Bhattacharjee encouraged delegates to use the symposium to connect across disciplines and sectors, and to turn ideas into challenge-led collaborations with real environmental, economic and social impact, saying “Circularity is not just an outcome of our work – it is the method. Progress will only happen when we break silos and connect expertise across disciplines.”

“Circularity is not just an outcome of our work – it is the method.”

Dr Bhattacharjee

Dr Chaichanawong underlined PMUC's mission to bridge research, industry and policy, urging participants to leverage diverse expertise to co-design inclusive systems and sustainable financing pathways, telling the symposium, “We must redesign, reduce, repair and recycle. But above all, we must work together – across sectors and borders – to create systems that are inclusive, innovative and financially sustainable.”

“We must redesign, reduce, repair and recycle. But above all, we must work together.”

Dr Chaichanawong





Several collaborations are now progressing into seed-fund proposals – a reflection of the chairs' focus on partnership-building and practical outcomes.

Across all discussions, the emphasis was on grounded innovation: building circular economies not just as an environmental imperative, but as a practical path to competitiveness, resilience and community wellbeing.

This report summarises the key findings from the session discussions, with the following overarching insights across the sub-themes:

1. Circularity is a business strategy: demonstrating that circular economy models can be commercially competitive and socially inclusive.

2. Inclusion is infrastructure: inclusion requires collaboration at all stages of the process between governments, the private sector, communities, and the informal workforce to design systems that work for all.

3. Systemic change, not surface tweaks: circularity requires redesigning materials, incentives, policies, partnerships and mind set shifts.

4. Finance and policy as enablers: targeted regulation with adequate enforcement and investment are the keys to unlocking progress.

5. Urgency meets optimism: Despite systemic challenges, the tone was pragmatic and hopeful, rooted in what's already working across Africa, Asia, and Latin America.





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Digital solutions and creative design for the circular economy

Session chair presentations

1. **Pilot activity on plastic waste management in Padang, Indonesia: Building a foundation for collaborative work through digital integration**

Miho Hayashi, Institute for Global Environmental Strategies (IGES), Japan

2. **Innovating waste management solutions for circular economies in Africa**

Mary Ngechu, TakaTaka Ni Mali, Kenya

3. **A circular economy product-as-a-service platform**

Nophol “Naps” Techaphangam, Nornnorn, Thailand

Key takeaways

- Technology as a connector: a digital app can connect a fragmented circular economy, strengthening existing systems by improving coordination and transparency between waste banks, aggregators, and municipal services.
- Human-centred approach: the most successful innovations focus on the people at the centre of the system.
- Circularity is a business strategy: case studies from Thailand and Kenya prove that circular economy models are not just about environmental benefit but are also commercially competitive and socially inclusive.
- Extending product life and rethinking design requires a mix of market innovation and practical services, from creating secondary markets with hygiene certification to offering cleaning, refurbishing and even “bed insurance”.
- Simplifying design and reducing materials makes reuse and recycling easier, while alternative end-uses (e.g. erosion control, sound insulation) can capture residual value.



This session focused on *upstream circularity* – designing waste out before it exists –and using digital tools to connect fragmented actors. Speakers showed how **digital integration** can strengthen existing informal systems, how **traceability and incentives** can formalise work without erasing it, and how **product-as-a-service** models make circularity commercially viable. Together, they illustrated a pathway from pilots to scale: build institutional capacity, create trusted data flows, and align business incentives from the start.

Pilot activity on plastic waste management in Padang, Indonesia: Building a foundation for collaborative work through digital integration

Miho Hayashi (IGES)

Miho Hayashi presented a pilot from Padang City which uses digital integration to link waste banks, aggregators, off-takers and the municipality. It aims to boost source segregation, strengthen the business viability of waste banks, and improve coordination and transparency. Grounded in Padang's Integrated Solid Waste Management (ISWM) studies and 2023 to 2030 action plan, the tool is framed as *foundational infrastructure* for better collection, reporting and stakeholder alignment that reduces leakage and pollution while preparing the city for longer term systems change.

"Data is indispensable – not only for business decisions but also for making policy," noted Hiyashi. "With the right tools, we can turn waste flows into knowledge that empowers communities and guides better solutions."



Miho Hayashi

Innovating waste management solutions for circular economies in Africa

Mary Ngechu (TakaTaka Ni Mali)

In Mary Ngechu's presentation, we heard about how Ecomali connects collectors, aggregators and buyers through transparent, data-rich transactions with mobile payments and carbon-credit potential. By making recovery traceable and rewardable, the platform helps informal workers capture value, supports extended producer responsibility (EPR) and ESG compliance for brands and regulators, and turns "waste" into a reliable, compensated resource flow – formalising with the informal sector rather than against it.



Mary Ngechu

Circular economy product-as-a-service platform

Nophol “Naps” Techaphangam (Nornnorn)

Nophol “Naps” Techaphangam took us through how mattress manufacturer Nornnorn operationalises the product-as-a-service model in Thailand and Indonesia, using e-commerce and fintech to embed repair, reuse and end-of-life recovery in their manufacture, sales and distribution from day one. The firm pairs operations with evidence (including life cycle assessment resources) to show commercial and environmental benefits, positioning circularity as a growth strategy rather than a constraint.

“Circularity isn’t the end of growth – it’s a smarter way to get there.”

Nophol “Naps” Techaphangam



Nophol “Naps” Techaphangam

Group activity

After hearing case studies on digital tools and product-as-a-service models, participants broke into mixed teams to apply the ideas to a practical challenge: How can upstream design and digital innovation extend product life and reduce waste?

Working together, the groups clustered ideas under five themes:

- Market expansion: find new outlets for used products by combining them into secondary markets, from budget hotels to student housing.
- Reuse: create certified hygiene processes, develop cleaning companies and techniques, and resell to lower-cost customer segments.
- Redesign: simplify product complexity, replace unsustainable materials, and experiment with dematerialisation strategies.
- Recycle/downcycle: test alternative applications for residual waste streams, such as erosion control or sound insulation.
- Product life extension: build services that increase longevity, such as cleaning tips, refurbishment offers, and even “bed insurance” to incentivise maintenance.

The exercise highlighted that circularity is rarely a standalone intervention. Instead, it requires a portfolio approach, pairing design decisions with service innovations and market strategies to capture value across the product lifecycle.



Inclusive systems and policy development for circular practices

Session chair presentations

1. Waste-picker-led, city-scale solid waste management

Lakshmi Narayanan,
Kashtakari Panchayat, India

2. Building inclusive circular economies

Zoë Lenkiewicz, Global Waste Lab, UK

3. Policy levers for circular economy implementation

Kiera Crowe Pettersson,
ICLEI Africa, South Africa

Key takeaways

- Inclusion delivers results: formal partnerships with waste-picker cooperatives can raise performance and equity.
- Use “sympathetic formalisation,” not top-down fixes: build on existing expertise, provide capacity and economic incentives, maintain autonomy, and transition gradually.
- Make the economics work for workers and cities: user-fee models plus value recovery can fund dignified livelihoods while cutting municipal costs; fiscal incentives and EPR-aligned measures help scale inclusive systems.
- Governance, data and social protection matter: elected representation, standardised reporting, traceability, and access to welfare and insurance underpin accountability, safety and a just transition, especially for women and marginalised groups.
- Inclusive circular systems depend as much on governance and finance as on technology.
- Localised solutions such as reuse, composting, biogas, or small-scale energy recovery are needed, instead of imposing uniform recycling models. Community ownership and awareness-raising are also essential.



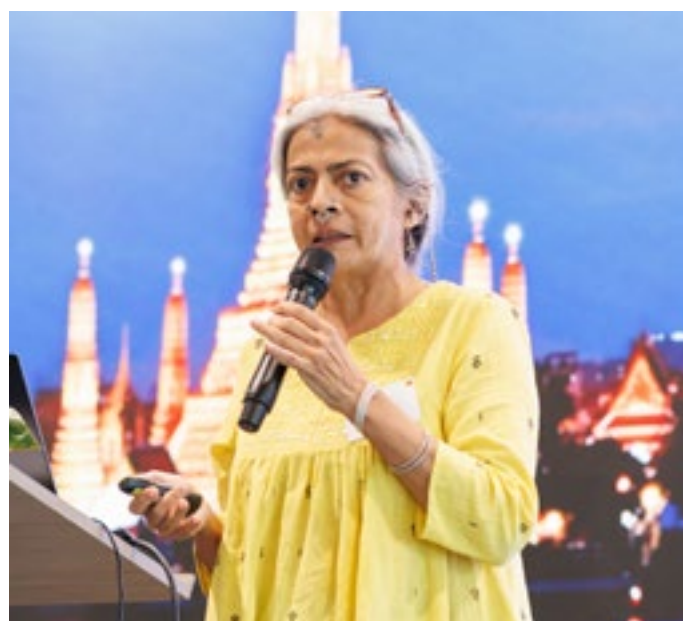
This session examined how circular transitions become just and workable when they recognise existing informal expertise, put the right policy levers in place, and make the economics add up for workers and cities.

Together, the talks reinforced that inclusion requires governance, data and traceability, and social protection – not just new infrastructure – and that transitions must be sequenced, context-specific and economically viable.

Waste-picker led, city-scale solid waste management

Lakshmi Narayanan,
Kashtakari Panchayat, India

Lakshmi Narayanan showed how SWaCH, India's largest waste-picker-owned cooperative, delivers door-to-door service funded by user fees and governed by elected representatives. Integrated with the Pune Municipal Corporation, the model achieves ~98% source segregation, ~35% dry-waste and ~37% plastic recovery, alongside social welfare access for workers and ~\$11.6 million annual savings to the municipality. Narayanan emphasised how inclusion was central to the success of the project, saying, "recycling without waste pickers is just garbage", and emphasising how the scheme fostered dignity and identity among pickers. SWaCH was framed as being part of a just transition, promoting gradual systems change while drawing on the strength, expertise and depth of knowledge of pickers.



Lakshmi Narayanan

Building inclusive circular economics

Zoë Lenkiewicz, Global Waste Lab, UK

Zoë Lenkiewicz argued for the "Sympathetic Formalisation Framework" based on six key principles:

- recognise existing expertise
- build capacity
- create incentives
- maintain autonomy
- ensure sustainability
- support a gradual transition.

Giving Colombia as an example, she noted 697 organisations registered, 56,800 workers formalised, and 5% monthly growth in recycling rates. Lenkiewicz explained the progress is meaningful yet uneven and sensitive to market conditions – underscoring the need to tailor pathways for villages, small islands and megacities rather than impose one-size-fits-all rules.



Zoë Lenkiewicz

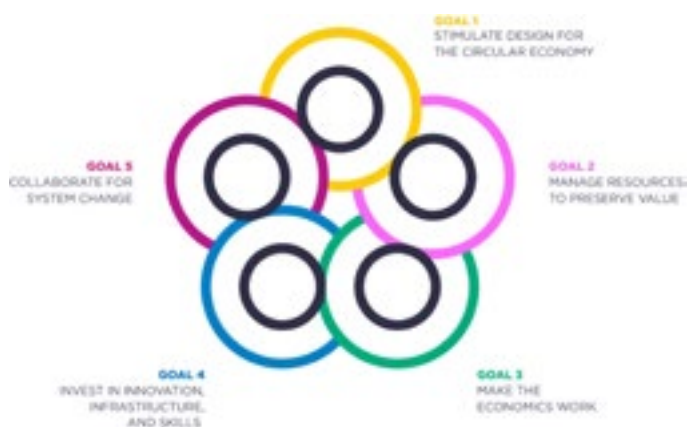
Policy levers for circular economy implementation

Kiera Crowe Pettersson, ICLEI Africa, SouthAfrica

Kiera Pettersson translated inclusion into policy design, mapping measures against EMF's five goals:

- Standards and design for durability and modularity
- Systems to preserve value (such as collection and sorting, product-as-a-service)
- Fiscal shifts to make the economics work
- Investment in infrastructure, innovation and skills
- Platforms for collaboration and cross-border alignment

The message: pair legal recognition and finance with capacity, data and skills so local governments can build circular economy systems that fit their realities.



EMF five goals



Kiera Pettersson

Group Activity

Following presentations on waste-picker cooperatives, policy frameworks and “sympathetic pathways” to formalisation, participants were asked to step into the shoes of policymakers. In mixed-sector groups, they designed policy packages that could both support inclusion and make circular systems financially viable.

The groups clustered challenges around costs, capacity and lack of awareness. Transport and recycling expenses often exceed local budgets; communities and municipalities may lack the institutional capacity to manage complex waste streams; and some sectors, such as tourism, remain unaware of their potential role in driving change.

From this diagnosis, several solutions emerged:

- New funding streams, such as a tourism tax or greater national allocations for municipal waste services.
- Strategic planning and regional coordination to pool resources and expertise.
- Localised processing to cut transport costs and enable more practical recovery, including composting, biogas and small-scale energy-from-waste.
- Source segregation and storage to improve feedstock quality.
- Context-sensitive choices: recognising that in some settings, reuse or composting may make more sense than costly recycling.

The exercise reinforced that inclusive circular systems cannot be copy-pasted. They must be designed for the realities of local economies, funded with predictable resources, and implemented through gradual, supportive pathways that value existing informal expertise while building towards formal recognition.



Waste valorisation and financing strategies

Session chair presentations

1. Safe, inclusive and circular e-waste management

Deepali Sinha Khetriwal,
E[co]work, India

2. Waste not, want not: regenerating Africa's soils through composting

William (Billy) Bray,
WASTE Advisers, Malawi

3. Ugly veggies plus: a circular economy model for sustainable food systems

Associate Professor Phaninee Naruetharadhol, Khon Kaen University, Thailand

Key takeaways

- Valorisation is investable: clear revenue models exist across e-waste, organics and agri-residues when infrastructure, skills and offtake are in place.
- Design for inclusion: facilities and finance must be designed with and work for informal operators (including tools, training, safe workplaces, and market linkages).
- Targeted incentives unlock scale: align user fees, public subsidies and carbon and impact finance to de-risk early-stage companies and crowd in private capital.
- Traceability builds trust: digital measurement of inputs, origins and emissions (such as blockchain and life cycle assessment) strengthens market access and policy credibility.
- Local systems, regional learning: decentralised models (such as Blantyre compost) thrive when adapted to context and connected to wider policy goals.
- Turning waste into value requires sector-specific solutions but also common enablers: traceability, new business models, and decentralised processing.

This session explored how waste streams become economic inputs with the right mix of infrastructure, skills and finance. Speakers highlighted how key themes, including decentralisation, “plug-and-play” accessibility, targeted incentives and credible data can make valorisation investable at scale.



The business case for better e-waste management

Deepali Sinha Khetriwal, E[co]work, India

Deepali showcased how E[co]work reframes formalisation as plug-and-play: a co-working facility where informal collectors, aggregators and dismantlers can access safe space, tools, training and buyer links without first navigating licensing and paperwork.

It's designed as an interface that solves pain points for all parties: recyclers want reliable feedstock, producers need traceable EPR credits, and regulators can't effectively police atomised informal yards.

The model emerged from participatory design with workers in Delhi, surfacing what they actually need: security, hygienic facilities, predictable market access, and acknowledging the diversity of roles along the informal chain. The pilot also highlighted the community dynamics at play: how cooperatives, family networks and peer-to-peer trust shape the way work is organised, and why a one-size-fits-all approach often fails.

The discussion drew out the role of the regulatory framework too, noting that without clear recognition and enforceable standards, informal workers remain vulnerable even when they enter more formalised spaces.



Deepali Sinha Khetriwal

Waste not, want not: regenerating Africa's soils through composting

William "Billy" Bray, Waste Advisers, Malawi

William Bray of Waste Advisers in Malawi demonstrated how unit economics improve when you fix the system, not just the site. To curb "fake compost" (sold as soil), the team created thermophilic compost certification with the Malawi Bureau of Standards, selling a "living product" (microbial activity as a quality signal) rather than a mere fertiliser substitute.

Malawi spends \$90 million per year subsidising synthetic fertiliser, and globally \$530 billion goes to agriculture-input subsidies, with less than 5% to sustainable inputs.

Waste Advisers' pilot now buys and re-subsidises compost to 1,000 farmers at parity with fertiliser, with a university evaluating outcomes as part of a push to shift national subsidies. Waste Advisers also brought in the Malawi Circular Economy Network to keep the whole chain aligned.



William "Billy" Bray



Ugly Veggies Plus: advancing sustainability in organic agriculture through technology and waste valorisation

Associate Professor Phaninee Naruetharadhol, Khon Kaen University, Thailand

Between 30-50% of crops produced by farmers in Thailand's Khon Kaen province are lost as “ugly veg”, unsuitable for consumer shelves. Associate Professor Phaninee Naruetharadhol presented a case study where, starting from a consumer preference problem, the Ugly Veggies platform lets farmers list produce, set prices and choose logistics, with the university helping on packaging and cold chain for transport to Bangkok.

After a year, about 5% residue still remained; the team valorised it into protein bars, compost soil and biodegradable plastic. They validated its performance with life cycle assessment, finding up to 40% CO₂ reduction, with 20 to 30% lower production costs, and a social return on investment (SROI) of 1.29. Crucially, the work changed vegetable production from a linear flow to a circular flow.



Professor Phaninee Naruetharadhol

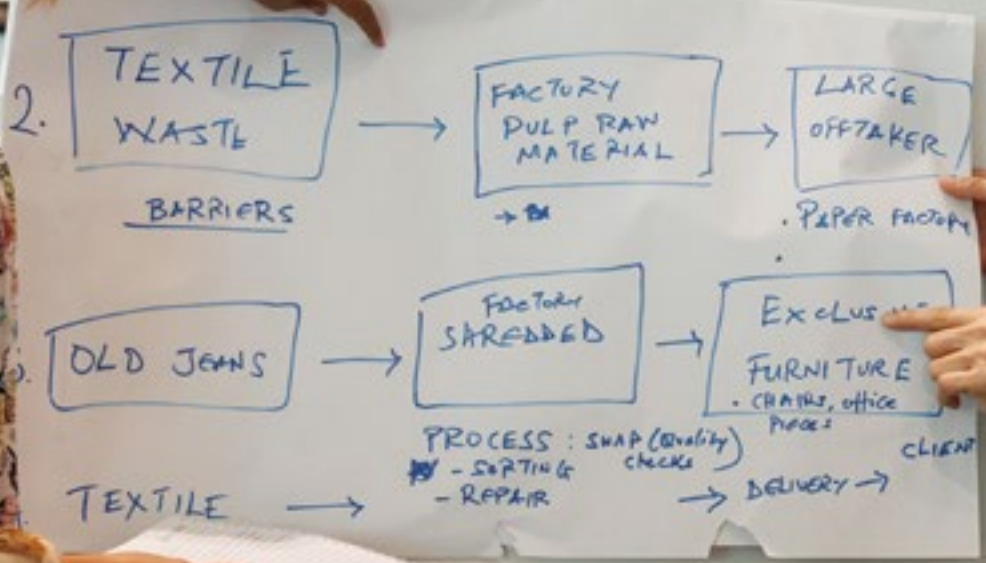
Group Activity

To close the session on valorisation and financing, participants took part in a hands-on exercise. Each table was asked to take a different material stream (e-waste, textiles or organics) and map the value chain, the barriers at each stage, and the private-sector solutions that could unlock investment. Finally, they were challenged to pitch their ideas as if to an investor panel.

- On the e-waste boards, groups traced the chain from mining and manufacturing through to dismantling and disposal, identifying barriers like high costs, weak enforcement, missing standards and consumer resistance. Solutions included digital product passports, dismantling hubs, and leasing models to spread costs and keep products circulating.
- The textile groups turned to creativity and consumer behaviour. Ideas included modular clothing (“clothes that grow”), fibre-to-fibre recycling, repair centres linked to online marketplaces, and swap apps using alternative currencies. Others sketched out co-working spaces for upcycling and digital marketplaces for vintage clothing. The common theme: design for adaptability, and give consumers visible, easy ways to take part.
- For organics, participants mapped barriers from logistics and contamination to weak regulation and limited demand for compost. Their solutions emphasised decentralisation – in-situ composting, community biogas plants, rooftop farming, P2P waste-matching platforms – as well as financial innovations like green credits and franchise models for composting. One group pitched an AI app to optimise collection routes and lower transport costs.
- Across all three streams, the activity made the same point: circularity becomes investable when practical innovations are paired with credible metrics, new business models, and enabling finance.



- #1 ~ Seat Belts → designer goods
- #2 ~ Pulp Repurpose → breakdown old textiles
↳ sell to factories
- #3 ~ Repair Centre → send clothes to be fixed
↳ online marketplace
- #4 ~ Swap App → alternative currency
↳ app membership
↳ people pay for events



Transformative Action in Waste

Charlie Fenn, Engineering X and Miho Hayashi, IGES

This spotlight session showcased a major cross-regional initiative, funded by the Climate and Clean Air Coalition, led by Engineering X with partners: IGES, International Solid Waste Association, Practical Action, and UN-Habitat: the development of national and regional roadmaps to phase out open burning of waste across Africa, Asia and Latin America. The project is part of a wider Engineering X programme focused on Safer End of Engineered Life, for which many of the symposium participants are awardees, working towards global coordinated action to end open burning of waste.

Despite growing awareness of its harms, open burning remains one of the most widespread and dangerous waste management practices. It is responsible for severe health impacts, air pollution, and toxic black carbon emissions. Yet in many contexts, it persists not due to lack of policy or awareness, but because enforcement is weak, and there is a lack of alternative solutions.

Africa: Regional roadmap targets 2040 phase-out

In Africa, more than 3 billion kilograms of waste are burned every year, much of it in urban and peri-urban environments. The regional roadmap, recently endorsed by 54 African Ministers for Environment, includes:

- City action plans for infrastructure and enforcement, including monitoring frameworks
- A Transformative Action Framework focused on policy and legislation, financing and behaviour change enablers
- Tackling the critical lack of data on open burning across the continent

The next step is to focus on the implementation of the roadmaps at the city level, translating learnings back to the regional.

Asia: Pilots underway in Laos, Maldives and Iraq

In Asia, pilot programmes are testing how local governments and communities can transition away from burning. The biggest challenge? Not lack of legislation, but poor enforcement. Pilots aim to support:

- Integrated waste collection systems
- Practical alternatives to burning
- Realistic timeframes for national implementation

“Without local consultation, the roadmap is just a shelf decoration.”

Miho Hayashi, IGES

The session called for increased coordination across governments, funders, and technical experts, and underscored the role of engineers in creating scalable, community-driven waste management solutions. It also sparked discussions among participants about how their own countries might adapt the roadmap model – and what support would be needed to move from policy to practice.



Insights from government, academia, and industry leaders

Throughout the symposium, keynote speakers brought depth and perspective to the core themes of circular economy – connecting grassroots innovations to national policy, global funding, and long-term systems change.

Keynote 1

Pavich Kesavawong, the Deputy Director General, Department of Climate Change and Environment, Thailand, spoke on 'Propelling the circular economy towards net zero policy: the national and international perspectives'. He explained how initiatives like low-carbon communities and green hotels emphasised low-emission and zero-waste communities, as well as the circular economy measures outlined in the Thai government's Decarbonisation Pathway, NDC Action Plan and National Adaptation Plan.

His keynote described circular economy actions across the value chain. These included reducing virgin materials, systematic recycling and reuse, eco-design, circular business models (such as product-as-a-service), and life-cycle carbon management. He also highlighted the enabling policy under the draft Climate Change Act.



Pavich Kesavawong

Keynote 2

Dr Kanittha Tambunlertchai of Chulalongkorn University spoke on 'Incentivising the circular economy in Thailand and beyond'. She stressed how a circular economy creates value but faces cost disadvantages compared with linear models, which currently have lower capital costs, simplified supply chains and easier access to finance. Dr Tambunlertchai suggested that the key to unleashing the circular economy was overcoming institutional barriers and even creating new institutions that motivate the protection of natural resources. After outlining ASEAN's Framework for a Circular Economy for the ASEAN Economic Community and giving regional case studies such as Malaysia's reverse vending machines, she warned that there remains a lack of coordination between public, private, and civil sectors and that rules and policies often exist but are weakly enforced.



Dr Kanittha Tambunlertchai

Keynote 3

Speaking on 'The private sector's role to drive Thailand's plastic circularity through public-private partnerships', **Poranee Kongamornpinyo, Executive Vice President of Corporate Affairs and Southeast Asia & ANZ Public Affairs, Dow and Communication Taskforce Leader, PPP Plastics Association**, gave a detailed presentation on the role of the Public-Private Partnership for Sustainable Plastic and Waste Management (PPP Plastics), which aims to achieve 100% circularity for target plastic waste by 2027. Kongamornpinyo highlighted achievements so far, such as plastic labelling, community and city models, and databases for plastic waste and recycled resin. She described the "Magic Hand", a plastic film collection initiative; smart recycling hubs in Bangkok and Rayong to recover high-quality plastic feedstock; and initiatives to scale up standards for individual trash pickers and junkshops. Kongamornpinyo ended the presentation by telling attendees, "Collaboration is the key... You are our valuable partners," noting that "the project will not be sustained if we don't connect all the dots along the value chain."

"The project will not be sustained if we don't connect all the dots along the value chain."

Poranee Kongamornpinyo



Poranee Kongamornpinyo

Bangkok Metropolitan Administration (BMA)

On the second day of the symposium, participants attended a networking session hosted at the Bangkok Metropolitan Administration.

The session included a presentation by **Pornphrom Vikitsreth**, Advisor to Governor of Bangkok and Chief Sustainability Officer of Bangkok, who outlined the city's transition toward sustainable waste management and discussed the emerging impacts of these initiatives on Bangkok's urban development and environmental resilience.

Pornphrom outlined how the city is shifting from reactive clean-ups to data-driven, people-centred waste management. Bangkok generates more than 9,000 tonnes of waste per day (of which about 50% is food waste) at a cost of 7 billion Thai baht per year. The BMA's revenues from waste collection fees come to just 500 million baht, underscoring the need for source separation and system redesign. He presented several initiatives, such as:

- **Food-waste first:** BMA is rolling out separation models for large, medium and small sources. Actions include dedicated pick-ups at fresh markets, more than 1,000 restaurants enrolled in a medium-source scheme, and a 2025 district target of at least 50 medium-source collections per district. The current capture rate is about 300 tonnes per day, with a 2026 goal of more than 1,000 tonnes per day.
- **Policy and pricing:** a draft waste-separation ordinance and 'pay-as-you-throw' will align incentives; households register and implement separation, and trucks move to separate onboard containers (food,

recyclables, hazardous, general) to build trust that separation is maintained. This came in response to issues such as insufficient trust in the waste management system, as well as a lack of information and infrastructure.

- **Behavioural evidence:** a Program Management Unit on Area-based Development study of 150 households tested communication, buckets for different types of waste collection and a small economic incentive. The takeaway suggested pairing infrastructure and incentives to shift behaviour at the household level.
- **Digital engagement:** the Traffy Fondue LINE app empowers citizens to quickly and easily report issues such as flooding or potholes in their neighbourhood. Whereas previously submitting reports or complaints to local government involved navigating a layer of bureaucracy (with seven approvals required for a submission to the governor's office), the app allows people to submit complaints directly via a chatbot, aiming to reduce response times from the authorities and increase trust in the authorities among citizens, who are then even more encouraged to take action. Over a million cases have been logged, more than 830,000 completed, with average resolution time cut from over 2 months to less than 2 days in three years. BMA is extending digitisation to GPS-tracked garbage trucks, open data, and real-time ops as part of its "Smart Enough City" approach.



Insights session

At the close of the symposium, the event co-chairs facilitated an exercise to help participants identify key insights and plan strategic goals. Participants clustered actions into short-, medium-, and long-term goals that reflect the week's core themes (digital and design, inclusion and policy, valorisation and finance).

Short term (1 to 3 years): get moving with no-regret actions	• Form cross-border project teams and draft seed-fund proposals; use the Frontiers programme's linking up / proposal planning and funding and pitching scaffolds to shape scopes, roles and timelines. • Pilot digital integration in select cities (for example, waste bank coordination, traceability for informal recovery) to create trusted data flows and improve collection and segregation. • Launch municipal inclusion pilots with cooperatives and SMEs using "sympathetic pathways" that recognise existing expertise, build capacity, create incentives, and maintain autonomy. • Start valorisation micro-projects (e-waste co-working, decentralised compost, agri-residue upcycling) to prove unit economics and offtake.
Medium term (1 to 10 years): build enabling systems	• Develop EPR operational models (including fee structure, registry, and data) and align with regional cooperation to reduce friction for recyclers and cities. • Invest in local manufacturing and processing capacity (such as materials recovery facilities, repair and refurb hubs, safe dismantling), with workforce training and professionalisation of informal actors. • Roll out digitised waste systems (such as standardised reporting, traceability, open registries) to support compliance, finance, and market access.
Long-term (over 10 years): redesign the system	• Embedded circular economy across policy, finance and culture so "waste" is designed out via product standards, business models and incentives. • Align national and regional roadmaps (for example, ending open burning) with realistic implementation and monitoring timelines to lock in health and climate co-benefits.

Enablers and watch-outs

- Collaboration is the method: cross-sector partnerships are the fastest route from pilot to policy and investment.
- Value informality: avoid top-down “erase and replace” approaches; build with existing community expertise and transition gradually.
- Data with purpose: traceability and standardised reporting unlock EPR, finance and accountability. Don’t over-engineer before proving use-cases.
- Finance sequencing: blend early grants and corporate social responsibility with public support and private capital as ventures mature; pair incentives with clear offtake.

How we’ll know it’s working: the metrics participants proposed

- Project formation and funding: number of cross-country teams formed; seed-fund applications and awards.
- Inclusion outcomes: workers or SMEs integrated via cooperative and registry models; access to training, insurance and social protection.
- System performance: % source segregation, recovery rates, verified EPR credits, and quality-assured compost/materials reaching markets.
- Evidence of impact: LCA/SROI or equivalent to demonstrate carbon and social value, feeding back into policy and finance decisions.

The Bangkok activities reinforced a central lesson: that collaboration is the way we build investable, inclusive circular systems.



Participants reflections

From Ethiopia to India, Malaysia to Nigeria, participants brought a range of experiences and left with new allies, sharper ideas, and renewed energy.

Making sustainability mainstream

“The challenge I face in my industry... most people think sustainable materials are a luxury. When we try to sell to business owners, they go for the cheaper one, whether it’s sustainable or not. From this symposium, I got insights into the systematic way of approaching these people, and how to make them agents of sustainability.”

**Afomia Andualem Bogale,
Agelgil Eco-Packaging, Ethiopia**

Translating tech into community impact

“The biggest insight was the amazing work people are already doing at the community scale. In India, Lakshmi spoke about the network of waste pickers they’ve developed and upskilled. I’m planning to apply with her – to take my biomass-to-biochemicals technology into the community using this whole new network I’ve just stumbled upon.”

**Parimala Shivaprasad,
University of Nottingham, UK**

Policy relevance and new directions

“The discussions here have enriched my thoughts and opened up how waste management and circular economy must be established – from policy and laws, to regulation, community engagement and active participation. I’m leaving with comparative insights I can apply directly to Nigeria’s Just Transition Guideline for the waste sector.”

Gboyega Olorunfemi, Society for Planet and Prosperity (SPP), Nigeria





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