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POLICY REPORT

Customs: Global Border Authorities as Pillars in Mitigating Climate Change and Transitioning to Global Green Energy

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Climate change and environmental threats require the attention of all stakeholders. Customs Authorities, as the primary border authorities of global trade, can be frontline leaders in the development of a "circular economy" and global green-energy transition. The World Customs Organization plays a pivotal role in the universal development of customs frameworks and has prioritized the transition to circular and green economies. The challenge is to balance these priorities with the promotion of global trade and economic growth. This requires reform and innovation to adjust to new and disruptive technologies, specifically, increased involvement in policy formulation, greater investment in human resources expertise, the promotion of tax relief Customs policy in Renewable Energy Sources (RES) and environmentally friendly goods, and more substantive collaboration with stakeholders from the private sector. This policy report explores these challenges, using case studies in the European context and beyond in combination with policy proposals and recommendations. Mitigating climate change is crucial, and, as this paper shows, requires alternative, global, and even "beyond-borders" approaches, so that recurring "statements" and "decrees" can also be mitigated.

Executive Summary

At the current moment, which is critical in terms of climate change and serious environmental threats, the activation of all stakeholders involved is vital. The development of the circular economy and the global green energy transition can find a crucial defender in Customs authorities, the global trade border authorities par excellence. In this context, Customs administrations have a prominent role to play, exercising their core competencies such as the implementation of Multilateral Environmental Agreements, the facilitation of legitimate trade, and the oversight, both across borders and on their territory, of global trade.

Customs authorities all over the world are expected to play a key role in the "green transition" due to their similar worldwide objectives, their particular "international nature", and the quite well harmonized customs legal framework. The World Customs Organization has a pivotal role in the universal development of customs frameworks and efficiency and has prioritized as a key issue the contribution of Customs in the transition to a circular economy. However, Customs administrations are facing the challenge of managing the execution of their complicated missions, protecting the environment—and in parallel promoting global trade and

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economic growth—by embracing innovations, adjusting to new disruptive technologies, through reform and transformation, all in a changing world.

Increasing Customs' contribution to meeting sustainability targets depends on Customs substantial involvement in related policy formulation, investment in producing "human resources" expertise, the effective embrace of new technologies, the promotion of tax relief Customs policy in Renewable Energy Sources and environmentally friendly goods, more substantive collaboration with other stakeholders from private sector, and on the development of more effective Coordinated Border Management. Case studies, such as the European context and other worldwide examples of Customs' contributions to mitigating climate change and to the global green energy transition, are presented, in combination with policy proposals and recommendations for the reinforcement of Customs' crucial role.

However, aside from the transformation of the role of Customs, which is expected to effectively face the many new challenging opportunities, the whole concept of mitigating climate change must be approached and considered in alternative, global, even "beyond-borders" ways as well, so that ineffectual "statements" and "decrees" may also be mitigated.

1. Introduction

In the geological era of the "Anthropocene", unfavorably affected by human-led global warming, multi-level pollution, and energy inefficiency, where the mitigation of climate change is an alarming global necessity, setting up effective defense strategies and policies seems more than essential. In the framework of coordinated global action to achieve the 17 Sustainable Development Goals (SDGs) of the United Nations (2015), the outcomes of the Climate Change Conference in Glasgow, the transcendence of "*planetary boundaries*", and the need for an effective implementation of the Multilatelar Environmental Agreements, the formulation of public policies targeted at developing a "*circular economy*" and "*environmental sustainability*" lies at the heart of the strategic "*arsenal"* that humanity must activate. In this context, it is imperative that all the involved authorities and stakeholders take full action. Among them, Customs administrations, and therefore relevant customs regulatory frameworks, as complementary to the global environmental legal framework, are in an especially good position to bolster the fight against climate change. Customs are the border control authorities par excellence and act as the supply chain's "check-points", and ought to be mandated to respond to the fight against environmental risks (Raath 2020).

There is no need to provide evidence that the environmental threat is a major universal topic that must be faced in a common global, coordinated way. Moreover, the doctrine that environmental protection must pass through a green energy transition does not need any further development, since the energy sector contributes the majority of greenhouse gas (GHG) emissions and the majority of energy consumption is covered by fossil fuels (Leal-Arcas et al. 2022, 298). In this context, the global green transition—the transition from a linear to circular economy and the promotion of Renewable Energy Sources such as wind, solar, geothermal, and certainly hydrogen (Verdonck & Kammoun 2020)—can be effectively supported by Customs authorities at the global level through the implementation of harmonized processes, standards, and norms (Mikuriya 2022).

This paper offers a summarized and holistic approach to how Customs administrations and customs legal frameworks can contribute significantly to the successful reinforcement of environmental sustainability and the global green transition. The nexus "*environmental protection and energy transition*" can only be approximated in a combined manner if we intend to approach the issue in terms of causality and under the policy dipole "*problem-solutions*". In the research the basic topics of the Customs' regulatory framework (facilitation and simplified procedures, customs control) and their pivotal role in the global supply chain are lightened, as well as the forthcoming challenges for Customs authorities. The paper concentrates also on future Customs modernized competencies, the importance of the implementation of disruptive technologies in "*customs matters*", and generally the importance of Coordinated Border Management. The issue is to bring to the surface the great challenge for transformation and adjustment to the new global "*ecological exigencies*" and the achievement of a "*high score*" of performance for Customs, in order to fulfill their prominent commitments: protecting the environment and promoting the global energy transition.

2. Customs As Pillars Of The Global Environmental Sustainability And Green Transition

Worldwide, for Customs Administrations, environmental protection and sustainability constitutes a priority issue and a basic competency. In general, Customs combine and balance a dual and almost contradictory role, as on the one hand they facilitate the legitimate trade of all cross-border movements of goods, and on the other hand they are charged with surveillance, control, and enforcement through all phases of the Global Supply Chain of cross-border trade (Heimann et al. 2020).

2.1. Customs competencies

The implementation of Multilateral Environmental Agreements (MEAs) and Regional Trade Agreements (RTAs), the surveillance of compliance of the economic operators with the provided customs obligations, formalities, and prohibitions-restrictions, the collection of duties and domestic taxes, the control of illegal trade, customs fraud and smuggling, the implementation of trade policy, the facilitation of legal trade and the support of the "*environmentally sustainable trade*", the protection of the environment, the assurance of public health and security, and the application of Trade Defensive Measures, such as tariff measures, agreements on Anti-Dumping Duties, quotas, subsidies, and Countervailing Measures, fall into worldwide Customs competencies.

2.2. Customs as border agency

Customs administrations, as first line border agencies, stand as pillars at land borders and around ports and airports, exercising their significant role at the border via efficient implementation of MEAs (Clark 2020) and by monitoring trade of environmentally sensitive or harmful goods and fighting smuggling and trans-boundary environmental crime. Customs administrations are placed on the top of the hierarchical pyramid of public cross-border authorities. But why Customs? What is the crucial element that makes them the primary border agencies and pillars in terms of environmental sustainability and global green transition? Far away from the intention to declare comparisons between Customs and the other border agencies such as Police, Coast Guards agencies, environmental and migration authorities, etc., it is essential to recognize that Customs Administrations present unique particularities. Customs Administrations have been characterized as "*international nature's*" authorities, implementing globally similar processes due to their similar objectives and their engagement of international conventions and standards, having reached an advanced level of global harmonization (Montagnat-Rentier & Bremeersh 2022). In their substantial core lies the "*supranational element*" which makes them the appropriate agency to defend a global legal good like the environment. Furthermore, customs legal and regulatory frameworks themselves are a precious asset and can add separate value to the facilitation of the global energy transition.

The next question arising is if Customs can respond to the big challenges in a perpetually transforming world. The answer could be positive and rests in the redefinition of their role and the creation of strong partnerships and profound collaborations with other involved authorities and the private sector in order to fulfill their strong commitments, controlling trans-boundary movements of dangerous goods (Ferraro & Nguyen 2021) and meeting environmental goals.

2.3. Global approach of Customs contribution: Global actors in Customs policy making

To achieve the Sustainable Development Goals, the below major factors, global organizations, and initiatives play a fundamental role.

The **World Trade Organization (WTO):** The most important international trade Customs agreements are the WTO's Agreement on Customs Valuation and the WTO Trade Facilitation Agreement (TFA). As parts of the ambitious initiatives of WTO in favor of the circular economy, it is also worth mentioning the Environmental Goods Agreement (EGA), regarding the elimination of tariffs on a number of important environment-related products where the role of Customs administrations is expected to be without a doubt critical (Eriksson 2022, 16), and also the Initiative on Trade and Environmental Sustainability Structured Discussions (Falgueras del Alamo 2024, 81).

The **World Customs Organization (WCO):** The WCO, over time and worldwide among its members, has developed agreements and standards for harmonized and simplified procedures, such as the Harmonized Commodity Description and Coding System (HS), the revised Kyoto Convention (simplification and harmonization of customs procedures), the Framework of Standards to Secure and Facilitate Global Trade (Norms SAFE), and the Authorized Economic Operator (AEO). Moreover, supporting the transition to a climate-neutral economy constitutes a very important issue for the WCO. In the global green transition, the contribution of the WCO is critical, through a significant number of publications and papers in the WCO magazine, related study reports, the first Green Customs Global Conference in June 2022, and the Symposia on greening the HS codes in 2022/2023. Furthermore, regarding Customs enforcement, the WCO Customs Enforcement Network and WCO enforcement operations warrant mentioning, such as PREASIDIO, THUNDERBALL, DEMETER, and more. Additionally, standards for successful coordinated border management—such as the effective implementation of Multilateral Environmental Agreements and Regional Trade Agreements, the mutual recognition of Authorized Economic Operators, the sharing of equipment and data, and joint risk analysis and border control—have been developed by the WCO, mainly via the Revised Kyoto Convention.

The **Green Customs Initiative (GCI)** refers to a partnership of international entities and organizations, such as the World Customs Organization, the United Nations Environment Programme (UNEP), the United Nations Office on Drugs and Crime (UNDOC), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora, for the enhancement of the capacity of Customs Administrations and other border control agencies under the scope of

environmental protection through synergies, workshops, etc.

2.4. Customs as supervisors of the Global Supply Chain

Customs and the global supply chain are two interactional ecosystems. The supply-chain network connects several parties including suppliers, retailers, distributors, and manufacturers (Al-Haddad et al. 2021). Customs authorities ensure trade facilitation and supervise the Global Supply Chain (GSC) through all its stages (liberalization, transport, licensing, electronic data transfer, payment, insurance, information) while the fulfillment of Customs formalities by economic operators (submission of declarations, customs clearance through electronic procedures) is necessary during all phases of the GSC. Taking into consideration that the supply chain's performance can be negatively affected by long clearance processes, such as in import, export, and transit procedures, the critical role of Customs and especially its function as a "*business strategic partner*" becomes clear. Nevertheless, in accordance with the grid of social, economic, political, and environmental evolutions of our era, a new approach to the role of Customs is under discussion regarding the adoption of innovations, such as digitalization and information technology (Heijmann et al. 2020, 131) in GSC management. "*Green supply chain"* management passes through efficient border management and fast Customs clearance, competitiveness, digitalization, and security (Ferrano & Nguyen 2021, 296).

2.5. The contribution of the traditional Customs regulatory framework

The appropriate use of the specialized Customs legal framework could become a catalyst for boosting environmental sustainability and the global energy transition. Worldwide, the Customs **classification** of goods is based on a common coding system for imposing customs duties and implementing trade and commercial policy measures, namely the Harmonized System (HS), which was developed by the WCO and is critical for the development of a circular economy. In the field of HS and its relationship with environmental sustainability, a lot of work has been already done by the WCO in preparing the new edition of the HS in 2027 (Tariff and Trade Affairs Directorate & WCO Secretariat 2020). The WCO has emphasized the lack of HS codes, the difficulties in classification of new environmentally friendly goods, and the necessity to align HS nomenclature especially by developing new HS codes (World Customs Organization 2022), considering the need for a "new greening HS" (Grooby 2022, 27). An aspect of the difficulties regarding the task of classification is the different philosophy and purposes between HS codes and MEAs (World Customs Organization 2023, 36), as for example between HS codes and the Basel Convention (Secretariat of the Basel Convention 2020), which is faced mainly with correlation tables. In any case, aside from the topic of classification, the establishment of low import duty rates for environmentally preferable goods or duty exemption, total or partial, and tax relief for goods or raw materials necessary for RES, could provide real progress in terms of sustainability.

Regarding the domain of **Origin**, which is the economic nationality of commercial goods—meaning the country where the products have been produced or manufactured, and particularly the *preferential* origin—the contribution of the Customs regulatory framework could be based on provisions included in preferential multilateral or bilateral trade agreements, for low or no duties in the case of imported raw material to be used for the production of Renewable Energy Sources (for example the infrastructure for a hydrogen pipeline). Additionally, it could be based on the implementation of simplified procedures, as, for example, the "*self-service printing of certificates of origin*" via the Electronic Origin Data Exchange System (EODES), as part of the initiative developed by China Customs, known as "Smart Customs, Smart Borders, and Smart Connectivity", or the 3S initiative (Jiang 2021).

Regarding the topic of **Taxation**, Customs policy and legislation's contributions could be significant in the field of the energy transition and RES, taking into consideration the necessity for brave removal of certain duties and tax relief.

Concerning **Customs procedures,** it would be of great importance for an economic operator to choose the appropriate customs procedure (for example customs warehousing, inward or outward processing, or specific use procedures, such as temporary admission and end-use) and take advantage of duty suspensions and other privileges provided by specific customs regulations. While the necessity for cost-effective policy measures, reliefs, and financial facilitations replies quite well to costly requirements for investment in clean energy, the clever use of such economic regimes is beneficial. For example, the end-use procedure could be a wise choice for a Renewable Energy Sources economic operator who imports raw material or infrastructure items from a third country under reduced or full exemption import duties due to its the specific destination (production of green hydrogen).

The complexity of customs formalities and therefore the necessity for simplifications and harmonization of processes occupy the first line of the Customs policy worldwide agenda throughout the development of **Simplified Customs Processes**. In this context, concerning the Authorized Economic Operator (AEO) status globally in particular, the WCO has developed and published a 2020 AEO Compendium which has universally become a harmonized single point of reference.

Regarding the domain **Control and Risk management,** according to the revised Kyoto Convention and the SAFE Framework of Standards of the WCO, the Risk Management System (RMS) constitutes globally a magnificent best practice of Customs control competence. Following the modern approach, the "Integrated Supply Chain Management" concept tends to move away from traditional Customs control procedures and toward a modern customs reality which is based on Authorized Economic Operators (trusted traders) and authorized supply chains (trusted trade lanes).

3. The World in Transformation: The Challenging Metamorphosis of Customs Administrations

In a variously transforming world, the issue of environmental sustainability and energy transition should be launched far away from traditional policy approaches and territorial strategies and models (Dalby 2021). In this framework, new types of international cooperation are also born, such as Climate Clubs, which are groups of member countries and even non-state actors with a common strategy on a specific climate issue, engaged by agreed rules and guidelines on a voluntary basis (Monkelbaan 2021). Moreover, the on-going evolution of the circular economy, changing global trade patterns, and increasing technological innovations also complicate the traditional role of Customs. A great challenge for Customs authorities, despite their expertise, is primarily to gain a deep knowledge of the circular economy's policies, mainly by involving themselves in policy-making discussions at the government level but also through dialogue with the private sector.

Regarding Customs' competence in the implementation of Multilateral Environmental Agreements (MEAs), according to the outcomes of a 2020 survey of WCO about the level of engagement and capacity of Customs Administrations, a lack of operational tools, guidelines, and partnerships were noted, while a differentiation was observed depending on the kind of MEA, as, for example, the majority of Customs agencies are more familiar with the CITES Convention than with others (Raath 2020).

Approaching the role of Customs as border data collectors, the adjustment of Customs administrations to disruptive technologies (AI, block chain technology, data analytics) constitutes a great "*bet*" but simultaneously an optimal opportunity and useful tool for cross-border visibility, fraud detection, Risk Management System (RMS) implementation, revenue collection, and efficiency in customs controls (World Customs Organization 2023, 52). Furthermore, the use of geo-data by Customs authorities will be an important aspect in this framework, which will strengthen their role in border management and increase their capability to facilitate and enhance cross-border sustainable economic activities (Cantens 2019). From the point of view of the other stakeholders, such as the economic operators, the digitalization of logistic systems has an impact not only in reducing enterprises' costs but in better leveraging of Customs risk management and control systems (Stephens 2020).

Finally, Customs, at their own level, go through the transitional phase of the circular economy via the self-adaptation of sustainable practices. Dubai Customs published their Sustainable Report in 2021 promoting best practices for energy management and recycling (World Customs Organization 2023, 23), and Uruguay Customs has implemented a similar policy on recycling.

3.1. Case Studies: The "greening" of Customs policies and procedures

The case of Europe: The energy transition pioneers—EU and European Customs

Apart from the worldwide concept of Customs' contribution to coherent "green policy" development in the framework of the WCO and WTO, it is crucial to underline primarily that in the framework of the European Union and the common customs territory, the harmonization of customs policy, legislative, and regulatory frameworks is almost absolute and entire, mainly due to Union's Customs Code Reg. 952/2013 and the relevant legal and regulatory arsenal of Regulations, Directives and Decisions. The EU, itself a member of WCO and WTO as well as its member-states, is a pioneer regarding the achievement of environmental goals and energy transition, having developed an admirable policy and strategic-legal framework (Kettlewell & Jones 2021). It is worth mentioning the Green Deal, the FIT for 55 (Goldberg & Bille 2022), the Clean Energy Package, the Ecodesign Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009, establishing a framework for the setting of ecodesign requirements for energy-related products and its complementary "Energy Labelling Directive" (Directive 2010/30/EU of the European Parliament and of the Council of 19 May 2010 on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products), which establish a framework for reducing energy consumption. Another important step toward this policy and a challenging new Customs competency is the Carbon Border Adjustment Mechanism and especially the Carbon Border Tax for confronting the phenomenon of carbon leakage (Meyer & Tucker 2022; Schippers & de Wit 2022).

Special reference must also be made to the *Digital Product Passport* which is a mechanism—based on blockchain technology—for collecting and providing data information throughout a product's lifecycle, such as origin, composition, recycled components, etc., ensuring its traceability, transparency, "circularity", and "sustainability" (Protokol 2025), which is expected to

become a new competency of Customs' cross-border control activities. Part of the same context (Circular Economy Action Plan—CEAP) is the EU Batteries Regulation. Another characteristic example of Customs border control competencies is the management of declarations of conformity and related documentation (Hydrochlorofluorocarbons—HFCs) according to Regulation EU 517/2014 (or the F-gas Regulation) which targets the achievement of large reductions in F-gas use and emissions.

In the context of European Customs, the on-going Customs reform and the new planned EU Customs Authority, the EU Customs Data Hub, and the Trust and Check Framework for a new type of Trust and Check Trader-economic operator, are expected to accelerate the ability of Customs agencies to meet the expectations of the new environmental and energy challenges (Arendsen 2024). The shining example of EU Customs also includes successful Coordinated Border Management (CBM) case studies such as the Customs Eastern and South Eastern Land Border Expert Team (CELBET), the European Border and Coast Guard Agency (FRONTEX), the EU Customs Port Alliance, and **the European Union Customs Alliance for Borders Expert Team (EUCAB).**

CELBET (2016–2025) was an initiative of 11 EU Member States (MS) established to strengthen cooperation and operational coordination, improve the control of external borders, and prevent the entry of environmentally dangerous goods. FRONTEX, the European Board and Coast Guard Agency, is an EU agency developing exemplary activities of border management by using expertise and pursuing the fight against cross-border crime, including environmental maritime crime. EUCAB is an expert team established to foster operational customs cooperation among EU MS and to assist the ongoing EU Customs reform at the operational level. In addition, we must also mention the *PEN CP,* a five-year project funded by the EU under Horizon 2020 for creating an innovating networking system for efficient border management (Hintsa 2019) aiming also at efficient cooperation in the field of environmental protection.

Other worldwide Customs case studies
Uruguay Customs support the energy evolution of the country by implementing control processes on imports of raw materials or machines in order to rapidly release the goods while providing importers with special buildings at the ports for the safe storage of such goods (Uruguay Customs 2020). Moreover, in the **United States,** the USA Customs and Borders Protection (CBP) released the Green Trade Program in June 2022, focused on the facilitation of legitimate trade and the reduction of environmental damage. In **Indonesia**, under the governmental policy of the National Taskforce for Non-Hazardous Wastes, the Customs Administration has a specific competency enforcing the related legislation and regulatory nexus of other national agencies as the Ministry of Environmental Forestry, the Ministry of Trade, etc. (World Customs Organization 2023). **Singapore Customs** have launched the Network Trade Platform (NTP), a one-stop trade and logistics information management ecosystem connecting all players across the value chain in Singapore as well as abroad (Singapore Customs 2022). The **Jamaica Customs Agency** has developed a significant border cooperation system (Electronic Single Window, centralized risk assessment, and coordinated inspections) with 12 other partnering (border) regulatory agencies through Information and Communications Technology (Williams 2019).

4. Policy Options: Recommendations

4.1. Customs administrations as policy makers

Given that "a global problem cannot be solved with domestic solutions … [because] climate change is a global problem and requires a global solution" (Quick 2009, 357), global trade's supervision authorities, Customs, should be directly involved in policy negotiations regarding environmental sustainability and the energy transition, providing their expertise to other agencies. If the role of Customs is to be upgraded to that of participants in policy creation at the governmental level, it is important to focus on global policy-making, considering the reciprocal relation between the environment and trade (Monkelbaan 2021), so as to reach policy coherence in the nexus of trade and the environment (Gstohl & Schnock 2024), a subject that lies at the heart of Customs' mission. In order to face the necessity of the involvement of Customs in the circular economy and policy development for the energy transition, the creation of separate organizational units or sectors within Customs' organizational structures will probably be required to deal with the development of policies and the reform of Customs' legal framework (World Customs Organization 2023, 23).

Regarding the pivotal role of the private sector and economic operators in contributing to the energy transition, Customs, except from public policy's makers and governance players, could also contribute through their advisory role, becoming an interface between public and private cooperation. However, Customs must develop new policies concerning how the transition could affect their role, without losing competencies and by proposing adjustments and new alternative policy options.

4.2. Increase of Customs efficiency: Investment in capacity building

Customs have expertise and holistic knowledge regarding the movement and flows of trans-boundary goods. Furthermore, boosting Customs' efficiency in implementation and enforcement of MEAs **(Pisupati 2016)** is key, and depends on the legal and technical capacity

of human capital. However, in general, Customs policies must be oriented to the investment of developing Customs officials' education-skills (Mikuriya 2006) via training programs organized at all possible levels, for example worldwide at the level of the WCO, which has developed a constant and integrated capacity-building network for Customs officers, and at the national level, in order to increase *expertise*. Public financing or sponsorships from the private sector could be key factors in Customs Administrations' capacity building.

4.3. Engagement and cooperation between Customs authorities and the private sector

Customs, the private sector, and national and international organizations, with the WCO as the major player, recognize the value of sustainable enhanced engagements and strategic alliances. In the framework of the WCO, the Private Sector Consultative Group (PSCG) constitutes a great example of successful collaboration and partnership between Customs and the private sector. This collaborative pattern is in force also at the national level, where most Customs Administrations collaborate with private-sector stakeholders such as brokers, importers, exporters, airport and seaport authorities, and industry associations in many ways, either by discussing—at the policy level—important Customs matters and legislative amendments, by sharing data and information, by participating in common working groups, or by calling on experts.

4.4. Coordinated Border Management

Revitalizing the cooperation between Customs and other border agencies, such as port (World Customs Organization & IAPH 2023) and environmental authorities, is pivotal for implementing law enforcement measures. For example, the FAL Convention (Convention on Facilitation of International Maritime Traffic), is very important while the Maritime Single Window is crucial for the electronic information exchange and the boost of stakeholders' cooperation. A critical step in terms of Coordinated Border Management (CMB) is also the creation of Joint Integrated Border Control Centers (IBCCs), such as the one established in Peru and Chile, including participation of all relevant public services, Customs, public security, migration, environmental, and agricultural agencies in full coordination at a juxtaposed border post, which carry out joint controls reducing the crossing time for all stakeholders (Cordova Crusada 2018).

Particularly, regarding cooperation and partnerships between Customs and environmental agencies, the type and the depth of cooperation could vary, from information and data sharing and joint operations in fighting environmental crime up to collaboration in the development of border environmental policies (World Customs Organization 2023). Belgian Customs have developed a collaborative relationship with the Environment Authority of Belgium and the Belgium Environmental Directorate, with operational communication on a daily basis and with the exchange of crucial information, such as data regarding recycling business operators, which align Belgian RMS system and relevant Customs inspections. Canada has chosen a different approach of CBM (Portelance 2015) by creating the Canada Border Services Agency (CBSA) which integrated the entire grid of border-related functions (Customs, migration, safety and security, environmental protection) into a single organization, with the establishment of a centralized governance structure in the framework of data analytics strategy (Slowey 2017), which should improve the cooperative efficiency and interoperability of all involved agencies.

In the framework of universal transformation process, another new alternative approach to citizens' environmental contribution is so-called "*energy citizenship*" (Pel et al. 2022). *Energy citizenship* is a new concept, a label and empirical phenomenon, which, particularly for border area zones, could develop a model for active participation of all border area entities and also Indigenous Nations, transforming the traditional notion of CBM.

As launched by the Customs global policy driver, the WCO, the future purpose is to create "**Smart** Borders", **S**ecure, **M**easurable, **A**utomated, **R**isk management based and **T**echnology driven (Mikuriya 2019). Considering the global transformation and digitalization in border processes, we will probably in the future discuss an "*invisible, adaptable and radically connected border agency*" (Cacham & de Voet 2020). In any case, as a policy option, the effectiveness of the CBM is a building block of the new strategic plan corresponding to the challenges that Customs face (Mikuriya 2006).

4.5. Investment in disruptive technologies and data sharing

Looking for policy solutions and in the concept of *"Digital Customs"*, it is important to underline that developing and embracing new, advanced technologies will boost Customs efficiency in terms of transparency, security, and sustainability, and can enable Customs authorities to face unprecedented challenges and opportunities.

Data sharing between Customs and other stakeholders is a key factor (Montagnat-Rentier & Bremeersh 2022, 26) in the transformation of Customs agencies. The WCO Data Model was developed to provide a universal language for cross-border data in order to enable the implementation of Single Window systems, Data Analytics, and CBM (**World Customs Organization n.d.).**

4.6. Duty exemptions and tax relief

Without ignoring that taxation is a matter of national policy in general, it constitutes an important policy option to promote and adopt policies related to the global tendency towards reduction or elimination of tariffs on climate-friendly technologies and environmental goods and services. In other words, in terms of governmental energy policy, a tax-free regime is a must, for example, for green hydrogen used in electricity, transport, heating, and industry. The same concept must be kept in the case of selected environmental goods.

4.7. Reform, self-improvement, and deeper harmonization of Customs legislative and regulatory frameworks

Although a binding harmonization, as mentioned above, of the hybrid of EU customs legislative and regulatory frameworks is not possible at a global level, a reform based on the WCO standards and recommendations is imperative. The pass-through from international rules to national, and further at the regional and local level, is not easy but it is the only way to assure the transition to the circular economy and high technology requirements of the coming years. Progress toward more substantial harmonization depends on the willingness of each Customs Administration. In the frame of self-improvement, WCO (Mikuriya 2017) has launched performance measurement tools and methods based on data analysis, such as WCO Time Release Study (a methodology for measuring border agency clearance times) and mirror analysis (WCO tool to compare imports and exports among countries using the HS) which should be considered for adoption by all Customs administrations.

5. Instead Of A Conclusion

Customs administrations are expected to play a key role in reversing the ongoing climate catastrophe, to lead the planet safely to a sustainable model of survival and growth. Consequently, "*Customs authorities are certainly a key factor to facilitate the sustainability and the global energy transition in a way that will enable long term progress"* (World Customs Organization 2022). Through the transformation of their multiplied role, mainly under the guidance of the WCO, Customs will manage to execute their missions, traditional and modernized. Nevertheless, the challenge of transformation does not only concern the mission and legislation of Customs. Policy decisions regarding climate change actions constitute a matter of transformation of the whole concept of the earth system which should be conceptualized under a global perspective, where the notion of "*Globalization*" must also contextualize the notion of "*Borders*" (Dalby 2021). We may have to rethink everything—border lines, jurisdictions, competences—to move from the *international* approach of borders-frontiers to a *transnational* and *cross-border living areas* approach, where collaborative ecological governance could be considered under other dimensions.

Furthermore, developing non-binding global policies on the basis of voluntary compliance which will be implemented at the national, regional, or local level within different countries always risks their remaining a "dead letter". It is a paradox to call for a solution to a transnational problem through national jurisdictions. In other words, can we reach global governance in climate mitigation and global green transition, or is it a utopia? Multilateral Environmental Agreements and international law are limited in terms of implementation, as there is no clear binding means for their international enforcement. In fact, the imperative for transformation concerns any traditional pattern or approach, even of international public law. Maybe it is time to look for alternative solutions beyond jurisdictions, territories, even borders, because the environmental and climate threat has no territory or borders. The mitigation of climate change will also signal the mitigation of so many "pledges" and "decrees". Customs authorities can, it seems, and I maintain, manage challenges to their own burden of responsibility. However, will states, governments, private interests, and the world in general finally seize this last chance? The response could be an interesting issue for another future study.

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