



Mitigating the Green Paradox: Aligning EU Trade with Human Rights and Environmental Sustainability

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1. *The European Green Paradox: Problem Definition*

In recent decades, the EU has actively pursued the task of guiding the green transition and the fight against climate change globally. In this context, significant efforts have been made to develop a robust and comprehensive legal framework centered on stringent environmental and climate protection standards. The ambition to lead the green transformation has been embodied in the European Green Deal (EGD).¹ Indeed, since December 2019 the European Commission has framed the EGD as a new growth strategy aimed at «reconciling the economy with

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¹ European Commission, Directorate-General for Communication, *European Green Deal: Delivering on our Targets*, 2021.

the planet»,² pledging that the EU will achieve climate-neutrality by 2050³ through the coordinated pursuit of environmental, economic, and social policies. The European Commission has reiterated on several occasions that the Green Deal must be fundamentally people-centered, affirming that the European Pillar of Social Rights⁴ will serve as a compass to ensure that the transition process is inclusive and leaves no one behind. This position highlights the pivotal importance of aligning the socio-economic dimension of the transition with the principles of social justice, environmental sustainability, and economic development, the latter to be attained through a model of growth that is structurally dissociated from the consumption of resources.⁵

² For a detailed analysis of the European Green Deal, see: M. C. CARTA, *Il Green Deal Europeo. Considerazioni critiche sulla tutela dell'ambiente e le iniziative di diritto UE*, in *EJ*, n. 4, 2020, p. 54.

³ Relevant doctrine has highlighted the Green Deal's long-term goal of climate neutrality by 2050 and its medium-term 2020–2030 trajectory, to be periodically adjusted through the European Climate Law's five-year review cycle. Further, the centrality of the energy sector has been underlined, since energy production and use account for more than 75% of EU greenhouse gas emissions, see: M. FALCONE, *Il Green Deal europeo per un continente a impatto climatico zero: la nuova strategia europea per la crescita tra sfide, responsabilità e opportunità*, in *SIE*, n. 2, 2020, pp. 379-394. In addition, the Green Deal has been interpreted as a turning point in the evolution of the Union's economic constitution: by making climate neutrality by 2050 a unifying objective of EU governance and mobilizing a wide range of sectoral measures (including agriculture, industry, energy, transport, and trade), the Green Deal represents a structural transformation of the European economic order, see: D. BEVILACQUA, E. CHITI, *Green Deal. Come costruire una nuova Europa*, Bologna, 2024. Furthermore, it has been stressed how the Green Deal relies on a complex architecture of multi-level planning instruments, combining Union-wide strategies with national implementation measures, and underlines the need for coherence when pursuing both the 2030 pathway and the 2050 objective. Within this perspective, energy efficiency, the deployment of renewables and the integration of EU energy markets emerge as indispensable operational levers, see: D. BEVILACQUA, *L'attuazione del Green Deal europeo e le pianificazioni*, in *RGA*, n. 60, 2025. Taken together, these contributions show that the centrality of energy in the green transition, hence why it might be argued that the so-called green paradox remains a salient dimension of the debate.

⁴ The European Pillar of Social Rights, proclaimed jointly by the European Parliament, the Council, and the Commission in 2017, sets out 20 principles for fair working conditions, equal opportunities, and social protection. While not legally binding, it acts as a guiding policy framework for Member States. See: Proclamation of the European Parliament, the Council, and the Commission, of 13 December 2017, European Pillar of Social Rights, available at: www.eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2017_428_R_0009.

⁵ See: M. C. CARTA, *op. cit.*, p. 64.

The EGD also situates EU action within the broader 2030 Agenda for Sustainable Development,⁶ calling for a systemic re-configuration of economic governance so that sustainability becomes a transversal objective of every future initiative.

Through this new growth strategy, the EU aimed at asserting its role as a world leader in the fight against climate change and environmental degradation through the steering of a coordinated and global approach to environmental policy. In particular, the European Commission has expressed a clear intention to take a leading role in coordinating international efforts aimed at placing sustainability and citizens' well-being at the core of economic policymaking, thereby making the Sustainable Development Goals a cornerstone of EU policy design and implementation.

Scholars quickly acknowledged the EGD as the Union's most ambitious growth and equity project since the 1970s environmental action programs. Yet, critics inside and outside the Union identify a widening cleavage between that promise and the Union's trade reality. Indeed, it has been pointed out that the new EU's policies on green transition entailed an unintended "spill-over effect", meaning that European consumption continues to drive deforestation, poverty wages and other external harms that the internal dimension of the Green Deal leaves largely unaddressed.⁷ Indeed, the social impacts of the EGD at the level of the EU trading partners have been disregarded, not taking into ac-

⁶ The 2030 Agenda for Sustainable Development, adopted by all UN Member States in 2015, provides a shared global framework for ending poverty, protecting the planet, and ensuring prosperity for all. It is structured around 17 Sustainable Development Goals (SDGs) to be achieved by 2030. See: UN General Assembly Resolution 70/1 (A/RES/70/1), of 25 September 2015, Transforming our World: the 2030 Agenda for Sustainable Development, available at: www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_70_1_E.pdf.

⁷ More information about the unintended spill-over effect of the European Green Deal may be found in: E. PONTHEU ET AL., *Fair Trade Principles Can Transform the European Green Deal: Moving towards a Global Green Deal*, in *Journal of Fair Trade*, vol. 4, n. 2, 2023, pp. 3-5.

count the challenges in complying with these policies for the stakeholders that are in a weaker position in the global supply chain.⁸ For instance, in a recent report on Global Commons Stewardship,⁹ the Sustainable Development Solutions Network (SDSN) acknowledges that the EU Member States has successfully diminished their domestic CO₂ emissions linked to economic growth. However, it stresses that significant efforts are still required to address the environmental externalities embedded in EU trade, with particular regard to the impacts on deforestation, water scarcity, and pollution that arise from imported goods and services. Notably, reducing the overall volume of imported resource-intensive goods remains outside the core objectives of the European Green Deal.¹⁰

This tension between the upholding of such high standards within the EU and the lack of compliance in third countries has been acknowledged by the European Commission. Indeed, the Regulation prohibiting products made with forced labor¹¹ marks a shift from voluntary corporate responsibility to enforceable market-access conditions, while the Green-Deal Industrial Plan for the Net-Zero Age¹² laments China's dominance of solar-panel and other clean-tech supply chains and recognizes the geopolitical risks of such dependence¹³. Furthermore, as pointed out by Leonelli, the EU might currently be facing an incipient "securitization" of EU trade and climate policy, which might worsen

⁸ *Ibidem*.

⁹ For more information on global environmental responsibility metrics and cross-border sustainability spillovers, see: the Global Commons Stewardship Index, developed by the Sustainable Development Solutions Network (SDSN), available at: www.gcsi.unsdsn.org/.

¹⁰ See: E. PONTHEIU ET AL., *op. cit.*, pp. 1-10.

¹¹ Regulation (EU) 2024/3015 of the European Parliament and of the Council, of 27 November 2024, on *Prohibiting Products Made with Forced Labor on the Union Market*.

¹² See: Communication from the European Commission, A Green Deal Industrial Plan for the Net-Zero Age, of 1 February 2023, COM (2023) 62final.

¹³ See: F. FONTANELLI, *The Paradigm Shift in the EU's Economic Action: The Epoch of Homeland Economics*, in E. BARONCINI, A. M. DAZA VARGAS, F. FONTANELLI, G. KOSTKA, D. R. REGUEIRO, P. SZWEDO, R. TOIVANEN (eds.), *The UN 2030 Agenda in the EU Trade Policy: Improving Global Governance for a Sustainable New World*, Bolonia, 2025, pp. 16-17.

the above-mentioned spill-over effect, implying that as strategic-autonomy rhetoric rises, environmental leverage abroad may weaken.¹⁴

Recent legal scholarship has highlighted that the new Critical Raw Materials Act (CRMA),¹⁵ while aiming to reduce the EU's dependence on single suppliers, particularly China, may inadvertently create new sustainability risks and dependencies if not accompanied by effective environmental and social safeguards. Although the CRMA sets ambitious targets for 2030 in terms of extraction, processing, and recycling, its effectiveness in preventing the Green Paradox remains debated. This is particularly the case in the absence of binding environmental and social conditionalities in the EU's strategic partnerships with third countries.¹⁶

Commissioner Thierry Breton contributed to the debate in November 2022, when in a keynote speech he openly acknowledged the geopolitical risks and ethical concerns connected to the EU's reliance on external suppliers. He pointed out that the EU's solar-panel supply chain relies on raw materials from regions where the use of forced labor and electricity fueled through coal is extensive. In doing so, Breton defined what is now commonly referred to as the "Green Paradox", that is the risk that the Union's decarbonization efforts might, paradoxically, end up reinforcing practices that are incompatible with the EU's core values, including human rights respect and sustainable development.¹⁷ While this article retains the term "Green Paradox", it is important to clarify that the underlying dynamic, the externalization of environmental and social costs through global supply chains, is far from unusual in the context of international trade. Economically, such spillover effects

¹⁴ G. C. LEONELLI, *Critical Raw Materials, the Net-Zero Transition and the 'Securitization' of the Trade and Climate Change Mitigation Nexus: Pinpointing Environmental Risks and Charting a New Path for Transnational Decarbonization*, in *World Trade Review*, vol. 24, n. 2, 2025, p. 240.

¹⁵ Regulation (EU) 2024/1252 of the European Parliament and of the Council, of 11 April 2024, establishing a framework for ensuring a secure and sustainable supply of critical raw materials.

¹⁶ For an in-depth analysis of the Critical Raw Materials Act and its drawbacks, see: C. GRIECO, A. ROSANÒ, *Il Critical Raw Materials Act e la sostenibilità ambientale: non è tutto "oro" quel che luccica*, in this *Journal*, 2024, pp. 1-42.

¹⁷ Speech by Commissioner Thierry Breton, of 9 December 2022, Launch of the European Solar Photovoltaic Industry Alliance. Europe's efforts for a green industrial destiny, SPEECH/22/7619.

often occur when regulatory standards diverge across jurisdictions. The term “paradox,” as used here, therefore does not imply that the phenomenon is inherently anomalous, but rather highlights the normative tension between the EU’s internal sustainability ambitions and the external impacts of its trade dependencies.

Moreover, this issue extends beyond the green transition, reflecting a broader dilemma that the EU will have to face in the foreseeable future having to balance its internal standards with external trade obligations, through the development of mechanisms that should be at the same time effective and compliant with international trade laws and obligations.

Documented inquiries confirm the point, indeed, investigations into the solar supply chain centered in Xinjiang, China, have confirmed the widespread use of forced labor involving Uyghur workers,¹⁸ in parallel with the reliance on coal-powered polysilicon components necessary for the production of solar panels. These findings raise serious human rights and climate concerns, which are effectively outsourced through the importation of such components into the EU. Contemporary journalistic evidence echoes these findings, warning that EU solar modules rely on components linked to such abuses intertwined with the coercive transfer of Uyghur workers.¹⁹ These findings converge on a core question: how can the EU turn its market power into a predictable, WTO-compatible mechanism that aligns external supply-chain practices with its internal climate and human-rights standards?

¹⁸ The Uyghurs are a predominantly Muslim Turkic ethnic minority native to the Xinjiang Uyghur Autonomous Region in northwestern China. In recent years, numerous reports and investigations have documented widespread human-rights violations against Uyghur communities, including mass surveillance, arbitrary detention, and forced labor.

¹⁹ Many journal articles have discussed the topic, for more information see: C. SHEPHERD, L. JINPENG, *How China Came to Dominate the World in Renewable Energy*, in *The Washington Post*, 2025; S. BRADLEY, *China’s Solar Dominance Will ‘Push Countries to Adopt Clean Technologies*, in *SWI Swissinfo.ch*, 2024; A. HERNANDEZ-MORALES ET AL., *Fears over China’s Muslim Forced Labor Loom over EU Solar Power*, in *politico.eu*, 2021; A. SWANSON, B. PLUMER, *China’s Solar Dominance Presents Biden With an Ugly Dilemma*, in *The New York Times*, 2021.

2. Methodology

This study combines three complementary research techniques, namely systematic literature review, doctrinal legal analysis, and an embedded case-study design, in order to capture both the normative architecture and the empirical tensions that underpin the EU's Green Paradox.

The starting point was an in-depth literature review of scholarly and policy writings on trade and labor standards; trade and climate governance; and supply-chain sustainability. Recent bibliometric work confirms that, while each of these strands is comparatively well covered, integrated analyses remain fragmented across disciplinary lines. Therefore, the article conducts a doctrinal and systematic analysis of EU law, including primary sources such as the TEU and TFEU provisions on sustainable development (Articles 2, 3 and 21 of the TEU; and Articles 11, 191-193 of the TFEU) and the Charter of Fundamental Rights (Article 37). Secondary legislation and CJEU jurisprudence are examined in light of their internal coherence and their capacity to project EU standards externally. This study thus entails close textual reading and case-law analysis to evaluate the evolution of competences and conditionality tools.

As above mentioned, in order to operationalize these legal insights, the study adopts an embedded case-study approach centered on the Xinjiang-based solar-panel supply chain. The choice is justified on both empirical and theoretical grounds: polysilicon sourced from the region accounts for a dominant share of global photovoltaic production, thereby exposing the EU to forced-labor allegations and high-carbon inputs. Hence, this case study epitomizes the structural dilemma the article seeks to address. The case study data rely on documentary evidence compiled by Murphy & Elimä²⁰ which traces the link between labor abuses and carbon intensity throughout the supply chain.

²⁰ See: L. MURPHY, N. ELIMÄ, *In Broad Daylight: Uyghur Forced Labor and Global Solar Supply Chains*, 2021.

3. Evolution of EU Environmental Competences

Understanding the evolution of the EU's environmental competences²¹ is vital in order to shed light on the EU's ability to project its environmental and social standards beyond its borders while maintaining consistency with its internal obligations and global commitments. By outlining the legal and policy shifts over time, this section provides a contextual framework for evaluating the EU's existing legal instruments and the potential for using trade-related conditionality tools to address the Green Paradox.

When the six founding States signed the Rome Treaty in 1957, they gave the EEC no express mandate on the environment, since environmental issues and the climate crisis were mostly unknown at the time. Early measures therefore relied on the Treaty's economic clauses: Article 2 on improved living standards, Articles 100 and 308 on market harmonization.²² Jurisprudence soon reinforced that workaround. In the case *Cassis de Dijon*²³ the Court of Justice accepted ecological concerns as “imperative requirements”, meaning that ecological protection could justify restrictions on free movement, thereby inserting environmental objectives into the very fabric of the internal market.²⁴ This jurisprudential opening paved the way for legislative action that used harmonization competences to tackle pollution and product standards, even before a specific Treaty basis existed.²⁵

A decisive breakthrough arrived with the SEA (1986), whose Articles 130 R-T formally introduced an autonomous environmental policy while obliging the EC to integrate ecological concerns across sectors.

²¹ For an overview of the progressive construction of the EU's environmental policy and its guiding principles, see E. TRIGGIANI, *Spunti e riflessioni sull'Europa*, III ed., Bari, 2021, pp. 255–271.

²² For more information on the matter, see: H. SELIN, S. D. VANDEVEER, *Broader, Deeper and Greener: European Union Environmental Politics, Policies, and Outcomes*, in *Annual Review of Environment and Resources*, vol. 40, 2015, p. 312.

²³ Court of Justice, Judgment of 20 February 1979, Case 120/78, *Rewe-Zentral AG v Bundesmonopolverwaltung für Branntwein*, *Cassis de Dijon*.

²⁴ See: M. C. CARTA, *op. cit.*, pp. 61-62.

²⁵ See: A. CAMPOLMI, *Verso una competenza esclusiva dell'Unione europea in materia ambientale? Tendenze della prassi e proposta di riforma dei trattati*, in this *Journal*, 2024, pp. 2-3.

The Act also codified “preventive” and “polluter-pays” principles,²⁶ anchoring them in primary law and signaling that ecological considerations had become integral to market building.²⁷ Subsequent Treaty reforms deepened and globalized that ambition. For instance, with the Treaty of Maastricht (1993) environmental protection was listed among the Union’s objectives and brought most ecological legislation under qualified-majority voting, signaling that the environment had become part of the *acquis*. Later on, the Treaty of Amsterdam, which entered into force in 1999, marked a turning point in the constitutional recognition of environmental and sustainability principles within EU law. First, it amended Article 2 TEU by introducing sustainable development as one of the Union’s core objectives. Second, it transformed the earlier environmental “integration requirement”, meaning the idea that environmental protection should be considered in all EU policies, into a horizontal legal obligation,²⁸ which is now enshrined in Article 11 TFEU.²⁹ This article requires that «environmental protection requirements must

²⁶ The Single European Act introduced into EU primary law key environmental principles that later became enshrined in Article 191(2) TFEU. These include the precautionary principle, the principle of preventive action, and the polluter-pays principle, which holds that the cost of environmental damage should be paid by those responsible for it.

²⁷ See: H. SELIN, S. D. VANDEVEER, *op. cit.*, p. 317.

²⁸ On the integration principle as a driving force of EU environmental policy, extending beyond mere protection to include environmental improvement, see: B. NASCIMBENE, L. GAROFALO, *Studi su ambiente e diritto: il diritto dell’Unione europea*, Bari, 2012, esp. p. 35 ff.

²⁹ On this point, see the updated analysis offered in the fourth edition of the handbook, which situates the horizontal integration duty of Article 11 TFEU within the broader framework of the European Green Deal, read as a roadmap towards climate neutrality, and underlines the Union’s ambition to act as a global leader in climate and environmental action, also through its external policies, see: G. CORDINI, P. FOIS, S. MARCHISIO, *Diritto ambientale: profili internazionali, europei e comparati*, Torino, 2024, p. 115 ff., esp. p. 122; See also the recent edited volume that examines the multifaceted impact of climate change on international and EU law, including human rights litigation, climate migration and the EU’s Green Deal policies: S. VEZZANI, M. C. CARTA (eds.), *International and European Union Law in the Face of Climate Change*, Turin, 2024, esp. p. 69 ff.

be integrated into the definition and implementation of the Union’s policies and activities»,³⁰ ensuring that sustainability is not an isolated concern, but a cross-cutting priority across all sectors.³¹

Finally, the Treaty of Lisbon completed this trajectory. Indeed, Articles 3(3)-(5) of the TEU, together with Articles 191-193 of the TFEU, bind the Union to a high level of environmental protection internally and externally, while Article 21 TEU requires that all external action, including the Common Commercial Policy, promote sustainable development.³² Furthermore, the Lisbon Treaty also introduced the ordinary legislative procedure for virtually the entire environmental *acquis*, further normalizing ecological objectives inside EU law-making.³³

Moreover, environmental protection was formally enshrined in the Charter of Fundamental Rights of the EU through Article 37, which provides that «a high level of environmental protection and the improvement of the quality of the environment must be integrated into the policies of the Union and ensured in accordance with the principle of sustainable development».³⁴ While this provision embeds environmental protection within the Charter’s framework, it does not confer an enforceable subjective right upon individuals. Rather, it constitutes a programmatic principle, binding on the Union and Member States when implementing EU law, but not directly justiciable before the courts by private parties.

Moreover, judicial doctrine ensured that the Union’s growing internal powers translated into an ability to act externally. In *AETR*³⁵ the Court formulated the principle of “implied external competence”, that is to say that once the Community legislated internally, Member States could not conclude international commitments, a logic later applied to

³⁰ See: Art. 11 TFEU, which establishes the horizontal obligation to integrate environmental protection into all EU policies and activities.

³¹ See: A. CAMPOLMI, *op. cit.*, pp. 1-17.

³² *Ibidem.*

³³ *Ibidem.*

³⁴ On the legal scope and interpretative developments of Article 37 of the Charter of Fundamental Rights of the EU, see: F. ROLANDO, *L’attuazione del principio di integrazione ambientale nel diritto dell’Unione europea*, in *DPCE online*, vol. 58, 2022.

³⁵ Court of Justice, Judgment of 31 March 1971, Case 22/70, *Commission of the European Communities v Council of the European Communities*, *AETR*.

environmental agreements.³⁶ Opinion 2/00³⁷ confirmed that the Union could conclude multilateral environmental agreements under Article 192 TFEU, even where competences were shared³⁸. Finally, Opinion 2/15³⁹ on the EU-Singapore FTA⁴⁰ confirmed that Trade and Sustainable Development (TSD) chapters have “direct and immediate effects” on trade, and therefore fall within the Union’s exclusive commercial policy, reinforcing the linkage between environmental objectives and external economic relations.⁴¹

Taken together, these Treaty revisions and landmark rulings have turned environmental protection from a peripheral concern into a core objective that permeates both internal legislation and external action. Remarkably, they provide the EU with the legal grounds to introduce environmental and human-rights conditions in its trade instruments, a power that underpins the conditionality mechanisms analyzed in the next sections.

4. *The EU’s external conditionality toolkit*

Nowadays, after the long evolution analyzed so far, the EU’s external climate strategy has become central to the Union’s trade and sustainability agenda. Articles 3(5) and 21 TEU, indeed, represent some of the most innovative and significant instruments within International

³⁶ Further information on the *AETR* might be found in: A. CAMPOLMI, *op. cit.*, pp.13-14.

³⁷ Court of Justice, 6 December 2001, Opinion 2/00, *Cartagena Protocol on Biosafety*.

³⁸ In Opinion 2/00, the Court of Justice clarified that the EU could conclude multilateral environmental agreements based on what is now Article 192 TFEU (then Article 175 EC), even where competences are shared with the Member States. The Court held that shared competence does not preclude the EU from acting alone in cases where the envisaged agreement falls predominantly within EU objectives and existing internal rules, especially in the field of environmental protection. See: A. CAMPOLMI, *op. cit.*, pp. 13-14.

³⁹ Court of Justice, 16 May 2017, Opinion 2/15, *EU-Singapore Free Trade Agreement*.

⁴⁰ For an in-depth analysis of the implications of Opinion 2/15 for the EU’s external competences and trade policy, see: V. BOHNENBLUST, *The EU-Singapore Free Trade Agreement: A Landmark Deal?*, 2016, available at SSRN: www.ssrn.com/abstract=3033136.

⁴¹ See: S. VILLANI, *EU Trade Agreements and Dispute Settlement Mechanisms on Sustainable Development: Remarks on the EU-New Zealand FTA*, in E. BARONCINI, A. M. DAZA VARGAS, F. FONTANELLI, G. KOSTKA, D. R. REGUEIRO, P. SZWEDO, R. TOIVANEN (eds.), *op. cit.*

Economic Law, reframing trade, and investment as levers to promote sustainability.⁴²

Over the past two decades, this duty to integrate sustainable development, environmental protection, and the promotion of human rights into its external action has taken the shape of a two-pillar framework that combines: Hard Binding Instruments, which impose enforceable obligations both horizontally (between the EU and third countries) and vertically (on private companies), and Soft Law and hybrid Instruments, which complement these obligations through diplomatic, reputational, and procedural tools. Leonelli has described this combined strategy as an “environmental leverage”, where the EU uses the pull of the Single Market to direct foreign production towards its own labor and climate standards, while avoiding outright disengagement.⁴³

Within the first pillar, the Hard Binding Instruments, the EU employs a range of legal tools to project its environmental and human rights values externally.

Horizontally, a key tool is Regulation 978/2012⁴⁴ on the Generalized Scheme of Preferences (GSP).⁴⁵ The latter offers unilateral tariff reductions on imports from developing countries, with the ultimate aim of supporting their integration into the global economy and promoting sustainable development abroad. The basic GSP grants reduced tariffs on a wide range of goods, but the Regulation also includes a more developed component, that is the GSP+ mechanism. The latter is signifi-

⁴² E. BARONCINI, *The First Case Law within the Dispute Settlement Mechanisms of the New Generation of EU Trade Agreements: Taking Care of Sustainability*, in *EU Trade Governance: Assessing Prometheus?*, in L. RUBINI (ed.), Florence, 2025, pp. 66-83.

⁴³ For further information on the concept of “environmental leverage”, see: G. C. LEONELLI, *op. cit.*, pp. 240-256.

⁴⁴ Regulation (EU) No 978/2012 of the European Parliament and of the Council, of 25 October 2012, Applying a Scheme of Generalized Tariff Preferences (É).

⁴⁵ The Generalized Scheme of Preferences is a trade instrument that allows the EU to grant unilateral tariff reductions or exemptions to imports from developing countries. Its objective is to promote sustainable development and good governance in beneficiary countries by enhancing their access to the EU market. The current framework, established by Regulation (EU) No 978/2012, includes three arrangements: the standard GSP, the GSP+ (for countries committed to implementing core human rights and labor rights conventions), and the EBA (Everything but Arms), which offers duty-free access to all products except arms and ammunition for least developed countries.

cantly more complex since it grants full tax-free access to the EU market, but only to countries that meet certain strict criteria. Specifically, the countries which are eligible for the mechanism must not only ratify, but also actually implement 27 international conventions, adopted under the framework of the UN and the International Labor Organization (ILO). These conventions cover many fundamental rights regarding labor, environmental and climate protection, and good governance. The logic is that preferential market access should be contingent upon a demonstrable commitment to international norms.⁴⁶ Importantly, the mechanism combines positive incentives (tariff elimination) with negative conditionality: the EU retains the right to suspend or withdraw preferences in cases where a beneficiary country engages in serious and systematic violations of the relevant international conventions. This is not a mere theoretical provision: the EU has already applied it in practice. For example, Sri Lanka was suspended from the GSP+ scheme in 2010 due to human rights violations, and Myanmar faced the same issue in 2019,⁴⁷ particularly in light of grave violations against the Rohingya population. This dual system, composed of both positive incentives and sanctions through the above-mentioned withdrawal clauses, illustrates how the EU aims at leveraging trade preferences not only for economic purposes, but also as a tool for projecting its values beyond its borders while promoting compliance with international law.⁴⁸ Nonetheless, some caution should be exercised so that such leverage remains proportionate, non-discriminatory, and transparently administered if it is to withstand WTO scrutiny and avoid degenerating into disguised protectionism. Indeed, inconsistent monitoring and uneven sanctions risk eroding both legal certainty and normative credibility.⁴⁹ Finally, the selective and rare use of withdrawal clauses, in low-sensitive geopolitical

⁴⁶ For more in depth-analysis of the GSP scheme, see: I. BORCHERT ET AL., *The Pursuit of Non-Trade Policy Objectives in EU Trade Policy*, in *World Trade Review*, vol. 20, n. 5, 2021, pp. 634-639.

⁴⁷ Sri Lanka's GSP+ status was suspended in 2010 due to persistent concerns over human rights violations during and after the civil war. In 2019, the EU also reinstated trade sanctions against Myanmar by partially withdrawing Everything but Arms (EBA) preferences, citing grave human rights abuses committed against the Rohingya minority by state security forces.

⁴⁸ See: I. BORCHERT ET AL., *op. cit.*, pp. 636-646.

⁴⁹ *Ibidem*.

cases as Myanmar and Sri Lanka and not against countries such as China and Pakistan, has drawn criticism for undermining credibility, prompting a shift toward more automatic mechanisms. In this spirit, the EU has introduced Regulation (EU) 2024/3015,⁵⁰ which prohibits the placing and making available on the Union market, as well as the export, of products wholly or partially manufactured with forced labor, regardless of the country of origin. The Regulation, which will become fully applicable from 14 December 2027, introduces a horizontal and equal mechanism grounded in the EU's internal market competences and in fundamental rights obligations under Article 5(2) of the EU Charter of Fundamental Rights and ILO Conventions No. 29 and 105.⁵¹ It enables the custom and national competent authorities to investigate supply chains by conducting risk-based assessments, and ordering the withdrawal, donation, or destruction of non-compliant goods. Unlike the GSP+ scheme, which conditions tariff preferences on the ratification and implementation of international conventions, this Regulation imposes legally binding compliance conditions on all market operators, without relying on a system of incentives. The Regulation will thus empower the Union to block products at its borders when their production violates non-negotiable human-rights standards, indicating a broader turn towards unilateral regulatory instruments in trade governance. The Regulation thus enhances the credibility and enforceability of the EU's value-based trade policy by directly linking access to the Single Market to compliance with core labor rights.

Alongside state-focused mechanisms, the EU increasingly relies on Hard Binding Instruments directed at private economic operators, the vertical dimension of its conditionality framework. These instruments

⁵⁰ Regulation (EU) 2024/3015 of the European Parliament and of the Council, of 27 November 2024, on Prohibiting Products Made with Forced Labor on the Union Market (É).

⁵¹ ILO Conventions No. 29 (1930) and No. 105, of 1957, are two core international instruments prohibiting forced labor. Convention No. 29 in Art 2.1 defines forced or compulsory labor as “all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily,” and requires ratifying states to suppress it in all its forms. Convention No. 105 specifically prohibits the use of forced labor for purposes such as political coercion, punishment for participation in strikes, or discrimination. Both conventions are part of the ILO's eight Fundamental Conventions and are binding on all countries benefiting from the EU's GSP+ scheme.

reflect a strategic shift: rather than relying solely on trade preferences or diplomatic pressure on third countries, the Union now places direct, enforceable obligations on companies that seek to access the Single Market, regardless of their domicile.

At the core of this vertical strategy two recent legislative instruments are particularly relevant, namely the Corporate Sustainability Due-Diligence Directive 2024/1760 (CSDDD)⁵² and the Corporate Sustainability Reporting Directive 2022/2464 (CSRD).⁵³ The CSDDD imposes binding obligations on large EU and non-EU companies to identify, prevent, mitigate, and remedy adverse impacts on human rights and the environment throughout their entire value chains.⁵⁴ These tasks are carried out through enforceable procedures such as risk identification, the establishment of complaints mechanisms, and transparency obligations.

Complementing this, the CSRD requires EU-listed and certain non-EU companies to disclose detailed and audited sustainability data in line with international instruments such as the UN Guiding Principles on Business and Human Rights⁵⁵ and the OECD Due Diligence Guidance.⁵⁶ This disclosure framework creates a regulatory feedback loop,

⁵² Directive (EU) 2024/1760 of the European Parliament and of the Council, of 13 June 2024, on Corporate Sustainability Due Diligence.

⁵³ Directive (EU) 2022/2464 of the European Parliament and of the Council, of 14 December 2022, on Corporate Sustainability Reporting.

⁵⁴ See: E. BERGAMINI, M. FERRARI, *La responsabilità delle società multinazionali quale strumento per promuovere la sostenibilità del mercato: l'applicazione della direttiva due diligence e i problemi derivanti dalle regole di diritto internazionale privato*, in L. RUGGERI, S. ZUCCARINO (eds.), *Persona e mercati nel prisma della sostenibilità*, Naples, 2024, pp. 7-8.

⁵⁵ The UN Guiding Principles on Business and Human Rights (UNGPs), endorsed by the UN Human Rights Council in 2011, constitute the leading global soft-law standard for preventing and addressing human-rights risks associated with business activity. They are structured around three foundational pillars: the State duty to protect individuals against human rights abuses by third parties, including businesses; the corporate responsibility to respect human rights through policies, due diligence, and remediation; access to effective judicial and non-judicial remedies for victims. While not legally binding, the UNGPs have become a cornerstone for both national and regional frameworks, including the EU's Corporate Sustainability Due Diligence Directive (CSDDD) and Corporate Sustainability Reporting Directive (CSRD).

⁵⁶ The OECD Due Diligence Guidance for Responsible Business Conduct, adopted in 2018, provides practical recommendations to help enterprises implement the due diligence provisions of the OECD Guidelines for Multinational Enterprises. It sets out a

whereby firm-generated sustainability data serve not only internal reporting functions, but also become operational inputs for customs authorities, financial markets, and trade-related mechanisms including, potentially, CBAM and sectoral Regulations.

However, the CSDDD's extraterritorial reach is undermined by gaps in jurisdiction and applicable law,⁵⁷ as the Directive does not establish specific rules to determine which courts are competent or which law applies when harms occur outside the EU. As a result, cases often default to Brussels I bis and Rome II Regulations, creating uncertainty, opportunities for forum shopping by companies, and, for victims, the risk of litigating in jurisdictions with weak judicial safeguards. Without complementary reforms to EU private international law, these structural gaps could dilute the Directive's effectiveness.⁵⁸

This convergence between disclosure of data by private entities and public Regulation is already visible in legislation concerning certain sector-specific vertical regimes. For instance, Regulation 995/2010⁵⁹ (EU Timber) blocks illegally harvested wood unless operators can demonstrate due diligence throughout the supply chain. The New Batteries Regulation 2023/1542⁶⁰ goes further, setting carbon-footprint

risk-based, six-step framework for identifying, preventing, mitigating, and accounting for adverse impacts on human rights, labor, the environment, and good governance throughout the supply chain. While not legally binding, the Guidance is widely recognized by governments, businesses, and auditing bodies as a global standard for responsible business conduct.

⁵⁷ For a broader discussion of the legal challenges surrounding the extraterritorial application of due diligence obligations, including issues of private international law, conflicts of jurisdiction, and corporate liability, see: E. BERGAMINI, M. FERRARI, *op. cit.*, pp. 6-24.

⁵⁸ For a recent discussion on the implications of the “*Omnibus P*” legislative package, which substantially amends the Corporate Sustainability Reporting Directive and the Corporate Sustainability Due Diligence Directive by introducing significant simplifications to reduce the regulatory burden on companies, see: M. FERRARI, *È tempo di competitività in UE: un nuovo sguardo alla direttiva due diligence*, in this *Journal*, 2025, pp. 2-9.

⁵⁹ Regulation (EU) No 995/2010 of the European Parliament and of the Council, of 20 October 2010, Laying Down the Obligations of Operators Who Place Timber and Timber Products on the Market.

⁶⁰ Regulation (EU) 2023/1542 of the European Parliament and of the Council, of 12 July 2023, Concerning Batteries and Waste Batteries.

ceilings and mandatory human-rights due-diligence duties for any battery, either EU-made or imported, sold on the internal market.⁶¹ The 2023 New Batteries Regulation imposes a mandatory due diligence system which requires the economic actors to control and report on environmental and social risks associated with the use of raw materials. These obligations are embedded in market access conditions specific to certain products, also they are supported by third-party audits and contractual clauses with suppliers. This illustrates how private due diligence and public trade, including market restrictions and sustainability yardsticks, are increasingly intertwined, preparing the ground for a more integrated model of trade governance based on enforceable corporate accountability.

Finally, the Carbon Border Adjustment Mechanism (CBAM) Regulation 2023/956,⁶² though not a conditionality tool in the strict sense, also falls within the vertical pillar as it targets importers directly. Indeed, it requires EU importers of certain specific carbon-intensive goods to purchase CBAM certificates corresponding to the amount of greenhouse gas emitted in the process of production of the imported goods. The price of these CBAM certificates will reflect the cost of allowances under the EU Emissions Trading System (ETS),⁶³ thereby aligning the carbon cost of imported goods with that of domestically produced ones. Fundamentally, the Regulation allows for a full deduction of the CBAM obligation if the importer can demonstrate that a carbon price has already been paid in the country of origin. This “full credit” mechanism serves a dual purpose: it mitigates the risk of carbon leakage, i.e., the relocation of emissions-intensive production outside the EU, while safeguarding compliance with the most-favored-nation

⁶¹ See: G. C. LEONELLI, *op. cit.*, pp. 238-239.

⁶² Regulation (EU) 2023/956 of the European Parliament and of the Council, of 10 May 2023, Establishing a Carbon Border Adjustment Mechanism.

⁶³ The EU Emissions Trading System (ETS) is the EU’s main market-based tool for reducing greenhouse gas emissions. Introduced in 2005, it operates on a “cap-and-trade” principle: a limit (cap) is set on the total amount of certain greenhouse gases that can be emitted by covered installations, and emission allowances can be traded on the market. The ETS currently covers sectors such as power generation, industry, and aviation, and has been progressively tightened as part of the EU’s climate neutrality goals.

(MFN) principle under WTO law,⁶⁴ by treating all foreign producers equally on the basis of objective carbon pricing criteria. Therefore, CBAM functions primarily as a level-playing-field mechanism, ensuring that imported goods face a carbon cost equivalent to that borne by EU producers. While it indirectly promotes decarbonization abroad, its primary purpose is to prevent carbon leakage rather than to reward or sanction compliance with social or environmental standards.

In conclusion, within the Hard Binding pillar, instruments differ not only in their addressees but also in their temporal design: some operate *ex ante*, setting entry conditions for market access (e.g., CBAM, GSP+), while others work *ex post*, intervening through bans or remedial actions based on proven violations (e.g., Forced Labor Regulation). Alongside these instruments, there is the above mentioned Critical Raw Materials Act (Regulation (EU) 2024/1252) which, while not a conditionality tool strictly speaking, complements them by seeking to diversify and secure supply chains for strategic inputs, such as rare earths, lithium, and cobalt, which are vital for solar and battery technologies. It seeks to mitigate the Union's reliance on value chains dominated by suppliers with weak social and environmental safeguards, aligning with the broader "de-risking" trend noted by Leonelli.⁶⁵ By doing so, it functions as a resilience-oriented counterpart to CBAM and due diligence obligations, addressing structural vulnerabilities that aggravate the Green Paradox. Nonetheless, scholars and the European Commission itself have warned that, absent binding sustainability requirements for strategic partnerships and clearer monitoring of third-country practices, the CRM Act risks prioritizing security of supply over the enforcement of environmental and human rights standards, potentially shifting, rather than solving, the Union's external sustainability dilemmas.⁶⁶

⁶⁴ The most-favored-nation (MFN) principle is a cornerstone of WTO law, requiring that any advantage, favor, privilege, or immunity granted by a WTO Member to the products or services of another country must be extended immediately and unconditionally to all other WTO Members. It is codified in Article I of the GATT 1994 (goods), Article II of the GATS (services), and Article 4 of the TRIPS Agreement (intellectual property). The MFN principle ensures non-discrimination among trading partners, unless an exception applies under WTO rules (e.g., preferential trade agreements or the Enabling Clause).

⁶⁵ See: G. C. LEONELLI, *op. cit.*, pp. 240-247.

⁶⁶ COM (2023) 165final, of 17 March 2023, A secure and sustainable supply of critical raw materials in support of the twin transition.

Because tariff preferences and border bans reach only so far, a second tier uses soft law instruments, including reputation, to widen coverage. One example is the 2021 *Open, Sustainable and Assertive Trade Policy Review*⁶⁷ which represented a milestone in the EU's trade strategy. It instructed trade negotiators to systematically «mainstream the European Green Deal and the Sustainable Development Goals (SDGs)» throughout all new trade and investment agreements. The review effectively establishes a public benchmark against which the sustainability credentials of each agreement are to be evaluated. By doing so, the EU seeks to ensure that its trade policy becomes a tool for the attainment of its green and social policies, introducing environmental and human rights objectives not only in dedicated sustainability chapters, but as cross-cutting obligations throughout the entire Treaty structure.⁶⁸ Furthermore, the EU Action Plan on Human Rights and Democracy 2020-2024⁶⁹ reinforces the EU's external human rights policy through political dialogues which have become one of the main instruments for implementing the EU's values abroad. The Plan not only reiterates longstanding priorities such as freedom of expression and gender equality, but also introduces new dimensions, including the link between human rights and environmental protection, the impact of new technologies on fundamental rights, and corporate social responsibility. These priorities, together with thematic Guidelines and the active involvement of the EU Special Representative for Human Rights, contribute to shaping a value-based narrative that accompanies trade negotiations. While not legally binding, the Action Plan provides civil society and third countries with a structured interpretative framework through which the

⁶⁷ COM (2021) 66final, of 18 February 2021, Trade Policy Review. An Open, Sustainable and Assertive Trade Policy.

⁶⁸ See: S. VILLANI, *op. cit.*, p. 180.

⁶⁹ The EU Action Plan on Human Rights and Democracy 2020-2024 sets out the Union's strategic framework for promoting human rights, democracy, and the rule of law worldwide. Structured around five key objectives, it aims to protect and empower individuals, build resilient, inclusive, and democratic societies, promote a global system for human rights and democracy, harness new technologies responsibly, and deliver a more effective and united EU external action. The Plan, adopted by the Council on 18 November 2020, places particular emphasis on protecting civic space, supporting fair and sustainable economic systems, and ensuring responsible business conduct as cross-cutting priorities across EU external policies.

Union’s external economic instruments can be monitored and assessed in light of their alignment with fundamental rights commitments.⁷⁰

Since the Lisbon Treaty, the EU has systematically included TSD chapters in its new-generation free trade agreements, embedding commitments on labor and environmental standards within the broader structure of the Common Commercial Policy. These provisions are formally binding, as confirmed by the Court of Justice in its 2017 Opinion 2/15 on the EU-Singapore agreement, analyzed in the previous section, the Court of Justice clarified that such provisions have a “direct and immediate effect on trade”, and therefore fall under the Union’s exclusive competence. This position has significantly shaped the legal structure of EU FTAs by confirming that sustainability clauses are fully integrated into the EU’s external trade powers.⁷¹ However, while TSD chapters require parties to uphold international labor and environmental standards, including ILO core conventions and multilateral environmental agreements, they lack strong enforcement mechanisms.⁷² Violations do not trigger trade sanctions or suspension of concessions. Instead, disputes are addressed through consultations, panels of experts, and public recommendations, as illustrated by the EU–South Korea FTA case in 2021, when an expert panel was organized under the EU–South Korea FTA to evaluate Korea’s failure to ratify core ILO conventions. The panel concluded that Korea had breached its “best endeavors”⁷³ obligation under Article 13.4.3 of the agreement and recom-

⁷⁰ For more information on soft-law instruments for the spread of EU’s fundamental rights in third countries, see: A. ADINOLFI, *Il ruolo dell’UE nella diffusione dei diritti fondamentali in Stati terzi: strumenti vincolanti e adeguamento ‘spontaneo’ agli standard dell’Unione*, in *La Nuova Giuridica - Florence Law Review*, vol. 3, n. 1, 2023, pp. 1-22.

⁷¹ See: S. VILLANI, *op. cit.*, p. 180.

⁷² To deepen the understanding of the most recent developments regarding environmental conditionality in TSD Chapters, see: C. LA MACCHIA, *The Formulation of the Trade and Sustainable Development Chapter in the European Union-New Zealand Free Trade Agreement: Novel Aspects and Likely Effectiveness Issues*, in questa *Rivista*, 2025; L. RICCARDI, *I meccanismi di risoluzione ed enforcement nei capitoli su commercio e sviluppo sostenibile alla luce dell’accordo di libero scambio tra l’UE e la Nuova Zelanda: verso una condizionalità ambientale?*, *ivi*, 2024.

⁷³ A panel of experts was convened under the dispute settlement mechanism of the EU-South Korea Free Trade Agreement (FTA) to assess South Korea’s failure to ratify key ILO conventions on freedom of association and collective bargaining. The panel

mended the adoption of a detailed compliance roadmap, but no sanctions were imposed. Importantly, the report was made public a strategic feature that illustrates how transparency, even in the absence of sanctions, can exert meaningful normative pressure and contribute to triggering domestic legal and policy reforms. As a result, academic commentators characterize TSD chapters as hybrid instruments: they are binding in law but rely primarily on reputational and procedural enforcement rather than coercive measures. This hybrid nature explains why they are grouped alongside soft law tools, even though they create legal obligations.

A further hybrid enforcement mechanism employed by the EU consists in the systematic incorporation of the above-mentioned ILO Conventions No. 29 and 105 on forced labor into its trade instruments. These conventions function both as eligibility criteria under the GSP+ and as reference standards in TSD chapters of free trade agreements. Anchoring these conventions in legal texts allows the EU to translate ILO-based compliance assessments into tangible trade risks, ranging from preference withdrawal to panel-based scrutiny. In the GSP+ context, the European Commission issues biennial monitoring reports that explicitly incorporate the findings of ILO supervisory bodies, turning international reporting into a source of potential legal and economic consequences.⁷⁴

Notwithstanding, all these instruments analyzed so far must necessarily be in compliance with the rules of the WTO. To ensure compatibility with the multilateral trade regime, the EU has created such instruments within the scope of the exceptions permitted by Article XX of the General Agreement on Tariffs and Trade (GATT).⁷⁵ In particular,

found that Korea had not met its obligation under Article 13.4.3 of the FTA, which requires the parties to make continued and sustained efforts (“best endeavors”) to ratify core ILO conventions. Although the panel’s findings were non-binding, they marked the first enforcement case under the EU’s trade and sustainable development chapters and led to public recommendations for a time-bound roadmap to compliance, exerting reputational and political pressure for reforms.

⁷⁴ For a detailed empirical analysis of the EU’s selective use of negative conditionality and the geopolitical determinants of preference withdrawal, see: I. BORCHERT ET AL., *op. cit.*, 2021, pp. 641-647.

⁷⁵ Article XX of the General Agreement on Tariffs and Trade (GATT) 1994 provides a list of general exceptions that allow WTO Members to adopt measures that would

two sub-paragraphs are regularly invoked as legal gateways: Article XX(b), which allows trade-restrictive measures that are «necessary to protect human, animal or plant life or health», and Article XX(g), which permits measures «relating to the conservation of exhaustible natural resources».⁷⁶ However, relying on these exceptions is not automatic. Under the chapeau of Article XX, even if a measure qualifies under a specific exception, it must also be applied in a manner that is non-arbitrary, non-discriminatory, and not a disguised restriction on international trade. To meet this overarching requirement, the EU carefully designs its instruments to include procedural safeguards such as transparency, non-discrimination among trading partners, due process, and objective criteria for enforcement.⁷⁷ The respect of the above-mentioned criteria is essential to defend the legality of EU sustainability Regulations in the event of a WTO dispute.

Taken together, the EU's two-pillar conditionality framework, merging Hard Binding rules, both horizontal and vertical, with Soft Law and hybrid instruments, forms a structured system of leverage. The first pillar ensures enforceable thresholds for market access and regulatory compliance as well as corporate transparency and due diligence obligations which provide a steady flow of traceable, audited data. This data enables regulators, investors, and civil society to assess compliance across supply-chains and to strengthen enforcement. Alongside these, soft-law tools and diplomatic dialogues extend normative expectations beyond the minimum legal requirements. This dual structure enhances the Union's ability to project its core environmental and human rights values externally.

otherwise be inconsistent with their GATT obligations. These include, inter alia, measures that are “necessary to protect public morals, human, animal or plant life or health” (Article XX(b)), and those relation to “the conservation of exhaustible natural resources” (Article XX(g)). However, any such measures must also comply with the conditions of the chapeau of Article XX, which prohibits their application in a manner that constitutes arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade.

⁷⁶ For more information concerning the WTO framework, see: G. M. RUOTOLO, *On the Incorporation of WTO Obligations in the European Union Trade Agreements: The Dispute with Ukraine on the Timber Export Ban and the Environmental Exceptions*, in *OIDU*, n. 4, 2019.

⁷⁷ The legal design of recent instruments such as CBAM reflects a conscious effort to align with WTO disciplines, particularly through Article XX GATT exceptions.

However, this architecture can be undermined if the EU prioritizes inward-looking strategies, such as reshoring or friend-shoring, at the expense of the promotion of its core values elsewhere thereby reducing the external reach of its regulatory influence.⁷⁸ As previously mentioned, although innovative and ultimately useful, each instrument presents some possible drawbacks. Empirical research shows that the application of negative conditionality has so far remained limited, as enforcement has been inconsistent or absent against countries such as China. This selective application has raised concerns about a credibility gap in the EU's trade instruments based on its core values, since in these cases the political cost of withdrawal decisions might often prevent action even in the face of clear violations.⁷⁹ This same logic of value-based conditionality also underpins the EU's autonomous trade instruments. In the case of GSP+, civil society actors and EU institutions rely on data provided by the ILO to monitor compliance, however, the absence of automatic triggers and the predominance of discretion limit the preventive power of the mechanism. As a response to this institutional fragility, the adoption of the Forced Labor Regulation (EU) 2024/3015 has significantly changed the EU's approach which was essentially based on soft-law instruments shifting to a model based on prohibitive market access rules establishing a more enforceable framework based on clear rules and promoting fundamental labor standards in global supply chains.⁸⁰ Yet, even though this instrument represents an important step forward for the mitigation of the Green Paradox, in some cases, such as the solar-supply chain analyzed in the case study below, some difficulties in its enforcement may still arise. For instance, lack of supply chain transparency, difficulties in obtaining reliable audit data, limited cooperation from third-country authorities, and the risk of political retaliation are all factors that can become hindrances in the process of identifying forced labor practices through an *ex-post* mechanism. Com-

⁷⁸ For further discussion on how reshoring and friend-shoring strategies may undermine the EU's external sustainability leverage, see: G. C. LEONELLI, *op. cit.*, pp. 240-256.

⁷⁹ *Ibidem.*

⁸⁰ *Ibidem.*

parable concerns have also been raised regarding the CSDDD, particularly its jurisdictional gaps and vulnerability to forum shopping, which risk limiting its impact on transnational accountability. Similar weaknesses characterize the EU's soft and hybrid tools, especially TSD chapters, whose reliance on consultations and non-binding expert recommendations, without sanction mechanisms, often undermines their effectiveness, unless paired with stronger monitoring mechanisms.

In other words, when applied coherently and comprehensively, this conditionality toolkit enables the EU to convert the gravitational force of its Single Market into a driver of global decarbonization and social sustainability. Yet, if applied selectively or inconsistently, for instance targeting only certain sectors, countries, or violations, while tolerating others for political or economic reasons, it risks entrenching the very "Green Paradox" it was designed to solve: high environmental standards at home coexisting with continued dependence on unsustainable and unjust practices abroad.

5. Case Study: *The Solar-Panel Value Chain*

No segment of the green-tech economy captures the Union's Green Paradox more starkly than solar photovoltaics, making this case study particularly suitable for the aim of this analysis. Indeed, in recent years, the EU has experienced a rapid and unprecedented increase in solar capacity installation, with solar energy now supplying a growing share of the Union's electricity mix. Nonetheless, the vast majority of solar modules arriving in European ports continue to be manufactured within China's supply chains. As the International Energy Agency⁸¹ notes,

⁸¹ The International Energy Agency (IEA) is an intergovernmental organization established in 1974 within the framework of the OECD, in response to the 1973 oil crisis. Originally created to help coordinate emergency oil-sharing and ensure energy security among industrialized countries, the IEA has since broadened its mandate to provide authoritative data, analysis, and policy recommendations on global energy markets, with the aim of promoting not only energy security and economic growth but also the transition toward environmental sustainability. Today, the IEA is a leading reference point for monitoring the global energy transition, particularly through its annual *World Energy Outlook* and sector-specific technology roadmaps.

Chinese companies currently dominate all stages of the global photovoltaic value chain,⁸² from raw material processing to final module assembly, and this dominance is expected to grow without targeted diversification policies.⁸³ Beijing's power is thus particularly high: four of the world's five largest wafer-and-cell clusters sit in the Xinjiang Uyghur Autonomous Region (XUAR), giving that single province almost the entirety of wafer output and of cell production by 2023. Seen from the EU's perspective, therefore, the Green Deal's leading technology rests on an almost monopolistic external supplier.⁸⁴

The concentration of polysilicon production in Xinjiang creates two major externalities that are invisible to European climate metrics. The first is carbon leakage: although the EU may reduce emissions domestically, it increasingly relies on solar components manufactured in regions with far higher carbon footprints. In particular, the process of refining silicon into solar-grade polysilicon requires extremely high temperatures and massive energy inputs. In Xinjiang, this energy is supplied almost entirely by coal-fired power, sourced from the Zhundong basin, which contains around 40% of China's coal reserves.⁸⁵ Because coal is one of the most carbon-intensive energy sources, the same kilogram of polysilicon produced in Xinjiang generates up to four times more CO₂ emissions than polysilicon refined in countries that use hydropower, such as Norway or South Korea. This means that the EU's green energy transition may inadvertently shift emissions abroad, rather

⁸² For detailed analysis of China's role in the global PV industry, including data on supply chain concentration and manufacturing capacity, see: International Energy Agency, *Solar PV Global Supply Chains*, 2022, available at: www.iea.org/reports/solar-pv-global-supply-chains.

⁸³ More information concerning the use of Critical Raw Materials for solar-panels components may be found in: G. C. LEONELLI, *op. cit.*, p. 240 ff.

⁸⁴ While some geographical diversification within China has recently occurred, Chinese firms still control the vast majority of global solar photovoltaic manufacturing, with over 80% of polysilicon, wafer, cell, and module production concentrated in China as of 2025. Xinjiang remains a major hub for early production stages, particularly polysilicon refining, despite growing capacities in other Chinese provinces.

⁸⁵ For more information on the carbon intensity of polysilicon production in Xinjiang and its implications for global supply chains and climate accountability, see: L. MURPHY, N. ELIMÄ, *op. cit.*, p. 17 ff.

than eliminate them, thus undermining the integrity of its climate targets.⁸⁶

A second and even more concerning dimension is the systematic use of forced labor. As documented by Murphy and Elimä, the Chinese government has, since 2018, restructured the XUAR from a network of internment camps into what they describe as «an enormous forced-labor regime».⁸⁷ According to official Chinese sources, 2.6 million Uyghur and Kazakh individuals have been placed in so-called “surplus labor” and “labor transfer” programs, operating under the *façade* of poverty alleviation but in reality, sustained by pervasive coercion. The threat of internment thus creates a system in which individuals cannot meaningfully refuse participation, and workers are routinely transferred far from home, monitored by security personnel, and subjected to ideological indoctrination. Independent research⁸⁸ has verified that all eleven of the ILO’s indicators of forced labor, including intimidation, restriction of movement, wage withholding, and abuse of vulnerability, are present within these transfers.

Moreover, reports such as the one from Nankai University⁸⁹ admit that the purpose of these programs is not merely economic development, but also the “integration and assimilation” of minority populations into Han Chinese society. This repressive social engineering is enforced through a points-based surveillance system and reinforced by government incentives, propaganda, and direct intervention into rural households and traditional lifestyles. Therefore, the consequence is what could be described as a double externality: every shipment of solar

⁸⁶ *Ibidem*.

⁸⁷ For further discussion on the structure and scope of China’s forced labor system in the Xinjiang Uyghur Autonomous Region, including the scale of “surplus labor” transfers, the presence of all ILO forced labor indicators, and the ideological aims of assimilation, see: L. MURPHY, N. ELIMÄ, *op. cit.*, p. 13 ff.

⁸⁸ For a detailed analysis of the available evidence regarding the presence of the ILO indicators of forced labor within Xinjiang’s labor transfer programs, see: Office of the United Nations High Commissioner for Human Rights (OHCHR), *Assessment of human rights concerns in the Xinjiang Uyghur Autonomous Region, People’s Republic of China*, 31 August 2022, available at: www.ohchr.org/en/documents/country-reports/ohchr-assessment-human-rights-concerns-xinjiang-uyghur-autonomous-region; ASPI, *Uyghurs for Sale: “Re-education”, forced labor and surveillance beyond Xinjiang*, 1 March 2020, available at: www.aspi.org.au/report/uyghurs-sale.

⁸⁹ For further information regarding the report issued by the Nankai University, see: L. MURPHY, N. ELIMÄ, *op. cit.*, p. 11.

modules arriving in European ports potentially contains two hidden costs, a high level of embedded carbon, and a significant risk of having been manufactured through forced labor.

These twin externalities expose interlocking weaknesses in the present EU approach. Climate bookkeeping registers territorial emissions reductions, but ignores the offshore coal intensity embedded in imported panels; corporate due-diligence rules struggle in practice when an entire upstream tier sits behind a state-controlled information barrier; when trade measures impose strict requirements on carbon emissions while treating labor rights violations, such as forced labor, as optional or secondary concerns, they risk violating the non-discrimination clause in Article XX of the GATT.

Finally, the geopolitical dependence on a single province grants Beijing implicit leverage should wider disputes arise. Therefore, reconciling rapid solar deployment with genuine climate integrity and respect for fundamental rights requires a unified policy ladder that ties market access, carbon pricing and mandatory supply-chain transparency together in one predictable framework. Polysilicon is an ideal proving ground: if a coherent set of incentives can reshape behavior in a sector as geographically concentrated and politically sensitive as this, the same architecture can be scaled across the broader portfolio of net-zero technologies on which the European Green Deal ultimately relies.

6. *Conclusions*

This study has offered a legal analysis of the external dimension of the EU's green transition, with particular attention to the systemic frictions that emerge when internal climate and human rights objectives are not adequately matched by consistent external trade instruments. While the academic literature has addressed many of the individual components underpinning this tension, ranging from the evolution of environmental competences to the design of conditionality tools and the challenges of supply chain regulation, what remains underexplored is the coherence of the overall architecture and its capacity to deliver on the normative aspirations of the European Green Deal beyond EU borders. Of course, the intention of this paper has thus been that of contributing to scholarly debate by highlighting areas in which the existing legal and

institutional framework still reveals important asymmetries and potential gaps.

In this perspective, each section of the paper has aimed to highlight on a specific layer of the problem. The analysis of the evolution of EU environmental competences provided the legal foundations for understanding how internal normative obligations can and do translate into external action. The mapping of the Union's conditionality instruments highlighted both the scope, the advancements, but also the fragmentation of current tools, showing where coherence and enforcement mechanisms are still lacking. The embedded case study on the solar-panel value chain was selected to ground the argument in a concrete and geopolitically sensitive example, illustrating how the Green Paradox manifests in practice. Together, these parts support a broader reflection on the need for more integrated and predictable governance frameworks.

In this context, the results of this paper suggest that the introduction of a "progressive conditionality model" may represent a possible avenue for further legal and policy analysis and development. Indeed, existing instruments often operate at opposite ends of the regulatory spectrum: some adopt rigid prohibitions that require high thresholds and are difficult to enforce in complex global supply chains, while others rely on broad country-level incentives with limited gradation between full access and full suspension and are subject to discretionary political decisions. A progressive conditionality approach would instead allow for intermediate, adjustable steps linking market access to concrete and verifiable improvements over time. By doing so, it would complement existing instruments by enhancing compliance pathways, providing structured incentives for gradual reform, and offering a more flexible tool to address sector or country specific challenges that cannot be effectively tackled through the current instruments. In doing so, it could enhance legal certainty, reduce enforcement discretion, and better reflect the Union's dual commitment to sustainability and human rights-based trade.

The rationale for such a model stems from a critical evaluation of the existing legal instruments. As examined throughout the paper, the Union's current instruments, even though innovative and fundamentally robust, present certain limitations in terms of fragmentation, enforcea-

bility, and systemic impact. The coexistence of diverse regulatory approaches, the persistence of political discretion in enforcement, and the absence of automatic compliance mechanisms tend to undermine the overall credibility and effectiveness of value-based trade governance. Furthermore, while some instruments such as the Forced Labor Regulation represent important advances for the mitigation of the Green Paradox, their ability to produce systemic and effective change remains limited in the absence of a comprehensive and unified framework.

The case study on the solar-panel value chain has served to concretely illustrate the limitations of the current approach. It exemplifies how the EU's decarbonization efforts, if pursued not taking in full account the external trade realities, risk outsourcing both environmental degradation and human rights violations. Yet, it also shows how targeted progressive conditionality could transform such a high-risk sector into a first test for more balanced and sustainable trade practices. A progressive conditionality model could indeed provide a more effective response by introducing graduated access conditions based on verifiable improvements in supply chain transparency, labor standards, and environmental performance. Compared to a rigid ban-based approach, a progressive conditionality model could offer a more realistic pathway for sectors like solar photovoltaics, where full verification of supply chain practices remains extremely difficult due to limited transparency, restricted access for independent audits, and political sensitivities in supplier countries. Thus, rather than relying on companies, or government authorities, to prove full compliance immediately, such a model would set clear, incremental benchmarks that incentivize gradual improvements over time. For instance, by encouraging geographical diversification of production, increased transparency where feasible, and cooperative monitoring frameworks. This approach would allow the EU to exert sustained normative pressure while acknowledging the complex constraints of global supply chains, ultimately making its sustainability objectives more enforceable in politically sensitive contexts.

As mentioned, the progressive conditionality model would not replace existing instruments such as the Forced Labor Regulation, but rather complement them by addressing different stages of regulatory intervention. The Forced Labor Regulation operates on an *ex-post* logic,

targeting specific goods when there is sufficient evidence that forced labor has occurred in their production. However, as previously stated, obtaining such evidence remains extremely challenging. A progressive conditionality mechanism could thus work alongside this framework aiming at a more progressive long-term change, rather than immediate intervention, requiring the companies to gradually improve transparency, conduct risk assessments, implement mitigation measures, and engage in credible monitoring processes. This combined approach would allow the EU to apply immediate prohibitions where forced labor is demonstrably identified, while simultaneously promoting broader structural improvements in supply chain governance where full verification is not yet feasible. While the specifics of the solar sector may not be generalizable to all other fields, the underlying governance tension is broadly relevant across strategic supply chains, especially those tied to raw materials, energy technologies, and agri-environmental goods.

Critics may argue that gradual roadmaps risk becoming symbolic exercises with limited tangible impact. However, when designed with robust enforcement mechanisms, such a model can produce meaningful results. The key lies in ensuring that each stage of the roadmap is tied to objectively verifiable benchmarks, such as independently audited transparency measures, measurable improvements in labor and environmental indicators, and time-bound milestones, along with the possibility of both rewards (incremental market access or technical assistance) and sanctions (suspension or rollback of preferences). Historical precedents demonstrate the potential of such an approach: the European Commission's biennial monitoring under the GSP+ scheme and the compliance roadmaps adopted in TSD disputes, notably under the EU-South Korea FTA, have shown that phased conditionality can lead to substantive reforms when anchored in credible oversight. However, these mechanisms often suffer from two major shortcomings: GSP+ relies heavily on political discretion and lacks automatic triggers for escalation, while TSD roadmaps, although transparent, are based on non-binding recommendations without enforceable consequences. The Progressive Conditionality Model addresses these gaps by combining phased engagement with automatic escalation mechanisms: each stage of the roadmap would be tied to objective benchmarks, time-bound milestones, and the possibility of both rewards and sanctions. This dual-

track structure reduces the political selectivity and “ineffective” nature of existing mechanisms, while maintaining flexibility for cooperation. While the Progressive Conditionality Model requires careful legal and operational design, it is not inherently fallible. On the contrary, it offers a pragmatic and enforceable bridge between rigid prohibitions, which are often hard to operationalize in opaque global supply chains, and purely voluntary tools, particularly in sensitive sectors like solar photovoltaics and other strategic net-zero technologies.

It is in this light that the present contribution should be read, as a critical reflection on how legal design might evolve to address the structural dilemmas posed by the Green Paradox. However, this model certainly raises its own legal and operational questions. Its implementation would require the careful definition of legal grounds, the development of transparent procedural safeguards, and to deploy a close monitoring to ensure that WTO-compatibility as well as the principle of proportionality are respected. In addition, careful attention should be paid to the differentiated capacities of trading partners, so as to avoid *de facto* exclusion or excessive burdens on countries with limited institutional resources.

Further research is also needed to explore how such a model could be operationalized in practice. Empirical studies on actual implementation in various sectors as well as assessments of the possible effects, and comparative analyses with other normative trade actors (such as the United States or Canada) would all contribute to refining the analytical validity and feasibility of the proposal. Likewise, insights and feedback from stakeholders, including Member States, civil society organizations, and economic operators, would be essential to evaluate how progressive conditionality could be translated into actionable criteria and enforcement mechanisms.

In conclusion, this paper contributes to the legal debate on the Green Paradox by examining how the EU can reconcile its normative ambitions with the regulatory constraints of global supply chains. It argues that the effectiveness of the Union’s external sustainability policies depends not only on the availability of legal instruments, but on their capacity to operate in a coherent, progressive, and practically enforceable manner. In this sense, the Green Paradox does not reflect a normative

inconsistency, but highlights the need for continuous refinement of the EU's legal toolbox to address the structural complexities of interdependent global markets.

ABSTRACT (ITA)

Il presente contributo affronta il cosiddetto “*Green Paradox*” dell’Unione europea, ossia la tensione tra l’adozione interna di elevati standard ambientali e sociali e la perdurante dipendenza da catene globali del valore che esternalizzano emissioni e violazioni dei diritti fondamentali. Attraverso una metodologia composita, che coniuga revisione sistematica della letteratura, analisi giuridico-dottrinale dei Trattati, della normativa e della giurisprudenza dell’Unione, e un caso di studio sulla filiera fotovoltaica radicata nello Xinjiang, l’articolo ricostruisce l’evoluzione delle competenze ambientali dell’UE e ne esamina gli strumenti di condizionalità esterna. L’indagine mette in luce come la combinazione di strumenti vincolanti e *soft law*, pur concepita per conformarsi al diritto dell’OMC, risulti insufficiente a prevenire le contraddizioni generate dall’affidamento a fornitori di Stati terzi. Alla luce delle criticità emerse, si propone l’adozione di un “modello di condizionalità progressiva”, fondato su traguardi verificabili, incentivi e sanzioni automatiche, quale via per garantire una più coerente proiezione esterna dei valori dell’Unione. In tal modo, il contributo auspica la costruzione di un’architettura normativa più integrata e prevedibile, capace di coniugare le ambizioni climatiche con la tutela dell’ambiente e dei diritti umani lungo le catene del commercio internazionale.

ABSTRACT (ENG)

This contribution addresses the so-called “*Green Paradox*” of the EU, namely the tension between the Union’s high domestic environmental and social standards and its continued reliance on global supply chains that externalize both emissions and fundamental rights violations. Employing a composite methodology, combining a systematic literature review, a doctrinal legal analysis of EU Treaties, legislation and case law, and a case study on the solar supply chain rooted in Xinjiang, the article retraces the evolution of the Union’s environmental competences and examines its external conditionality instruments. The analysis reveals that the current mix of binding measures and soft-law mechanisms, although designed to comply with WTO law, remains insufficient to avert

the contradictions arising from dependence on third-country suppliers. In light of these shortcomings, the paper advances a “Progressive Conditionality Model”, grounded in verifiable benchmarks, automatic incentives and sanctions, as a pathway to ensure a more coherent external projection of EU values. In so doing, it calls for the construction of a more integrated and predictable normative architecture, capable of reconciling climate ambitions with the protection of the environment and human rights across international trade chains.