

Regulatory Trends and Technical Developments

Reshaping the border environment: e-commerce, Green Customs, disruptive technologies and integrity.



Reshaping the border environment

This module explores regulatory trends and technical developments and how they are reshaping the border environment, with a focus on:

- E-COMMERCE
- GREEN CUSTOMS
- DISRUPTIVE TECHNOLOGIES
- INTEGRITY

Customs is under growing pressure to modernise as digital trade expands and environmental expectations rise. These trends highlight the shift toward innovation, sustainability, and ethical governance.

Today's webinar explores how customs administrations are responding through reform, technological innovation and global cooperation, while upholding integrity at the border.



E-Commerce: introduction

- Major driver of global trade growth; now a multi-trillion-dollar ecosystem
- Creates high-volume, low-value flows that challenge traditional customs models
- Key issues: revenue collection, risk management, data quality, facilitation
- WCO leads global standards, guidance, and cooperation
- Defined broadly as online buying and selling; cross-border when goods move between economies



Current and emerging landscape

- Rapid growth driven by digital access, smartphones, and demand for fast, low-cost delivery
- Key customs challenges: volume, compliance complexity, fraud, illicit goods, revenue loss
- Agile, resilient supply chains essential for industry: alertness, accessibility, decisiveness, speed, flexibility
- Creates vulnerabilities: low-value shipment surge, non-traditional supply chains, complex regulation
- Administrations strengthening advance data requirements and platform accountability
- DHL and Everstream partnership shows the shift toward predictive, data-driven risk management

USD 6.3tn+

Global e-commerce sales

~25%

Of all retail sales by 2027



E-commerce models

B2C

Business to Consumer

Businesses sell goods directly to individual consumers. For example Amazon and online retail.

B2B

Business to Business

Businesses sell goods or services to other businesses. For example wholesalers and raw-material suppliers.

C2C

Consumer to Consumer

Individuals sell goods to other individuals via platforms. For example eBay and Marketplace.

Other

Other digital models

Includes C2B, where individuals provide goods, services, or digital content to businesses, and government-linked models such as B2G, C2G, G2B, and G2C, which involve digital transactions for services, data, or procurement.

DHL global support for e-commerce clients

- DHL has adopted agile, data-driven logistics to help businesses stay resilient and responsive
- Publishes the E-Commerce Trends Report, International Shipping Guide, and Global Customs Guidelines
- Supports clients with accurate, electronic data for smooth cross-border shipping
- Highlights the global shift toward fully data-driven, digital clearance

Early, complete Commercial or Proforma Invoice data enables:

- Accurate declarations
- Faster, automated clearance
- Pre-arrival processing
- Better compliance
- Earlier risk assessment, including dangerous goods



Key players in global e-commerce

Sellers and vendors
Provide goods to global consumers

Platforms and marketplaces
Amazon, Alibaba, eBay, Temu, Shein, Tokopedia

Express carriers
DHL, FedEx, UPS enabling fast, predictable delivery

Logistics providers
DHL, UPS, COSCO, Kerry, SF Express; specialised services such as cold chain

Payment providers
PayPal, Stripe, Adyen enabling secure cross-border payments

Customs and border agencies
Ensure compliance, collect revenue, protect borders

Brokers and fulfilment providers
ShipBob, Flexport, Rakuten SL supporting clearance, warehousing, last mile

Tech enablers
ChannelAdvisor, ESW, Shopify tools for listings, pricing, compliance

Customs-related challenges in cross-border e-commerce

VOLUME	Massive surge in low-value parcels; legacy systems under strain
DATA QUALITY	Incomplete or incorrect data undermines targeting, compliance, and automation
RISK MANAGEMENT	Harder to detect fraud, illicit goods, IPR violations, unsafe products
REVENUE	Undervaluation, misdescription, de minimis abuse, fragmented shipments
DE MINIMIS	Many countries lowering or abolishing thresholds to protect revenue
ILLICIT TRADE	Criminals exploit anonymity, small parcels, and fragmented supply chains
COLLABORATION	Stronger cooperation needed across customs, platforms, carriers, and payment providers



De minimis: global trends and impacts

- Simplifies low-value imports but increasingly under review
- Thresholds vary by country: duties versus GST or VAT; gifts versus commercial goods
- Rapid e-commerce growth means more parcels qualifying as de minimis
- Governments tightening rules to address revenue loss and unfair competition

RECENT CHANGES

United States	800 dollars → abolished 2025
European Union	VAT on all imports; duty exemption ends 2026
Significant reduction	Australia, India, Russia, Indonesia, Turkey, South Korea
VAT on all	Brazil, Singapore, Chile apply VAT to all low-value imports
Enforcement	Mexico and Japan: stricter enforcement and platform accountability



Adapting to new e-commerce business models

Digital tools	AI and ML risk profiling, blockchain, automated verification, image analytics
Risk-based compliance	Focus on high-risk sellers and shipments; pre-arrival data; trusted-trader models
Strategic partnerships	MoUs with platforms, carriers and fintech; system integration; joint operations
Legal and regulatory	New rules for low-value goods, marketplace liability, EAD mandates, de minimis reforms
Intelligence sharing	Cooperation with WCO, Interpol and Europol; databases of high-risk actors; public-private data sharing



WCO Framework of Standards on cross-border e-commerce

Global standards to manage e-commerce growth and risks, widely adopted through national reforms, pilots, and public-private partnerships.

01

Advance Electronic Data

Pre-arrival shipment data for targeting

02

Simplified clearance

Streamlined processes for low-risk, small parcels

03

Revenue collection

Fair, efficient duty and tax assessment

04

Risk management

Analytics-driven, technology-enabled enforcement

05

Stakeholder engagement

Strong cooperation with platforms, carriers, and regulators

Summary: e-commerce

- E-commerce is reshaping global trade and straining traditional customs systems
- Automation, digitisation, and high-quality data are now essential
- Low-value shipments complicate enforcement, targeting, and revenue collection
- Collaboration and risk-based, data-driven approaches are critical
- The WCO Framework guides global alignment; compliant carriers like DHL become trusted partners



Green Customs: introduction

- Green Customs refers to the integration of environmental protection into everyday customs operations
- Addresses illegal trade in hazardous waste, wildlife, ozone-depleting substances, and chemicals
- Supports global climate, biodiversity, and sustainability goals
- Part of a wider enforcement network: customs, logistics providers such as DHL, environmental agencies, police, and MEA partners



Global green initiatives

- UNEP's Green Customs Initiative builds capacity for border agencies
- Partnership includes Multilateral Environmental Agreement secretariats, Interpol, the WCO, and UN agencies
- Focus on ozone-depleting substances, hazardous waste, toxic chemicals, and endangered species
- The Green Customs Assessment Tool helps administrations evaluate and improve sustainability performance

WCO GREEN CUSTOMS ACTION PLAN

Being	Reduce customs own environmental footprint
Doing	Facilitate green trade and enforce environmental rules
Innovating	Test transformative sustainability ideas



Key Multilateral Environmental Agreements

Customs is responsible for enforcing several major environmental treaties, such as:

Convention on International Trade of Endangered Species (CITES)

Regulates international trade in wild animals, plants, and endangered species to ensure it does not threaten their survival

Montreal Protocol

Controls trade in ozone-depleting substances

Basel Convention

Regulates transboundary hazardous waste movements

Stockholm Convention

Restricts trade in persistent organic pollutants



Country examples: Green Customs in action

Green corridors

INDIA · BRAZIL · SINGAPORE

Dedicated lanes or processes for certified sustainable goods, low-emission fuels, and environmentally friendly commodities to speed compliant trade and promote green supply chains

Wildlife protection

COLOMBIA · KENYA · NEW ZEALAND

Specialised border units, enhanced inspections, and interagency cooperation to detect and stop wildlife trafficking at airports, ports, and postal hubs

Waste and chemicals

NORWAY · CHINA · CANADA · JAPAN

Advanced targeting tools, including Norway's AI models, plus stricter controls and inspections to prevent illegal shipments of hazardous waste, toxic chemicals, and regulated materials

Sustainable commodities

AUSTRALIA

Mandatory due diligence checks and border enforcement to prevent illegal timber entering supply chains, ensuring compliance with Australia's Illegal Logging Prohibition laws



European Union and internal sustainability practices, and the impacts of human rights and deforestation

EU initiatives

DG TAXUD: Single Window plus the Customs Risk Management Framework, integrating environmental risks

Green Deal Customs Strategy: stronger controls, digitalisation, cooperation with environmental authorities

CBAM: carbon price on imported goods; reporting 2023 to 2025; certificates from 2026

Internal sustainability practices

Paperless processing, green procurement, energy-efficient facilities, solar border posts, recycling programmes, Green Customs training

Human rights and forced labour

Due diligence obligations across supply chains; high-risk sectors include critical minerals, agriculture, forestry, and recycling

Deforestation controls

For example the EUDR: traceability, geolocation, risk assessments, and due diligence statements for cattle, cocoa, coffee, palm oil, rubber, soy, and wood



Summary: Green Customs

- Customs are key actors in global sustainability
- Success requires modernisation, digitalisation, and strong partnerships
- Logistics providers are critical for data quality, documentation, and compliance
- Green Customs will shape future trade flows and enforcement models



Disruptive customs technologies and automation

- Trade growth and e-commerce are driving unprecedented volume and complexity
- Traditional border processes are no longer sufficient
- Customs is shifting to technology-driven, data-informed operations
- Dual mandate: facilitate legitimate trade and secure borders
- Digital transformation is now essential, not optional

Core technologies transforming customs

AI and machine learning	Automated risk assessment, fraud detection, document processing, image analytics: faster, more accurate decisions
Blockchain	Secure data sharing, digital certificates, trusted-trader programmes: greater transparency and reduced fraud
Internet of Things	Real-time tracking, condition monitoring, tamper detection: better compliance and visibility
Big data	Anomaly detection, profiling, resource optimisation: intelligence-led operations
Non-intrusive inspection	X-ray, CT and gamma imaging plus AI: high detection rates with minimal trade disruption

These are illustrative examples – many other technologies are emerging.

Other supporting technologies

Drones	Remote border surveillance and environmental monitoring: extends reach into hard-to-access areas
Robotic process automation	Automates repetitive tasks such as data entry and licence checks: frees staff for higher-value work
Biometrics	Secure identity verification: faster, more reliable traveller processing
Cloud platforms	Scalable, interoperable customs systems: supports real-time data sharing and modernisation
Digital twins and quantum computing	Future modelling and optimisation: next-generation planning and simulation capabilities

Global examples of digital customs in action

European Union

Customs Data Hub, EU Single Window Environment for Customs, CBAM digital reporting

Singapore

National Trade Platform: an integrated national digital trade ecosystem

South Korea

UNI PASS: a fully paperless, IoT-enabled customs system exported globally

Japan

SMART Customs: a user-centric digital transformation programme

DHL

AI classification, RPA declarations, IoT monitoring, blockchain pilots

These are illustrative examples – many other digital customs examples are emerging.



Key challenges: governance, skills and interoperability

- Overregulation: can stifle innovation, slow adoption, and create compliance bottlenecks
- Fragmented governance: inconsistent rules and data standards lead to duplication and inefficiencies
- Skills shortages: limited digital capability reduces the effectiveness of new technologies
- Integration issues: legacy systems and interoperability gaps hinder seamless data exchange
- Cost and resource constraints: modernisation requires phased, scalable investment to be sustainable

AI risk mitigation, governance and key challenges

Responsible AI use

Requires ethical principles, legal frameworks, transparency, and explainability

Human oversight

Officers must supervise, interpret, and challenge AI outputs

Data integrity and security

Strong cybersecurity, access controls, and audit mechanisms

Key risks

Data and cyber risks, integration gaps, governance issues, fraud and ethics, skills needs

Ecosystem for success Logistics providers, border agencies, technology vendors, policymakers, and international bodies



Summary: disruptive technologies

- Digital customs strengthens security, speeds trade, reduces costs, and builds trust
- Requires sustained investment, political commitment, and international cooperation with ecosystem partners: logistics providers, border agencies, technology vendors, policymakers, international bodies
- Now foundational to efficient, secure, sustainable border management



Why integrity matters in customs

WHY IT MATTERS

- Integrity underpins trade facilitation, revenue collection, and border security
- Corruption distorts trade, reduces investment, and erodes public trust
- Integrity is essential for fair, predictable, and accountable border processes
- Private sector actors also share responsibility for ethical conduct

CORE CONCEPT

- Integrity means honesty, professionalism and ethical behaviour in customs operations
- It ensures fair enforcement, transparent decision-making and equal treatment of stakeholders
- Not just a government responsibility: traders, brokers and logistics firms share it too
- Goes beyond the absence of corruption: includes service standards and accountability
- Supports credibility, voluntary compliance, and effective governance
- Collaboration among all parties is key to fostering a culture of integrity

WCO leadership: the Revised Arusha Declaration

- Global benchmark for integrity in customs, revised in 2003
- Focus on eliminating opportunity, reducing motivation, and strengthening controls
- Supported by the WCO Integrity Guide, the ACIP Programme, and global standards

TEN CORE ELEMENTS

01 Leadership and commitment	02 Regulatory framework	03 Transparency	04 Automation	05 Reform and modernisation
06 Audit and investigation	07 Code of conduct	08 Human resource management	09 Morale and organisational culture	10 Relationship with the private sector

Integrity risks and consequences

- Revenue leakage and economic distortion
- Reduced public trust and weakened interagency cooperation
- Lower morale and reduced voluntary compliance
- National security and community protection compromised
- Barriers to trade and investment

Working with the private sector

Trust	Open communication and transparency build trust
Shared responsibility	Shared responsibility for ethical behaviour and compliance
Tools	Memoranda of Understanding, codes of conduct, integrity surveys, liaison committees
Incentives	Authorised Economic Operator programmes, simplified procedures, reduced inspections
Automation	Automation reduces opportunities for corruption

Integrity as a pillar of modernisation

- Integrity is embedded in WCO capacity-building and reform frameworks
- Essential for digital transformation, AI governance, and data transparency
- Supports Multilateral Environmental Agreements, Free Trade Agreements, and global trade rules
- Logistics providers such as DHL must uphold strong compliance and ethical standards
- Integrity is the foundation of credible, modern border governance

Summary: integrity

- Integrity underpins trade facilitation, revenue, security, and public trust
- Weak integrity leads to corruption, revenue loss, and distorted trade
- Integrity means honesty, professionalism, transparency, and consistent enforcement
- Shared responsibility: customs plus traders, brokers, and logistics firms
- Supported by WCO frameworks: the Revised Arusha Declaration and the Integrity Guide



Questions?

