

COP 30 CIVIL SOCIETY CONTRIBUTION

ROADMAP ON THE TRANSITION AWAY FROM FOSSIL FUELS IN A JUST, ORDERLY AND EQUITABLE MANNER

SYSTEMIQ CONTRIBUTION

Based on:

a) What are the most critical barriers — whether physical, economic, financial, institutional, technological or social— preventing a transition away from fossil fuels?

The most critical barriers are now less about technology availability and more about whether clean alternatives can be financed, delivered and made socially credible at scale. Across sectors, four constraints stand out: lack of bankable demand, high first of a kind risk and green premia, weak implementation capacity, and the political economy of fossil-dependent regions.

Lack of predictable revenues is a major reason for the failure of projects. The Mission Possible Partnership Global Project Tracker identifies more than 1,000 commercial-scale clean industrial projects globally, but only 144 have reached Final Investment Decision (FID)¹. From the remaining projects that have not yet reached Final Investment Decision (FID), 70 projects are on the verge to secure funding, representing roughly USD 140 billion of near-term investment. Still, the majority of projects remain stuck because of uncertain offtake, slow permitting, policy inconsistency and constrained grid access, showing that the issue is not lack of pipeline, but lack of bankability.

Early clean-fuel and industrial projects face financing challenges, as investors see projects as high-risk. Europe accounts for around 60% of announced global e-SAF capacity, yet among roughly 30 large projects reviewed, none had reached Final Investment Decision (FID) and only around 300 ktpa appeared on track for 2030, about half the required level². Analysts estimate Europe may need 10–15 large e-SAF plants by 2030, requiring around EUR 15 – 25 billion of capital (capital needed for CAPEX-like investment) and EUR 3 – 5 billion per year to bridge the green premium³. The lesson is that mandates alone are not enough, early projects need blended finance and multi-year revenue certainty.

Clean industrial projects take a long time to become operational. Even where policy intent is clear, projects are delayed by fragmented permitting, uncertain grid connection, slow certification and poor inter-agency coordination. These are often the practical reasons projects fail to move from strategy to construction. This can be observed in Brazil, where main bottlenecks include grid-connection delays, unclear degraded-land definitions and fragmented ministerial responsibility^{4,5}. Taking grid connection as an example, two key constraints often delay clean industrial projects:

¹ MPP (2025) *Clean industry Dawn of a new era*

² Project Skypower (2025) *Five key policy interventions to unlock the scale up of e-SAF in the EU*

³ Project Skypower (2024) *Accelerating the take-off for e-SAF in Europe*

⁴ Systemiq, UKPact, AYA (2025) *Economic, Trade, Human and Financial Diversity for Brazil's Ecological Transformation*

⁵ ITA Brazil (2024) *Challenges and opportunities for commercial-scale green industry in Brazil*

insufficient network capacity and connection processes based on first-come, first-served application queues. The latter can result in economically strategic projects being delayed behind less impactful ones, highlighting the need to prioritize grid access based on system and industrial value. At the same time, limited grid capacity reflects the absence of forward-looking infrastructure planning. Expanding transmission and distribution networks requires lengthy studies, permitting and construction timelines, which can significantly delay project timelines. Anticipating demand by identifying high-growth industrial regions and proactively planning grid expansion is therefore critical to ensure timely connection and accelerate project deployment. These are not uniquely Brazilian issues, they are common implementation barriers across many emerging markets.

Regions heavily dependent on fossil resources are more exposed to social and economic risks, driving resistance to decarbonization. The UK Continental Shelf shows the scale of the challenge: production peaked at 4.5 million barrels of oil equivalent/day in 1999, the sector still supports around 210,000 jobs, and decommissioning liabilities are estimated at about GBP 40 billion⁶. Without retraining, repurposing and credible replacement industries, resistance grows and decline becomes politically harder to manage. Developing countries are expected to face even more hardships, as although natural resources may be abundant, cost of capital tends to be higher and industrialization level lower.

A mismatch between transition potential and fossil demand assumptions is hindering timely capital reallocation and prolonging fossil fuel dependence. The Energy Transition Commission (ETC) analysis suggests current clean technologies could displace roughly 75% of present fossil demand, while Electric Vehicles (EVs) already displace around 1.3 million barrels/day and could reach 5 million barrels/day by 2030⁷. Yet policy and investment decisions often still assume more durable fossil demand than credible transition pathways support. That misalignment slows capital reallocation and prolongs fossil fuel dependence.

Overall, the main barriers are not a lack of technical solutions, but a failure to make clean alternatives bankable, implementable and socially viable at the speed required.

b) What potential levers, whether economic, financial, institutional, social or technological, exist for accelerating the implementation of the transitioning away commitment?

The strongest levers are those that turn climate ambition into investable and deliverable projects. In practice, that means creating demand for clean products, lowering fossil fuel use through electrification and efficiency, de-risking early projects, strengthening implementation capacity, and managing the territorial effects of fossil decline.

The first lever is deliberate market creation. Many projects do not fail on technical grounds, they fail because they lack long-term cashflow. Project SkyPower shows that mandates alone do not create bankability. Its proposed solution for e-SAF is a market intermediary offering 10 – 15-year purchase contracts to producers and shorter sales contracts to buyers, with the gap financed through recycled Emission Trading System (ETS) revenues and penalties⁸. The combination of demand

⁶ Systemiq (2025), *Delivering a rapid, orderly and just energy transition for the UK Continental Shelf*

⁷ Energy Transitions Commission (2025), *Energy productivity: Increasing efficiency in an expanded, electrified energy system*

⁸ Project Skypower (2024) *Accelerating the take-off for e-SAF in Europe*

creation and revenue certainty addresses the core barrier to scale: predictable cashflows. By locking in long-term purchase agreements while bridging price gaps through public support, mechanisms, like the one proposed by project SkyPower, reduce market risk and facilitate investment decisions. More broadly, tools such as public procurement, blending mandates, carbon contracts for difference, and structured offtake agreements serve the same function, providing the revenue visibility required to reach Final Investment Decision (FID).

The second lever is increasing energy productivity through higher electrification rates and higher energy efficiency. The Energy Transition Commission shows the world could double Gross Domestic Product (GDP) by 2050 while using 24% less final energy⁹ and 36% less primary energy¹⁰, generating around USD 15 trillion in energy-investment savings over 25 years¹¹. Electrification of vehicles, buildings and industrial heat is central to this shift. It reduces fossil demand, lowers exposure to price volatility and shrinks the green premium by reducing the scale of clean supply required. Electrification depends on access to abundant, low-cost renewable electricity, enabled not only by generation capacity but also by sufficient transmission, distribution and energy storage infrastructure. Where these conditions are in place, electricity prices become structurally lower and more stable, creating a strong incentive for industry to locate and expand in these regions. As a result, industrial competitiveness increasingly depends on access to cheap clean power, particularly for energy-intensive sectors.

The third lever is targeted public finance for First of a Kind (FOAK) and early-scale projects. Again, Project SkyPower suggests that a plausible First of a Kind (FOAK) e-SAF plant of around 50 ktpa may require EUR 1 – 2 billion in total financing, including roughly EUR 100 – 200 million in grants and EUR 250 – 500 million in concessional loans or guarantees^{12,13}. The ITA Brazil Programme applies the same logic: use blended finance, long-tenor concessional tranches and risk-sharing instruments to move early projects to bankability and crowd in private capital¹⁴. Capital availability is not always the main constraint, as illustrated by Brazil's Fundo Clima and EcoInvest programmes. In both cases, significant public capital exists, but it is not consistently directed toward early-stage clean industrial projects. For instance, of the BRL 10.1 billion (USD 1.9 billion) approved under Fundo Clima in 2024, BRL 6.1 billion (USD 1.2 billion) was allocated to renewable power and ethanol, while only BRL 1.3 billion (~USD 240 million) targeted green industry. This highlights that the challenge is often one of allocation rather than scarcity¹⁵. EcoInvest seeks to address this by structuring targeted investment programmes and thematic auctions for sectors such as clean hydrogen and fertilizers, helping to channel capital toward priority industrial value chains¹⁶.

The fourth lever is institutional delivery. Ambition matters much less if governments cannot accelerate permits, connect projects to the grid, align standards, and coordinate decisions across agencies. This is where practical tools matter: public project dashboards, time-bound KPIs, standardised offtake templates, and implementation units with authority to clear blockers. The Industrial Transition Accelerator (ITA) Brazil Programme points to exactly these kinds of delivery

⁹ By final energy, it is meant the energy delivered and used by the end-users

¹⁰ By primary energy, it is meant the energy taken from a natural resource before conversion

¹¹ Energy Transitions Commission (2025), *Energy productivity: Increasing efficiency in an expanded, electrified energy system*

¹² Project Skypower (2024) *Accelerating the take-off for e-SAF in Europe*

¹³ Project Skypower (2025) *Five key policy interventions to unlock the scale up of e-SAF in the EU*

¹⁴ ITA Brazil (2024) *Challenges and opportunities for commercial-scale green industry in Brazil*

¹⁵ ITA Brazil (2026) *Finance Insights Briefing*

¹⁶ Brazilian Government (2025) *Eco Invest Brasil*

mechanisms, focusing on identifying challenges for industrial projects and communicating with Government for the creation of targeted public policies. Examples include the review of the current grid access policies, with the objective to establish an industrial orientated view, rather than an energy distribution view.

The fifth lever is social and territorial transition planning. The Energy Transmission Commission (ETC) indicates fossil consumption should already be falling by 2030 under accelerated pathways, while the UK Continental Shelf work shows that decline must be managed through sequencing, decommissioning and repurposing rather than passive contraction^{17,18}. That means labour-transition plans, local economic development, and funded place-based packages must sit alongside clean-investment strategies.

In short, the most effective levers are those that reduce risk, create durable demand, lower system costs and make the transition administratively and politically executable.

c) What country, regional or sector roadmap experiences, best practices, and lessons learned can be shared?

The clearest lesson from country and sector experience is that roadmaps only work when they combine strategic focus with project-level delivery. Across the evidence base, four enablers recur: low-cost clean power, bankable demand, First of a Kind (FOAK) de-risking, and institutions capable of executing at speed.

China is the clearest example of what happens when these elements align. China hosts more than 200 projects in the Global Project Tracker, with 54 already financed or operating, accounting for around 60% of recent Final Investment Decisions (FIDs). That performance sits on top of exceptional clean-power deployment, including about 360 GW of solar in 2024 and 212 GW in the first half of 2025. The lesson is direct: abundant, reliable and competitively priced clean electricity is the foundation of rapid industrial transition¹⁹. Although the Chinese example illustrates how clean-power deployment accelerates projects to Final Investment Decision (FID), it also reflects conditions that are not easily replicable elsewhere. Strong central coordination, large-scale public financing, and targeted industrial subsidies have enabled sustained investment at a pace and scale beyond most markets. While few countries can match this level of state-backed capital, the underlying lesson holds: aligning long-term industrial strategy with energy policy is critical to accelerating clean industrial deployment.

A second lesson is that national roadmaps are most credible when they focus on sectors where countries have genuine comparative advantage. The Brazilian Government Ecological Transformation Plan (ETP) does this by prioritising a limited number of chains, including bio-SAF, green fertiliser, batteries and Electric Vehicles (EVs), based on Brazil's resource base, industrial position and relatively clean power mix²⁰. The transferable point is not Brazil-specific, it is that

¹⁷ Energy Transition Commission (2023) *Fossil Fuels in Transition: Committing to the phase-down of all fossil fuels*

¹⁸ Systemiq (2025), *Delivering a rapid, orderly and just energy transition for the UK Continental Shelf*

¹⁹ MPP (2025) *Clean industry Dawn of a new era*

²⁰ Systemiq, UKPact, AYA (2025) *Economic, Trade, Human and Financial Diversity for Brazil's Ecological Transformation*

roadmaps are stronger when they are selective, grounded in national strengths, and linked to measurable project pipelines.

A third lesson comes from sector roadmaps, especially in clean fuels. Project SkyPower’s e-SAF review shows that Europe had roughly 30 large projects representing around 2 Mtpa, but none had reached Final Investment Decision (FID) in the reviewed pipeline and only around 300 ktpa appeared on track for 2030²¹. The lesson is that mandates need to be complemented by long-tenor contracts, bridging finance and market-making institutions. Roadmaps must explain not just what should be built, but how early plants will become financeable.

A fourth lesson is that early-stage sectors need explicit First of a Kind financing plans. Reaching sectoral tipping points for hard-to-abate commodities, clean hydrogen and its derivatives, biofuels/SAF, green steel and green cement, will require coordinated market-formation instruments and Green Market Makers backed by concessional capital to bridge the residual “green price gap” and mobilise the multi-billion-euro project finance packages needed to make First of a Kind plants bankable per year in support to bridge early green premia²². Roadmaps become more credible when they include concrete financing ranges, piloting sequences and a pathway from concessional to commercial capital.

A fifth lesson is that export-oriented chains depend on regulatory alignment as much as production economics. For sectors such as bio-SAF, certification, feedstock rules and land-use definitions can determine whether projects secure access to lead markets. The Industrial Transition Accelerator Brazil Programme has highlighted this through work on degraded-land definitions and certification support. Regulatory mismatches across regions can prevent otherwise viable projects from accessing key markets, particularly when differences in certification standards, feedstock eligibility or land-use change criteria lead to non-recognition of production pathways²³. Work under the Industrial Transition Accelerator Brazil Programme points to how even small definitional gaps can delay or block market entry. Addressing these frictions through greater alignment or mutual recognition can significantly reduce costs and unlock trade, considering that the criteria respect robust sustainability constraints. The broader message is that roadmaps need a dedicated regulatory alignment workstream alongside investment targets.

Finally, roadmaps are more durable when they include a place-based strategy for fossil decline. The UK Continental Shelf experience shows why: large asset bases, employment dependence and decommissioning liabilities require active management²⁴. Roadmaps should therefore pair new industrial investment with retraining, repurposing and local economic transition.

Overall, the best roadmap experiences show that targets are not enough. What matters is whether countries can combine power, demand, finance and delivery into a sequence of measurable, fundable actions.

²¹ Project Skypower (2024) *Accelerating the take-off for e-SAF in Europe*

²² MPP, Bezos Earth Fund (2024) *Unleashing market forces to scale green industry: The role of Green Market Makers*

²³ MPP, ITA Brazil (2026) *ITA Brazil 2026 Workplan*

²⁴ Systemiq (2025), *Delivering a rapid, orderly and just energy transition for the UK Continental Shelf*

d) How can a just, orderly and equitable transition best reflect the diverse realities of countries at different stages of development and with different degrees of dependence on fossil fuels?

A just transition cannot mean a single pathway for all countries. It must reflect different development needs, different levels of fossil dependence, and different capacities to finance and manage change. Equity therefore requires both a common direction of travel and differentiated implementation.

For emerging and developing economies, justice means preserving the right to industrialise and expand access to modern energy services while avoiding future fossil fuel dependence. The Energy Transmission Commission (ETC) shows that by 2050 global demand for cooling and aviation could each rise by around 150%, road transport activity by around 70%, and heated floor area by around 25%, even as total energy use falls through efficiency and electrification²⁵. The implication is that countries will need different mixes of electrification, efficiency, cleaner fuels and industrial policy depending on their development stage and sector profile.

Equity also means a fairer distribution of transition investment. Mission Possible Partnership's "new industrial sunbelt" framing points to roughly USD 1.17 trillion of clean-industrial investment potential, of which around USD 900 billion sits in emerging and developing economies²⁶. A just transition therefore depends not only on burden sharing, but on who gets the projects, jobs, concessional capital and export opportunities associated with the next energy system. Without that, advanced economies may capture most of the upside while poorer countries face tighter constraints.

For fossil-producing countries and regions, justice requires managed decline rather than disorderly contraction. The UK Continental Shelf again provides a useful lesson: historical dependence on production, employment and associated infrastructure means that sequencing matters. Where decline is not accompanied by decommissioning plans, repurposing strategies, retraining and replacement industries, social and political resistance will rise²⁷. A just transition must therefore include costed regional packages, not only national targets.

Justice within countries matters as much as justice between them. IRENA reports that clean energy employed 34.8 million people globally in 2023, compared with 32.6 million in fossil fuels, but the transition is not automatically fair in its distribution²⁸. Governments need active labour-market measures, local supplier development, vocational training and social protection to ensure that employment gains are accessible, decent and regionally inclusive.

Finance allocation is another core equity issue. A just transition requires concessional support and risk-sharing instruments to be directed not only toward the cheapest emissions reductions, but toward projects with strong social, developmental and regional benefits. This is where transparent selection criteria matter. The Ecological Transformation Plan and the Industrial Transition Accelerator Brazil Program are relevant examples because they link industrial opportunity with delivery tools, labour-transition planning and place-based conditions for support. The wider lesson is that justice has to be built into project selection, not added afterward.

Finally, equitable transitions must address tariffs, subsidies and consumer impacts. Electrification will not scale fairly if fiscal and pricing systems continue to favour fossil use or expose

²⁵ Energy Transitions Commission (2025), *Energy productivity: Increasing efficiency in an expanded, electrified energy system*

²⁶ MPP (2025) *Clean industry Dawn of a new era*

²⁷ Systemiq (2025), *Delivering a rapid, orderly and just energy transition for the UK Continental Shelf*

²⁸ IRENA (2024) *Renewable energy and jobs: Annual review 2024*

vulnerable households to higher costs. Targeted fiscal reform, consumer protection and transitional support are therefore essential parts of an orderly transition, especially in countries with limited fiscal space.

In sum, a just and orderly transition reflects diverse national realities by combining differentiated pathways, fairer access to finance and industry, credible management of fossil dependence, and stronger protection for workers and vulnerable households.

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