Contribution by IEA Bioenergy Task 32 (Biomass Combustion) to the COP30 Presidency Roadmap consultations

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COP30 Roadmaps

1 Roadmap on "Transitioning Away from Fossil Fuels in a Just, Orderly and Equitable Manner"

(a) What are the most critical barriers?

- Industrial decarbonisation is constrained by a combination of structural, economic, and institutional barriers.
- Competitiveness and carbon leakage risks remain a primary concern, particularly for trade-exposed sectors such as steel, cement, chemicals, and food processing. Strong carbon policies can shift production offshore rather than reduce global emissions if not carefully designed.
- Long asset lifetimes (typically 25–40 years) create emissions lock-in. Industrial systems are replaced infrequently and are tightly coupled with production processes, making rapid transition difficult without significant cost or disruption.
- Infrastructure dependencies are a major constraint. Electrification requires grid upgrades and capacity, bioenergy depends on reliable and sustainable feedstock supply chains, and hydrogen and carbon capture require entirely new infrastructure systems. These dependencies create coordination challenges beyond individual firms.
- Fragmented, project-based delivery models limit scale. Each project is treated as bespoke, increasing transaction costs and slowing replication.
- Capability and delivery ecosystem gaps are emerging as a binding constraint. Industrial decarbonisation requires integrated expertise across engineering, energy systems, finance, and operations, which is often not available within a single organisation.
- Finally, weak and uncertain demand signals for low-emission products reduce investment confidence and slow adoption.

(b) What potential levers exist for accelerating transition?

- Acceleration requires a shift from isolated interventions to system-level approaches.
- Portfolio and roadmap-based approaches enable sequencing of investments aligned with asset lifecycles. This reduces perceived risk and allows organisations to move from single projects to scalable programmes.
- Demand reduction and heat integration should be prioritised as first steps. These measures reduce total energy demand, lowering the size and cost of subsequent investments such as electrification or fuel switching.
- Electrification should be treated as a flexible toolkit, including electric boilers, heat pumps, and resistive heating, combined with storage and demand-side management to manage grid impacts.
- Sustainable bioenergy provides an important complementary pathway, particularly for high-temperature heat. Deployment should reflect regional resource availability and prioritise residues and waste streams to minimise land-use impacts.
- Public–private co-investment mechanisms can de-risk early projects, generate learning, and accelerate wider adoption.
- Risk-adjusted economic frameworks are critical. Incorporating fuel security, price volatility, and carbon exposure into decision-making improves the business case for low-emission technologies.
- Finally, capability building and standardization such as common tools, baselines, and delivery models—are essential to reduce transaction costs and enable replication.

(c) What experiences, best practices, and lessons learned can be shared?

- A key lesson is that industrial decarbonisation is fundamentally a system design and delivery challenge rather than a purely technological one.
- Portfolio-based approaches consistently outperform isolated project delivery by enabling learning, reducing costs, and improving scalability.
- New Zealand's experience demonstrates the value of roadmap-led approaches, where structured planning aligned with asset lifecycles helps translate ambition into implementable pipelines.
- Internationally, long-term policy certainty has been critical in enabling investment beyond pilot projects. Stable incentives and clear signals allow industry to plan at scale.
- Fuel security shocks, such as those experienced in Europe, have shown that decarbonisation can be accelerated when framed as a resilience and risk management strategy rather than solely a climate objective.
- Early projects play a critical role in building confidence. Designing projects to generate learning enables faster and lower-risk deployment of subsequent investments.

(d) How can a just, orderly and equitable transition be achieved?

- A just transition must reflect the diversity of national circumstances and industrial structures.
- Different countries have varying levels of fossil fuel dependence, infrastructure readiness, and resource availability. Transition pathways must therefore be regionally tailored rather than uniform.
- Sequencing transitions to align with asset lifecycles helps minimise economic disruption and stranded assets, supporting an orderly transition.
- Maintaining industrial competitiveness and affordability is essential, particularly for export-oriented sectors, to ensure economic stability during transition.

- Investment in workforce capability and skills should be treated as core infrastructure, enabling industries to adapt and participate in new energy systems.
- Inclusive stakeholder engagement including industry, workers, and communities is critical to ensure that benefits are shared and risks are managed.

2 Roadmap on Halting and Reversing Deforestation and Forest Degradation by 2030

(a) What are the most critical barriers?

- Deforestation and forest degradation are driven by multiple interconnected pressures.
- Competing land-use demands, particularly from agriculture and development, are the dominant drivers of forest loss.
- Weak governance and enforcement in some regions limit the effectiveness of conservation policies.
- Economic incentives for conservation are often insufficient compared to alternative land uses, making deforestation financially attractive.
- Fragmented supply chains and lack of traceability reduce transparency and accountability.
- Limited recognition of indigenous rights and knowledge can undermine effective forest management.
- Uncertainty in sustainable biomass supply chains creates additional pressure, particularly where demand for bioenergy is increasing.

(b) What potential levers exist for accelerating progress?

- Integrated land-use planning is critical to balance forestry, agriculture, and energy needs.
- Certification and traceability systems can ensure sustainable sourcing and improve transparency in forest-based value chains.
- Economic incentives such as carbon markets and payments for ecosystem services can make conservation financially viable.
- Support for indigenous and community-led management has been shown to improve conservation outcomes.
- Bioeconomy approaches that prioritize residues and waste streams can reduce pressure on primary forests.
- Landscape-level planning enables coordinated action across jurisdictions and sectors.

(c) What experiences, best practices, and lessons learned can be shared?

- Best practices highlight the importance of integrated and system level approaches.
- The use of forestry and agricultural residues for bioenergy helps minimize land-use change impacts.
- Integrated forest management systems can balance conservation, production, and restoration objectives.
- Public private partnerships are effective in developing sustainable supply chains.
- Alignment between climate, biodiversity, and land-use policies reduces conflicting incentives.
- Robust monitoring and transparency systems build trust and support accountability.

(d) How can this be just and equitable?

- Equitable forest transitions must prioritize social and environmental integrity.
- The rights of indigenous peoples and local communities must be recognised and upheld.
- Approaches should be tailored to national and regional contexts, reflecting differences in forest cover, governance, and economic reliance.
- Equitable benefit sharing from forest-based value chains is essential to ensure local support.
- Livelihood transitions should be supported for communities dependent on activities linked to deforestation.
- Sustainable bioeconomy pathways should balance economic development with ecosystem protection.

Contact

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