Scaling up transition finance
A toolkit to turn carbon into capital
ABAC Japan
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Executive summary

The toolkit aims to address the urgent need to expand transition finance in the APEC region through strategic levers to transform carbon markets from peripheral mechanisms into core financial infrastructure.[1] The toolkit also operationalizes the Incheon Plan's pillar for sustainable fiscal frameworks, and can help balance the trilemma of decarbonization, energy security, and financial stability. The toolkit is designed to mitigate four high-level structural frictions – the bankability gap, credibility risk, opacity, and capacity constraints – that hold back capital flows for transition finance.

To address these frictions, ABAC Japan proposes a toolkit with levers in five areas:

i. *Tax and accounting*. Establish standardized frameworks to treat carbon credits as high-value financial assets. By creating a reliable price signal, these assets become bankable financial instruments that lower the cost of capital from simple offsets.

ii. *Transparency*. Mandate digital connectivity via the Climate Action Data (CAD) Trust to ensure real-time visibility and eliminate double counting.

iii. *Risk sharing*. Embed carbon credits into financial instruments like sustainability-linked bonds (SLBs) to lower the cost of capital for clean energy projects. By embedding a verified price signal into SLBs, for example, governments can utilize performance-linked interest rate step-downs for projects that meet carbon-reduction milestones. This directly bridges the bankability gap by improving the risk-adjusted return for private lenders.

iv. *Mutual recognition*. Adopt pragmatic frameworks that respect domestic rules while ensuring cross-border interoperability.

v. *Trade resilience*. Ensure domestic carbon pricing is compatible with global mechanisms like the EU carbon border adjustment mechanism (CBAM) to protect APEC's trade competitiveness. A recognized domestic price acts as a credit against international border taxes. This ensures that capital remains within APEC to fund transitions rather than being exported as border fees.

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[1] *The toolkit and levers are supported by the global standards set forth in the ICMA Climate Transition Finance Handbook (CTFH) and the Climate Transition Bond Guidelines (CTBG); respect the industrial policies and emissions trading systems (ETS) of each economy; and, build a transparent framework for financial facilitation. See ICMA, Climate transition bond guidelines, ICMA, November 2025; ICMA, Climate transition finance handbook, ICMA, November 2025; and, Appendix 1 for further details.*

1. The carbon market ecosystem

Carbon markets are trading systems – typically implemented as emissions trading systems (ETS) or cap-and-trade systems – that assign a price to greenhouse gas emissions, allowing entities to trade allowances or credits to meet reduction targets.[2] These systems function by valuing a metric ton of carbon dioxide equivalent (tCO2e) reduced or removed, thereby creating a financial incentive for decarbonization. By internalizing the negative externalities of industrial activity, carbon markets redirect capital toward transition strategies such as energy efficiency and green technologies.

A robust carbon price internalizes emission costs, effectively reducing the "green premium" and making clean technologies economically competitive with fossil-fuel alternatives. A functioning price mechanism serves as the primary catalyst for transition finance; without a reliable price signal, private investors cannot accurately calculate the long-term internal rate of return (IRR) required to fund large-scale projects.

1.1 The compliance carbon market lifecycle

Compliance carbon markets (CCMs) operate under a regulatory mandate that enforces a jurisdictional cap on emissions. CCMs function through a structured cycle of allocation, trading, and settlement.

- *Setting the cap*. Regulators identify "covered emitters" (ie, firms in regulated sectors) and set an annual emissions limit based on historical data. To drive the transition, this cap is designed to decrease annually, approaching zero over a defined timeframe.[3]

- *Issuing allowances*. The regulator issues carbon allowances, each serving as a legal permit to emit one metric ton of CO2 equivalent within a calendar year.[4]

- *Market trading*. The system creates a price signal through a simple "buy or sell" logic:

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[2] While CCMs and ETS are often used interchangeably to describe market-based emission regulations, they refer to different aspects of the same ecosystem. A CCM represents the regulatory environment and jurisdictional mandate where participants fulfill legal obligations. An ETS is the mechanical framework – the specific cap-and-trade system – used to operate that market. Most modern CCMs, such as the EU ETS and the China National ETS, utilize an ETS as their core operating tool.

[3] Each CCM selects the sector it aims to regulate. Most CCMs cover high-emitting industries, such as power generation and heavy industry, and they often extend coverage to the transportation sectors. Entities in the covered sectors that exceed the emission threshold set by regulators become covered entities and are subject to the regulation of the CCM. As CCM coverage expands and thresholds decrease, more sectors and entities will be incorporated. In addition, many CCMs are open to noncovered entities (eg, Switzerland, the UK). By voluntarily joining a CCM, these noncovered emitters (eg, SMEs) can begin adapting to relevant regulations and markets early, smoothing out future compliance costs. See Appendix 7 for a list of covered sectors in various jurisdictions.

[4] When formulating policies, regulators must balance multiple factors, including emission reduction outcomes, operational efficiency, short-term business impacts, carbon leakage risks, and long-term planning. Regulators design and implement CCMs based on relevant legislation, aiming to make them an effective tool for achieving reductions in carbon emissions, and are responsible for: i) designing the framework of CCMs following relevant laws and regulations; ii) defining the details of the operating mechanisms, such as the cap, scope, coverage, and thresholds; iii) establishing allowance allocation mechanisms; iv) setting the legal and operational frameworks for trading, clearing, and data storage systems; v) implementing real-time monitoring systems and price stabilization mechanisms to ensure fair and orderly market operations; and, vi) Reviewing the framework regularly and adjusting policies when necessary to enhance the efficiency of CCMs.

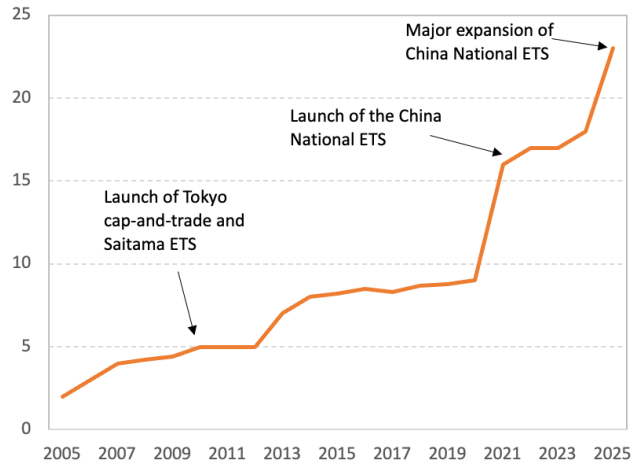
- Emitters exceeding their limit (ie, are in deficit) must purchase additional allowances through auctions or by trading with other participants.

- Emitters who reduce emissions below their limit (ie, are in surplus) can sell their extra allowances, turning decarbonization into a revenue stream.

- *Settlement and cancellation.* At the end of the year, emitters surrender allowances equal to their actual emissions. Failure to do so typically results in significant fines. To prevent reuse and ensure the integrity of the cap, regulators then cancel these allowances, permanently removing them from circulation.

Nearly 40 CCMs operate worldwide, covering approximately 23% of global greenhouse gas emissions. ETSs generated a traded value of nearly $1tr in 2025.[5] Jurisdictions in which ETSs are enforced account for nearly 60% of global GDP and around one-third of the global population.

Chart 1. Global ETSs
(% of global emissions covered by ETSs)



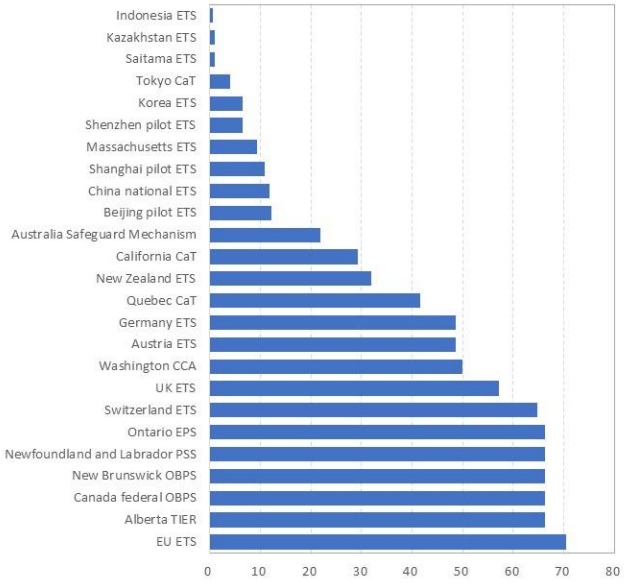
Source: Emissions trading worldwide: ICAP status report 2025; ICAP, 2025.

[5] *Emissions trading worldwide: ICAP status report 2025; ICAP, 2025.*

In CCMs, a primary friction is that the market price for emission allowances is often significantly lower than the cost required to make early-stage, high-impact technologies (eg, tech-based carbon dioxide removal) economically viable. This price gap prevents these technologies from being deployed at the scale necessary to meet long-term net-zero goals.[6]

IMF analysis confirms this critical market failure. According to the IMF, containment of global warming requires carbon prices of $75 per ton, but the current global average is a mere $3. This disparity is the primary driver of the bankability gap, making essential high-impact technologies economically unviable.

Chart 2. ETS carbon prices by jurisdiction
($/tCO2e)



NB: Prices as of end-2025.
Source: Carbon pricing dashboard, World Bank.

A functioning price mechanism is the primary catalyst for transition finance. Without a predictable price floor, private investors cannot calculate the long-term IRR for decarbonization projects.[7]

Data and capacity constraints are pervasive structural barriers that prevent carbon markets from achieving a larger scale. A lack of digital interoperability and standardized reporting makes the monitoring, reporting, and verification (MRV) process a manual, costly, and time-consuming endeavor. These constraints create ambiguity for investors and deprive them of the legal and fiscal certainty required to manage carbon assets with the same precision as traditional financial products. Small- and medium-sized enterprises (SMEs) are particularly disadvantaged as the high fixed transaction and due diligence costs effectively bar them from participating in carbon-linked finance.

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[6] According to the IMF, a global average carbon price of at least $75 per tCO2e is necessary by 2030 to keep global warming below 2°C. To address the multi-dimensional challenge of balancing decarbonization with economic growth and financial stability, IMF staff has proposed an International Carbon Price Floor (ICPF) framework. This tiered approach suggests minimum price levels based on an economy's stage of development: $75 for advanced economies, $50 for high-income emerging markets, and $25 for low-income emerging markets. Establishing these predictable price signals is considered a "core financial infrastructure" requirement to unlock the large-scale private capital needed for a secure and clean energy transition. See Proposal for an international carbon price floor among large emitters; IMF, 2021.

[7] The toolkit addresses this by aligning domestic systems with the IMF's International Carbon Price Floor (ICPF) logic, transforming carbon from a regulatory cost into a predictable revenue stream.

1.2 The voluntary carbon market ecosystem

Voluntary carbon markets (VCMs) enable entities to purchase carbon credits to offset voluntarily their carbon emissions, often as part of corporate social responsibility or transition strategies.[8, 9] These markets are projected to reach $100bn in traded value by 2030, and function through a distinct value-creation lifecycle.

i. *Project appraisal.* VCMs appraise the market value of underlying benefits from activities that reduce or remove carbon.

ii. *Capital channeling.* The market provides a platform on which private investment can be allocated toward high-impact projects, such as carbon removal technologies and sustainable initiatives in developing markets.

iii. *Partial integration.* In certain jurisdictions (eg, Singapore, China, California), companies are permitted to use high-integrity VCM credits to partially satisfy legal obligations under CCMs or carbon tax systems.

VCMs still face significant barriers that prevent them from serving as an institutionalized catalyst for transition finance:

- *Bankability gap (ie, the price gap).* VCMs often lack forward signals (ie, reliable future price indicators). Without these signals, investors and financiers cannot accurately assess the risk-return profile or IRR for long-term transitional activities.

- *Credibility risks.* The market is hindered by three core integrity challenges:
    - Additionality. Whether the carbon reduction would have occurred without the revenue from the credit.
    - Permanence. The risk that stored carbon (eg, in a forest) is released due to fire or disease.
    - Double counting. The risk that a single reduction is claimed by both a private buyer and the host country toward its Nationally Determined Contribution (NDC).

- *Opacity*. Credits are highly heterogeneous and opaque, originating from various project types and methodologies. Most trades occur in over-the-counter deals, making price discovery and verification difficult for investors.

2. Transition finance frictions and bottlenecks

Transition finance is impeded by four high-level structural frictions. The most critical is the bankability gap: risk-adjusted returns that are insufficient to meet those offered by the capital requirements of decarbonization projects. Capital is also held back by credibility risk (ie, a lack of regulatory clarity and concerns over asset integrity), opacity (ie, the inability to verify assets

[8] *Countries can use credits generated from VCM activities toward their Nationally Determined Contributions (NDCs), but this is governed by specific rules under Article 6 of the Paris Agreement to ensure environmental integrity and to prevent double counting.*
[9] *As in CCMs, VCM credits represent one tCO2e either reduced (eg, renewable energy) or removed (eg, reforestation, direct air capture).*

due to fragmented data systems), and a capacity barrier (ie, limited sectoral coverage for the reference pathways that investors use to judge progress). These frictions derive from work by the Asia Green Transformation Consortium (AGXC) that identified seven technical bottlenecks that inhibit transition finance.[10, 11]

Chart 3. Structural frictions and the Asia GX Consortium's seven key bottlenecks

Structural friction	
1 ***Bankability gap***	*Projects do not meet the necessary return thresholds for private capital*
Bottlenecks	-Insufficient policy support for the essential transition projects (1)
	-Underdeveloped carbon pricing mechanisms (3)
	-Few investment opportunities (5)
2 ***Credibility risk***	*Lack of regulatory clarity and concerns regarding the integrity of transition assets*
Bottlenecks	-Lack of strong climate policies and regulatory clarity in transition finance (2)
	-Complexity and liquidity challenges in blended finance (4)
3 ***Opacity / Data gaps***	*Investors cannot verify assets due to a lack of digital interoperability and standardized reporti*
Bottleneck	-Data gaps, lack of capacity to implement transition finance, limited access to local verifiers (6)
4 ***Capacity barrier***	*SMEs and smaller markets are excluded due to high fixed costs and limited sectoral coverage*
Bottleneck	-Limited sectoral / regional coverage for reference pathways (7)

NB: The numbers listed after the bottlenecks refer to the numbering in the Asia GX Consortium's list of bottlenecks.

2.1 The transmission mechanism: Carbon pricing as foundational infrastructure

To reduce the frictions hindering the expansion of transition finance – including bank debt, corporate bonds, or blended finance – carbon markets must play a significant role. An efficient pricing mechanism in a well-functioning carbon market – effectively internalizing the negative externalities of greenhouse gas emissions – alters the financial math of the transition by making cash flows and risks more predictable and quantifiable.

The clear economic signal of a market-determined carbon price transmits across the capital structure. Commercial banks can anchor sustainability-linked instruments to cash-convertible performance targets in their transition lending, and multilateral development banks (MDBs) gain a measurable baseline to structure first-loss guarantees and subordinated risk-sharing facilities.

Alleviating the four structural frictions

Transforming carbon credits into credible financial assets helps alleviate the four structural frictions by:

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[10] The Asia GX Consortium – a public-private initiative led by the Financial Services Agency (FSA) and ASEAN financial authorities – was launched in October 2024 to accelerate transition finance in Asia. It creates a "common approach" for decarbonizing the region by bringing together regulators, banks, and development agencies (eg, ADB, GFANZ) to develop practical, bankable green projects.

[11] Asia GX Consortium high-level meeting 2025; FSA, 2025. See Appendix 3 for the list of bottlenecks, and the Consortium`s insights to appropriate countermeasures.

i. *Bridging the bankability gap.* Without a transparent and predictable price floor, investors may be unable to calculate a reliable long-term IRR. Developing carbon credits into high-value financial instruments shifts carbon into an investable, forward-looking revenue stream from a regulatory penalty.

ii. *Neutralizing credibility risks.* The transition finance market is hampered by greenwashing concerns and complex integrity standards. Standardizing carbon credits under international financial tax and accounting frameworks brings legal and fiscal certainty to carbon accounting. When carbon reductions are treated as legal and financial obligations rather than voluntary, investors gain an assurance necessary to deploy capital with commensurate risk exposure.

iii. *Dissolving opacity.* The transition finance landscape is fragmented and opaque, characterized by heterogeneous project methodologies and siloed data verification. Mandating digital metadata connectivity across compliance and voluntary registries dissolves this opacity. By creating an interoperable, unified view of asset lifecycles, carbon markets mirror the structural clarity of traditional financial clearings, removing data ambiguities and building cross-border investor confidence.

iv. *Overcoming capacity constraints.* High fixed transaction costs, data gaps, and the intensive resource requirements of MRV create a capacity barrier, locking out the vital SME sector. Transforming the system into a standardized financial architecture enables the deployment of automated digital tools and reporting tiers. This reduces compliance and operational burdens, broadens sectoral market access and allows value chains to scale transition capital concurrently.

3. The toolkit: Five strategic levers to mobilize capital

The toolkit contains five levers designed to transform carbon markets into a key transmission channel for capital mobilization.[12] These levers integrate carbon market signals directly into transition finance pricing, risk-sharing frameworks, and core investment decisions. By transforming carbon credits from simple offsets into bankable financial assets, these levers alleviate the structural frictions that slow investment, providing the architecture necessary to mobilize transition capital at scale.

3.1 Tax and accounting

Establish standardized, international tax and accounting frameworks to treat carbon credits as high-value financial assets rather than mere coupons or offsets.

The lack of defined rules and data gaps creates significant ambiguity for banks and investors, hindering transition finance scaling and deployment of mechanisms like Japan's GX-ETS.[13] Standardizing these treatments is essential to ensure accountability to investors and to allow

[12] *Full details for each lever are provided in Appendix 4.*

[13] *Despite its scale, several structural barriers contribute to GX-ETS being underutilized for transition finance. These include a low price (ie, $3-4/tCO2e, far below the $75 benchmark identified by the IMF as necessary to drive investment; key banking regulations (eg, the ability to carry over unused allowances to future years) are not expected until FY27, discouraging long-term carbon asset management; and, the GX-ETS is not linked to other systems, making it a siloed market.*

companies – including SMEs with limited resources – to manage carbon credits and transition-linked instruments with the same legal, fiscal, and operational certainty as traditional financial products. By establishing a common approach to transparency, APEC can enhance the soundness of carbon trading and provide the objective criteria necessary to match capital providers with recipients.

To transform carbon credits into bankable financial assets, APEC economies should adopt a framework that puts "climate on the balance sheet".[14] By treating unmitigated emissions as financial liabilities and high-integrity carbon credits as productive assets, companies can utilize existing accounting principles to reflect real-world climate impacts. A ledger-based approach ensures that climate commitments are recognized as constructive obligations, providing the fiscal precision required for auditors and investors to value transition-linked portfolios accurately.

3.2 Transparency

Mandate digital registry connectivity via the Climate Action Data (CAD) Trust to provide real-time visibility, eliminate double counting, and support Article 6 transparency.[15]

To eliminate double counting and provide the high-integrity transparency required by international capital markets, governments should mandate that all domestic carbon registries be connected to the CAD Trust Model 2.0. This centralized metadata platform provides real-time visibility into the lifecycle of carbon credits and the status of corresponding adjustments under Article 6 – the rules for ensuring emission reductions are counted accurately toward national goals. To prevent a "green squeeze" on regional supply chains, the framework mandates data-lite reporting tiers for SMEs. This ensures that smaller enterprises can access transition capital without being excluded by high fixed costs.[16]

3.3 Risk sharing

Integrate carbon markets as risk-sharing tools in transition finance instruments such as sustainability-linked bonds.

To bridge the bankability gap for high-risk emerging technologies and transitional activities in Asia, APEC governments should provide policy guidance on the integrated use of carbon markets and blended finance. Governments should facilitate frameworks where financial institutions utilize the price signal from carbon markets as a core risk-sharing component. The toolkit transforms carbon into a financial trigger. By linking interest rate step-downs directly to the generation of high-integrity credits, the toolkit improves the project's IRR. This turns carbon-reduction milestones into a core asset that directly lowers the cost of debt for hard-to-abate sectors.

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[14] *See Climate Liabilities and Assets Initiative for more information.*

[15] *Article 6 accounting refers to the rules and methods for tracking and recording GHG emission reductions and transfers under the Paris Agreement, so that emission reductions are only counted once, and countries' NDCs remain accurate and comparable.*

[16] *Transparency is operationalized through CTFH Element 4 (Implementation Transparency), which recommends disclosing specific CapEx and OpEx plans that deliver the transition strategy. Utilizing digital tools like the CAD Trust automates data collection and reduces the reporting burden for SMEs through "data-lite" tiers.*

3.4 Mutual recognition

Adopt a pragmatic mutual recognition framework for credit integrity that respects domestic rules while ensuring cross-border interoperability.

To address the lack of regional sectoral coverage and diverse economic conditions across APEC, jurisdictions should move beyond a one-size-fits-all integrity standard. Such a framework would allow APEC to address the higher emissions intensity and lower income levels of emerging markets while achieving substantive collective mitigation. This approach ensures cross-border interoperability while preserving domestic policy autonomy, allowing economies to decarbonize according to their unique industrial structures without surrendering control to global mandates.

3.5 Trade resilience

Ensure strategic compatibility with global mechanisms like the EU Carbon Border Adjustment Mechanism (CBAM).

To safeguard the trade competitiveness of APEC industries and prevent carbon leakage, governments must ensure that domestic carbon pricing, ETS, and transition finance frameworks are technically compatible with global guidelines like the ICMA Climate Transition Bond Guidelines (CTBG) and mechanisms like the EU CBAM. APEC should support a price-deduction and equivalence model, where the explicit or implicit carbon price paid within an APEC economy is fully recognized and deducted from international carbon border fees. This ensures that APEC's unique industrial needs and transition steps are not unfairly penalized by international mandates.

Chart 5. Summary table - Toolkit

Lever	Mechanism
1 ***Tax and accounting***	*Establish standardized international tax and accounting for carbon assets to provide legal certainty for global banks*
Friction addressed	-Credibility / Regulatory clarity -AGXC bottlenecks 2, 4
2 ***Transparency***	*Mandate registry connectivity via the CAD Trust to eliminate double counting and support Article 6 transparency*
Friction addressed	-Opacity / Data gaps -AGXC bottleneck 6
3 ***Risk sharing***	*Integrate carbon credits as a risk-sharing tools in transition finance toolkits (eg, in sustainability-linked bonds)*
Friction addressed	-Bankability / Underdeveloped pricing -AGXC bottlenecks 1, 3, 5
4 ***Mutual recognition***	*Adopt a pragmatic mutual recognition framework for credit integrity that respects domestic industrial policies (eg, Japan's GX strategy)*
Friction addressed	-Capacity / Limited sectoral coverage -AGXC bottleneck 7
5 ***Trade resilience***	*Ensure strategic compatibility with global mechanisms like the EU CBAM*
Friction addressed	-Global compatability

NB: The seven AGXC bottlenecks are: 1) insufficient policy support for the essential transition projects; 2) lack of strong climate policies and regulatory clarity in transition finance; 3) underdeveloped carbon pricing mechanisms; 4) complexity and liquidity challenges in blended finance; 5) few investment opportunities; 6) data gaps, lack of capacity to implement transition finance, limited access to local verifiers; and, 7) limited sectoral / regional coverage for reference pathways.

NB: Lever 4 Mutual recognition provides the technical pathway to the IMF's International Carbon Price Floor.

3.6 APEC transition finance readiness scorecard

To utilize the toolkit to design an actionable regional roadmap, the following scorecard serves as a strategic benchmark. By evaluating an economy's current maturity against the five strategic levers, authorities can pinpoint where capital flows are being obstructed by structural frictions of the bankability gap, credibility risk, opacity, and capacity constraints.

This assessment aims to help anchor domestic performance to global benchmarks such as the IMF's tiered price floors and digital transparency mandates via the CAD Trust. By identifying these specific gaps, authorities can prioritize the legislative and digital infrastructure needed to transform carbon credits into bankable financial assets from environmental tools.

Chart 4. APEC transition finance readiness scorecard

Economy group	Lever 1 *Tax and accounting*	Lever 2[17] *Transparency (CAD Trust)*	Lever 3 *Risk sharing (SLBs)*	Lever 4[18] *Price gap (IMF ICPF)*	Lever 5 *Trade resilience*
Advanced economy (eg, Canada, Japan)	🟢 Standardized rules in place	🟡 Registry integration in progress	🟡 SLB usage increasing	🔴 Japan GX-ETS below IMF $75[19]	🟢 CBAM technical readiness high
High-income EME (eg, China)[20]	🟡 Evolving framework	🟢 Major National ETS expansion	🟡 Developing credit-linked bonds	🟡 Pricing ~$13; target $50	🟡 Strategic alignment ongoing
Emerging economy (eg, Indonesia, SE Asia)	🔴 High ambiguity and data gaps	🔴 High opacity; manual MRV	🔴 High bankability gap for high-risk tech	🔴 Pricing ~$2; target $25[21]	🔴 High risk of double taxation

NB: 🟢 Green (functional): The economy has implemented the lever, providing the legal and technical certainty required to mobilize global institutional capital; 🟡 Amber (developing): A system is in place (eg, Japan's GX-ETS) but is currently underutilized due to price signals or regulatory ambiguity; and, 🔴 Red (critical gap): Significant friction remains, resulting in an unaddressed bankability gap or high risk of trade penalties.

Box 1: From policy rationale to toolkit – Building on the 2023 ABAC CBAM study

The toolkit represents the technical implementation of strategic priorities first identified by ABAC in 2023. The foundational study, *Assessing the implications of Carbon Border Adjustment Mechanisms (CBAMs) for APEC*, warned of the "meaningful" trade and investment costs APEC industries face from unilateral mechanisms like the EU CBAM. The toolkit operationalizes that report's call for APEC to act as an "incubator of ideas" by developing "alternatives to CBAMs which achieve the same objectives but without the costs involved".

The 2023 report argued that "a common carbon price is not needed to advance the outcomes committed in the Paris Agreement". Instead, it advocated for a model based on mutual recognition and equivalence, asserting that APEC should, "Advance the concept of 'climate clubs' so that these can be developed to be genuinely supportive of trade and investment...The climate club model based on mutual recognition of the different approaches taken by members to lower emissions would appear to have the most potential".

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[17] Lever 2 (transparency) utilizes the Climate Action Data (CAD) Trust to provide the digital infrastructure necessary to operationalize Article 6 of the Paris Agreement. As a decentralized metadata platform, the CAD Trust acts as a "link of links," connecting fragmented domestic registries to provide a unified, real-time view of the global carbon market. This connectivity is essential for managing Corresponding Adjustments (CAs)—the mandatory bookkeeping mechanism that prevents double counting, where both the credit buyer and the host country claim the same emission reduction. By mandating this digital integration, APEC economies can provide the high-integrity transparency required by international institutional investors and ensure their carbon assets remain valid for global trade. As of Q2 2026, a full transition to the CAD Trust Version 2.0 Data Model is expected for all connected registries, making interoperability a technical requirement rather than a future goal.

[18] The assessment for Lever 4 (price gap) is based on the IMF's International Carbon Price Floor (ICPF) framework. This macroeconomic model addresses the ambition-policy gap by recommending coordinated, tiered price floors rather than uncoordinated unilateral pledges. To ensure equity and respect differentiated responsibilities, the IMF suggests a three-tier structure: $75 for advanced economies, $50 for high-income emerging markets (eg, China), and $25 for low-income emerging markets (eg, Southeast Asia). Aligning with these benchmarks is a prerequisite for the Mutual Recognition and Trade Resilience levers, as it ensures that domestic carbon costs are high enough to be recognized by international mechanisms like the EU CBAM.

[19] Japan has launched a mandatory national ETS in 2026, moving beyond the voluntary phase.

[20] China has issued guidelines to transition its National ETS to an absolute cap by 2027 from an intensity-based, improving the assessments for each of the levers for the high-income EME group.

[21] Vietnam and India are launching national compliance systems in 2026, moving them to "amber" from "red".

This mandate is the direct precursor to Lever 4 (mutual recognition) and Lever 5 (trade resilience). By establishing a "price-deduction and equivalence model," the toolkit fulfills the 2023 recommendation to support APEC businesses in a manner that "avoids further costs on trade and investment".

The following table demonstrates how the 2026 levers provide the technical highway for the 2023 rules of the road.

2023 recommendation		**2026 lever**
Global accounting standards	"*Contribute to the development of global accounting standards for carbon...what is really required are global platforms for such standards*."	Lever 1. Tax and accounting
Capacity building for SMEs	*"Developing capacity building programs...to achieve their emissions reductions commitments, particularly through the development of carbon pricing mechanisms."*	Lever 2. Transparency
Equivalence of policies	"*Recognize equivalence of carbon pricing policies and/or of carbon reduction strategies" as a way to unlock investment.*	Lever 3. Risk sharing
Mutual recognition	*"Countries can decisively advance their climate commitments...while developing guidelines for carbon abatement policies deemed equivalent."*	Lever 4. Mutual recognition
Avoidance of border taxes	"*Support the ability of APEC economies and businesses to address the impact of CBAMs in a manner that avoids further costs*."	Lever 5. Trade resilience

While the 2023 paper focused on diplomatic and multilateral alternatives, the 2026 toolkit moves into market-based execution. It recognizes that to avoid a dampening effect on investment, the region must move towards the legal and fiscal certainty required by global investors. By transforming carbon into a bankable financial asset from a trade risk, the APEC economies will be able to retain more transition capital within the region to fund local decarbonization rather than being exported as international border fees.

Box 2. Accelerating demand – Toward toolkit v2.0 (2027)

While the 2026 recommendations focus on the financial plumbing of transition architecture, a critical next step for APEC is the active stimulation of demand for high-integrity carbon assets. As major regional markets – such as Japan's GX-ETS – transition to full trading phases in 2027, it would be helpful to explore a complementary step of market-making levers for the APEC 2027 Vietnam host year.

Key components for demand stimulation:

- *Regional market-maker intermediaries.* Based on the H2Global model, APEC economies should evaluate the creation of demand aggregators that conclude long-term offtake contracts with producers, providing the revenue certainty required for final

investment decisions.[22] These intermediaries can then auction assets to private buyers in the short term, bridging the chicken-and-egg problem of new markets.

- *Carbon contracts for difference CCfDs.* To bridge the green-fossil cost gap, governments can utilize CCfDs to guarantee a strike price for carbon-linked projects.[23] If market prices for credits or clean products fall, the government compensates the project for the difference, effectively de-risking the project's IRR against price volatility.

- *Mandated purchase quotas***.** Demand can be structurally locked in by mandating that high-emitting industries meet a specific percentage of their transition through the purchase of high-integrity tech-based credits (eg, sustainable aviation fuel mandates).

- *Public anchor procurement.* Utilizing state procurement as an early market signal by committing to purchase low-carbon materials (eg, green steel for infrastructure) creates a guaranteed buyer status that lowers the risk premium for private lenders.

4. Impact on transition finance: Mobilizing the regional architecture

By reforming these markets, transition finance can shift from technical carbon trading to a foundational element for the energy transition.

4.1 Bridging the bankability gap

The bankability gap is driven not only by low carbon prices but also by the failure to account for the rising cost of capital associated with accumulated climate liabilities. By recognizing climate actions as assets on the balance sheet, firms can transform transition activities from sunk expenses into sources of value that improve their risk-adjusted return and facilitate lower-cost finance. The toolkit proposes integrating high-integrity credits as core risk-sharing components within transition bonds and loans. By linking financial payouts – specifically interest rate step-downs in SLBs – to the generation or retirement of these credits, the strategy improves the IRR for clean energy projects in hard-to-abate sectors.

To further bridge the bankability gap, the strategy calls for MDBs and Development Financial Institutions (DFIs) to serve as anchor participants, providing subordinated debt or first-loss guarantees to mitigate the reputational and financial risks that currently deter private bank participation in emerging markets.[24]

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[22] H2Global is an innovative market-making platform designed to bridge the chicken-and-egg problem of emerging low-carbon markets. It functions via a double-auction system through a physical intermediary. The intermediary concludes long-term offtake contracts with producers to provide the revenue certainty required for project financing, and then resells the assets to private buyers via short-term sales contracts. Any price gap between the production cost and the market's willingness to pay is covered by government funding, effectively creating a predictable price signal where a liquid market does not yet exist. H2Global was established in Germany, and has been expanded through a partnership with Australia.

[23] CCfDs are financial instruments used to bridge the green-fossil cost gap by guaranteeing a fixed strike price for carbon-linked projects. Under a CCfD, the project developer is compensated if the market price for carbon (or the clean product) falls below the agreed strike price, protecting the project's IRR from market volatility. Conversely, if market prices exceed the strike price, the developer pays the difference back to the government. This reversible mechanism de-risks private investment while remaining more budget-efficient for governments than traditional flat subsidies. CCFDs were introduced in the US, and are in use in Japan, Korea, and elsewhere.

[24] In 2026, the Asian Development Bank and Asian Infrastructure Investment Bank are testing blended finance hubs.

4.2 Resolving credibility and opacity

The strategic levers resolve transition finance frictions by mandating that all domestic carbon registries technically connect to a centralized metadata platform, specifically the CAD Trust. This connectivity provides the real-time visibility required to eliminate double counting and ensures that credits maintain the high integrity necessary for international trade under Article 6 of the Paris Agreement. By establishing these "rules of the road," the toolkit provides the legal and fiscal certainty required for global investors to treat carbon as a bankable asset.

4.3 Addressing capacity barriers for SMEs

To ensure market inclusion and prevent a "green squeeze" on regional supply chains, the toolkit introduces a specialized category for SMEs. This allows smaller enterprises to report material climate ambition via a data-lite tier, they cannot yet meet the heavy data requirements of full science-based targets. This capacity-building measure ensures that smaller enterprises can access global transition capital without being excluded by high fixed costs, thereby protecting the export competitiveness of the economy.

5. Toward a unified price signal

The transition to a net-zero future in APEC is primarily a challenge of system integration rather than capital scarcity. By reforming carbon markets through the proposed toolkit, APEC economies can move beyond technical carbon trading toward a predictable financial architecture that addresses the energy trilemma.

The success of these levers will be defined by three key outcomes:

1. *Financial legality and certainty*. Standardized tax and accounting treatments will provide banks with the legal certainty required to treat carbon as a high-value financial asset. This evolution to asset from offset allows carbon to function as a core risk-sharing tool, directly improving a project's IRR and lowering the cost of debt for hard-to-abate sectors.

2. *Market transparency and integrity*. Digital connectivity via the CAD Trust will ensure every credit is tracked, trusted, and verified in real-time. By aligning with Article 6 standards, APEC creates the high-integrity environment necessary to attract global institutional capital and prevent the reputational risks of double counting.

3. *Trade resilience and inclusion*. Innovative risk-sharing models and data-lite reporting tiers ensure that SMEs and emerging markets are active participants in the transition, rather than victims of a "green squeeze". This ensures domestic carbon costs are recognized globally, protecting the region's export competitiveness against international border taxes.

By utilizing these levers, APEC can transform carbon credits from niche environmental tools into high-value-added financial assets. This toolkit provides a path to mobilize private capital at scale, ensuring a secure, efficient, and clean energy future for the region.

Appendix 1. Consistency of toolkit with international guidelines

The toolkit is designed to be an application that bridges the gap between high-level global standards and the structural failures of markets. ICMA provides the "what" (ie, standards for a credible bond), the toolkit provide the "how" (ie, the market infrastructure and policy coordination needed to broaden usage of such bonds). In other words, the ICMA Guidelines can be considered the "rules of the road" while the toolkit aims to build the highway.

The strategy addresses three critical areas that ICMA's voluntary guidelines do not cover:

- *Market infrastructure*. ICMA recommends transparency, while the toolkit mandates a technical solution by requiring domestic registries to connect to the CAD Trust. This creates the "link of links" necessary to eliminate double counting across different jurisdictions – a prerequisite for the integrity ICMA demands.

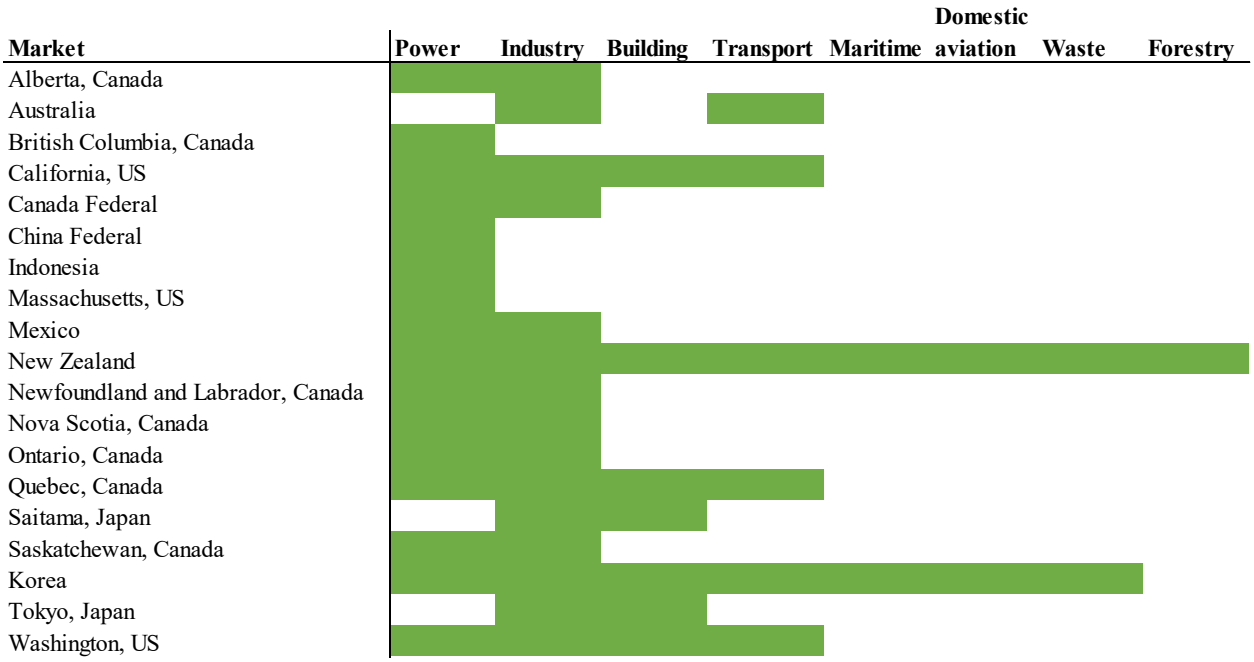
- *The bankability gap*. ICMA guidelines are intended for issuers and investors. The toolkit calls for coordination between governments and MDBs to act as anchor participants. By using MDBs to provide guarantees or subordinated debt, the strategy reduces the reputational risk that prevents private banks from following ICMA standards in high-risk regions.

- *Trade competitiveness*. ICMA focuses on financial markets, while the toolkit links carbon pricing to global trade resilience. It proposes that local carbon costs are recognized by mechanisms like the EU CBAM, protecting APEC exporters from being taxed twice – a critical economic concern for the region that falls outside ICMA's scope.

Appendix 2. Covered sectors in CCMs

Each CCM selects the sector it aims to regulate. Most CCMs cover high-emitting industries, such as power generation and heavy industry, and they extend coverage to the transportation sector to varying degrees. Entities in the covered sectors that exceed the emission threshold set by regulators become covered entities and are subject to the regulation of the CCM. Small- and medium-sized noncovered entities can voluntarily participate in CCMs and trade under the same rules and compliance obligations as large, covered entities. By voluntarily joining a CCM, these noncovered emitters can begin adapting to relevant regulations and markets early, smoothing out future compliance costs.

Covered sectors in selected compliance carbon markets



Source: Global compliance carbon markets: Structure explained; CFA, 2025.

Appendix 3. Asia GX Consortium's seven key bottlenecks

	Bottleneck	Insights on the countermeasures
1	Insufficient policy support for the essential transition projects	More policy support is crucial to make several key projects related to energy transition and early-stage technologies economically viable
2	Lack of strong climate policies and regulatory clarity in transition finance	Regulators should provide sector specific pathways or guidance, standardized and simplified frameworks to promote transition finance
3	Underdeveloped carbon pricing mechanisms	Establishing policy certainty and legal frameworks for credit issuance and trading could address economic viability of transition finance. Collaboration with more matured carbon markets can help ASEAN nations enhance the integrity of the carbon credit market.
4	Complexity and liquidity challenges in blended finance	Sufficient inter-agency coordination among government, DFIs, and private investors, enhancing institutional capacity are needed.
5	Few investment opportunities	Developing innovative instruments tailored to the needs of small-scaled finance, mobilizing capital to the decarbonization value chain, and utilization of sustainability-linked finance can improve access to funding and accelerate emissions reductions.
6	Data gaps, lack of capacity to implement transition finance, limited access to local verifiers	Digital tools, collaborative engagement platforms, fostering local verification and advisory ecosystem can reduce transaction costs.
7	Limited sectoral / regional coverage for reference pathways	Transition pathways should have wider sectoral coverage and granular regional coverage, being aligned with government programs.

Source: Asia GX Consortium high-level meeting 2025; FSA, 2025.

Appendix 4. A toolkit for integrating carbon markets into transition finance

Lever 1. Tax and accounting
Establish standardized accounting, tax, and data frameworks for transition-linked assets

Recommended framework for transition asset accounting:

i. Harmonized digital data integration
   - *Interoperable digital tools*. Utilize digital technologies to improve data quality and quantity while reducing the reporting burden on SMEs.
   - *Metadata connectivity*. Ensure accounting frameworks are compatible with centralized platforms like the CAD Trust to provide real-time visibility into the lifecycle of carbon credits and corresponding adjustments.
   - *Verification ecosystems*. Foster local verification and advisory ecosystems to reduce transaction costs and improve the reliability of transition data.

ii. Investor accountability and rational criteria
   - *Objective valuation*. Define clear, internationally consistent tax and accounting treatments for carbon credits to ensure they are treated as high-value-added assets.
   - *Transition-linked clarity*. Establish standardized accounting for Sustainability-Linked Bonds and loans where financial payouts are tied to the generation or retirement of high-integrity credits.
   - *Science-based benchmarking*. Align accounting disclosures with regional sectoral roadmaps (eg, steel, cement, power) to ensure transition plans are science-based and avoid carbon lock-in.

iii. Practical social implementation
   - *Inclusive categorization*. Incorporate a tiered accounting approach that recognizes not only aligned entities but also those in aligning or progressing categories.
   - *Legal certainty*. Provide specific policy guidance to global banks on how carbon markets can function as legitimate risk-sharing tools within their portfolios.
   - *Alignment with global guidelines*. Ensure frameworks are aligned with recognized standards, such as ICMA guidelines, to maintain the international credibility demanded by global investors.[25]

Lever 2. Transparency
Mandate digital registry connectivity via CAD Trust[26]

To eliminate double counting and provide the high-integrity transparency required by international capital markets, governments should mandate that all domestic carbon registries be technically connected to the CAD Trust. This centralized metadata platform provides real-time visibility into the lifecycle of carbon credits and the status of corresponding adjustments under

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[25] Alignment with CTFH Element 1 ensures that these assets are governed by board-level climate transition strategies. Standardized accounting allows carbon-linked instruments to be managed with the same legal and fiscal certainty as traditional financial products.

[26] It may be helpful to develop a simplified, "tier-based" reporting standards within the digital registry to reduce the data collection burden for SMEs, a key component of APEC economies.

Article 6. To address the resource constraints of SMEs in the APEC region, the framework must include simplified, tier-based reporting standards. This reduces the data-collection burden while building the cross-border investor confidence necessary to scale transition finance to the whole economy.

Recommended framework for digital registry connectivity and transparency:

i. Data-lite SME tiering[27]
   - *Tiered disclosure*. Implement a "progressing" category for SMEs that allows for material climate ambition reporting even if they cannot yet meet all data-heavy science-based targets.
   - *Resource burden reduction*. Utilize digital technologies to automate data collection, specifically designed to lower the barriers for companies with limited internal resources.
   - *Capacity building.* Provide technical support and digital toolkits to help SMEs and emerging market entities structure transition data correctly for international registry standards.

ii. Technical interoperability and integrity
   - *Real-time CAD trust sync*. Ensure all domestic compliance and voluntary credit movements are reflected instantly on the CAD Trust to prevent double counting.
   - *Article 6 corresponding adjustments*. Create a transparent, automated workflow for recognizing adjustments to ensure credits remain high-integrity for international trade.
   - *Digital verification*. Foster a local ecosystem of digital verifiers and advisors to reduce transaction costs while maintaining the soundness of the trading framework.

iii. Market-linked visibility
   - *Metadata for bankability*. Use digital registries to quantify decarbonization efforts, allowing capital providers to match with recipients based on objective and rational criteria.
   - *Dynamic monitoring*: Enable ongoing monitoring through the registry to track organization-level progress against transition targets in real-time.
   - *Public-private connectivity*. Link the registry to regional platforms (eg, the Asia GX Consortium) to identify potential demands and track the flow of funds effectively.

[27] *Transparency is operationalized through CTFH Element 4 (Implementation Transparency), which recommends disclosing specific CapEx and OpEx plans that deliver the transition strategy. Utilizing digital tools like the CAD Trust automates data collection and reduces the reporting burden for SMEs through "data-lite" tiers.*

Lever 3. Risk sharing
Integrate carbon markets and blended finance as unified risk-sharing tools in transition-finance toolkits[28]

Recommended strategies to address regional bottlenecks include:

i. Linking financial payouts to credit integrity
Improve the bankability of clean energy projects in hard-to-abate sectors by linking interest rates or financial payouts (eg, sustainability-linked bonds) to the generation or retirement of high-integrity carbon credits.

ii. Formalizing blended finance coordination
Address "reputational risk" and complexity by ensuring the participation of Multilateral Development Banks (MDBs) and Development Financial Institutions (DFIs) as anchor participants in transition projects.

iii. Risk-sharing mechanisms
Implement specific instruments such as subordinated debt, guarantees, and insurance to improve the risk-return profile and catalyze private sector capital for "aligning" entities.

iv. Digital integration for SME inclusion
Use digital tools and centralized metadata platforms like the CAD Trust to reduce data collection burdens, allowing SMEs to participate in carbon-linked finance with lower transaction costs.

v. Engagement-led structuring
Use corporate transition plans as a starting point for deep engagement between banks and companies to identify specific capital expenditure needs and transition and mitigation impact opportunities.

Lever 4. Mutual recognition
Adopt a "pragmatic mutual recognition" framework for credit integrity and regional pathways[29, 30]
To address the lack of regional sectoral coverage and the diverse economic conditions across APEC, Finance Ministers should move beyond a "one-size-fits-all" integrity standard. Instead, APEC should develop a framework for the mutual recognition of domestic carbon credits, treating national rules (eg, Japan's GX-ETS or the Joint Credit Mechanism) as the foundation for cross-border interoperability.[31]

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[28] According to ICMA CTBG Section 3.1, high-integrity credits should be embedded directly into sustainability-linked bonds, in which financial payouts (such as interest rates) are linked to specific carbon credit milestones. For hard-to-abate sectors where direct emissions data is complex, "Green CapEx" can serve as a supportive proxy KPI.

[29] AGXC supports the use of "labels" to scale impact and recognizes Japan's Sector-Specific Roadmaps as a vital benchmark for evaluating the credibility of such instruments.

[30] It may be useful to establish a collaborative mechanism to develop science-based pathways for additional sectors (ie, beyond Japan's GX roadmaps for heavy emitters such as steel, cement, and power. This would include agriculture, shipping, or specialized manufacturing, sectors relevant to the broader APEC region, and addresses the AGXC-identified bottleneck of "limited sectoral coverage" (Bottleneck 7).

[31] This approach utilizes science-based sectoral roadmaps (eg, Japan's GX roadmaps for steel, cement, and power) to avoid "carbon lock-in". CTBG Annex 1 validates this by recognizing domestic roadmaps and the ASEAN Taxonomy as credible tools for identifying transition activities.

Recommended steps towards mutual recognition include:

i. Expanded sectoral roadmaps
Transition pathways must move beyond heavy industry to provide science-based, regionally contextualized guidance for sectors like power, steel, and cement, while adapting to local industrial policies to avoid carbon lock-in.

ii. Inclusion of "progressing" entities
Aligned with the ASEAN Transition Finance Guidance, the framework should recognize companies in the "progressing" category – those showing material climate ambition even if they are not yet fully aligned with a 1.5C or 2C trajectory.

iii. Focus on "aligning" strategies
Given Asia's high-growth context, the framework should prioritize mobilizing funds toward companies that are "aligning" with net-zero goals rather than only those already "Aligned".

iv. Strategic compatibility with global standards
Domestic systems should be designed with a "price-deduction" model to remain compatible with international mechanisms like the EU Carbon Border Adjustment Mechanism (CBAM), protecting the trade competitiveness of APEC industries.

v. Interoperability for financial facilitation
By ensuring that transition plans are analyzed against regional benchmarks, APEC can match capital providers with recipients based on objective, rational, and science-based criteria.

Lever 5. Trade resilience
Ensure strategic compatibility and trade resilience through global mechanisms alignment
To safeguard the trade competitiveness of APEC industries and prevent carbon leakage, governments must ensure that domestic carbon pricing, ETS, and transition finance frameworks are technically compatible with global guidelines like the ICMA CTBG and mechanisms like the EU CBAM. APEC should support a price-deduction and equivalence model, where the explicit or implicit carbon price paid within an APEC economy is fully recognized and deducted from international carbon border fees. This ensures that APEC's unique industrial needs and transition steps are not unfairly penalized by rigid international mandates.

Recommended strategies to raise trade resilience include:

i. Institutional coordination for bankability
- *Blended finance hubs*. Establish inter-agency coordination between APEC governments, MDBs, and private investors to structure "bankable" transition projects.

- Public risk-sharing. Use the MOF model of issuing sovereign Climate Transition Bonds (CTBs) to catalyze private investment into high-value-added assets and economic security.
- *Reputation risk mitigation*. Facilitate the participation of DFIs/MDBs in projects to transform high-emission activities into low-emission ones, thereby reducing the "reputational risk" that hinders private bank participation.

ii. Technical and digital infrastructure
- *Unified digital registry*. Mandate that all domestic registries connect to a centralized metadata platform (eg, CAD Trust) to ensure real-time visibility and eliminate double counting under Article 6.
- *Standardized reporting for SMEs*. Deploy digital tools and collaborative engagement platforms to reduce the transaction costs and data-collection burdens for SMEs.
- *Accounting and tax frameworks*. Establish internationally consistent tax and accounting treatments for carbon credits to provide the legal and fiscal certainty required by global investors.

iii. Science-based regional pathways
- *Contextualized benchmarking*. Develop sector-specific roadmaps (eg, for steel, cement, and power) that reflect Asian geographical characteristics rather than relying on rigid global pathways that may not fit the regional context.
- *Dynamic monitoring*. Implement ongoing monitoring and independent verification processes as guardrail measures to track progress against transition targets while avoiding greenwashing.
- *Inter-sectoral recognition*. Recognize the interdependencies between sectors, ensuring that transition finance is prioritized for aligning entities that drive a whole-economy transition.