

Technology Industries of Finland

Submission to the COP30 Presidency Consultation on the "Roadmap on the Transition Away from Fossil Fuels in a Just, Orderly and Equitable Manner"

April 2026

About Technology Industries of Finland

Technology Industries of Finland represents Finland's technology industries, electronics and electrotechnical industry, mechanical engineering, metals industry, information technology, and consulting engineering. Our member companies represent the biggest export sector in Finland and develop solutions that improve energy and material efficiency, enable electrification and system integration, and reduce emissions across global value chains. For our companies, decarbonization presents a significant growth opportunity.

Finnish technology companies are committed to the objectives of the Paris Agreement and to Finland's national goal of carbon neutrality by 2035. In cooperation with the Ministry of Economic Affairs and Employment, Finnish sectors have prepared and updated sector-specific low-carbon roadmaps to clarify the scale, costs and preconditions of emissions reductions and to support the implementation of national climate and energy policy. These experiences can also contribute to the development of a roadmap to transitioning away from fossil fuels.

Context

The Global Stocktake adopted at COP28 highlights the need to accelerate mitigation and to transition away from fossil fuels in energy systems in a just, orderly and equitable manner. For the real economy, the key challenge is implementation: translating high-level commitments into investable and deliverable pathways.

Finland's sectoral low-carbon roadmap process provides a practical example. The roadmaps are sector-led and based on the principle that each sector knows its own operating context best. They establish a shared picture of necessary measures to meet emissions reduction targets and are used to inform national strategies and industrial policy.

The low-carbon roadmaps were first adopted in 2021. The 2024 update of the technology industries' roadmap extends earlier work by covering value-chain emissions (Scope 3) and by emphasising cross-cutting enablers, such as electrification and clean electricity, the hydrogen economy and e-fuels, smart energy systems and system integration, digital solutions and AI-enabled optimisation, critical raw materials for the twin transition, and the role of carbon handprint solutions that reduce customers' emissions beyond national borders.

Critical Barriers

Constraints to transitioning away from fossil fuels are increasingly systemic and investment-related rather than technological, as many of the technologies needed for the transition are already available.

Uncertainty in the operating and investment environment. Since 2020, overlapping shocks, including the COVID-19 pandemic, Russia's war against Ukraine, the energy crisis and unstable economic outlooks, have increased uncertainty for long-lived investments. In many cases, short-term cost pressures outweigh emissions considerations, particularly where policy and regulatory frameworks are difficult to predict.

Availability of clean and affordable electricity. Clean, reliable and competitively priced electricity is a core precondition for electrification and for scaling new energy carriers such as hydrogen. Delays in grid reinforcement, permitting and system integration can become binding constraints even where technologies are mature.

Emerging value chains not yet at scale. Several industrial pathways depend on value chains, for example for clean hydrogen, that are not yet deployed at sufficient scale. Coordinated infrastructure development and market creation are required to enable final investment decisions.

Value-chain emissions and fragmentation. A significant share of technology-industry emissions occurs upstream and downstream. Fragmented standards and inconsistent measurement approaches complicate cooperation across borders and increase transaction costs.

Skills, materials and implementation capacity. Access to skilled labour, critical raw materials and practical implementation capacity is essential for delivering projects on schedule. Shortages in any of these can delay the transition.

Potential Levers to Accelerate Implementation

A coherent set of mutually reinforcing levers is needed to accelerate implementation.

Predictable long-term policy and market-based incentives. Stable climate and energy policy frameworks—supported by market-based instruments such as emissions trading and other carbon pricing measures—are essential for investment planning. Targeted measures can help reduce first-mover risk by crowding in private capital.

Electrification, energy efficiency and system integration. Electrification supported by clean electricity and strong energy-efficiency policies offers rapid emissions reductions. Timely grid investment, streamlined permitting and efficient connection processes are central enabling measures.

Hydrogen economy and renewable fuels where necessary. Clear strategies for hydrogen and bio- and e-fuels, including infrastructure planning and predictable regulation, can help move projects from feasibility to execution where electrification alone is insufficient.

Digital solutions and smart energy systems. Digitalisation, smart energy systems and flexibility solutions improve system efficiency and resilience and reduce operating costs. Roadmaps consistently identify these as cross-cutting enablers.

Demand-side tools and carbon handprint impacts. Demand-side tools such as public procurement and product standards can create lead markets for low-carbon solutions. Recognising carbon handprint, the positive climate impact through a technology or service, can promote the best available technologies, provided methodologies remain transparent and robust.

Roadmap Experiences and Just Transition

Finland's roadmap experience suggests that sector-led, voluntary processes strengthen ownership and implementation when matched with enabling conditions. A flexible approach allows sector-specific characteristics to be reflected while preserving comparability and a shared knowledge base.

A just, orderly and equitable transition requires recognising different starting points and dependencies on fossil fuels. Importantly, justice is also an implementation issue: pathways must be investable and build practical capacity, such as skills, permitting competence and project pipelines, so that transitions do not stall and costs do not fall disproportionately on exposed regions and sectors.

Conclusion

Technology Industries of Finland welcomes the COP30 Presidency's initiative to develop a practical roadmap for transitioning away from fossil fuels. To be effective, the roadmap should focus on implementation and enabling conditions—such as clean electricity availability, electrification and system integration, the scaling of necessary new value chains, and the diffusion of technologies, standards and skills across global value chains. Predictable policies and market-based incentives are needed to create a solid foundation for investment into decarbonization.

Finnish technology companies stand ready to contribute solutions, implementation experience and constructive cooperation to support the roadmap process in turning international commitments into concrete investment action. We believe that transitioning away from fossil fuels is a significant opportunity for growth and building thriving, resilient societies.

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