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Carbon Pricing: Developing Carbon Markets and Border Adjustment Policies

Sustainability Research Paper

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Carbon pricing through taxes, cap-and-trade or crediting, attaches a cost to greenhouse-gas emissions and rewards low-carbon choices. More than a quarter of world emissions already face a price, and the EU's Carbon Border Adjustment Mechanism (CBAM) is extending that signal into trade. For the Middle East and North Africa (MENA), the trend brings both the risk of export penalties and the chance to monetise vast renewable resources and sovereign-wealth capital. How can carbon pricing cut emissions without deepening inequality? What will CBAM do to trade and development trajectories? How can resource-rich MENA turn pricing into sustainable growth?

SUSTAINABILITY RESEARCH PAPER

This research paper is part of a 12-month series published by the Al-Attiyah Foundation every year. Each in-depth research paper focuses on a current sustainability topic that is of interest to the Foundation's members and partners. The 12 technical papers are distributed to members, partners, and universities, as well as made available on the Foundation's website.

03 EXECUTIVE SUMMARY

- Global carbon pricing has reached unprecedented scale, with 113 instruments active globally covering 28% of emissions and mobilising over USD 100 billion in revenues. Yet, most prices remain below the threshold needed for 2°C targets.
- CBAM represents a fundamental shift in climate-trade integration, effectively extending EU carbon pricing beyond its borders through trade policy.
- The Middle East and North Africa (MENA) confronts a dual challenge: safeguarding trade exposed to the EU's Carbon Border Adjustment Mechanism (CBAM) while turning abundant renewables into a competitive advantage.
- Policy design choices determine who pays and who benefits. Climate justice concerns are central to CBAM's legitimacy, as the mechanism risks functioning as trade protectionism that deepens vulnerabilities for developing countries.
- Technical implementation challenges create significant barriers, particularly for countries with limited administrative capacity, as accurate measurement, reporting and verification of emissions becomes both a prerequisite for participation and an obstacle to equitable access.
- MENA faces immediate trade vulnerabilities across key export sectors, such as fertilisers, steel, cement, with potential compliance costs of USD 10-20 billion annually and risks of 15-25% trade losses in affected industries by 2030.
- Strategic opportunities exist for MENA leadership through energy diversification, sovereign wealth fund deployment for transition investments, regional carbon pricing development, and positioning as a bridge between developed and developing country perspectives in global climate governance.
- Concrete mitigation pathways include directing CBAM revenues toward MRV capacity-building in vulnerable countries, establishing inclusive climate clubs, implementing differentiated carbon pricing, and leveraging local expertise in policy design and impact assessment.
- Projected cost estimates and impact forecasts reflect current market conditions but may increase as CBAM scope expands and carbon prices rise, introducing uncertainty into economic planning and risk assessments.

Table 1: An Overview of Carbon Pricing Instruments

Carbon Pricing Instruments

An overview of prominent examples globally

Mechanism	Coverage	Examples	Financial size
Carbon tax	Fuels, industry process emissions	South Africa, Canada	Public revenues > USD 100bn annually (tax + ETS combined)
ETS/cap-and-trade	Power, industry, aviation, maritime (expanding)	EU ETS, California-Quebec	Major markets in the hundreds of billions of equivalent traded value
Baseline-and-credit	Industry, facilities with intensity benchmarks	Alberta TIER, Australia safeguards	Smaller but material compliance credit markets
Hybrid models	Mixed sector coverage	EU ETS Market Stability Reserve (MSR(/price floors proposals; Output Based Allocations (OBAs)	Not separately sized
Article 6 mechanisms	Cross-border mitigation outcomes	Japan Joint Crediting Mechanism (JCM), bilateral Article 6 pilots	Early-stage; growing pipelines
Voluntary crediting	Cross-sector projects and removals	Verra, Gold Standard	Low single-digit billions annually

Source: Research from various sources by Al-Attiyah Foundation

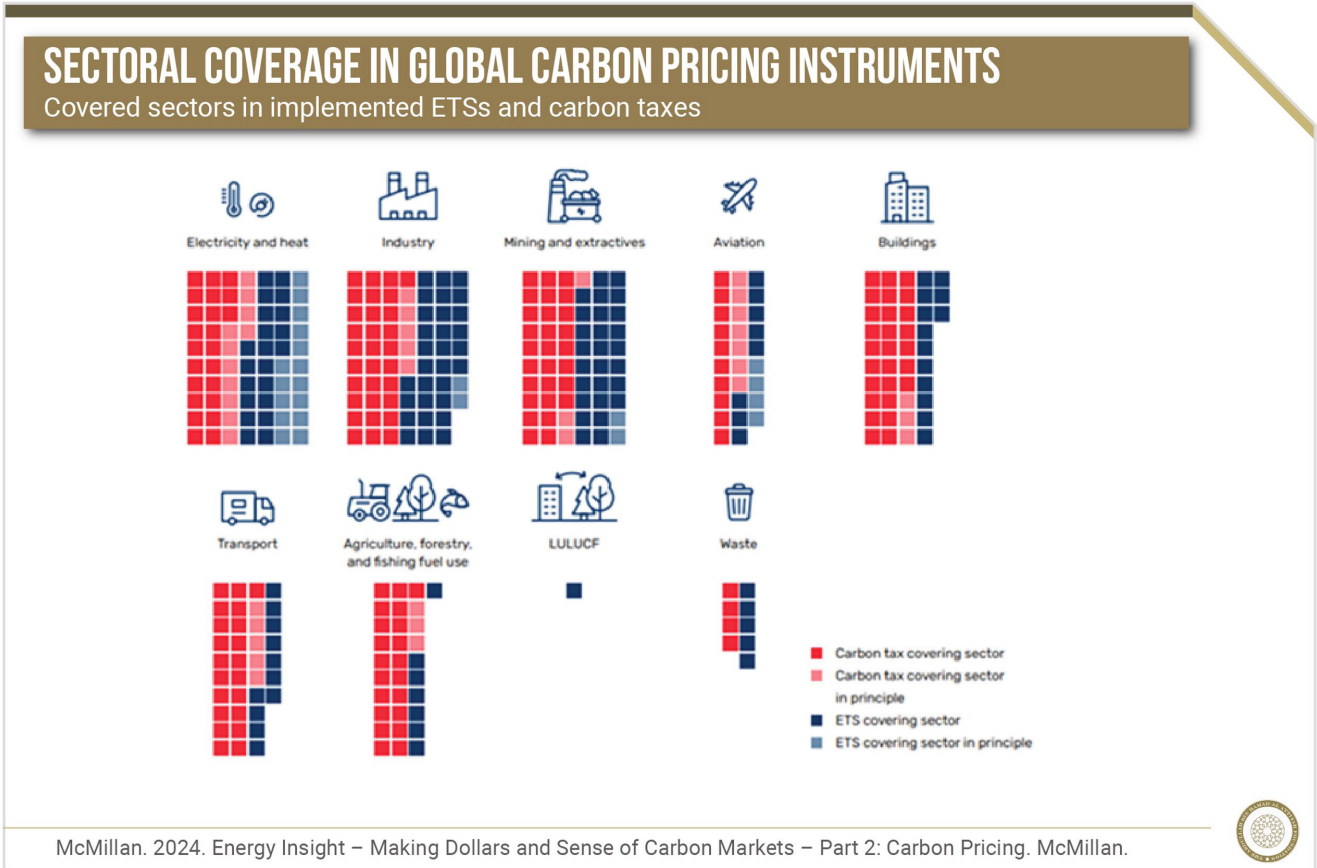
Carbon pricing mechanisms have become essential climate policy tools, yet their design, coverage, and effectiveness vary significantly across global jurisdictions, creating both opportunities and challenges for strategic implementation. The EU ETS covers heavy industry through cap-and-trade, Alberta's TIER system uses hybrid baseline-and-credit approaches, South Africa applies carbon taxation with equity considerations, Japan's Joint Crediting Mechanism facilitates Article 6 transfers, and Singapore integrates carbon pricing with a broader climate strategy.

The concept of carbon pricing includes both direct carbon pricing and carbon crediting mechanisms.

Direct carbon pricing mechanisms assign explicit costs to emissions through taxes, trading systems, or regulatory frameworks, while carbon crediting mechanisms generate tradable credits from verified emission reduction projects, complementing pricing systems by enabling offsetting and flexibility in compliance. The key distinction is that carbon pricing mechanisms impose explicit costs on emissions, while crediting mechanisms create tradable offsets from verified reductions.[1,2]

Growth in carbon markets remains geographically concentrated in developed economies. Developing country participation is limited by an absence of mandatory emission offset requirements in many markets.

Figure 1: Coverage of Global Carbon Pricing Instruments by Sector



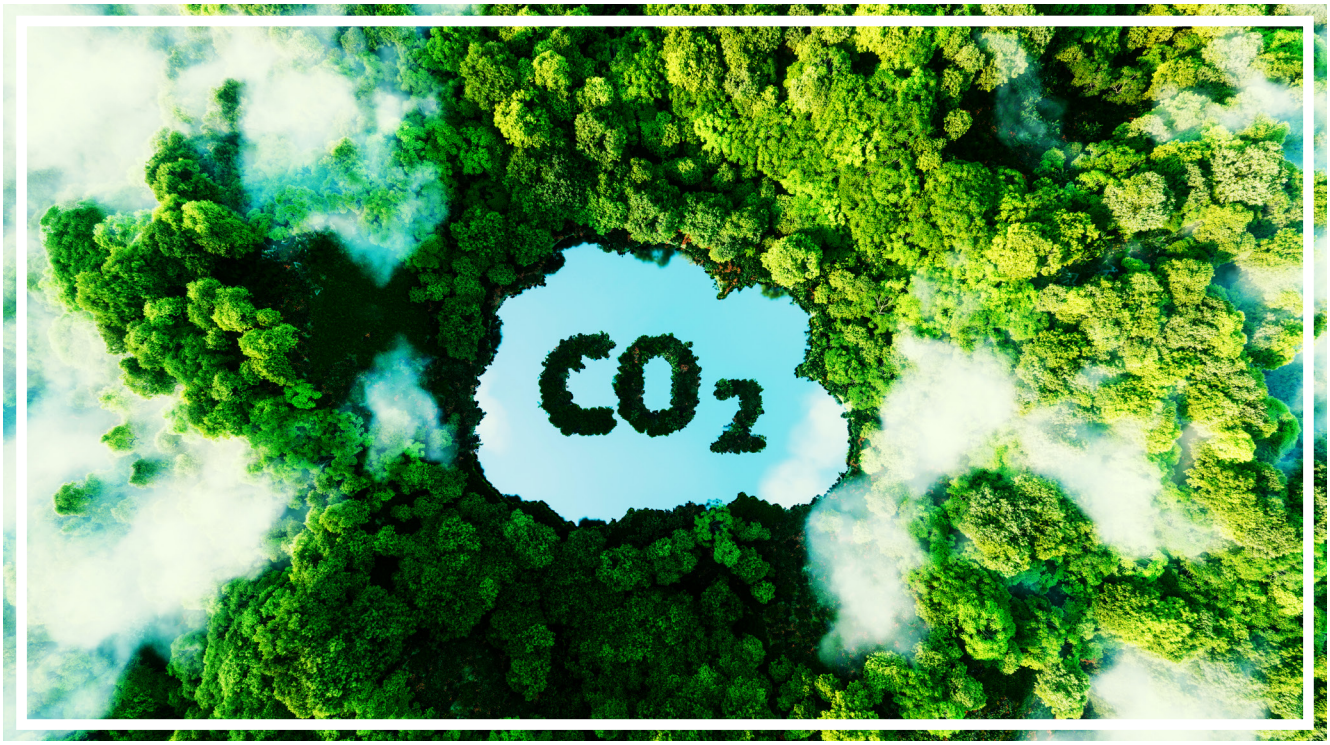
McMillan. 2024. Energy Insight – Making Dollars and Sense of Carbon Markets – Part 2: Carbon Pricing. McMillan.

After an abortive start to the Abu Dhabi Global Market exchange, new national carbon credit regulations took effect in the UAE in December 2024, while Japan's Joint Crediting Mechanism has approved 15 MENA projects worth $120 million in carbon finance, demonstrating Article 6 implementation potential.[1]

For policymakers, a principal concern is that most carbon market prices are below thresholds consistent with global climate targets. The High-Level Commission on Carbon Prices concluded in 2017 that achieving "well below 2°C" would require prices of USD 40 – 80/tCO_2e by 2020, rising to USD 50 – 100 by 2030. Adjusted for 2024 inflation, this equates to approximately USD 63 – 157/tCO_2e.

However, only seven carbon pricing instruments worldwide, covering less than 1% of global emissions, meet even the lower bound for estimated marginal abatement costs for 1.5°C pathways.

Factors that affect the success of carbon pricing policies include measurement, reporting and verification (MRV) systems, price stability mechanisms (floors and ceilings), and leakage protection tools. As core components of policy design, MRV defines what counts and how; price stability tools (floors, ceilings, market stability reserves) limit volatility; integrity safeguards address over-allocation and over-crediting; and leakage protection (free allocation, output-based rebates, border measures) reduces competitiveness impacts.[3]



Risks and trade-offs

Carbon pricing can disproportionately burden low-income households and developing country exporters. Research indicates that carbon pricing costs fall harder on average consumers in lower-income countries than on lower-income consumers in rich countries, creating global inequality concerns. South Africa's carbon tax implementation required up to 90% free allowances to maintain industrial competitiveness, while cost pass-through increased household energy expenses by approximately 2-4%. Studies of the EU's CBAM indicate vulnerable exporters may face trade losses ranging from 15-25%, with compliance costs representing 3-6% of export values in carbon-intensive sectors.[4]

The EU ETS experience highlights the challenge posed by production relocation to regions with less stringent regulations. While free allowance allocations have helped moderate leakage risks, they have introduced market distortions estimated at €57 billion between 2008 and 2012. This undermines environmental effectiveness and creates unfair competitive advantages. Recent analysis suggests carbon leakage through international trade offsets around 13% of domestic emission reductions achieved through carbon pricing. Border adjustment mechanisms have emerged as preferred tools for leakage mitigation, though they raise essential trade and development concerns.[5]

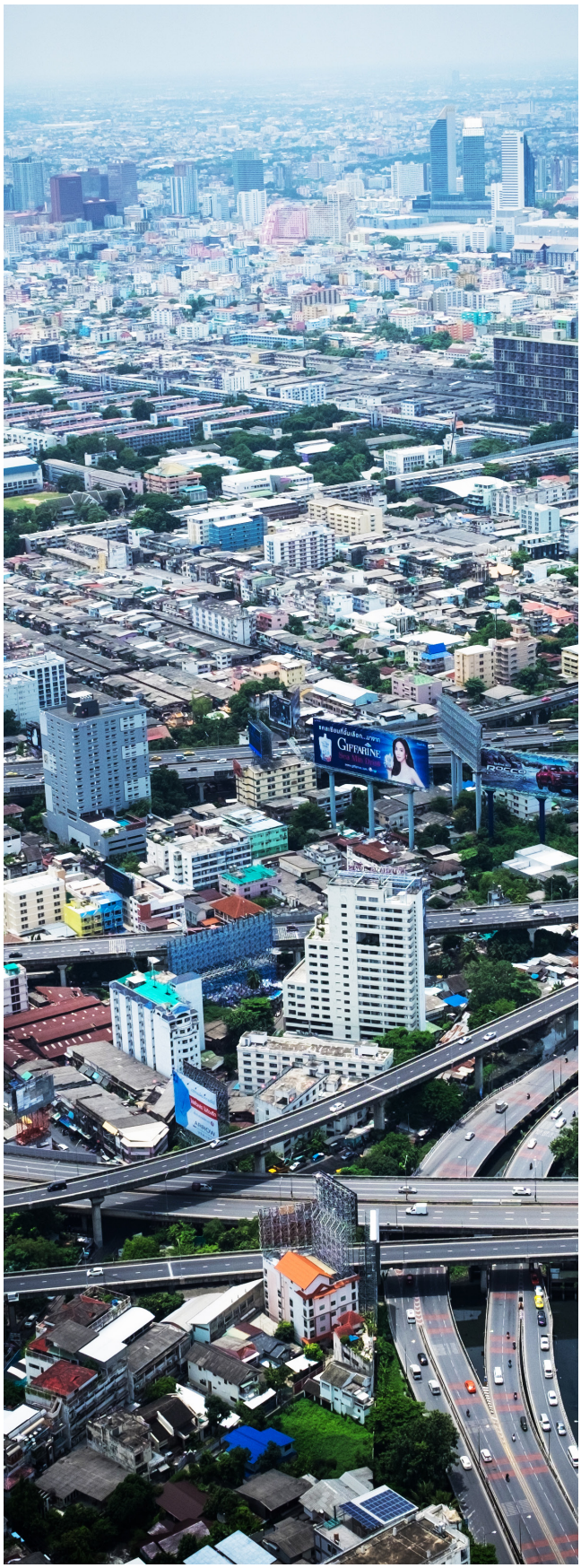
Carbon pricing has been critiqued for its potential neo-colonial implications, particularly regarding border adjustments and international offset mechanisms. Critics argue that measures like CBAM extend developed country influence over developing nations' economic policies, while carbon offset markets can function as effective "get-out-of-jail-free cards" for Global North polluters. These critiques, combined with concerns about unjust transitions for fossil fuel-dependent communities, create significant resistance to carbon pricing implementation.

However, supporters counter that well-designed carbon pricing is inherently anti-colonial, as nations maintain sovereignty over their own carbon revenues and allocation decisions.

Historical market failures have repeatedly undermined the credibility of carbon pricing. The EU ETS Phase I (2005-2007) suffered from 6.5% over-allocation, causing carbon prices to collapse from €30 to near zero and eliminating incentive effects. Notwithstanding, the EU persisted with over-generous free allocations by continuing to allocate significant free allowances to industry, with only 51.5% of the annual cap initially auctioned during 2021-2025. Baseline-and-credit systems face risks of over-crediting through inflated baselines, while voluntary carbon markets suffer from integrity concerns and accusations of greenwashing.[7]

Developing countries in particular face substantial MRV infrastructure gaps that limit effective participation. Establishing robust national monitoring systems typically costs $2-5 million, while differing regulatory standards across jurisdictions increase compliance burdens by up to 40%. Digital MRV technology and independent third-party verification are becoming essential for market credibility and transparency. These systems must provide evidence-based validation, integrate with established standards, and maintain robust accountability to prevent greenwashing and ensure genuine emission reductions.[7]

Carbon pricing remains an essential climate policy tool. When well-designed with appropriate safeguards, revenue recycling, and complementary measures, carbon pricing delivers significant emission reductions while supporting economic development objectives.

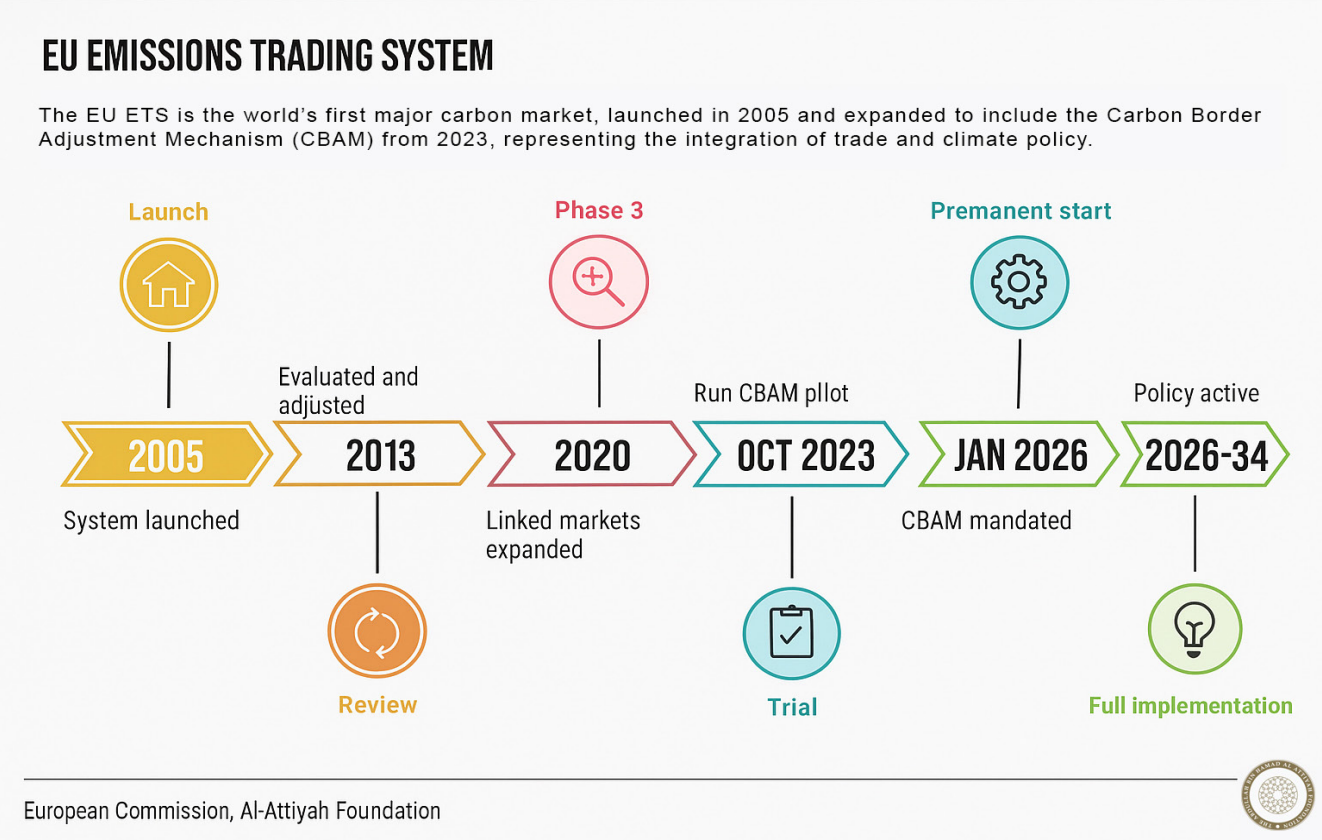


Border Carbon Adjustments (BCAs) are trade measures that assign carbon costs to imports, ensuring competitive parity with domestic producers subject to carbon pricing while preventing emissions leakage to unregulated jurisdictions. Outside the EU, the UK intends to introduce a BCA on selected industrial imports from 2027, while Canada has tabled options ranging from import charges to adjustments at the border for Emissions-Intensive, Trade-Exposed (EITE) industries and sectors. The UK and Canada, through these measures, aim to align trade with domestic carbon costs. Regulatory divergence across markets creates disproportionate administrative and compliance burdens for developing exporters with limited technical capacity.[8]

EU CBAM in Focus

The evolution of the EU's CBAM reflects the complex institutional landscape of European climate governance and the broad set of policy tools deployed to meet its long-term commitments. Its origins lie in the European Green Deal (2019), which set the trajectory toward climate neutrality by 2050. CBAM functions as the external complement to the reformed ETS by extending carbon pricing to imports while phasing out free allowances for the domestic industry. Alongside other Green Deal instruments, such as the EU Taxonomy and the Green Deal Industrial Plan (which together mirror the industrial policy approach of the U.S. Inflation Reduction Act), CBAM illustrates how the EU is combining market mechanisms, trade instruments, and financial regulation into an integrated framework for climate ambition.[9]

Figure 2: Timeline of EU ETS Gradual Phase-in



Because the shift from free allowances under the ETS to CBAM represents a significant structural change, the EU has opted for a gradual transition. During the CBAM's initial phase (2023–2025), it will operate in parallel with free allocation. From 2026 onward, free allowances will be steadily reduced to 93% in 2027, 84% in 2028, 69% in 2029, 50% in 2030, 25% in 2031, and eliminated by 2032.[6, 10] By phasing down free allocation while phasing in CBAM, the EU seeks to gradually align domestic and foreign producers under the same carbon cost framework, minimising competitiveness risks and mitigating potential supply chain disruptions. The phased implementation particularly affects MENA exporters in covered sectors, with countries like Algeria (fertilisers), Morocco (cement), and Saudi Arabia (steel) facing significant compliance challenges.

CBAM initially covers imports of cement, iron and steel, aluminium, fertilisers, electricity, and hydrogen. These sectors were chosen for their high emission intensity and high exposure to trade, collectively accounting for over 50% of industrial emissions under the ETS once fully implemented. Over time, CBAM could expand to other ETS-covered sectors, depending on the outcomes of the transitional period and political agreement. Importers must file quarterly reports documenting embedded emissions in their products and any carbon prices paid in origin countries, covering both production emissions and electricity consumption, with sector-specific requirements for complex products.[10]

CBAM is jointly implemented by the European Commission and the National Competent Authorities (NCAs) of the 27 EU Member States.

NCAs manage importer registration, verify reports, and grant access to the CBAM Transitional Registry, a centralised online platform for data submission and compliance tracking. Recent EU simplification measures aim to reduce administrative burden while maintaining environmental integrity, with new authorisation procedures for importers effective from 2026. In parallel, CBAM's design continues evolving, with ongoing consultations on scope expansion to downstream products and anti-circumvention measures to prevent carbon leakage through trade routing.

Understanding vulnerability to CBAM requires more than a broad categorisation of developing versus developed economies; it needs accurate, context-specific measurement that captures both exposure and adaptive capacity. For example, Algeria, Libya, Egypt, Tunisia, and Trinidad and Tobago are highly exposed in the fertiliser sector. At the same time, Zimbabwe, Zambia, Mozambique, and Nigeria face risks in steel exports, and Mozambique, Ghana, and Cameroon face risks in aluminium. Morocco is particularly vulnerable to electricity, while Canada, Brazil, South Africa, and Turkey are identified as highly exposed due to their iron and steel exports.[4, 5] Such cases illustrate that vulnerability is not evenly distributed and sector-specific. For CBAM to avoid compounding inequities, the EU must consider its most vulnerable trading partners, while individual countries must also assess their own exposure and capacity to adapt. Only through accurate and equitable measurement can CBAM's impacts be properly understood and addressed.

Impact assessment under CBAM should be guided by sound, science-based criteria that account for both trade exposure relative to GDP and structural carbon intensity, rather than relying narrowly on competitiveness benchmarks like the World Bank's Relative CBAM Exposure Index.23 Such narrow measurements have reinforced the notion of a flat carbon price, which applies the same absolute value across all actors but, in practice, disproportionately burdens those with less capacity to pay. Vulnerability assessment should integrate trade exposure, economic capacity, and carbon intensity rather than focusing narrowly on trade volumes, enabling fairer cross-country comparisons that reflect development constraints.

The EU CBAM particularly affects trade flows in steel, aluminium, fertilisers, cement, and petrochemicals from major non-EU exporters. MENA countries face significant exposure across fertiliser exports (Algeria), steel production (Saudi Arabia), cement (Morocco), and aluminium (UAE). Beyond MENA, Ukraine faces severe impacts given its carbon-intensive steel exports, which represent 34% of sectoral exports to the EU. In contrast, India's steel sector faces medium-high exposure despite lower EU export shares due to high carbon intensity.

The table below summarises expected CBAM risks for key EU exporting regions:

Table 2: Trade Exposure to CBAM by Selected Exporters to the EU

CBAM exposures

Impact on trade flows on selected exporters to the EU

Country/Region	Major CBAM-Exposed Exports	Export Share to EU	Carbon Intensity vs EU	Domestic Carbon Pricing
Ukraine	Steel, Fertilisers	34% (steel)	900x higher than the EU	Developing ETS
Turkey	Steel, Cement	38.6% (cement)	Significantly higher	Limited
India	Steel, Aluminium	Lower share	6x higher than the EU	Coal Cess
China	Steel, Aluminium	7.9% (aluminium)	Higher	National ETS
South Africa	Steel	Medium exposure	Higher	Carbon Tax
MENA Overall	Fertilisers, Steel, Cement, Aluminium	High dependency	Variable by country	Pilots Only

Source: Research from various sources by Al-Attiyah Foundation

Inset 1: The Climate-Justice Nexus in relation to CBAM

Climate Equity: Who Pays the Price?

EU policymakers frame CBAM as creating competitive parity between climate-ambitious countries and those with weaker policies. However, this framing overlooks capacity constraints and vulnerabilities that prevent many countries from matching the EU's climate ambition or adapting to CBAM's requirements. CBAM extends EU influence over global emissions while potentially functioning as trade protectionism rather than genuine climate leadership. CBAM discourse has focused on major economies and WTO compliance.

At the same time, developing countries, despite facing the most significant exposure, have engaged with limited agency. Their responses typically emphasise adaptation costs rather than critically assessing CBAM's legitimacy or exploring alternatives.

Theoretical concerns translate into concrete impacts. Based on 2025 EU ETS prices averaging EUR 70-90 per tonne, Algeria's fertiliser exports face estimated compliance costs of USD 80-100 per tonne (3-4% of export value), though estimates are subject to market and policy variability. Meanwhile, Morocco's steel sector may incur costs equivalent to 6% of sectoral GDP contribution.

These impacts vary significantly across MENA: Qatar and the UAE have stronger institutional capacity for compliance, while countries like Yemen face severe technical constraints.

CBAM's effectiveness must be evaluated against its distributional impacts, particularly on countries least equipped to absorb compliance costs while having contributed least to historical emissions. In this connection, climate policy can be regarded as a multi-dimensional discipline that reflects a broader backdrop of North–South economic inequalities and the growing influence of green taxonomy frameworks in shaping access to sustainable finance for the developing world.

Overall, CBAM's ethical justification requires balancing its emission reduction effectiveness against welfare losses imposed on countries least equipped to absorb compliance costs. Key climate justice principles from the Paris Agreement; including Common but Differentiated Responsibilities (CBDR-RC), Polluter Pays (PPP), and Ability to Pay (ATP); suggest the need for differentiated approaches that account for historical responsibility and development constraints.[11,12,13,14]

Pathways for CBAM Adaptation

While addressing all policy challenges remains complex, it is possible to identify a prioritised roadmap of measures that could address and mitigate the unintended consequences of CBAM. One such measure would be to direct revenues generated through the mechanism toward supporting decarbonisation in vulnerable, low-income countries that are exposed to CBAM.

This could involve strengthening their emissions monitoring and verification capacities, enabling them to meet international standards and engage more competitively in low-carbon trade. Additionally, these revenues could finance technology transfer, innovation programmes, and targeted subsidies for emission reductions in high-polluting sectors, helping to drive structural transformation without deepening existing inequalities.[3, 4, 5]

Another measure is to broaden stakeholder consultation in the design and ongoing governance of CBAM, with particular attention to the needs and perspectives of vulnerable, low-income countries. This should include structured engagement with civil society in affected regions to better understand the level of support these countries require, as well as the power relations and distributional impacts within their domestic contexts. Establishing a dedicated unit within the EU institutional framework to facilitate regular dialogue with relevant stakeholders and thought leaders from the developing world would help ensure these voices are meaningfully integrated into CBAM decision-making.[15]

There is also an opportunity for the CBAM to avail itself of a stronger "local" perspective. In this sense, the EU could commission context-specific impact studies led by local researchers in CBAM-affected countries, in order to create a basis for technical assessment that is more firmly grounded in local realities. This would help capture the nuanced political, economic, and social factors shaping CBAM's impacts. In addition, prioritising locally-driven research could deliver more accurate and actionable findings, ensuring that climate justice considerations are better integrated into the policy, and outcomes aligned with the development priorities of affected countries.[15]

Another potential solution could be to grant exemptions from CBAM for vulnerable countries. However, this raises complex questions about the methodology used to allocate exemptions, including evidence, decision-making and the prevention of abuse. Exemptions also risk diluting the impact of CBAM to the point of undermining its effectiveness, particularly if multinational companies in least-developed countries exploit transfer pricing to avoid carbon costs.[11]

An alternative, more internally focused approach could involve introducing an export rebate for European companies, allowing them to recover carbon costs incurred under CBAM when exporting to non-EU markets.

Such a mechanism could help maintain the competitiveness of EU industries without shifting the burden onto vulnerable trading partners. However, the design of any rebate scheme would need to navigate complex legal considerations under WTO rules to ensure compliance.[12]

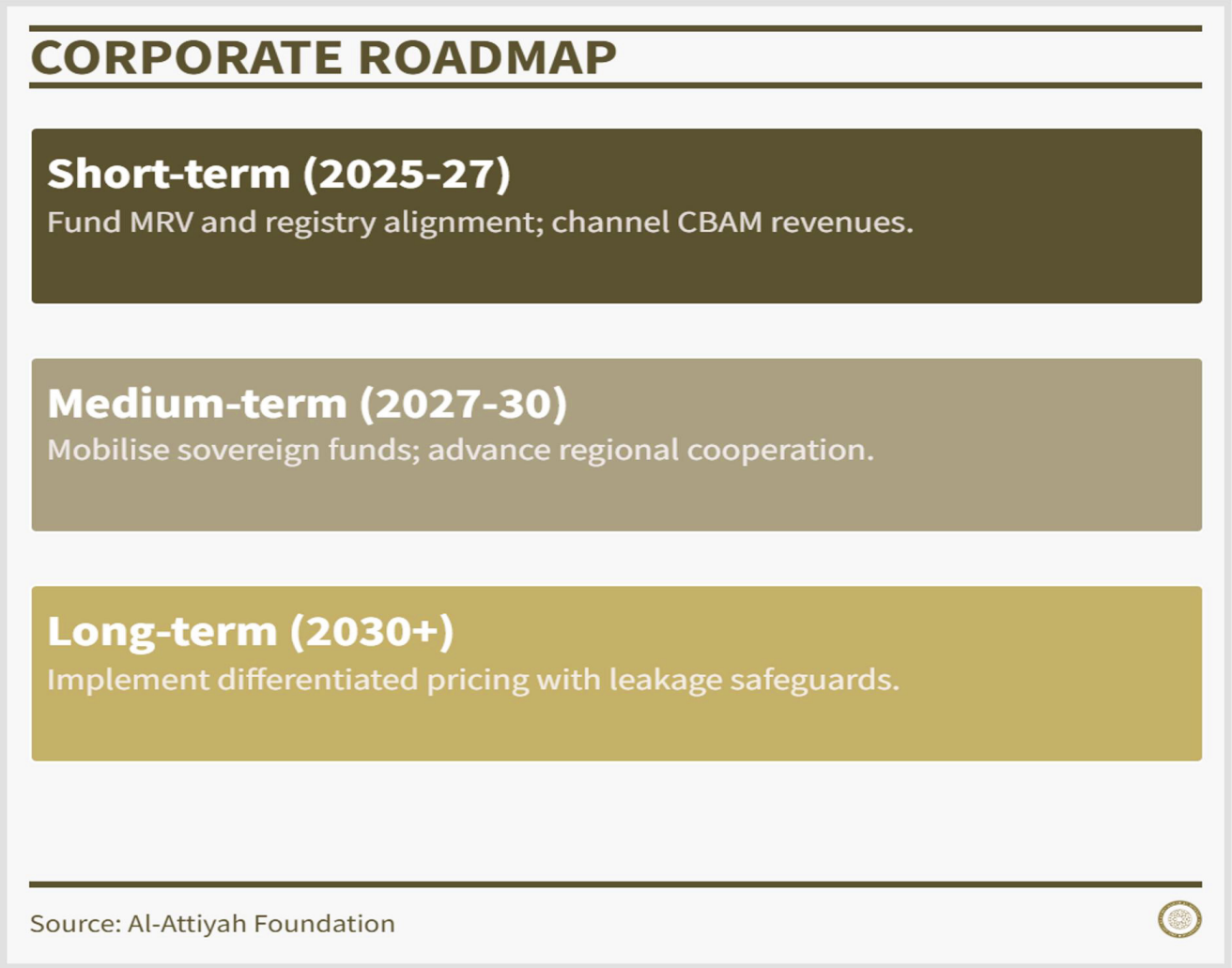
Immediate support mechanisms are essential to address CBAM's negative impacts on vulnerable countries. This support should encompass technology transfer, capacity building, and the strategic use of existing climate finance architecture, guided by an assessment of the most urgent decarbonisation and technology needs in industries across the Global South. Climate finance commitments are often vague and broken, contrasting with concrete CBAM obligations.

Effective support requires targeted, measurable climate justice finance with clear outcomes, not general climate finance promises.[11,12,15]

There is also an innovative proposal for the creation of "climate clubs," where countries demonstrating more ambitious and verifiable decarbonisation strategies would be granted exemptions from CBAM. Such an approach could incentivise higher climate ambition through positive reinforcement rather than solely relying on trade measures, while fostering cooperation among like-minded economies. However, its success would depend on transparent criteria, rigorous monitoring, and ensuring that the mechanism remains inclusive and does not create new divisions between participants and those unable to meet the entry thresholds.[16]

Figure 3: A Roadmap for Policy Action

Figure 4: A Roadmap for Corporate Action



MENA's carbon pricing landscape remains nascent, characterised by limited implementation but growing political and market interest. The UAE leads with its National Dialogue on Climate Ambition (NDC 3.0), extensive deployment of digital Measurement, Reporting, and Verification (MRV), and proactive private sector actions exemplified by ADNOC's net zero commitments and internal carbon pricing. Saudi Arabia is progressing rapidly, launching the Regional Voluntary Carbon Market Company and Carbon Exchange, backed by sovereign fund investments. Egypt has launched Africa's first voluntary carbon market on its stock exchange post-COP27, supported by regulatory reforms. Additionally, Qatar pursues balanced decarbonization of its LNG sector with major carbon capture initiatives expecting to capture over 4 million tonnes of CO2 annually and renewable integration.[17,18,19]

In 2023, Qatar convened a two-day groundbreaking workshop on 'Article 6 of the Paris Agreement and Climate Finance Mechanisms', aimed at kickstarting an inclusive consultative process to support the development of a robust strategy for the implementation of Article 6 of the Paris Agreement.

However, significant gaps in MRV infrastructure, registries, and capacity persist, compounded by fossil fuel dependency, geopolitical and economic challenges. Average MRV system setup costs range from $2 to $5 million, creating barriers for smaller economies.[20]

The following assessment illustrates varying readiness levels across key MENA countries, reflecting different approaches to carbon pricing, MRV capacity development, and private sector engagement:

Closing MRV and governance gaps, alongside enhanced cooperation and private-public partnerships, remains vital for MENA's successful participation in global carbon markets and optimal response to CBAM. Wealthier MENA states with diversified economies and stronger institutional capacity enjoy relatively more strategic room to manoeuvre, enabling them to act as visionaries. For such countries, CBAM presents less of an existential risk and more of an opportunity to lead. By leveraging their economic strength, they can accelerate low-carbon investments, set regional precedents, and take the initiative in shaping global support frameworks.

MENA's abundant solar and renewable resources position the region to transform carbon pricing from a compliance burden into a competitive advantage. Investment in green hydrogen production offers promising export opportunities, with the region's renewable energy costs 4-5 times below global averages, enabling cost-competitive low-carbon industrial development. Rather than viewing CBAM as a threat, MENA can leverage energy diversification to create future-proof trade advantages in clean steel, green ammonia, and renewable-powered manufacturing.

Regional tech hubs are fostering startups focused on AI, blockchain, and satellite technologies that revolutionise carbon accounting, transparency, and market participation. The UAE's blockchain-based carbon credit registry and emerging fintech solutions demonstrate potential for technological leadership in carbon market infrastructure.

These innovation ecosystems can position MENA as a global leader in digital MRV solutions, reducing compliance costs while enhancing market integrity.

MENA's existing energy infrastructure provides unique advantages for carbon capture, utilisation, and storage (CCUS) deployment. Qatar's major CCS initiatives and the region's enhanced oil recovery projects offer pathways to monetise carbon removal while supporting industrial decarbonization. Direct air capture pilots and methane capture from existing oil and gas operations complement strategic diversification efforts, and can create multiple revenue streams from carbon management.

Effective CBAM adaptation requires coordinated regional responses. Early regional initiatives, including the Arab League Renewable Energy Strategy and the GCC's climate cooperation frameworks, provide established platforms for unified negotiating positions and coordinated policy responses.

Establishing regional carbon market expertise centres, with technical assistance programs tailored to oil-dependent economies, could accelerate region-wide preparedness while fostering technology transfer and capacity building.19 Strategic partnerships with African nations to develop high-integrity carbon credit supplies under Article 6 frameworks position MENA as a bridge between developed and developing country carbon markets. Morocco's Article 6 agreements with Switzerland, Norway, and Singapore provide templates for regional expansion, while cross-border collaboration enhances both supply quality and market access for African carbon projects.

This integrated approach could transform MENA from a region vulnerable to external carbon policies into a proactive leader shaping global carbon markets through innovation, infrastructure leverage, and strategic partnerships.[21,22]

Institutions such as the Glasgow Financial Alliance for Net Zero (GFANZ) play a pivotal role in carbon markets by mobilising private sector commitments toward net zero-aligned capital allocation, leveraging over $130 trillion in assets under management globally. The Green Climate Fund (GCF) provides essential readiness support for developing carbon markets and MRV systems, with $2.8 billion approved for climate finance readiness globally. Multilateral development banks complement this through targeted financing for carbon market infrastructure and technical assistance programs in emerging economies.

Moreover, voluntary carbon markets (VCMs) offer attractive pathways for emerging economies despite integrity concerns. While challenges around additionality, permanence, and leakage persist, these are increasingly addressed through stringent verification protocols, transparent registries, and alignment with Article 6 of the Paris Agreement. For MENA countries, VCMs provide flexibility to monetise emission reductions while building capacity for future compliance markets, with voluntary credit prices ranging from $5 to $50 per tonne depending on project type and verification standards.

The private sector in MENA increasingly views carbon markets as strategic business opportunities. Energy companies like ADNOC, QatarEnergy, and SABIC are diversifying toward renewables and incorporating carbon offsets into net-zero strategies, driven by investor expectations and regulatory pressures.

Oil and gas firms are particularly attracted to carbon credits as hedging tools against future carbon liabilities while maintaining traditional operations during the energy transition.

Sovereign wealth funds are emerging as critical drivers of MENA's carbon market development. Abu Dhabi's ADQ has committed $15 billion to clean energy investments, while Qatar Investment Authority (QIA) and Saudi Arabia's Public Investment Fund (PIF) are directing capital toward decarbonising the carbon-intensive sector and developing renewable infrastructure. The UAE's $30 billion climate fund and Saudi Arabia's green bond programs demonstrate growing institutional commitment to transition financing.

MENA's strategic positioning for high-quality offset supply stems from abundant renewable resources and emerging Article 6 frameworks. The UAE, Qatar, Oman, and Tunisia have incorporated carbon market development into their NDC commitments, creating pipelines for nature-based solutions, renewable energy projects, and industrial emission reductions. The UAE's blockchain-based carbon credit registry enhances transparency and reduces transaction costs.

An integrated approach between climate finance institutions and carbon pricing mechanisms positions MENA to transform from a carbon-intensive region into a competitive player in global green markets, leveraging both abundant natural resources and growing financial sophistication to drive the low-carbon transition.[23]

Table 4: Summary of Scenario Pathways

Pathway	Risk Level	Description	Key Activities	Timeline	Cost Impact
Business-as-Usual	High	Reactive approach with limited progress	Slow MRV development, rising penalties, trade erosion	2025-2030	USD 10-20bn losses
CBAM Alignment	Medium	Compliance-focused strategy	Establish MRV systems, internal pricing adoption, and penalty mitigation	2025-2030	USD 5-10bn costs
Proactive Leadership	Low	Regional integration and market leadership	GCC pilots, sovereign fund deployment, MRV centres, green industries	2025-2030	USD 50-100bn investment
Internal Pricing Tool	Variable	Corporate adaptation strategy	Internal carbon fees, risk management, and strategic planning	Immediate	Company-specific

Source: Al-Attiyah Foundation

MENA countries face three distinct pathways in responding to CBAM, each reflecting different levels of preparedness, ambition, and regional coordination. Rather than passively adapting to EU policies, MENA has the opportunity to shape international carbon pricing through proactive leadership and collective action. The chosen pathway will determine whether the region emerges as a climate solutions provider or remains vulnerable to external policy shocks.[5]

Scenario pathways ahead could be grouped into three broad scenarios:

Business-as-usual: Reactive and High Risk of Marginalisation

- 2025–2027: Limited MRV progress; rising CBAM penalties; market share erosion
- 2028–2030: 15–25% trade loss in exposed sectors; USD 10–20bn annual compliance costs

The business-as-usual approach leads to economic marginalisation as MENA exporters lose competitiveness without addressing underlying carbon intensity challenges.

CBAM Alignment: Increased Costs but Preserved Market Access

- 2025–2027: Establish MRV systems; preserve EU market access; internal pricing adoption
- 2028–2030: Increased operating costs USD 5–10bn; stable access and reduced penalties

This pathway maintains trade relationships while building foundational capacity for carbon market participation.

Proactive leadership

- 2025–2027: Launch GCC pricing pilot; Sovereign Wealth Fund (SWF) deployment USD 50–100bn; regional MRV centres
- 2028–2030: Green hydrogen and clean industry scaling; regional climate solutions hub

This approach transforms CBAM challenges into competitive advantages through energy diversification and technological innovation.

Each pathway requires different implementation timelines and milestones. Business-as-usual represents drift until 2026-2030, resulting in reactive crisis management.

CBAM alignment demands immediate action through 2025-2027 to establish compliance frameworks before full implementation. Proactive leadership requires coordinated regional initiatives launched by 2025, with substantial results visible by 2028-2030, positioning MENA as a global climate solutions hub.

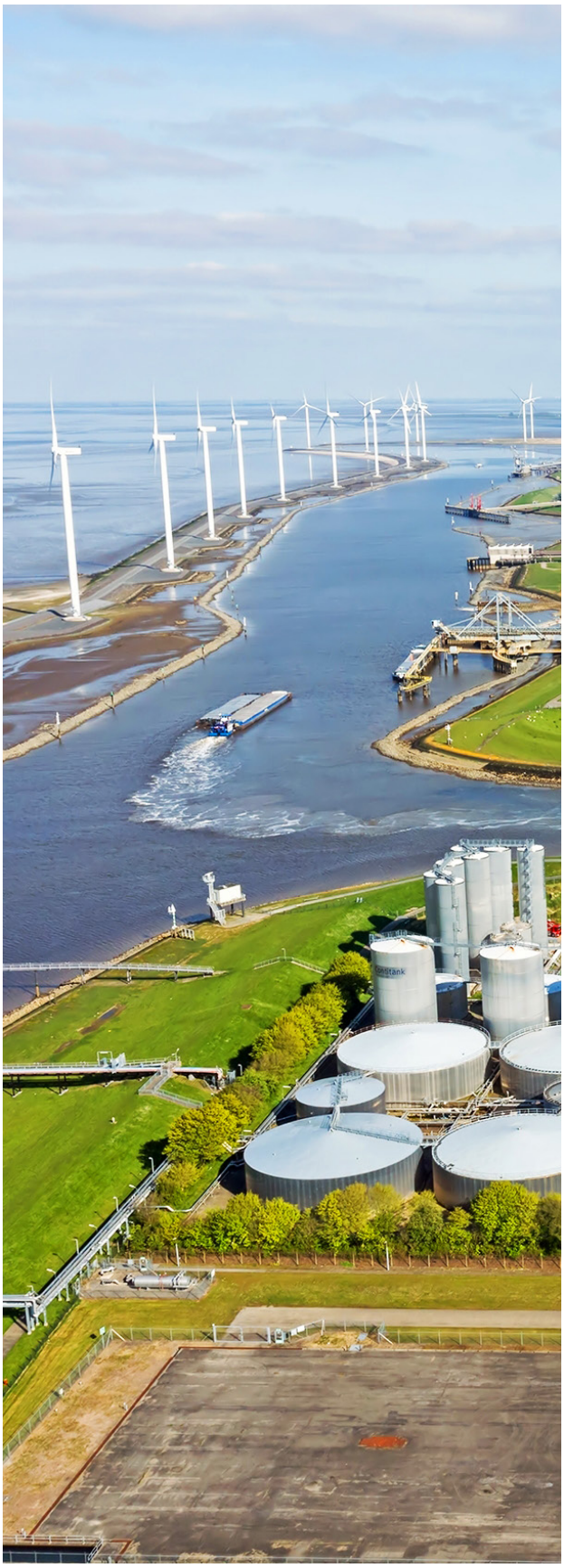
In addition, leading firms should consider short-term adaptation through internal carbon pricing to price transition risk into investment and procurement decisions. Such a step can support capital allocation, product strategy and CBAM-aligned reporting.

CBAM mandates regional strategic leadership, requiring MENA to balance resource dependence with climate governance ambitions while positioning the region to influence rather than merely respond to international carbon pricing policies. While generating significant uncertainty, it also creates unprecedented opportunities for regions like MENA to lead rather than follow in the global energy transition.

The ongoing climate crisis requires policies that are both effective and implementable to keep the global system within safe boundaries. Mechanisms like CBAM will ultimately be measured by their practical impact – whether they reduce emissions equitably, support fair transitions, and avoid worsening existing inequalities. The challenge is clear – global climate governance needs effective, equitable solutions that build rather than erode international trust in climate action. Credible, well-designed carbon pricing is increasingly essential for competitiveness, investment flows, and achieving climate goals. MENA's varied readiness creates both risk and strategic opportunity, requiring coordinated capacity building and proactive market engagement to convert compliance pressures into competitive advantages.

MENA stands at a transformative moment where CBAM pressures can catalyse regional evolution from resource dependence to climate leadership. Success requires coordinated action targeting measurable 2030 milestones – 60% emissions coverage under carbon pricing, USD 200 billion clean energy investments, 40% renewable electricity share, and positioning as a top-3 global green hydrogen exporter. The strategic framework outlined in this research paper provides a roadmap for policymakers and

corporate leaders to navigate this transition through five key priorities – accelerating MRV capacity, engaging in international negotiations, piloting hybrid pricing models, mobilising sovereign wealth funds, and building regional alliances for market integration and innovation. By choosing proactive leadership over reactive compliance, MENA can emerge as a significant global climate solutions provider, transforming from a region vulnerable to external carbon policies into one that actively shapes the future of international carbon markets.



25 APPENDIX

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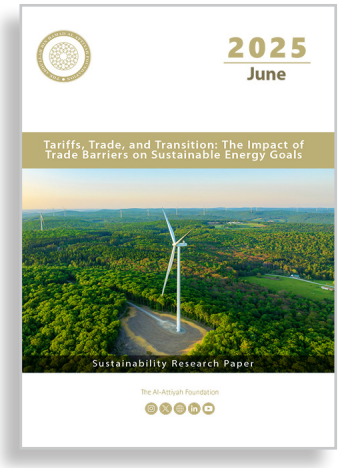

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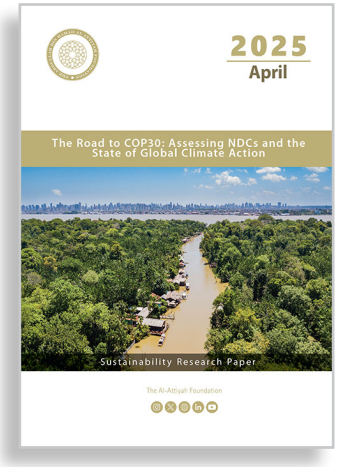

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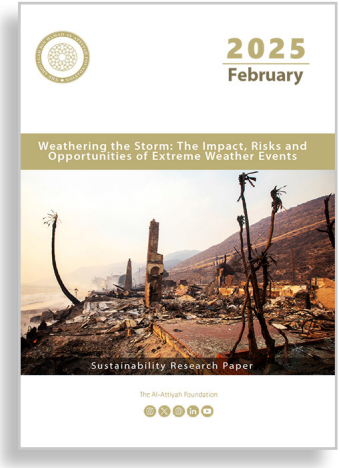

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