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# OECD WORK ON TRADE AND THE ENVIRONMENT

## A Retrospective, 2008-2020

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# List of acronyms and abbreviations

| | |
|---|---|
| **AI** | Artificial Intelligence |
| **AANZFTA** | ASEAN Australia New Zealand Free Trade Area |
| **ACCTS** | Agreement on Climate Change, Trade and Sustainability |
| **AfCFTA** | African Continental Free Trade Area |
| **AFTA** | ASEAN Free Trade Area |
| **ANZTEC** | New Zealand-Taipei Free Trade Agreement |
| **APEC** | Asia-Pacific Economic Cooperation |
| **ASEAN** | Association of Southeast Asian Nations |
| **BCA** | Border Carbon Adjustment |
| **CAFTA-DR** | Dominican Republic-Central America Free Trade Agreement |
| **CBD** | Convention on Biological Diversity |
| **CETA** | Comprehensive Economic and Trade Agreement |
| **CITES** | Convention on International Trade in Endangered Species of Wild Fauna and Flora |
| **CPTPP** | Comprehensive and Progressive Agreement for Trans-Pacific Partnership |
| **CLEG** | Combined List of Environmental Goods |
| **COP** | Conference of the Parties |
| **EEA** | European Economic Area |
| **EG** | Environmental Goods |
| **EGS** | Environmental Goods and Services |
| **ELIS** | Environmental Labelling and Information Schemes |
| **ESM** | Environmentally Sound Management |
| **EU** | European Union |
| **FDI** | Foreign Direct Investment |
| **GVC** | Global Value Chain |
| **GHG** | Greenhouse Gases |
| **IEA** | International Energy Agency |
| **IoT** | Internet of Things |
| **IUU** | Illegal, Unreported and Unregulated |
| **LCR** | Local Content Requirement |
| **MEA** | Multilateral Environmental Agreement |
| **NAFTA** | North American Free Trade Agreement |
| **NTM** | Non-Tariff Measure |
| **OECD** | Organisation for Economic Co-operation and Development |
| **PPM** | Processes and Production Methods |
| **RTA** | Regional Trade Agreement |
| **SDG** | Sustainable Development Goal |
| **USMCA** | US Mexico Canada Agreement |
| **WTO** | World Trade Organization |

# *Note from the Secretariat*

The OECD has a long tradition of working on the interlinkages between trade and the environment. Over the 30 years since its creation, the OECD's Joint Working Party on Trade and the Environment (JWPTE) has, in accordance with its mandate, analysed the interaction between trade and environmental policies, and contributed to the development of a mutually supportive agenda needed to underpin competitive, sustainable and resilient economies. The JWPTE has published over 120 reports on a wide range of trade and environment issues, and provided a forum for information exchange, fostering debate within the trade and environment community and beyond.

In 2008, a first retrospective report looked back on the JWPTE's first 17 years (Potier and Tébar Less, 2008[1]). Following ground-building work on policy principles in the 1990s, from 2001, the JWPTE turned to analytical work in support of the World Trade Organization (WTO) Doha Development Round negotiations. The JWPTE contributed pioneering work on environmental goods and services and the effect of environmental measures on market access. From the mid-2000s, the JWPTE also focused on regional trade agreements (RTAs) and the environment, and on trade and climate change linkages.

Since then, the international context has changed and the landscape of trade and environment issues has evolved, with slow progress of multilateral trade negotiations, opportunities to advance on regional approaches, and key developments around multilateral frameworks such as the Sustainable Development Goals and the Paris Climate Accord.

This report aims to highlight the transforming landscape of trade and environment issues during the past decade and the JWPTE's role in advancing policy analysis of these issues. The report also serves as a reference guide to inform future JWTPE projects, in the context of major emerging trends shifting policy needs and priorities in the trade and environment nexus.

# *Executive summary*

Since 2008, the global economy lived through and slowly recovered from a major financial and economic crisis, with trade failing to regain its momentum. Multiple threats to the global environment were brought into sharper focus by growing evidence of the climate crisis and the deterioration of ecosystems and biodiversity. These threats highlighted the need for more ambitious sustainable strategies, with a new sense of urgency for collective action increasing pressure to reconcile trade and environmental priorities. Multilateral frameworks such as the Sustainable Development Goals (SDGs) and the Paris Climate Agreement dominated the environmental agenda, influencing decisions across many other policy areas, including trade. On the trade side, there was limited progress in multilateral negotiations, but significant advances in regional approaches, as well as notable plurilateral initiatives relevant to the trade and environment nexus.

With these considerable changes, taking stock of the OECD's recent work on trade and environment is not only timely, but also essential to help inform the direction of future trade and environment work at OECD. This retrospective report, which follows up on an earlier report covering the 1991-2008 period (Potier and Tébar Less, 2008[1]), has a dual aim. First, it reviews the OECD's contribution to advancing policy analysis on trade and the environment between 2008 and 2020, focussing primarily on the work carried out by the Joint Working Party on Trade and Environment (JWPTE) on four topics: (i) Multilateral and plurilateral trade agreements and environmental policies, (ii) Regional Trade Agreements and the environment, (iii), Global environmental issues, policy responses, and their linkages with trade, and (iv) Mutually supportive trade and environment policies, with a focus on indicators and quantitative analyses. Other relevant work on trade and environment at the OECD is also highlighted. Second, the report explores emerging trade and environment issues and potential drivers for future trade and environment work to ensure it remains as relevant in the future as it has been in the past.

**Multilateral and plurilateral trade agreements and environmental policies**

Many of the issues the JWPTE explored in the early 2000s in support of WTO discussions remain topical and the OECD has continued to provide valuable insights into areas central to multilateral and plurilateral trade and environment issues, notably environmental goods and services (EGS), and the reform of government support.

The JWPTE's seminal work on an EGS classification started in 1999, followed by the widely used Combined List of Environmental Goods in 2014 and an innovative taxonomy of environmental services in 2017. These advances made it possible to analyse the benefits of and barriers to EGS trade, and study tools to ensure these trade flows contribute to meeting environmental objectives. A parallel strand of work has considered how environmental regulations and support for renewables and electric vehicles interact with trade. A major finding of this work is the positive impact of environmental regulations on trade in EGS, revealing broad areas of compatibility between trade and environmental objectives. It also found that support for environmental goods and services that intends to ensure a large share of demand is met by domestic suppliers is counter-productive because it tends to push up prices for these goods and services.

The OECD is also contributing to tracking progress towards the reform of inefficient and environmentally harmful fossil fuel support which has been regularly pledged at

international level since 2009, notably in the framework of the G20 and APEC. The OECD inventory of fossil fuel support launched in 2010 had by 2020 been extended to 44 countries and over 800 subsidy measures to producers and consumers. This uniquely comprehensive inventory is widely recognised as an essential tool in efforts to reform fossil fuel subsidies. It has led to interesting findings about the impact of fossil fuels support on renewable energy uptake, and on trade and competitiveness issues for environmental goods and services.

In addition, the OECD has completed an inventory of fisheries support and is analysing its effects, providing important input into WTO negotiations to help deliver the SDG of eliminating subsidies that contribute to overcapacity, overfishing and illegal fishing. It has completed analysis on the effects of fisheries support policies to understand and compare different support approaches.

**Regional trade agreements and the environment**

The number and scope of regional trade agreements (RTAs) with environmental provisions started increasing significantly in the 2000s, often with novel approaches to integrating environmental concerns with trade objectives generating widespread interest in the trade and environment community. The JWPTE provided much needed tracking and understanding of this dynamic field with surveys, reviews, analytical work and workshops to disseminate findings, create dialogue and share experience. Between 2008 and 2014, the JWPTE concentrated on surveying and analysing environmental provisions in RTAs, which increasingly included environmental provisions beyond simple environmental exceptions and environment-related preamble language. More substantive provisions were mostly concerned with environmental co-operation, as well as public participation and dispute settlement mechanisms.

From 2015, with a larger number of RTAs and a longer timeframe to evaluate environmental provisions, work turned to assessing implementation and effectiveness. While measuring implementation proved difficult, the work documented evidence that environmental provisions had contributed to positive environmental outcomes, including stronger environmental regulations, new institutional arrangements, environmental co-operation and improved public awareness of environmental governance.

More recently the JWPTE has focused on the greening of RTAs, exploring how environmental objectives can be incorporated into provisions that are not specifically environmental. The first round of work focused on chapters relating to investment and subsidies, and identified options for promoting environmental objectives and securing environmental policy space within existing provisions. The second round of work considered chapters and articles related to non-tariff measures, technical barriers to trade and regulatory co-operation. It concluded that dedicated chapters and sectoral annexes are one of the possible ways to reflect environmental objectives in RTAs.

**Mutually supportive trade and environment policies: indicators and quantitative analysis**

The development of trade and environment policy indicators is part of a long-standing OECD effort to measure policy progress and inform policymaking. While environmental and economic data continued to improve in the last two decades, the lack of a specific set of indicators on trade and the environment was holding back empirical analysis, limiting the scope of policy-oriented messages and making it difficult to measure progress towards policy goals. The JWPTE filled this knowledge gap in 2019 with an original set of ten

indicators covering six important areas of the interface between trade and the environment. The analysis of trends in these indicators produced valuable insights into essential issues, notably the pollution haven effect, the impact of fossil fuel subsidies on the low carbon transition, and drivers of flows of raw materials and EGS trade.

The issue of competitiveness is central to much of the JWPTE's work. Over the past decade, it has improved measurement and analysis of competitiveness issues, notably the effects of cross-border differences in environmental policies on trade, competitive advantage and environmental outcomes. It has examined impacts on global value chains and explored responses such as border carbon adjustment. OECD modelling work has also explored leakage impacts from multiple carbon markets. A major conclusion from this work is that the competitive loss from stringent environmental policies in pollution-intensive activities is compensated by a gain in less pollution-intensive ones, shifting specialisation without a significant overall impact on competitiveness.

**Global environmental issues, policy responses and their linkages with trade**

As international and domestic climate change initiatives gathered pace in the last decade, the JWPTE has provided relevant and detailed studies of barriers to trade in climate change mitigation technologies and of trade-facilitating measures to accelerate technology diffusion in cross-border electricity trade and renewable energy generation. It has also examined the interaction between trade and domestic support for renewables. These studies share the conclusion that support measures do encourage environmental goods and services uptake, except when they are trade restrictive. The JWPTE also examined the impacts of climate change on international trade patterns based on modelling work, and concluded that climate and trade policies that are aligned would help avoid the worst climate damages at least cost.

International initiatives on resource efficiency and resource efficient circular economies over the last two decades have highlighted the key role of trade, and recent restrictions on trade in certain waste and scrap have moved trade to the centre of the circular economy policy challenge. The JWPTE first approached the interaction between trade and the circular economy transition in 2010 when it explored the policy challenge of facilitating legitimate trade in non-hazardous recyclable materials while ensuring trade in hazardous materials is subjected to appropriate controls. Noting a lack of analysis in this area, the JWPTE's 2018 concept paper highlighted the trade implications of circular economies through global value chains and trade in waste and scrap, secondary materials and second-hand goods.

The link between trade and biodiversity was initially explored by the JWPTE through the analysis of trade measures in multilateral environmental agreements. In the last ten years the JWPTE focused on illegal trade in environmentally sensitive goods, alongside OECD reports on illicit trade and environmental crime which found that illegal trade is a major factor in the lucrative nature of such crime and that it has a direct effect on biodiversity. As efforts to mainstream biodiversity more effectively into sectoral policies are gaining momentum on the global policy agenda, OECD work is focusing on several areas relevant to trade, notably taxation and economic incentives.

Environmental labelling and information schemes are an area of long-standing interest for the JWTPE. Between 2012 and 2016, the JWPTE produced a grounding typology of over 500 schemes. It assessed the environmental and trade impact of multiple schemes, acknowledging international harmonisation efforts. It called for analysis of the role of

enforcement in the quality of environmental claims and of international collaboration on information and interoperable design across different efforts.

The digitalisation of the world economy touches upon many trade and environment issues and has recently become an important area of work, notably through the JWPTE's contribution to the OECD Going Digital project that provides policymakers with tools to help their economies prosper in an increasingly digital world. Two aspects of this project are particularly relevant to the JWPTE's work: competitive changes brought about by the digital economy; and the potential for digital technologies to improve the design and enforcement of public policies. Recent relevant work covers issues ranging from the impact of online sales on extended producer responsibility, to the use of new digital technologies to tackle trade in illegal pesticides.

**A view on the emerging context and directions for potential future work**

The second decade of the 21st century closed on uncertain times for international trade and environment governance, with complex economic and environmental choices, and a short term policy focus contributing to disappointing outcomes: the COP 25 Climate Conference was widely viewed as falling short of the action required to address the climate emergency; and failure to meet most of the 2020 Aichi targets of the Convention on Biological Diversity (CBD) is heightening concern about ecosystems and biodiversity. These shortcomings have heightened political and public awareness of the need to confront this "ambition gap". Well-informed debates on issues such plastics pollution in the oceans, pesticide use and insect populations, and the link between climate change and habitat loss, have led to calls to rebuild the foundations for collective action, notably from civil society. Several stocktaking milestones are on the horizon, with the 30th anniversary of the Rio Declaration in 2022 and the halfway point of the SDGs in 2023.

Where most of the JWPTE's existence has been defined by economic convergence and trade agreements, protectionism now risks fragmenting the global trading system, hindering cross-border trade and reallocating activity. The global recession triggered by the COVID-19 pandemic has increased uncertainty, with substantial effects expected well into the early 2020s. Despite the economic benefits brought by trade to many parts of the world, there are continuing controversies over adherence to multilateral rules, state support and behind-the-border protections, with trade sometimes perceived as extending environmental footprints across borders rather than disseminating environmental technology. Setbacks in meeting collective goals point to the complexity of the issues involved, with measures such as carbon taxes proving challenging. Without a framework to address the trade and competition issues raised by environmental responses, policies can falter when it comes to their adoption at domestic and international level.

In the trade and environment community, despite widespread acknowledgement of remarkable progress in the coherence of trade and environment policies, there is a sense that the policy agenda is becoming more complex and specialised. Nevertheless, there is a new willingness not to sidestep the thorniest issues, such as reform of government support. Unresolved issues holding back international cooperation are being revisited because countries are more open to discussing trade and environment linkages. Engagement and expertise are growing, with stakeholders embracing ideas promoted by a multiplicity of initiatives at the sustainability-trade interface. As the trade and environment debate matures, the range of issues under discussion is expanding and their relevance is better understood, contributing to widening the consensus that both trade and environment policies are needed to boost EGS markets and sustainable business models.

Despite the current highly uncertain outlook, the stronger environmental agenda which is likely to emerge in coming years can contribute to restoring faith in multilateralism as well as promoting trade policies central to achieving environmental outcomes. Broad trends such as the expansion of global value chains, services and digitalisation are blurring the lines between well-established policy silos, multiplying interaction between trade and environment responses. Including ecosystems services in a wider definition of resource use could revolutionise traditional approaches to sustainable development and trade. Circular economy paradigms are shifting the understanding of the resource basis of the global economy and improving knowledge of the factors driving resource use and trade.

A major lesson of this retrospective is the growing need for data, analysis and policy proposals on trade and the environment, where issues are often technically complex and politically arduous. With the trade and environment nexus in the throes of a major transformation, the JWPTE is uniquely placed to anticipate, analyse and explain emerging policy priorities.

# 1. Trade and Environment at the OECD

## Developments in the trade and environment nexus, 2008-2020

Since 2008, the trade and environment context has changed significantly. The global economy has lived through a major financial and economic crisis, which has left lasting and far-ranging repercussions across OECD and non-OECD countries. The world economy has slowly recovered, but trade growth has still not regained its momentum. Between 2011 and 2019, the real rate of growth of trade hovered around that of global GDP, around 3% or less. Several possible explanations for this slowing in trade growth have been suggested, among them cyclical factors, such as weaker demand, especially for more trade-sensitive durable and investment goods. Limited corporate investment and reduced trade financing in the aftermath of the crisis no doubt also came into play. Evidence is mixed as to the role of structural factors such as limits being reached to the fragmentation of production and to international specialisation, especially as global value chains are still expanding in terms of both product and country coverage.

The period since 2008 has also seen multiple threats to the global environment being brought into sharp focus. Evidence of and concern about the climate crisis has grown worldwide. Furthermore, long-standing scientific concern about the deterioration of marine and terrestrial ecosystems and biodiversity has moved into the public eye and moved up policy agendas.

These developments have revealed the shortcomings of existing policy responses, as well as the need for more ambitious strategies that are both sustainable and inclusive. They have also increased pressure on policymakers to reconcile essential economic and environmental priorities, for instance through resource efficiency and circular economies. They have also infused a new sense of urgency in international fora to promote collective action, in the context of an increasingly integrated global economy.

Though change in some areas has been slow, international governance for both trade issues and environment issues actively responded to the challenges of the last decade. On the environment side, there have been key developments around multilateral environmental frameworks such as the Sustainable Development Goals (SDGs) and the Paris Climate Agreement, among other notable initiatives. Such high-profile multilateral approaches came to dominate the environmental agenda and influence decisions across other policy areas, including trade. For instance, many of the 17 SDGs and the associated 169 targets involve long-standing trade-related issues, such as the reform of government support for fisheries or fossil fuels, providing much needed impetus to reboot sometimes flagging initiatives to reconcile trade and environmental objectives. They have also propelled work on the environment and trade nexus into new areas, such as trade and the circular economy transition. On the trade side, there has been a step-down in some expectations, with limited progress in multilateral trade negotiations. However, opportunities to advance on environmental provisions contained in RTAs have been remarkable, and there have been some notable plurilateral initiatives relevant to the trade and environment nexus, notably concerning trade in environmental goods.

The environmental and trade context has made many long-standing OECD recommendations seem all the more pressing and heightened the relevance of multilateral initiatives and co-operation promoted by the OECD since the creation of the JWPTE. Since

2008, the trade and environment debate has noticeably matured, the range of issues under discussion has expanded considerably and their relevance is better understood. Public and private stakeholder engagement and expertise have grown, along with awareness of the importance of policies at the trade and environment nexus. There is now little dispute that international trade flows, rules and policies are directly and deeply relevant to environmental performance, and that meeting environmental objectives require supportive trade policies.

## The OECD Joint Working Party on Trade and the Environment

When the Joint Working Party on Trade and Environment (JWPTE) was created in 1991, the OECD was the first international organisation to establish a standing body to examine trade and environment issues, share experience and advance knowledge on policy challenges. Its parent Committees, the Environmental Policy Committee (EPOC) and the Trade Committee (TC), provide strategic guidance. The mandate of the JWPTE has been regularly updated since its creation to reflect changes in the trade and environment agenda, with the current mandate adopted in 2019 for the period 2020-2025 (Box 1).

**Box 1. Mandate of the Joint Working Party on Trade and the Environment (2020-2025)**

The objectives of the Joint Working Party on Trade and the Environment are to provide a forum to exchange information; to monitor and analyse the interactions between trade policies and environmental policies; and contribute to the development of coherent, mutually supportive policies needed to underpin competitive, sustainable, productive and resilient economies.

In achieving these objectives, The Joint Working Party should:

- focus on analytical work, including empirical studies of selected policy areas and economic sectors, aimed at promoting the mutual supportiveness of trade and environment policies in practice, in order to contribute to sustainable development, while building on its work to date;
- focus on those areas where it has the greatest value added while supporting the activities of other OECD bodies and international organisations, and avoiding duplication;
- co-operate and liaise with other relevant OECD bodies, and with relevant international organisations including the WTO, UNEP, UNCTAD, and ISO;
- engage with emerging economies and developing countries to exchange knowledge and information and share experience, as appropriate;
- consult regularly as appropriate with relevant stakeholders on environment and trade related matters;
- advise and report to the parent Committees on new and emerging problems and major issues with respect to trade environment relationships;
- assist the parent Committees in ensuring the coherence and consistency of the trade and environment related work being carried out in the various bodies of the OECD.

*Source:* "Extension of the mandate of the Joint Working Party on Trade and the Environment (JWPTE)" [ENV/EPOC(2019)17].

Institutionally, the JWPTE positions itself upstream of bilateral, regional and multilateral negotiating bodies, and seeks to facilitate — in an informal, non-negotiating setting — discussion around evidence-based analysis and provide advice in advance of policy and decision making in OECD Member countries. In accordance with its mandate, it analyses the interaction between trade policies and environment policies, and contributes to the development of mutually supportive policies needed to underpin competitive, sustainable and resilient economies, addressing the critical issues of the day as well as longer-term concerns and emerging priorities.

Over almost 30 years, the JWPTE has covered a wide range of issues relevant to trade and the environment, bridging gaps in analysis and communication. The JWPTE's most visible output consists of reports to its parent Committees, most of which are published by the OECD (Annex 1). Since the JWPTE was created, over 120 reports have been published as OECD Trade and Environment Working Papers or made publicly available as official OECD documents.[1] These publications are intended to broaden the knowledge base for JWPTE members and further understanding of the issues that it has analysed well beyond the Working Group and its parent Committees.

Though the JWPTE is generally the focal point for work dedicated to trade and the environment within the OECD, because the trade and environment nexus touches on a wide range of policy issues, the JWPTE also liaises and collaborates with other OECD committees, and regularly contributes to relevant work across the OECD, ranging from databases and modelling, to peer reviews and key issues papers.

As a group, the members of the JWPTE share an interest in dialogue and debate, within the trade and environment community and beyond. The JWPTE conducts regular workshops and seminars, the outcome of which is generally written up and made publicly available. In addition, in the interest of sharing its work with a broader audience and initiating constructive discussions, policy dialogues bring together policymakers and advisors, academics, industry representatives and other experts from OECD and non-member countries. Such dialogues represent an important part of the JWPTE's outreach and are designed to address issues of international importance that cannot be solved by OECD members alone (Annex 2). The JWPTE also contributes analysis to policy and high-level dialogues that take place under the auspices of the OECD on issues that relate to trade and the environment, notably in recent years several OECD Ministerial Council Meetings, the Global Forum on Trade and the Round Table on Sustainable Development.

## The first retrospective report, 1990-2008

In 2008, the JWPTE looked back over its first 17 years with the report *Trade and Environment at the OECD: Key Issues since 1991* (Potier and Tébar Less, 2008[1]). This retrospective outlines four main periods of work, ranging from the early years that focused on policy principles to more analytical work carried out with reference to trade measures in multilateral environmental agreements (MEAs) or in support of negotiations on trade and environment issues under the Doha Development Agenda. Later work turned to environmental provisions in regional trade agreements (RTAs) as well the role of trade in

[1] Recent working papers by the JWPTE can be downloaded from: http://www.oecd-ilibrary.org/trade/oecd-trade-and-environment-working-papers_18166881. Other online official documents can be found at http://www.oecd.org/officialdocuments.

supporting environmental objectives, particularly those relating to climate change and resource efficiency (Box 2).

**Box 2. Trade and the Environment at the OECD: 1991-2007**

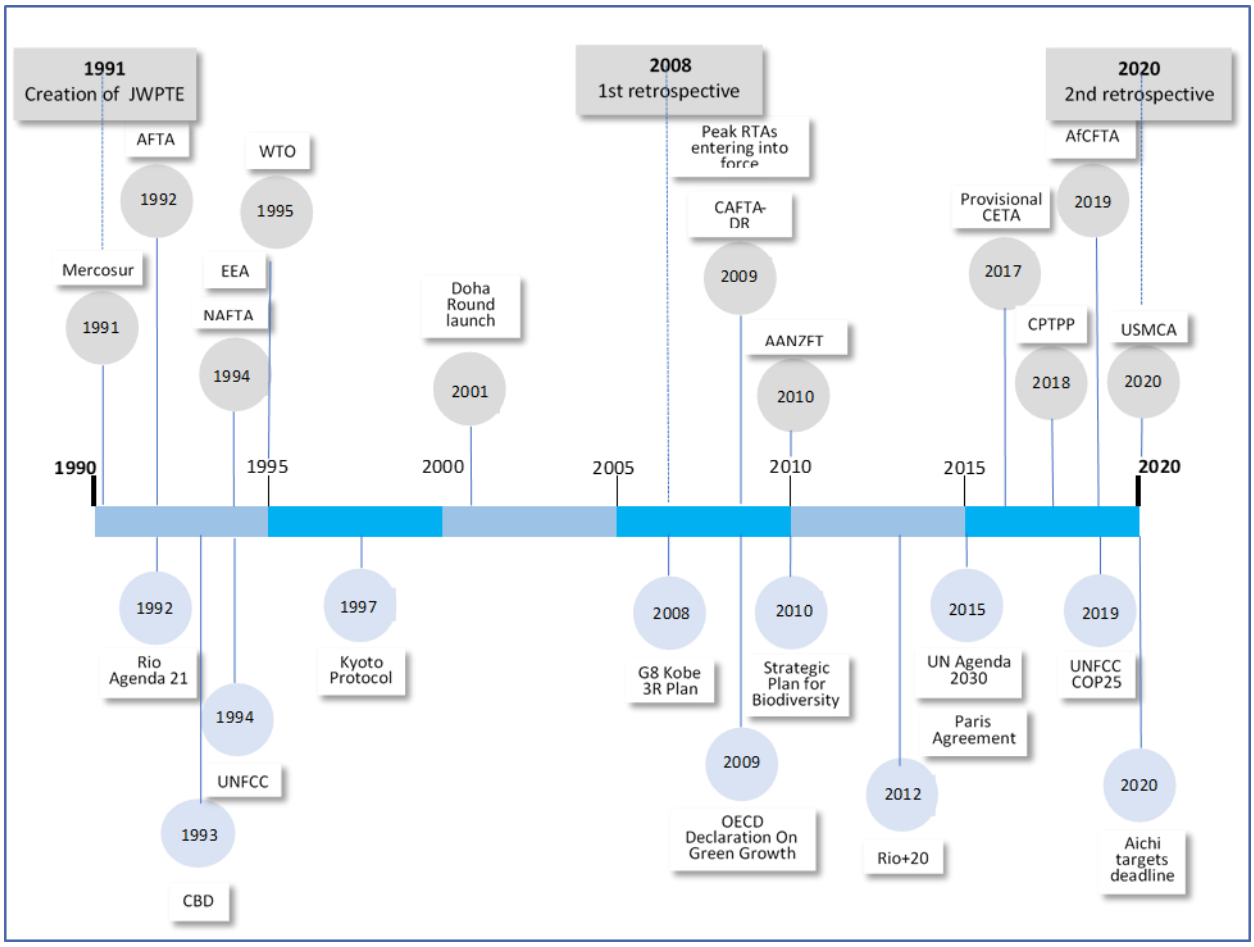
The first retrospective of trade and the environment work at the OECD was carried out by the JWPTE in 2008, covering the period since its creation in 1991 **(Potier and Tébar Less, 2008[1])**. It documented four periods of the JWPTE's work:

- During its early years, its work dealt mainly with policy principles. The general feeling was that trade and environment issues could be addressed by improving policy integration, notably through JWPTE's work on guidelines relating to the environmental effects of trade as well as procedural guidelines — for instance on transparency and consultation, assessing the environmental effects of trade, international co-operation and dispute settlement.
- From 1995, the JWPTE's work became more analytical, with key reports on trade and sustainable product policies (extended producer responsibility, eco-labelling, greening of public purchasing) and on links with environmental principles and approaches (the precautionary principle, the Polluter-Pays Principle). Work on the environmental assessment of trade liberalisation identified a gap in methodologies to assess trade in services, which the JWPTE went on to provide. Work also included analysis of trade measures in MEAs.
- Between 2001 and 2006, the focus shifted to providing analytical support for negotiations on trade and environment issues addressed under the Doha Development Agenda, notably in two areas: barriers to trade in environmental goods and services, and the effect of environmental measures on market access (noteworthy for considering organic goods for the first time).
- From the mid- to late 2000s, anticipating and tracking the shift towards plurilateral and regional approaches, the JWPTE turned its attention to areas that were not directly linked to negotiations at the WTO, notably analysis of environmental provisions in RTAs, promoting trade in climate change mitigation technologies and analyzing the environmental and economic benefits of removing barriers to trade in non-hazardous recyclable materials.

This first retrospective covered much of the "long 1990s", a period extending from the late 1980s to the mid-2000s during which real global trade flows expanded at twice the rate of real GDP growth (Figure 1). The JWPTE was launched at the onset of a period of intense activity in international trade governance with the creation of Mercosur in 1991, the Association of Southeast Asian Nations (ASEAN) Free Trade Area (AFTA) in 1992, the North American Free Trade Agreement (NAFTA) and the European Economic Area (EEA) in 1994, followed by WTO in 1995 and the launch of the Doha Round in 2001. The years leading up to the new millennium also saw a surge in international cooperation on the environment, with the Rio Conference and Agenda 21 in 1992, followed by a number of agreements that were to define global efforts to manage environmental issues in years to come, notably the CBD in 1993, the 1994 UN Framework Convention on Climate Change (UNFCC), and the Kyoto Protocol in 1997. In the first decade of the 2000s, cooperation also focused on preparing specific strategies and targets, making it possible to agree to wide-ranging plans such as the G8 Kobe 3R Plan and the Strategic Plan for Biodiversity. The early part of that decade was marked by the Doha Round and later by the multiplication

of RTAs with substantive environmental provisions, while the fastest-growing emerging economies were enjoying export growth that could exceed 10% per annum.

**Figure 1. Developments in the trade and environment nexus, 1990-2020[2]**




*Source*: Author's elaboration, based on the literature analysed in this report.

## The second retrospective report, 2008-2020

Taking stock of the twelve years since the previous retrospective report is not only timely, but also essential to help inform the direction of JWPTE's future undertakings. The aim of this report is therefore dual. First, it seeks to provide a retrospective of the contribution that the JWPTE and more broadly the OECD have made to advancing policy analysis over this period, serving as a reference for the Working Party's institutional memory. Second, with the benefit of hindsight, it seeks out the drivers of current and emerging trade and environment issues to ensure that the JWPTE's work remains as relevant in the future as it has been in the past.

The report focuses on issues that have been at the centre of the JWPTE's work in the last twelve years. In keeping with the dual aim of the report, these issues have been chosen as

[2] Acronyms are spelt out in the List of Acronyms and Abbreviations at the front of this report.

much for their historical importance as their relevance to the Working Party's ongoing and future work, which is first and foremost shaped by the broader economic and environment policy context. The Working Party in turn seeks to shape this context by informing the debate and improving understanding of trade and environment issues. As a result, the issues that the JWPTE focuses on at any one time are often the drivers of policy changes down the line.

This retrospective draws on the JWPTE's output such as Trade and Environment Working Papers and other unclassified reports (listed in the Annex I). Relevant work undertaken elsewhere in the OECD to which the JWPTE has contributed or which it has relied upon is also documented.[3] The JWPTE's work is placed in the wider context of economic, trade and environment policy developments and issues since 2008.

The retrospective is organised around four sets of major issues, which correspond to the main chapters of the report:

- *Multilateral and plurilateral trade agreements and environmental policie*s (Chapter 2), with a focus on two topics: (i) trade in environmental goods and services and (ii) environmentally harmful subsidies, notably on the reform of government support for fossil fuels and for fisheries.
- *Regional trade agreements and the environment* (Chapter 3), organised around three main streams of work: (i) tracking and analysing the typology of environmental provisions in RTAs, (ii) assessing the implementation and effectiveness of environmental provisions, and (iii) the greening of RTAs beyond environmental provisions.
- *Global environment issues, policy responses and their linkages with trade* (Chapter 4), with focus on the trade dimension of four key topics: climate change and renewable energy, resource efficient and circular economies, biodiversity, environmental labelling and information schemes, and digitalisation.
- *Mutually supportive trade and environment policies: indicators and quantitative analyses* (Chapter 5), which includes (i) policy indicators on trade and the environment, as well as (ii) assessments of competitiveness and the pollution haven effect.

These categories often overlap, a single piece of work being relevant to more than one topic and cross-referenced where needed. In many cases, work in one area has provided input for work in another area, with quantitative work (databases and inventories), and taxonomy work (typologies and surveys) feeding into several areas of analytical work.

The last chapter (Chapter 6) is devoted to providing a view on the emerging context and directions for possible future work undertaken under the auspices of the JWPTE (Chapter 6). It considers key elements of context in international governance, as well as the main drivers of current and emerging trade and environment issues that are likely to shape the Working Party's future work. These considerations, along with input from its Members and under the guidance of its parent committees, aim to ensure that the JWPTE's work remains at the forefront of policy developments and fully contributes to advancing analysis and understanding.

[3] Note also that the Environment Policy Committee, one of JWPTE's parent committees, also plans to publish an overview of its work in the last decade in 2021.

# 2. Multilateral and plurilateral trade agreements and environmental policies

The last twelve years have seen the impetus for multilateral and plurilateral trade and environment developments shift from the momentum provided by the Doha Development Round, to the collective pledges for action expressed through major environmental initiatives, the most prominent being the 2015 Paris Climate Agreement and the 2030 Agenda for Sustainable Development. Many of the issues the JWPTE explored in the early 2000s in support of WTO discussions remain topical and the OECD has continued to provide valuable insights into areas central to multilateral and plurilateral trade and environment issues, notably environmental goods and services, and the reform of government support.

The broad topic of EGS[4] represents an important part of the JWPTE's work. Encouraging the diffusion and adoption of EGS (notably by identifying and removing barriers to their trade) has regularly been identified as a priority area in trade and environment agreements alike, with the JWPTE's work often driven by or in support of such negotiations or agreements. The JWPTE has undertaken a considerable body of work on EGS, as interest has been bolstered by a multilateral context characterised by increasingly ambitious environmental targets that cannot be met without generating higher demand for EGS. This development has significant policy implications for the international market where these goods and services are traded. A further driver for renewed interest in the topic of EGS has come from the scrutiny applied to the environmental credentials of trade agreements: the role of trade in the diffusion of EGS has been highlighted because it points to the positive contribution that multilateral and plurilateral trading system can make to meeting environmental objectives.

Multilateral action relating to subsidies has until recently focussed on the trade effects of subsidies, leading to a body of WTO rules and disciplines, and several regional and bilateral free-trade agreements that also address subsidies (see Chapter 3). Nevertheless, by the mid-2000s the OECD had made significant progress towards understanding the environmental effect of these subsidies, and identifying environmentally harmful subsidies in several economic sectors, notably agriculture, transport and energy (Honkatukia, 2002[2]). The contribution of the JWPTE was summarised in the 2005 flagship publication *Environmentally Harmful Subsidies: Challenges for Reform*, which demonstrated that many of the subsidies distorting trade in primary products could be environmentally harmful, and vice versa (OECD, 2005[3]). In recent years, government support (including subsidies) for fossil fuels and for fisheries have garnered the attention of the trade and environment community, with several international fora expressing a collective will to address their environmental effects through reform and phase-outs. These initiatives provide the backdrop for much of the JWPTE's and the OECD's analysis of government support which has taken the lead in measuring and understanding the impact of environmentally harmful subsidies and in examining options for reform.

[4] The acronym "EGS" is used even though in many cases the term "environmental goods and services" does not necessarily include environmental services, usually due to data and information limitations.

## Environmental goods and services

The JWPTE's work on EGS has developed along two main themes: (i) definitions and taxonomies, with pioneering work on classifying EGS; and (ii) analytical work, exploring the benefits of facilitating trade in environmental goods (and, at a later date, services), and identifying barriers to trade in EGS to help disseminate critically needed environmental technologies and bring the economic benefits of greater trade flows.

### *Taxonomy of environmental goods and services*

Negotiations relating to trade in environmental goods are inseparable from the complex issue of defining which traded goods can be deemed environmental. As it did during previous decades in the context of multilateral trade discussions at the WTO, the OECD has been active in informing relevant negotiations with background materials, and has participated actively in technical workshops and similar events with OECD and G20 economies, and with interested NGOs. At multilateral level, since WTO negotiations on the reduction or elimination of tariffs and non-tariff barriers to EGS trade stalled as part of the overall Doha package, there have been several regional and multilateral initiatives. Two RTAs have been successful in both defining lists of environmental goods and agreeing on measures to be implemented to facilitate their trade (see Chapter 3). In 2012, APEC agreed to lower tariffs on a set of 54 green goods to 5% or less by the end of 2015. This agreement was followed by the New Zealand-Taipei Free Trade Agreement (ANZTEC) which entered into force in 2013 with a provision setting zero tariffs on a list of 132 environmental goods.

The environment chapters of some recent RTAs also comprise provisions calling for the liberalisation of trade in EGS, in addition to the tariff reductions and other commitments found in other chapters (e.g. on market access). This is for instance the case of the EU-Korea agreement that entered into force in 2011. It calls for Parties to "strive to facilitate and promote trade and foreign direct investment in environmental goods and services, […] including through addressing related non-tariff barriers". The 2018 Comprehensive and Progressive Agreement for Trans-Pacific Partnership also vows "to work together to address potential barriers to trade in environmental goods and services".

A plurilateral negotiation among 18 WTO members (counting the EU as one) was launched in 2014 to agree on an Environmental Goods Agreement to reduce bound tariffs on those goods to zero, with tariff cuts made by the signatories benefitting all WTO members (on a most-favoured-nation basis). The JWPTE supported this initiative, to which it contributed its expertise by helping to define the scope of the EGS concerned. Though the June 2016 OECD Ministerial Council Statement called for the conclusion of the agreement (OECD, 2016[4]), this initiative stalled at an unsuccessful WTO Ministerial-level meeting in December 2016.

In September 2019, five counties (Costa Rica, Fiji, Iceland, New Zealand and Norway) launched an initiative to reduce barriers to trade in EGS, phase out fossil fuel subsidies and encourage voluntary eco-labelling schemes. The planned Agreement on Climate Change, Trade and Sustainability (ACCTS) draws on OECD work on defining EGS.

Work by the JWPTE has made a major contribution to addressing the problems encountered when trying to devise a comprehensive list, notably:

- the lack of specificity of existing classifications, such as the Harmonized System (HS) at the six-digit level;
- the existence of products with multiple uses, some of which are not environmental;

- the problem of goods defined in terms of their relative environmental performance in use, something that may require chasing a moving target as technology improves over time.

An early effort carried out by the JWPTE in collaboration with EUROSTAT led to the publication in 1999 of a detailed manual for collecting data on the environmental goods and services industry as well as a first OECD list of environmental goods. It was regularly updated to take account on-going work in other fora, notably within the framework of the 2012 APEC agreement.

In 2014, a more comprehensive list - labelled the CLEG (Combined List of Environmental Goods) - was produced to arrive at a customised set of 248 products. It is often referred to as the OECD list and uses the HS 2007 classification at the six-digit level and further divides goods according to their environmental theme or medium (Sauvage, 2014[5]). The OECD also compiled an indicative list of climate-change-relevant goods, initially for the 2010 Toronto summit of the G20. Named for the plurilateral environmental goods and services (PEGS) agreement, the PEGS list covers more than 150 products, with a focus on goods of relevance to combatting climate change.

Related work has also been devoted to tackling difficult fundamental questions of whether to include environmentally preferable products (Steenblik, 2006[6]) – that is, goods distinguished as somehow greener than others in their category – or products distinguished by their green production and processing methods (Moïsé and Steenblik, 2011[7]).

The JWPTE has also addressed the problem of defining trade in environmental services, with two reports on this topic. The first was devoted to *Trade in Services Related to Climate Change: An Exploratory Analysis* (Steenblik and Geloso Grosso, 2011[8]). It adopts a cluster approach to identifying and analysing the range of services related to GHG mitigation. Cluster approaches allow for the recognition of intersectoral linkages in services sectors without requiring a reorganisation of existing classifications. Based on a range of case studies, the report found that that the deployment of GHG mitigation technologies is strongly dependent on many services, some imported. Business services, telecommunications services, and construction and related engineering services figure prominently. In certain countries, financial services also play an important role, particularly for the implementation of climate policy instruments (e.g. emission trading schemes). Training is another service that are sometimes provided as part of GHG mitigation projects.

The second report examined trade in environmental services as a whole (Sauvage and Timiliotis, 2017[9]). It acknowledged that existing lists had important gaps. For instance, the 1999 joint OECD/EUROSTAT does not include sectors such as engineering and finance. It also followed a typology based on a cluster approach around core environmental services (such as wastewater and solid waste management). Environmentally related services (such as environmental consulting and engineering) constitute a cluster since they serve a clear environmental purpose without being strictly environmental. Another cluster is that of other services whose primary purpose is not environmental (such as legal or accounting services for the environment industry). The report flags that lack of data collection on the scope, magnitude, and direction of trade in environmental services is a cause for concern. This issue is particularly acute for the environmental services industry, constraining the ability to conduct empirical analysis of the sector and informing trade negotiations. In particular, there is a need for more information at firm level to better account for the broader set of services that feed into environmental projects. Nevertheless, a number of national and international institutions are already engaged in the collection of

data relating to EGS, notably at the European level, where Eurostat has spearheaded efforts to collect information on the EGS sector that specifically includes environmental services.

### *Analytical work*

Since the JWPTE's 2001 flagship report*: Environmental Goods and Services: The Benefits of Further Global Trade Liberalisation* (OECD, 2001[10]), analytical work on EGS has continued in parallel to the taxonomy work, made all the more pressing by the multiplication of trade and environment negotiations and agreements. Over the last twelve years, the JWPTE has pursued the following areas of analysis:

- identifying barriers to trade, and the benefits of and approaches to removing tariffs and non-tariff measures (NTMs) on EGS;
- exploring the link between environmental policies and trade in environmental goods;
- examining sub-categories of environmental goods to explore their potential to further environmental and climate change goals;
- extending analysis to trade in environmental services and its contribution to meeting environmental goals.

The topic of identifying and removing barriers to trade in EGS was already well established in the JWPTE work programme in the 2000s. As that decade closed, the focus of its earlier work on tariffs was extending to NTMs for specific sectors or environmental goods. This was notably the case in the 2009 report on *Facilitating Trade in Selected Climate Change Mitigation Technologies in The Energy Supply, Buildings, and Industry Sectors* which explored the significance of tariff and non-tariff barriers in trade for a selection of globally traded climate change mitigation technologies: gas-fired combined heat and power, district heating distribution systems, thermal solar heating and cooling, and high efficiency electric motors (Steenblik and Kim, 2009[11]). A survey carried out for the report suggested NTMs were hindering trade in these technologies in some countries. The most common NTMs cited were technical regulations applied by the importing country that differed from international standards, because producing to different standards adds to manufacturing costs and often requires additional testing to demonstrate conformity. Different ways to measure thermal efficiency are a particular issue for the combined heat and power equipment manufacturers.

These findings are consistent with earlier OECD work on perceived trade barriers to environmental goods more generally, which found that the most important impediments to trade and investment are technology specific. Importing nations could address technology specific barriers by reducing or eliminating tariffs and aligning their technical regulations with international standards, though this might not be straightforward in the absence of a dominant international standard. International co-operation on harmonising standards for specific technologies and mutual-recognition agreements for testing results would then be needed. It was concluded that overcoming some of the measures that impede trade would take time, though environmental objectives could provide a greater sense of urgency for such policy initiatives.

In a related piece of analysis, the JWPTE commissioned a report on *Promoting Energy Efficiency Through Trade* (OECD, 2010[12]). It started from the premise that new household appliances are more energy-efficient due to technological advances, often spurred by government policies. These products are manufactured, sold and used on a global scale.

The paper includes a modelling exercise that finds that, if the world were to successfully implement a full range of negative- or zero-cost measures, the theoretical potential savings would be 8.9 Gt of $CO_2$-equivalent in 2020 — about 20% of global emissions projected for that year. However, numerous barriers exist to achieving such a potential, some of which are trade related. One fundamental barrier for some countries is the combination of high import tariffs on energy-using appliances and artificially low domestic prices for electricity or fuels. Trade and energy policies therefore need to address these issues to facilitate trade in energy-efficient products.

The section of the JWPTE's report on trends in trade and environment policy indicators looked at environmental goods trade flows and tariffs (Garsous, 2019[13]). The indicator revealed that between 2003 and 2016, global trade in environmental goods more than doubled to USD 1 260 billion. In relative terms, the share of trade in environmentally related goods in global trade grew from 7.2% to 8.1%. Renewable energy plants accounted for the single largest proportion of exported environmental goods (34.7%), followed by wastewater management and potable water treatment (19.4%,), environmental monitoring, analysis, and assessment equipment (10.7%,) and solid and hazardous waste management and recycling systems (8.8%). The OECD's share of total exports in environmental goods fell from 80.6% to 66.9%, while exports from countries outside the OECD area increased, driven mostly by exports from China.

The report found that average tariffs applied to imports of environmental goods were low and actually declined in OECD countries from 1.7% in 2003 to 0.8% in 2016. Tariffs in countries outside the OECD area were significantly higher but have also been declining, from 7.4% in 2003 to 4.1% in 2016. The distribution of tariffs in countries outside the OECD area was found to be generally much wider in OECD countries.

A parallel strand of JWPTE work has taken a different perspective on the issue of encouraging trade in EGS: rather than focusing on barriers to trade in EGS, it considers the impact of environmental policies on trade in EGS, through measures such as environmental regulations and support measures for environmental technologies such as renewables and electric vehicles.

Previous OECD analysis had suggested that stringent environmental policies go hand-in-hand with increased specialisation and exports in environmental goods (OECD, 2011[14]). This relationship between environmental regulations and specialisation had long been based on qualitative evidence. An OECD Trade and Environment Working Paper brought some rigor to this question by assessing that relationship empirically (Brunel and Levinson, 2013[15]). By providing a methodology for measuring environmental stringency, it provided valuable input for exploring the relationship further and examining the effects on trade: because they partly determine the size of the market for EGS, environmental regulations should therefore influence trade in environmental products.

The JWPTE's follow-up 2014 study on the relationship between the stringency of environmental regulations and trade in environmental goods built on this analysis (Sauvage, 2014[5]). The study confirmed that markets for environmental goods are essentially regulation-led in the sense that demand for EGS would likely be much smaller absent environmental regulations. The analysis also found empirical evidence that countries with stringent environmental regulations tend to be larger exporters of environmental products because the degree of regulation stringency is therefore a major determinant of market size. Using an index of revealed comparative advantage to measure countries' specialisation in environmental goods, the results indicate that regulatory stringency is strongly associated with higher exports of environmental products, even after

controlling for the influence that characteristics such as factor endowments and export diversification have on exports. These findings are consistent across indicators and sectors, suggesting that environmental regulations play an important part in shaping patterns of trade in environmental goods and that this role is distinct from that of more traditional trade factors, such as factor endowments and trade barriers.

Importantly, the study concludes that the positive impacts that environmental regulations have been found to have on EGS trade reveal broad areas of compatibility between trade and environmental policy objectives. Well-designed environmental regulations can lead to market creation. This potential needs to be emphasised as it serves to cast a more positive light on the trade and environment debate by highlighting areas of common interest. Consideration of the trade opportunities that can arise from the adoption of domestic environmental regulations could balance traditional concerns about their impact on pollution-intensive sectors (see Chapter 4).

These findings echo the conclusions of related OECD work on environmental policies and productivity growth. This work found that stringent environmental policies do not generally have detrimental effects on productivity, thereby providing additional evidence that stringent environmental regulations may not be as economically harmful as often assumed (Albrizio et al., 2014[16]).

A further strand of work relating to environmental goods examined the possible trade effect of domestic support measures for renewable energy (Bahar, Egeland and Steenblik, 2013[17]) and for electric vehicles and batteries (OECD, 2013[18]). Compared with many renewable-energy technologies, the market for plug-in electric vehicles and batteries was small, and the technologies less mature: in the annual turnover of the solar photovoltaic industry alone was about USD 90 billion a year, ten times that for plug-in electric vehicles at the time (it has since increased five-fold, so that the difference is smaller but still considerable). In both cases ambitious targets have been set for their contribution to the green transition in OECD countries, while many developed and emerging economies aspire to be at the forefront of developments in these new industries that are also widely traded.

The first paper surveyed the numerous domestic incentives used by governments to promote renewable energy, focusing on those that might have implications for trade — both those that are likely to increase opportunities for trade and those that may be inhibiting imports or promoting exports. Incentives for the renewable-energy-based electricity generating plants include quota systems, usually administrated through green certificates, and fixed feed-in tariffs and premiums. Renewable transport fuels are typically promoted by governments through obliging fuel suppliers to mix ethanol or biodiesel with petroleum-derived fuels. Frequently, they also benefit from exemptions from, or reductions in, fuel-excise taxes, and in a few countries from production bounties. Capital formation in these industries is supported with grants, subsidised loans or loan guarantees. In some jurisdictions, access to support schemes is conditional on local content requirements (LCRs) that are controversial because of their direct effects on trade. Import tariffs on technologies for renewable energy electric generation are generally low in most OECD and emerging economies.

The paper concludes that these effects, and the effects of other policies in combination and in isolation, are that while many domestic incentives are both increasing the supply of renewable energy and facilitating trade in associated technologies and renewable fuels, some — especially those combined with border protection or domestic-content requirements — are likely reducing export opportunities for foreign suppliers, and raising domestic prices for renewable energy.

The second paper which focused on electric vehicles and batteries notes that concerns about GHG emissions from vehicles have given a new impetus to efforts to develop and improve electric propulsion, though ultimately total GHG emissions from such vehicles depend on the mix of fuels used to generate the electricity they use for recharging. A wide variety of domestic policies aims to accelerate the uptake and use of electric vehicles. Direct government support concentrates on improving and lowering the cost of storage batteries, increasing the deployment of plug-in hybrid and battery electric vehicles, and developing recharging infrastructure. Many countries also provide tax incentives and grants to purchasers of qualifying vehicles. Border measures, particularly import tariffs, both favour domestic producers of the vehicles and increase their domestic price. Tariffs on motorised vehicles, including electric vehicles, are high, reaching 25% in China, South Africa and Russia, 35% in Brazil, 80% in Thailand, and 100% in India. By contrast, import tariffs on vehicle storage batteries are generally below 10%. The trade effects of government support for RD&D — though clearly generating positive externalities through the diffusion of new knowledge — can also give recipient industries an advantage over foreign competitors. Government assistance to manufacturers is more clearly linked to trade outcomes, through exports or import substitution. Some countries have combined these policies with other policies intended to ensure a large share of domestic demand is met by domestic suppliers, such as high tariffs on imports of fully assembled vehicles, local-content requirements and government-procurement preferences.

Both studies conclude that ensuring that domestic incentive policies for environmental goods such electric vehicles and batteries, and goods related to renewable energy, do not violate core trade principles is just as important for these goods as it is for other goods, with the same economic advantages. Full transparency on domestic incentives, including through the WTO subsidy-notification process, would be helpful both in keeping trading partners informed and in promoting best practice in the use of domestic incentive measures.

The international fragmentation and globalised nature of investment, production and trade has also played out for EGS. To explore what this means for EGS production and markets worldwide, an OECD Expert Workshop on Optimising Global Value Chains for Environmental Goods and Services was held back-to-back with a meeting of the JWPTE in 2016 (OECD, 2016[19]). The workshop brought together public and private sector stakeholders to discuss policy barriers and drivers shaping trade and investment in renewable energy and other EGS in the context of global value chains (GVCs). These GVCs can create opportunities for firms to enter an EGS industry. However, they also require countries to think differently about the ripple effects of their policies across the value-chain segments. Discussions during the workshop focussed on the implications of green GVCs for trade and investment policy; the mapping of GVCs for EGS; and the different drivers and policy barriers to trade and investment in renewable energy and other EGS.

As noted above, until recently most analytical studies have concentrated on environmental goods rather than services. The lack of a comprehensive framework to define the scope of the sector as well as the paucity of data have restricted both qualitative and empirical analysis on environmental services. Progress in defining environmentally related services has made it possible to initiate JWPTE work on evaluating the benefits of encouraging trade in environmental services (Sauvage and Timiliotis, 2017[9]). The study found that from the construction of a geothermal power plant to the repair and maintenance of a wastewater-treatment facility, numerous services are essential to environmental equipment and that users place significant value upon their provision. This strong complementarity makes the costs of environmental goods and services inextricably linked. Just as trade in

environmental goods has lowered the price of cleaner technologies, it appears that trade in environmental services could lower the cost of environmental protection by allowing firms to source the services they need from foreign suppliers.

The study also explores barriers to their trade, with the help of the OECD's Services Trade Restrictiveness Index (STRI), which covers over 10 000 regulations to identify those that inhibit services trade[5]. Analysis in the report indicates that the trade restrictions that countries impose on certain environmental services are negatively associated with the international supply of core environmental services. The findings are most robust in the case of restrictions imposed on engineering, architecture, IT and related services, and, to a lesser extent, construction services. While this may seem counterintuitive, the results suggest a significant negative correlation between countries' exports of core environmental services and the restrictions to services trade that they have put in place, reflecting the anti-competitive nature of restrictions that hinder the entry of new competitors. Further liberalisation of trade in environmental services could therefore benefit both domestic importers and exporters, enabling environmental companies to procure services inputs at competitive prices, and to operate on a larger scale.

Results from a case study looking at 61 companies providing environmental consulting and engineering services — a type of environmental service — corroborate the finding that services trade restrictions are associated with a lower export performance. Because environmental consulting and engineering services feed into numerous projects spanning all sorts of environmental domains, restricting the supply of these services makes the diffusion of cleaner technologies and practices unnecessarily costly. The study also finds exporting firms to be larger, more productive, and to pay higher salaries than their domestically focused counterparts. Efforts to remove remaining obstacles to trade in environmentally related services could therefore have important implications for sector-wide productivity, skills and earnings.

Overall, the report identifies three policy priorities for the trade and environment agenda:

- First, the need to accelerate efforts to liberalise trade in environmental services given the environmental and economic gains that this would entail.
- Second — and where the intention of countries is indeed to accelerate the uptake of cleaner technologies — the necessity for trade negotiations to consider the complementary relationship between environmental services, strictly speaking, and those other services that are not necessarily classified as "environmental" but that serve, nonetheless, a clear environmental purpose.
- Finally, countries should consider investing more resources into the systematic collection of information on firms that provide environmental services at home and abroad. Only through better data can more analysis be conducted and more informed decisions taken.

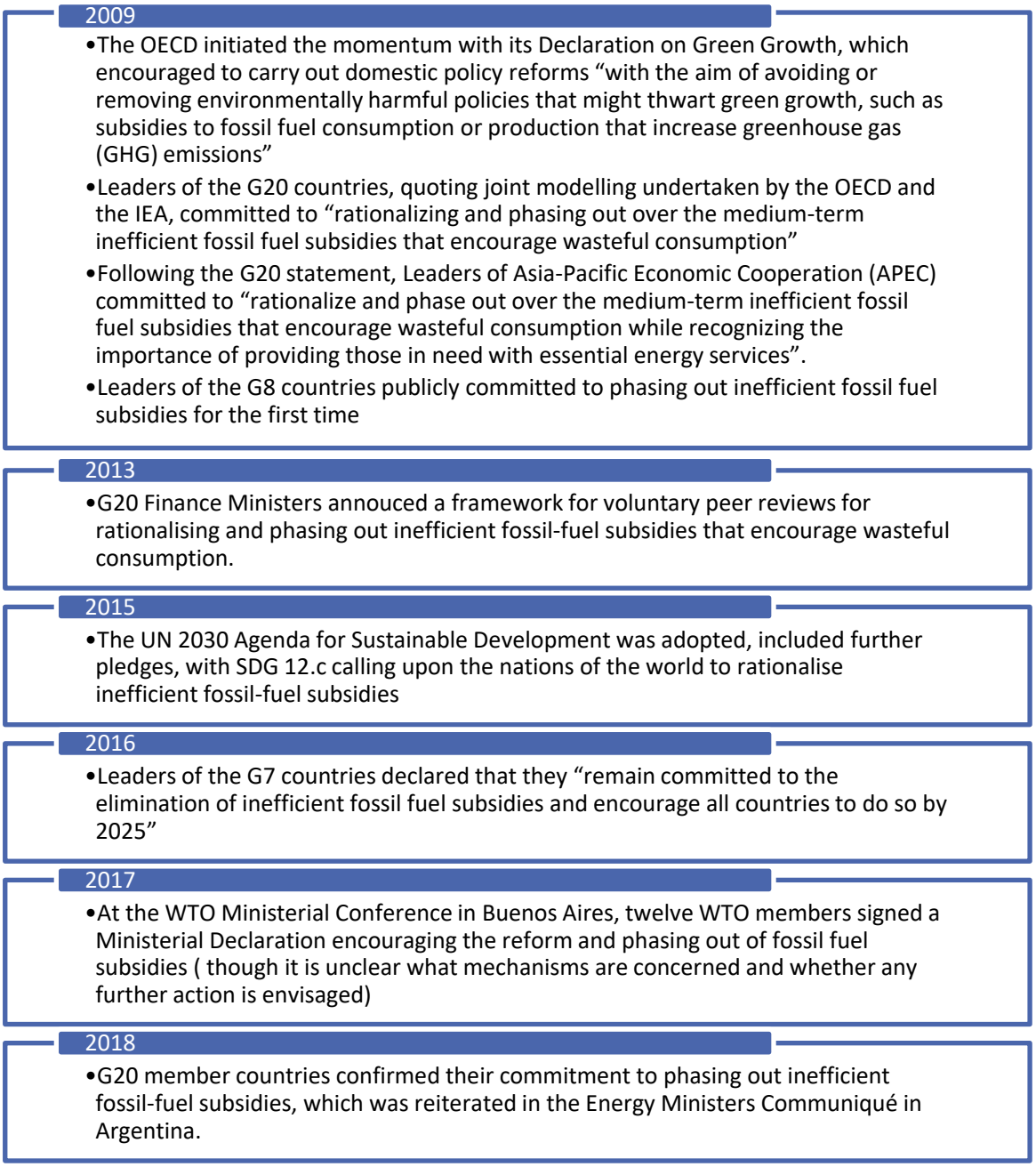
[5] More information the OECD's STRI database can be found at: www.oecd.org/tad/services-trade/services-trade-restrictiveness-index.htm.

## Reform of government support

### *Fossil fuels*

The relationship between trade liberalisation, fossil fuel subsidies and environmental outcomes has been explored by the JWPTE and other parts of the OECD from different angles since 1995, first under the impulse of trade negotiations and, in the last ten years, as a result of renewed international interest in the reform of government support for fossil fuels, with a largely environmental rationale. The timeline below tracks this period when multiple initiatives have kept the issue high on the international agenda (Figure 2).

**Figure 2. Reform of support for fossil fuels: international initiatives**




While these initiatives are essentially declarations of intent, two mechanisms have been implemented to track and report progress, to which the OECD is contributing directly. First, the OECD is contributing to the development of indicators to help monitor SDG 12.c.1, in support of UN Environment which is designing and testing a method to measure fossil fuel subsidies per unit of GDP (production and consumption) and as a share of total national expenditure on fossil fuels. Second, the main vehicles established by the G20 and APEC for reporting and assessing progress towards the achievement of their goals for fossil fuel subsidies reform have been the submissions of self-reports and the completion of peer reviews. Both are member-driven, voluntary processes. The OECD chaired the G20 peer

reviews of several countries and participated in the review team for the APEC review of New Zealand. Several countries that have voluntarily undergone such reviews have identified inefficient fossil fuel subsidies they are planning to phase out.

More generally, the OECD has supported policy makers in better understanding the benefits and costs of phasing out fossil fuel subsidies with quantitative model-based analytical work. In parallel, it has created and developed a comprehensive database on fossil fuel support.

In 2009 the OECD flagship publication *The Economics of Climate Change Mitigation: Policies and Options for Global Action beyond 2012* explored the scope for available instruments to strengthen incentives for countries to participate in ambitious international mitigation action (Burniaux et al., 2009[20]; OECD, 2009[21]). It discussed ways to overcome barriers to the development of an international carbon price, based on the quantitative assessment from a global and sectorally-disaggregated CGE model. It included a detailed analysis of fossil fuel subsidies. It concluded that a key step towards the emergence of a single international carbon price would most likely involve the phasing out of subsidies of fossil fuel consumption and various forms of linking between regional carbon markets.

The OECD ENV-Linkages model housed in the Environment Directorate was used to provide quantified estimates of the emission reduction and the 'real income' gains achieved by removing fossil fuel subsidies (Burniaux and Château, 2011[22]). The same modelling tools were used in a study on the trade effects of phasing out fossil fuel consumption subsidies, considering the impact on volumes and directions of trade flows, notably the balance between aggregate changes in total trade volumes and the reallocation of trade across sectors and trading areas (Burniaux, Château and Sauvage, 2011[23]). The analysis showed that a co-ordinated multilateral removal of fossil fuel consumption subsidies over the 2013-2020 period would not affect trade volumes at the global level. However, there would be large disparities across countries (or regions) and products. In particular, a reduction in the volume of imports and exports from oil-exporting countries would be partly compensated by an expansion of trade flows (both imports and exports) involving OECD countries, especially for energy-intensive products.

As part of the *OECD Environmental Outlook to 2050*, the OECD's ENV-Linkages model explored the economic and environmental impact of subsidies to fossil fuel consumption (OECD, 2012[24]). The Outlook projections indicated that phasing out fossil fuel subsidies could lead to a 10% reduction in global greenhouse gas emissions in 2050, compared with a business-as-usual scenario. It also showed that if countries that subsidise the consumption of fossil fuels removed these subsidies unilaterally, most would realise real income gains due to more efficient allocation of economic resources across sectors. A different outcome would result from all countries that subsidise fossil fuel consumption removing these subsidies multilaterally. In that event, the terms-of-trade changes associated with a decrease in world energy prices due to reduced demand would lead to a different distribution across countries of real income gains and losses.

In a parallel stream of work that provided input to these analyses, the IEA-OECD data on fossil fuel subsidies was extended in coverage and level of detail (OECD, 2011[25]). Initially, only fossil fuel consumption subsidies could be taken into account, since IEA estimates for fossil-fuel consumer subsidies are based on the price-gap method which estimates the gap between domestic energy prices and world reference prices. This approach did not generally capture subsidies to producers and tax concessions to both producers and consumers, which account for much of the support provided in OECD countries, where taxation ensures prices remain above market reference prices. Such

support and tax concessions nonetheless reflect policies that can encourage greater production or use of fossil fuels.

As fossil fuel subsidies and the reform of related government policies worked their way up the agendas of international fora, the need for a comprehensive inventory grew more pressing, since efforts to design reforms had long been hampered by a crucial lack of information regarding the amount and type of support measures. To help fill this critical data gap, in 2010 the OECD started collecting data on budgetary support and tax expenditures relating to fossil fuels, producing its first inventory in a selection of 24 countries (OECD, 2011[25]). This effort formed the basis for a full *Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels* that set out over 500 measures in 34 OECD countries (OECD, 2013[26]), estimating budgetary support and tax expenditures for fossil fuels in a consistent manner for all OECD countries. The inventory was updated in 2015 and extended to six large partner economies (Brazil, The People's Republic of China, Indonesia, The Russian Federation, and South Africa), covering over 800 individual policies that support the production or consumption of fossil fuels. It is now available as an online database and includes a further two countries (Argentina and Colombia). To reconcile the OECD's bottom-up estimates of government support to individual programmes, with the IEA's top-down estimates of consumer price support, the latest *Companion to the Inventory of Support Measures for Fossil Fuels* suggested a solution to combine the two sets of estimates, and presents a single figure on support given to fossil fuels (OECD, 2018[27]).

This inventory is now established as a unique source of information that is contributing to advancing analysis in a range of studies carried out at national and international levels. Indeed, for the first time the data captures policy-level detail for many types of support. Each iteration of the inventory brings in additional years of coverage and provides a clearer picture of policy change over time. Having such a comprehensive inventory has made it possible to carry out detailed analysis that would have been impossible otherwise and which has produced interesting findings, summarised below.

The new set of estimates for government support for fossil fuels was chosen as one of the trade and environment indicators recently developed for the JWPTE (Garsous, 2019[13]). This indicator was used in this first instance to help understand how support for fossil fuels, alongside an indicator measuring the enabling policy and regulatory environment for renewable energy, affected the energy mix and trade balances for environmental goods. Analysing trends in this indicator showed that estimates of global support to fossil fuels peaked in 2012 but have since declined, a trend driven by countries outside the OECD area where the slump in international oil prices decreased support linked to price controls, a policy instrument prevalent in these countries. The analysis also suggests that countries spending a larger share of their GDP to support fossil fuels seem to harm the competitiveness of their domestic industry producing renewable energy plant equipment, particularly in countries outside the OECD area (see Chapter 4).

The inventory has also made it possible to advance on analysis related to carbon pricing. The report on *Improving economic efficiency and climate mitigation outcomes through international co-ordination on carbon pricing* (Nachtigall, 2019[28]) presents the potential benefits and challenges of enhanced international coordination on carbon pricing and outlines the different types and levels of co-ordination that are available for national and sub-national governments. It considers carbon pricing schemes alongside effective carbon rates and efforts to phase out inefficient fossil fuel subsidies.

### *Fisheries*

The topic of reform of government support for fisheries has been pushed up the international environmental agenda in recent years, largely due to the UN 2030 Agenda, agreed by Heads of State and Governments in 2015. As part of SDG 14, which sets the broader goal of conserving and using sustainably the oceans, seas and marine resources, SDG 14.6 calls for "by 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing (IUU) and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation."

In the Doha Round of multilateral trade negotiations, WTO negotiators worked "to clarify and improve WTO rules that apply to fisheries subsidies". The negotiations were motivated by trade concerns as well as the need to improve the sustainability of fish stocks. At the 2017 WTO Buenos Aires Ministerial Conference, Ministers decided on a work programme to conclude negotiations started in 2005 with an agreement on fisheries subsidies by the subsequent Ministerial Conference (deferred from the summer of 2020 due to COVID-19), in keeping with SDG 14.6.

The OECD Fisheries Committee is contributing to the negotiations by providing a basis for identifying the characteristics of subsidies that could be subject to disciplines. Improved understanding of subsidies and their impact can also assist governments to reform their support policies to make fisheries sustainable. An inventory of support to fisheries in 35 countries has been completed.[6] The next stage is to build an analytical tool to identify the effects of support on IUU fishing, overcapacity and overfishing – three of the central issues under negotiation. The OECD report *Support to fisheries: Levels and impacts* (OECD, 2017[29]) provides a preliminary analysis of the factors that determine how support can affect overcapacity and overfishing, including illegal fishing.

The follow up OECD report on *The Relative Effects of Fisheries Support Policies* is intended to provide policy makers with a way to compare the effect of different support policy approaches in more detail than had been previously possible (Martini and Innes, 2018[30]). The results of the model-based analysis show that all six fisheries support policies investigated can result in overfishing, encourage IUU fishing and increase fleet capacity. However, their effects vary significantly:

- Support based on the costs of fishing, such as help to purchase fuel, gear or bait, can increase fishing effort more than other policy options and, in particular, increase IUU fishing effort leading to stock depletion.
- Such support also tends to favour larger fishers to the point where others in the fishery may be left worse off.
- Many support policies do little to improve fishers' livelihoods even though fuel support can translate into real income gains, because in the medium term any potential benefit is lost to increased effort and lower fish stocks.
- By contrast, payments designed to support the profitability of fishing operations bring significant benefits to fishers with limited effect on effort and capacity. These

[6] The OECD Fisheries Support Estimate (FSE) database can be accessed at https://stats.oecd.org/Index.aspx?datasetcode=FISH_FSE.

payments include programmes to ensure capital markets provide working capital for operations, or those that improve the business or operational skills of fishers.

- Payments that directly target fishers' incomes, such as disaster payments or employment insurance, also deliver benefits to all fishers.

The results also indicate that "it is possible to support the fishing sector and deliver benefits to fishers without unduly provoking overfishing or overcapacity". The report concludes that moving existing support away from gear, fuel, vessels or other inputs towards helping fishers to improve their businesses and deal with disasters could significantly improve fishers' income, reduce pressure on stocks and increase harvest by almost half a million tonnes per year.

In response to a G20 call to provide analysis on fossil fuel subsidies, the OECD published a study on *Fuel Tax Concessions in the Fisheries Sector* (Martini, 2012[31]). This report estimated the value of government transfers related to fuel use for fishing fleets in OECD Member countries, as well as non-member economies where data was made available. It also gave an initial assessment of the impacts of such support and the implications for the fishing industry of phasing it out. It concluded that when making the case for reform, it may be more useful to consider the policy objectives motivating support than the impacts of such support. While the impacts of fuel support are uncertain, there is considerable evidence in OECD policy research that better options exist to achieve most common policy objectives.

# 3. Regional trade agreements and the environment

The analysis of environmental provisions in RTAs by the JWPTE started in the early 2000s. As the number of RTAs increased, it grew to become a major part of its work programme from 2007, when it published an in-depth study on experience in the negotiation and implementation of environmental provisions in RTAs. This report effectively set out a roadmap for its work programme on RTAs over the years that followed (OECD, 2007[32]). The study found that while countries were increasingly integrating trade and environmental issues in RTAs, because most agreements were recent, countries had little experience with the actual implementation of environmental provisions. It showed that dealing with environmental issues in RTAs requires preparation, coordination among trade and environmental officials, setting of priorities, and, once a text is agreed on, continuous efforts to ensure the integration of trade and environmental issues throughout the life of the agreement. It concluded that with the proliferation of RTAs and the variety of their environmental provisions, some countries would face the complex problem of managing a range of different levels of environmental commitments and types of environmental co-operation programmes under a range of RTAs.

The JWPTE responded to these findings by dedicating a substantial body of work to these issues, with applications well beyond the area of RTAs and their environmental provisions. The JWPTE's work on this topic developed through three streams:

- Between 2008 and 2014, the JWPTE tracked and analysed the typology of environmental provisions in RTAs, with 4 workshops held over this period.
- From 2015, with a larger number of RTAs in place and a longer timeframe over which to evaluate the implementation of environmental provisions, work turned to assessing the implementation and effectiveness of environmental provisions in RTAs, which was also the topic of a regional workshop in 2018.
- More recently the JWPTE is focusing on "greening" RTAs, which explores how environmental objectives can be incorporated into chapters and articles that are not specifically environmental, in order to secure policy coherence throughout the agreements.

The workshops on RTAs and the environment organised throughout the project provided opportunities to exchange information and disseminate the findings of JWPTE's analytical work among stakeholders within and beyond OECD countries. These workshops also served as brainstorming exercises to highlight knowledge gaps and new approaches where the OECD could contribute through its future work programme.

## Tracking and analysing the typology of environmental provisions in RTAs

Between 2008 and 2014, the JWPTE tracked and analysed developments and issues relating to RTAs and the environment. A series of comprehensive surveys documented the different approaches to environmental issues in RTAs and reviewed countries' experience with their negotiation and implementation. The JWPTE also completed in-depth analysis and reports on the impact and effectiveness of RTA environmental provisions. A series of workshops (including regional workshops) created dialogue on RTAs and the environment and provided input to the working party's analytical work.

The increase in both the number and scope of RTAs was strongest between 2007 and 2014, with a 2009 peak in the number of RTAs entering into force at 27, compared to an annual average pace of 15 to 20 new RTAs. Over half of the more recent agreements included environmental provisions beyond simple environmental exceptions and environment-related preamble language, as opposed to less than a third prior to 2010. Tracking this dynamic, fast-moving field and understanding the approaches taken to building and implementing environmental provisions into RTAs called for regular updates and analysis, which the JWPTE provided.

The JWPTE completed annual updates on developments in RTAs and the environment, with seven monitoring reports produced between 2007 and 2014. They were based on publicly available information and were mostly published as OECD Working Papers on Trade and Environment (Gallagher and Serret, 2010[33]; George, 2014[34]; George, 2013[35]; George and Serret, 2011[36]; Gigli, 2009[37]; OECD, 2011[38]). These reports provided an overview of recent developments, with a focus on RTAs with a substantive environmental content. They also covered developments in implementing environmental provisions, at least in the case of RTAs that included a comprehensive mechanism for implementing such provisions. The updates also covered assessments of the impacts of RTAs, notably ex-ante environmental/sustainability impact assessments carried out in the framework of on-going negotiations, as well as any ex-post assessments identified in relation to existing RTAs.

Alongside this effort, the JWPTE completed several reports that provided in-depth analysis of the design and implementation of environmental provisions in RTAs. As a follow-up to its 2007 report, in 2008 JWPTE published a checklist for negotiators of environmental provisions in RTAs (Tébar Less and Kim, 2008[39]). It drew on OECD work collecting and analysing recent experience in negotiating and implementing environmental provisions in RTAs. It was intended as a reference to assist countries, discussing options for incorporating environmental provisions in RTAs and defining their content, the design of the environmental impact assessment of RTAs, as well as relevant institutional issues.

At the turn of the decade, it became possible to draw meaningful lessons from the experience accumulated and provide guidance on implementation issues. In 2011, the JWPTE drew up a framework for evaluating the implementation of environmental provisions in RTAs, with a checklist approach to the evaluation of countries' experience of implementation that complemented the checklist for negotiators published in 2008 (Gallagher and Serret, 2011[40]). Among the issues addressed were institutional arrangements, co-operation, capacity building, public participation, resolution of differences and assessment.

In 2014 the JWPTE took stock of environmental provisions in RTAs to identify trends and policy drivers that could explain the presence or absence of these provisions (George, 2014[34]). The analysis of the environmental provisions in RTAs revealed an upward trend in such provisions. The two most common basic provisions were either associated with Article XX of the General Agreement on Tariffs and Trade or Article XIV of the General Agreement of Trade in Services, or contained in a reference to environment or sustainable development in the RTA preamble. They figured in about 80% and 50% respectively of the RTAs reviewed. Nevertheless, the incidence of more substantive provisions had increased significantly, from around 10% of those entering into force in 2010 to 70% for those that did so in 2012, upholding environmental law, indicating specific environmental issues, pursuing environmental co-operation and setting implementation mechanisms being the most common. The provision for associated ex-ante impact assessment reached about 20%. There was also more reference to public participation and dispute settlement mechanisms.

This could have been due to countries extending their political mandates for RTAs, for example to include provisions for compliance with MEAs, as well as more experience with the use of environmental provisions.

## Assessing the implementation and effectiveness of environmental provisions

Since 2015, the JWPTE has continued to investigate RTAs and their environmental provisions, though attention has shifted from tracking and analysing the typology of environmental provisions in RTAs towards more analytical work. The focus has been on how governments actually implement these environmental commitments and whether these commitments have had an impact on environmental endpoints. Two main approaches have been used: documentation and analysis of the implementation of environmental provisions through surveys and desk analysis, and empirical assessment of the effectiveness of environmental provisions through econometric analysis.

Although many RTAs are subject to ex-ante impact assessments, few require the parties to carry out impact assessment of the environmental effects of the agreements after implementation. A 2018 report adopted a two-track approach to understanding this issue with a review of implementation and evaluation reports associated with environmental provisions, followed by a survey of government officials, trade negotiators and other experts (George and Yamaguchi, 2018[41]). The report develops a method for measuring the degree of commitment of environmental provisions in RTAs, which was then used to carry out an ex-post environmental impact assessment. It identified the key types of environmental provisions included in RTAs and outlines the specific areas they cover. Implementation is assessed using a range of measurements, from direct measurable changes (e.g. the creation of committees and co-operation bodies, or co-operation funding) to "softer" environmental policy changes, even if direct causality with environmental provisions could not be demonstrated. A set of indicators was developed to measure the degree of attention given to environmental issues in the agreement and the extent to which the legal texts bound the parties to adhere to or implement their environmental provisions. These commitment indicators were tested on a sample of twelve RTAs and found to be useful for ex-post impact assessment.

The exercise revealed a considerable lack of knowledge about the implementation of environmental provisions in RTAs. There was nevertheless anecdotal evidence that these provisions have contributed to positive outcomes, including stronger environmental regulations, new institutional arrangements, environmental co-operation and improved public awareness on environmental governance. Such results highlight the importance of measuring progress in implementing environmental provisions. While some countries may find it harder to obtain the necessary resources, all countries that promote the inclusion of environmental provisions in RTAs could benefit from strengthening their processes of monitoring, reporting and review. The study noted that the effectiveness of environmental provisions in providing environmental outcomes is poorly researched. Nevertheless, with 121 RTAs with explicit reference to the environment in force in 2016, there is a strong likelihood that these provisions are contributing to environmental goals to some extent.

The need to explore ways of evaluating this contribution prompted the interest of the JWPTE in empirical analysis to test whether the inclusion of environmental provisions had improved environmental quality among RTA members (Martínez-Zarzoso, 2018[42]). Three indicators of environmental quality were chosen: concentrations of suspended particulate matter less than 2.5 µm ($PM_{2.5}$), sulphur dioxide ($SO_2$) and nitrogen oxide ($NO_x$); a choice based mainly on data availability and coverage. The empirical analysis indicates a

statistically significant relationship between RTA membership, with or without environmental provisions, and improved environmental quality for two out of three of the pollutants investigated ($SO_2$ and $NO_x$), while the results for $PM_{2.5}$ do not always hold. For $SO_2$ and $NO_x$, the magnitude of the effect is slightly larger for RTAs with environmental provisions than for those without, though this difference is not statically significant. The study demonstrated how difficult it is to separate the impact of RTAs from other factors influencing country-level emissions in the broader economy. If this type of analysis is to be refined, it will require solid environmental indicators, as well a better understanding of the influence of environmental provisions in RTAs on domestic policy processes.

## Greening RTAs

While the number of new RTAs fell to its lowest level in 2018 since the early 1990s, in the last few years interest has grown around the broader question of how RTAs could pursue environmental and sustainable-development objectives not only via environment chapters or side-agreements but throughout the agreements, for instance in chapters related to market access, investment, and government procurement, technical barriers to trade, subsidies, implementation and capacity building. This greening of RTAs is emerging as a useful additional tool to further international environmental objectives alongside multilateral environmental agreements and environmental provisions in RTAs.

The JWPTE first explored the issue of greening RTAs in a 2016 workshop and followed up with in-depth analysis, focusing on two areas: subsidies and investment. The first report on this topic focuses on subsidies related to energy and environmental goods (Yamaguchi, 2020[43]). It provided an overview of how trade disciplines on subsidies for energy and environmental goods in RTAs can address environmental concerns. Subsidies are disciplined by the WTO Agreement on Subsidies and Countervailing Measures, which stipulates what action Members can take, notably through the WTO dispute settlement mechanism, to withdraw subsidy, remove its adverse effects, undertake remedial unilateral action such as countervailing duties. RTAs provide an opportunity to agree to disciplines that support environmental objectives without distorting trade, though there are only a few instances of RTAs that contain such provisions.

The second report focuses on greening investment provisions (Yamaguchi, 2020[44]). The analysis builds on work by the Directorate for Financial and Enterprise Affairs, notably a work stream that culminated in 2011 in a report on Harnessing Freedom of Investment for Green Growth, which contributed to the OECD Green Growth Strategy report (OECD, 2011[45]).[7] The report highlights available practices to ensure that investment-related provisions reaffirm the domestic environmental policy space. It also explores available practices to promote green investment in these agreements.

The third report considers chapters and articles related to non-tariff measures, technical barriers to trade and regulatory co-operation and identifies, among others, dedicated chapters and sectoral annexes as possible ways to reflect environmental objectives in these agreements (OECD, 2020[46]).

[7] The OECD Green Growth Strategy report (OECD, 2011[45]) focused on the relationship between international environmental law and international investment law; investment treaty practices and environmental goals; and investor-state dispute settlement, among others.

## Workshops on RTAs and the environment

In parallel to this analytical work, the JWPTE organised a series of workshops on RTAs at which experts from OECD and non-OECD countries discussed their experiences with the negotiation and implementation of environmental provisions in trade agreements. These workshops also provided input into JWPTE on-going work, with expert discussions on topics that were directly relevant to areas where hands-on country experience could feed into more theoretical work. This was notably the case for the first workshop held in Paris in 2006, which explored and discussed the experience acquired at country level of the issues covered in the JWPTE's first substantive work on RTAs published in 2007. Between 2007 and 2018, six workshops were organised around the topic of RTAs (Box 3).

These workshops have been a valuable occasion to disseminate OECD work on RTAs and the environment among relevant stakeholders within and beyond OECD member countries. Some workshops served to highlight emerging topics and issues related to RTAs and the environment feeding into future work, such as the case for the Greening RTA workshop in 2016. Many participants have highlighted that these workshops were very useful into establishing a multi-stakeholder dialogue on issues around RTAs and the environment in a non-negotiation setting.

**Box 3. JWPTE Workshops on RTAs (2007-2018)**

*2007 Workshop on Regional Trade Agreements and the Environment, Tokyo, Japan* (OECD, 2007[47])

The regional workshop gathered experts' input for the development of the 2008 checklist on environmental provisions in RTAs.

*2008 Regional Workshop on Regional Trade Agreements, Santiago, Chile*

The focus of this regional workshop was on relevant issues in the Americas as well as arrangements for implementing environmental provisions in RTAs and models for co-operation. As RTAs matured, stock was taken of the challenges that had become apparent in translating the provisions set up in RTA negotiations into action at sub-regional and country level

*2010 Workshop on Regional Trade Agreements: Monitoring implementation and Assessing Impacts, Paris (OECD, 2011)*

The workshop extended discussions beyond monitoring and facilitating implementation to assessing the environmental impacts of RTAs. It raised the issue of how RTAs could contribute to green growth, as environmental considerations broaden from damage limitation to sustainable development and green growth.

*2014 Regional Workshop on Regional Trade Agreements and the Environment, Hà Nội, Vietnam* (OECD, 2014[48])

The regional workshop aimed to encourage dialogue between RTA negotiators from OECD and ASEAN countries. It also provided a forum for advancing technical discussions on issues such as impact assessment of environmental effects of RTAs, and improved capacity building for ASEAN officials through a simulated mock negotiation. It also discussed the environmental effects of RTAs through the role of RTAs in promoting global EGS value chains.

*2016 Workshop on Greening Regional Trade Agreements: Opportunities and Insights from International Experience, Paris* (OECD, 2016[49])

Taking stock of experience from different regions and stakeholders, the workshop identified three drivers for greening RTAs: (1) the consensus around the objectives of the Paris Agreement and the SDGs imply trade agreements should contribute to sustainable development; (2) scepticism in civil society about the benefits of trade and globalisation suggests societal and environmental concerns need to be thoroughly addressed in trade agreements; and (3) experience from environmental provisions in RTAs points to the need to align non-environmental chapters of RTAs with environmental objectives. The workshop discussed greening RTAs through synergies between trade and environment objectives, and removing obstacles to environmental objectives within existing law. It also identified knowledge gaps.

*2018 Workshop on Regional Trade Agreements and the Environment: Establishing Dialogue with Regional Stakeholders, Santiago, Chile* (OECD, 2018[50])

The workshop focused on sharing international and regional experience and discussed developments in the monitoring and evaluation of environmental impacts of RTAs. It featured a session on the role of public participation, which was identified as a challenge by a number of countries, especially with regard to the implementation of environmental provisions, though it was widely recognised as an important element to secure environmental governance and address environmental concerns in trade agreements. The workshop also introduced the topic of greening RTAs in relation to investment provisions.

# 4. Global environmental issues, policy responses, and their linkages with trade

The interaction between global environmental issues and policy responses on the one hand, and trade issues and policies on the other, is complex and wide-ranging. This thematic chapter reviews relevant OECD work around several major and often overlapping themes: climate change and renewable energy, the circular economy transition, biodiversity, environmental labelling and information schemes and, more recently, digitalisation.

Except for the horizontal theme of digitalisation, all these topics represent areas of work that the JWPTE has tackled regularly almost since its inception 30 years ago. Since 2008, the JWPTE has explored most of these topics from several different angles, building up a solid body of analysis. There have been shifts in specific areas of interest in response to changes in the broader policy, economic and technological context, and international calls for action. There have also been substantial analytical advances in understanding how linkages between trade and the environment can work together to further both trade and environmental objectives. These advances have been supported by the emergence of new paradigms that have transformed policy thinking and practice in many of these areas, notably understanding biodiversity in terms of ecosystem services, and viewing resource efficiency within the broader framework of the circular economy transition.

## Trade, climate change and renewable energy

In the mid-2000s, the focus of JWPTE work relating to renewable energy was on ways to facilitate the transfer of environmentally sound technology, including renewable energy technologies. This was largely motivated by the recognition that the level and pace of technology transfer and technological transformation required to accelerate progress towards cleaner, more resource efficient systems and production processes in emerging and developing economies had been disappointing, notably with respect to the goals set in 1992 in the UN Agenda 21. There were new calls for comprehensive and targeted programmes, for instance at the 2002 World Summit on Sustainable Development. The JWPTE contributed to this policy push by analysing issues lying behind specific trade-related aspects of environmentally sound technology dissemination. It notably published the Working Paper *Achieving the Successful Transfer of Environmentally Sound Technologies: Trade-related Aspects* which provided empirical evidence that trade and FDI were significant channels for the diffusion of environmental technologies across countries (Tébar Less and McMillan, 2005[51]).

From 2008, as international and domestic climate change initiatives gathered pace, the focus shifted to measures that could facilitate trade in climate change mitigation technologies. The JWPTE sought to identify technology-specific barriers to trade in these technologies. It also explored trade-facilitating measures that could accelerate technology transfers that entailed reductions in GHG emissions. Drawing in part on its earlier work on EGS, many aspects of this work included the topic of renewable energy:

- *Facilitating Trade in Selected Climate Change Mitigation Technologies in the Energy Supply, Buildings, and Industry Sectors*, which included a section on solar heating and cooling systems (Steenblik and Kim, 2009[11]).

- *Trade in Services Related to Climate Change: An Exploratory Analysis*, which took as an example the many services associated with renewable energy-based electricity (Steenblik and Geloso Grosso, 2011[8]).
- *Trade-Related Measures Based on Processes and Production Methods in the Context of Climate-Change Mitigation*, which examined lifecycle sustainability standards for biofuels (Moïsé and Steenblik, 2011[7]).

The JWPTE has since launched several lines of analysis that focus on specific aspects of trade in renewable energy as it relates to climate change mitigation efforts. This is the case for the study *Cross-Border Trade in Electricity and the Development of Renewables-Based Electric Power: Lessons from Europe* (Bahar and Sauvage, 2013[52]). The study confirmed that cross-border electricity trade can increase the effective capacity factor of intermittent plants in the context of the growing share of intermittent renewables in the power sector in Europe. This positive contribution not only depends on addressing challenges that renewable energy technologies pose to electricity markets, but also requires an efficient cross-border electricity trading regime supported by an appropriate regulatory and administrative framework.

As part of its work on the interaction between trade and domestic incentive measures that support environmental goods, the JWPTE carried out a specific study on goods related to renewable energy (Bahar, Egeland and Steenblik, 2013[17]) (see Chapter 2). By 2013, 138 countries had implemented renewable-energy support policies. Globally, subsidies for renewable energy amounted to USD 121 billion, up 15% over 2012, with USD 82 billion for electricity generation from renewable energy and USD 19 billion for transport biofuels, distributed mainly as tax reductions (84 countries), feed-in tariffs and premiums (71 countries), and auctions or tenders (45 countries). Many of these domestic incentives were designed to promote green growth through the stimulation or creation of domestic industries manufacturing low-carbon power generation equipment, sometimes as part of has been called the rise of green industrial policy. The study concluded that many such incentives increase renewable energy supply and facilitate trade in associated technologies, and also appear to be beneficial for the low-carbon transition, but that if the measures are overly trade restrictive, they are likely to lead to higher prices for both domestic and international suppliers, with the overall effect of hindering uptake of low-carbon electricity-generating technologies.

These findings were confirmed by OECD research on investment in clean energy, with substantial contributions from the JWPTE (OECD, 2015[53]). Published as a book, *Overcoming Barriers to International Investment in Clean Energy* documents the essential role played by international trade and investment in driving the growth of the solar photovoltaic and wind-energy sectors and their integration into GVCs, flagging two trends that have important implications for policymakers:

- The solar photovoltaic and wind-energy sectors are increasingly reliant on imported intermediate inputs. Policies aimed at protecting domestic manufacturers may thus hinder the profitability of downstream activities, e.g. by raising the cost of inputs.
- The share of downstream activities in value added, employment and investment has increased relative to midstream activities such as manufacturing. Therefore, policies targeting upstream and midstream manufacturing activities may not be effective in creating domestic jobs and value across the value chains.

Using the information compiled in the 2013 JWPTE study *Domestic Incentive Measures for Renewable Energy with Possible Trade Implications* mentioned above, the book noted

that most support did not establish differentiated treatment between domestic and international investors. Furthermore, several countries have supported clean energy by removing trade and investment barriers for domestic and international investors, such as import tariffs and restrictions to FDI. Nevertheless, LCRs linked to wind and solar photovoltaic were planned or implemented in at least 21 countries, including 16 OECD countries, mostly after 2009. The green industry policy prevalent in many countries in the post-2008 crisis context led several governments to implement measures such as LCRs aimed at protecting domestic solar panel and wind turbine manufacturers. The establishment of LCRs were meant to facilitate public acceptance of policy support for clean energy, as they are commonly thought to create local value and employment. JWPTE research provided new empirical evidence that LCRs can hamper international investment in solar and wind electricity generation, both in the country that adopts them and globally, especially in a context of global value chains. In addition, experience from country case studies suggested that LCRs have mixed or negative impacts on local job creation, value added and technology transfer in solar photovoltaic and wind energy when the full value chain is taken into account. By raising the cost of inputs for downstream businesses, LCRs can push up costs, reduce price competitiveness and international investment, and increase wholesale electricity prices.

Renewable energy also figured prominently in the 2019 study *Trends in Policy Indicators on Trade and the Environment* (Garsous, 2019[13]), since renewable energy plants are a major component of the indicator that was developed for trade in environmental goods: in 2016, they were the single largest item of exported environmental goods, accounting for 35% of the total (see Chapter 4). Between 2003 and 2016, exports of renewable energy plants experienced the highest growth rate of any environmental good, with an average annual growth of 8.9%, largely driven by growth in exports of solar photovoltaic systems. Another important trade and environment indicator measured the enabling and regulatory environment for renewable energy.

These different pieces of work on the issue of trade, climate change and renewable energy have advanced the theoretical and empirical understanding of the linkages between trade and environmental policies on the essential point of the role of trade in promoting the contribution of renewable energy in the carbon transition. They share a common conclusion, namely that the wide range of substantial support provided to renewable energy as part of climate change policies have been effective in encouraging the uptake of renewable energy technologies and the development of related industries. They also show that where these same measures are trade restrictive, they can have the opposite effect on renewable uptake because they tend to push up overall costs.

The JWPTE has taken advantage of its specific dual viewpoint on climate change and trade interactions to commission two pieces of work that explore very different but little studied topics: regionalism in climate change and trade governance, and the impact of climate change on trade.

The first study examines the broader implications of regionalism for climate change and trade policy integration (van Asselt, 2017[54]). Regionalism (i.e., co-operation between limited-membership coalitions of countries), in trade and environment governance is often associated with lack of progress at multilateral level and the perceived advantages of moving forward with a smaller group of countries. The study examined climate-related provisions found in many RTAs, including general provisions on the environment (e.g. provisions to uphold or enforce environmental laws); provisions on the liberalisation of trade in environmental goods and services; and provisions on climate-related co-operation

(e.g. co-operation on carbon markets or renewable energy technologies). It also found a wide range of other possibilities for addressing climate change in RTAs, such as mutual recognition or harmonisation of regulatory standards, reducing the harmful effects of energy subsidies, promoting climate-friendly government procurement and investment, as well as specific co-operation on clean energy technologies or carbon markets. By drawing lessons from the evolution of trade governance, the study suggested that it may be beneficial for regional agreements addressing climate change and trade to: (1) start small (in terms of membership and/or the scope of the agreement), with a view to reaching critical mass over time; (2) maintain connections with multilateral approaches, either by multilateralising what has been achieved at regional level or by feeding into multilateral regimes; and (3) ensure transparency in the negotiation and implementation of regional agreements, with a view to building trust between members and non-members, and showcasing achievements. The study also looked at "climate clubs", which are a specific type of limited-membership coalitions that promote co-operation on climate-related activities, conferring benefits on its members in return for contributions. Existing coalitions are not climate clubs in the narrow sense, but limited-membership coalitions can nevertheless bring significant benefits to members, such as access to finance and technology. Even though trade measures are envisaged in some proposals for climate clubs, none of the existing coalitions identified in this study include such measures.

At the request of the JWPTE, a Trade and Environment Working Paper adopted an innovative take on the linkages between trade and the environment: it looked at the impacts of climate change on trade (Dellink et al., 2017[55]). It combined a literature review-based qualitative analysis of the direct effects of climate change with modelling of the indirect impact of climate change on trade to explore the largely unchartered topic of how climate change would deeply affect trade and transform the global economy. It considered damage to infrastructure and transport routes, and the economic consequences of changes in endowments and production that would affect international trade patterns by changing relative competitive positions. The findings on how climate change could affect international trade in the coming decades provide a sobering backdrop to competitiveness concerns that could result from mitigation measures: while the mechanisms driving trade patterns are complex, with many mutually reinforcing and dampening effects, the impact of climate change on international trade and infrastructure is shown to be far more negative and disruptive that any possible pollution haven effect due to the climate change mitigation measures considered to date.

## Trade and resource efficient circular economies

Over the last twelve years, the JWPTE has both contributed to and drawn on OECD-wide work on resource efficient circular economies that is relevant to many economic and environmental issues. In 2008 this area of work was not yet referred to under the more recent concept of the circular economy transition, though the approach was similar: increasing resource efficiency to improve resource sustainability and reduce the environmental impact resulting from resource use and disposal. With trade policies clearly at the centre of many aspects of this effort, the JWPTE commissioned a report on the policy challenge of facilitating legal trade in non-hazardous recyclable materials while ensuring that trade in hazardous materials is subjected to appropriate controls (OECD, 2010[56]; OECD, 2010[57]). A scoping study and case studies of the most traded non-hazardous materials (steel, paper and plastic scrap) led to a synthesis report that concluded that measures to facilitate trade in non-hazardous recyclable materials could contribute to efficient resource use, but entailed the risk of waste being disposed of inappropriately. To

limit this risk, the report recommended building on Environmentally Sound Management (ESM) concepts, as outlined in the corresponding 2008 OECD Recommendation, and relying on EPR approaches.

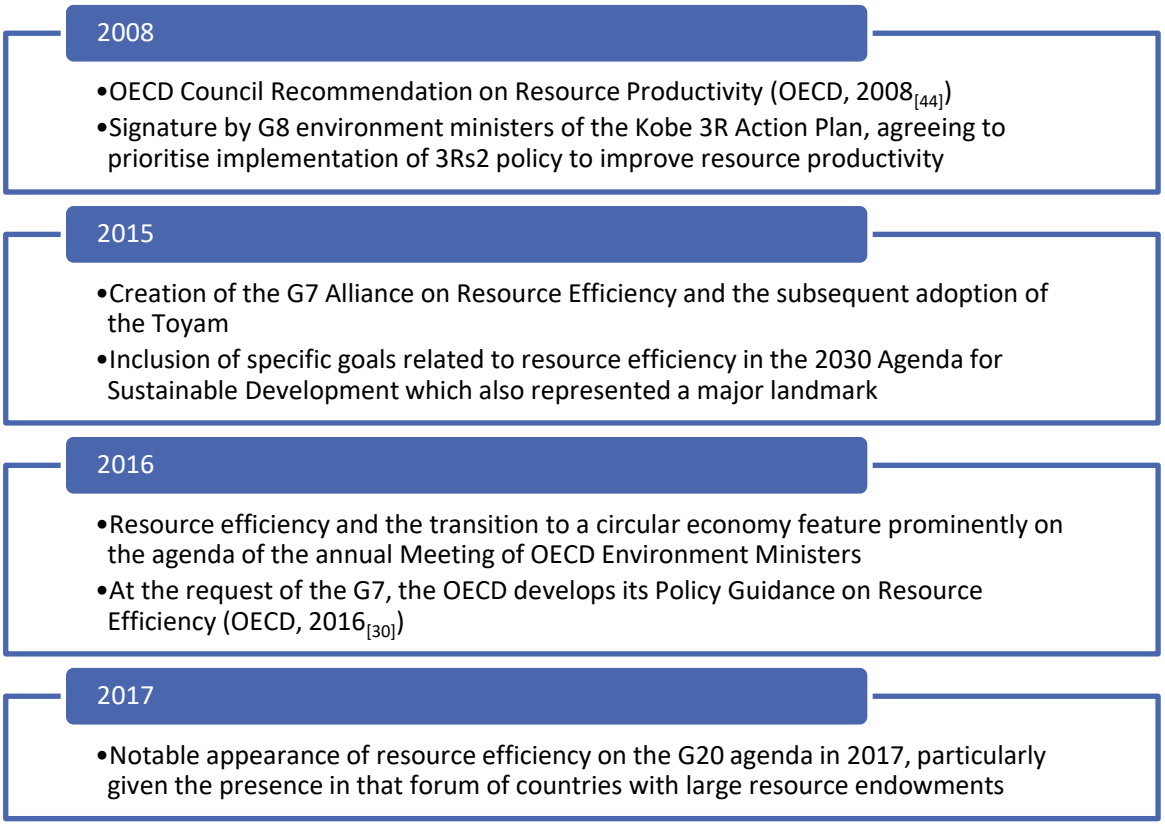
In 2018, the JWPTE returned to the topic with the Trade and Environment Working Paper *International Trade and the Transition to a More Resource Efficient and Circular Economy: A Concept Paper* (Yamaguchi, 2018[58]). It considered the linkages between trade and the circular economy transition through the emergence of GVCs as well as trade in second-hand goods, end-of-life products, secondary materials and waste. The concept paper found that existing analysis was limited. It identified four areas for further investigation:

- modelling the impact of a transition to a more circular economy on trade patterns and on sectoral competitiveness in different countries;
- analysing options for securing policy coherence between trade and circular economies;
- understanding the nature and scale of trade in waste and scrap, secondary raw materials, second-hand goods, and goods for refurbishment and re-manufacturing;
- exploring the role of international co-operation in circular value chains.

It found that measures to facilitate the circular economy transition have numerous linkages to international trade and to trade policy. Measures that direct changes in production processes include EPR schemes, standards for recyclability and reparability of products, and standards for recycled content. Without international harmonisation, these measures can act as powerful barriers to market access since they can require different product designs for each market. For instance, as pointed out in the OECD's Policy Guidance on Resource Efficiency, since EPR policies impose requirements on products, they necessarily have implications for related product and secondary markets (OECD, 2016[59]). They can affect competition and trade, either intentionally or unintentionally, simply as a result of the higher administrative and transport costs faced by importers.

Between these two JWPTE studies, the policy context was marked by a succession of multilateral initiative concerning resource efficiency and the circular economy transition, driven by greater awareness and understanding of the unsustainable trajectory of growth in material use (Figure 3). The OECD Environmental Outlook to 2050 projects unprecedented growth in demand for resources, due to the rapid industrialisation of emerging economies, continued high levels of material consumption in developed countries and the expansion of global trade (OECD, 2012[24]). The Outlook expects world population to rise from about 7 billion to over 9 billion in 2050, with average per capita income roughly tripling. This would substantially increase demand for natural resources, especially if global production and consumption patterns converge with those of OECD countries.

**Figure 3. Resource efficiency and the circular economy: international initiatives**




There is a growing realisation that the sustainable management of finite resources and the impact of their use are by nature not only local or national issues. Though it is mostly considered at the domestic level, the growing use of resources has a strong international trade dimension because no country is self-sufficient in every raw material and resource. Trade is also increasingly involved in the re-use or disposal of end-use products. Trade in primary and secondary materials is particularly important for global supply chains, and trade and specialisation patterns drive material flows and influence the decoupling of materials use and economic growth.

Recent developments have moved trade firmly to the centre of the circular economy policy challenge: import restrictions on certain waste and scrap, notably plastics, imposed by some countries (notably China) from 2018 have transformed trade patterns for "end-of-life" products. In addition, in June 2019, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was amended to increase controls for transboundary movements of certain plastic waste, including non-hazardous recyclable scrap. The OECD publication *Improving Markets for Recycled Plastics: Trends, Prospects and Policy Responses* (OECD, 2018[60]) discusses the reasons behind low recycling rates of plastics and policy approaches to improve them, including measures to create a separate market for recycled plastics where its price is decoupled from virgin plastics, and ways to increase the quantity and quality of recovered plastics. It indicates that about 13 Mt (or 4%) of the plastic waste generated each year are exported beyond their country of origin, mostly from high-income countries. The United States, Europe and Japan account for approximately 73% of global plastics waste exports. In recent years, China has been the

largest importer of plastics waste for reprocessing. The impact of China's import restrictions on global waste markets is significant: China has traditionally accounted for around two-thirds of the global trade in waste plastics. Reduced imports places pressure on waste management systems in exporting countries, though not all are affected equally. Countries that previously exported large volumes of domestic plastics scrap and waste to China and are unable to quickly improve waste quality are most likely to be affected. In some cases, waste management firms in exporting countries might seek new markets for their materials, leading to increased pressure on waste management systems in importing countries with relatively less stringent environmental regulations.

These developments have given greater urgency to work on trade and the circular economy transition in the on-going JWPTE work programme, which, like much of the OECD work on resource efficiency and the circular economy transition, is brought together through the Environment Directorate's RE-CIRCLE project. The project includes two main work streams — quantitative analysis and qualitative policy guidance, with several lines of work pursued in parallel. It aims to provide policy guidance on resource efficiency and more circular economies, and identify and quantify the impact of policies to guide stakeholders in OECD member countries and emerging market economies. Its work focuses on interlinkages between material use and economic activity, the labour market, trade, climate change, digital innovation, food security, circular business models, GVCs and plastic waste.

Data collection, indicators and environment-economy modelling capabilities have been extended to include material resources. This effort has resulted in the publication of the *Global Material Resources Outlook to 2060* (OECD, 2019[61]) which presents global projections of materials use and their environmental consequences, providing a quantitative outlook to 2060 at the global, sectoral and regional levels for 61 different materials (biomass resources, fossil fuels, metals and non-metallic minerals). It explains the economic drivers determining the decoupling of economic growth and materials use, and assesses how the projected shifts in sectoral and regional economic activity influence the use of different materials. The projections include both primary and secondary materials, which provides a deeper understanding of what drives the synergies and trade-offs between extraction and recycling. The report projects a (quasi) doubling of global primary materials use between today and 2060 (from 89 Gt to 167 Gt), with population and converging per capita income growth driving the growth in materials use. However, structural change, particularly the shift towards services projected for all regions, can put brakes on the strong growth in materials use – reducing materials use by 80 Gt by 2060. Technology developments within sectors, for instance the use of more efficient technologies in production processes, would save another 68 Gt of materials from being used. Metals and non-metallic minerals are projected to grow more rapidly than other types of materials.

Based on this outlook exercise, a RE-CIRCLE project is spearheading analysis on the economic consequences of resource efficiency and transition to a more circular economy, with a critical review of modelling approaches to the macroeconomics of the circular economy (McCarthy, Dellink and Bibas, 2018[62]), followed up by modelling of policy scenarios for a more resource efficient and circular economy. The recent modelling assessment of *The Consequences of a More Resource Efficient and Circular Economy for International Trade Patterns* is of particular relevance for understanding the linkages between international trade and the circular economy transition (Dellink, 2020[63]). It presents a quantitative analysis of the effects of such a transition on international trade patterns, with baseline trends to 2060 contrasted with trade patterns arising from a hypothetical illustrative circular economy policy package that includes a primary materials

tax, a subsidy on secondary materials and recycling, and a labour tax reduction. The paper focuses on the way the policy package shifts sectoral and regional competitive positions and alters trade flows, affecting macroeconomic outcomes. It finds that a global policy package would make secondary materials cheaper, while primary materials would become more expensive to produce. By 2040, primary non-ferrous metals use would decline by 35-50%, primary iron & steel by 15% and primary non-metallic minerals by around 10%. Regional shifts in production and trade-related effects (shifts in the regional sourcing of the primary materials by materials processing sectors) account for about one-third of the total reduction in materials use. The remaining two-thirds of materials use reduction would come from scale effects (reduced economic activity) and efficiency effects (reduced materials use per unit of output of the commodities processed).

The paper also considers possible outcomes according to the geographical extent of the implementation of the policy package, with countries generally faring better if regional coverage is more extensive. Indeed, by 2040, with all regions implementing the policy package, regional GDP increases 0.4% above baseline levels. As imports become cheaper, domestic demand is stimulated. However, this trade effect is dominated by domestic implementation of the policy package, which reduces domestic economic activity levels. Overall, the impact of the policy package varies between -0.1% and -0.9% from baseline levels across countries by 2040. Some countries, not least those with a high Revealed Comparative Advantage in materials-related commodities, have economic incentives not to implement the policy package. However, if opting out can prevent losses in materials exporting sectors, it also significantly lowers the global effectiveness of the policy package. Indeed, while the global GDP loss is halved, materials use reductions are cut more than tenfold for metals and threefold for non-metallic minerals.

Other relevant streams of work under the umbrella of RE-CIRCLE include:

- Assessing the scalability and environmental implications of business models that could support the transition to more resource efficient and circular economies (OECD, 2019[64]). Circular business models are becoming more sophisticated and widespread, leading to the provision of goods and services.
- Understanding the impact on the circular economy transition of horizontal developments such as innovation and digitalisation, with on-going work outlining key digital technologies, and exploring their role in solving market failures and supporting effective delivery of circular economy policies.
- Analysing cross-border issues in specific areas relevant to the circular economy transition, notably plastics, with flagship outputs including a report for the G7 *Improving Plastics Management: Trends, Policy Responses, and the Role of International Co-operation and Trade* (OECD, 2018[65]).

In 2019, the OECD's annual Green Growth and Sustainable Development Forum explored a greener low-carbon future for extractive, mining and heavy industries and discussed its innovation and fiscal implications. The JWPTE was part of the Task Force that prepared the agenda, which included a session on the role of international trade in ensuring that materials stay in the economy as long as possible, closing the circular economy loop. The session addressed the following questions:

- the challenges and opportunities for free trade in secondary materials, and whether existing trade policies promote material efficiency;

- the consequences of the emerging trade restrictions on waste and scrap, and possible policy responses;
- the regional or multilateral harmonisation of national standards to avoid fragmentation of international markets;
- the role of innovation, including block-chain technology.

The discussions re-iterated the growing importance of trade in the circular economy transition, noting that GVCs mean that products cross borders several times before reaching final consumers and, once they reach their end-of-life, they are often re-exported. Efforts to decouple economic growth and materials use need to consider domestic consumption as well as materials embedded in imported goods. The debate investigated the tension between the long-standing principle of avoiding trade in waste due to potential negative environmental impacts and growing awareness of the importance of waste, scrap and secondary materials as tradable commodities. The need to harmonise domestic circular economy policies, such as standards and labelling, to ensure international waste trade flows was also be discussed.

In 2020, the OECD organised a multi-stakeholder workshop on international trade and circular economies which gathered experts from OECD and non-OECD countries, inter-governmental organisations, the private sector and civil society. The workshop examined the interlinkages between trade and circular economies, notably the impact on supply-chains and trade, waste trade and trade in goods for refurbishment and remanufacturing, and second-hand goods. It explored a forward looking "mutually supportive agenda" covering standards, innovation and international co-operation. Its four key messages were:

- The circular economy transition will likely impact supply chains and trade including those for primary raw materials; the impact of the circular economy transition therefore needs to be considered for sectors such as extractive industries;
- Waste can be traded as a valuable resource and waste trade can create economies of scale, improving the use of waste and recyclables. Environmentally sound management at destination is nevertheless essential. Illegal waste trade needs to be tackled at national and international levels;
- There are important differences on how trade can contribute to circular economies when considering heavy industry versus fast-moving consumer goods;
- Securing both environmentally sustainable supply chains and end-of-life value chains is critical in a mutually supportive trade and circular economy agenda, and the role of standards, innovation, and international co-operation is central to achieving this aim.

The detailed findings from this workshop are being prepared as a workshop summary (OECD, 2020[66]). These findings are currently feeding into a detailed report on trade and circular economy policy alignment (Yamaguchi, 2020[67]).

A 2020 OECD study focusing on circular economies and trade in metals and minerals emphasised the importance of metallic waste and scrap in global trade in waste and scrap, accounting for 80% of its value and over half its volume (Korinek, 2020[68]). It also pointed to their high economically viable recycling potential. It found that trade policies can promote greater resource efficiency and circularity by enabling economies of scale in recycling, ensuring regulatory coherence between different waste frameworks, and tackling problems of exports to countries with inadequate recycling facilities. Export restrictions,

affecting 40% of traded copper waste and scrap, 30% of aluminium, and 20% of iron and steel waste and scrap, can negatively impact trade in waste and scrap. Meant to safeguard domestic supply, they can provide a disincentive for further collection of end-of-life products by lowering prices for domestic downstream users. Concerns about exports of waste and scrap, including e-waste from discarded end-of-life electric and electronic products, to countries that do not have adequate recycling facilities could be addressed through strengthened international cooperation.

## Trade and biodiversity

Most of the JWPTE's initial work on the topic of trade and biodiversity focused on the use of trade measures in MEAs, with three case studies in the late 1990s covering CITES, the Montreal Protocol on Substances that Deplete the Ozone Layer and the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. The last decade has seen a renewed interest in trade and biodiversity issues within the context of illegal trade in environmentally sensitive goods, with three areas relating to biodiversity generally considered to be of major importance: illegal trade in certain species of wildlife; illegal logging and its associated timber trade; and IUU fishing.

Starting in 2009, the JWPTE undertook a pluriannual work programme devoted to trade in environmentally sensitive goods, commissioning several studies that examined its economic, environmental and social impacts, the use of customs and licensing data to identify and measure this trade and the role of economic incentives and licensing schemes to address the problem of illegal trade in environmentally sensitive goods.

This work was pulled together in a synthesis report (OECD, 2011[69]). It reviewed the evidence on the key drivers of illegal trade in environmentally sensitive goods, such as differential costs, as well as at enabling conditions such as regulatory and enforcement failures. It assessed its economic, social just and environmental impacts. It examined data collected by customs and licensing schemes for selected environmentally sensitive goods and how this information can be used to identify and measure illegal trade. The role of national and international policy mechanisms to reduce illegal trade flows was discussed, with a focus on international licensing schemes (and associated trade restrictions) designed to allow importing countries to distinguish between legal and illegal products. In addition, national environmental policy measures on illegal trade were considered, notably property rights-based systems and economic incentives.

The report found that it is illegal trade in natural resources that has the largest local economic impact. Evidence of illegal trade varies by sector, though it should in principle be possible to identify illegal trade in some environmentally sensitive products by examining import and export data and analysing discrepancies between the two sources. For threatened wildlife products listed on CITES appendices, licensing data for both exports and imports are sometimes available, but customs data are rarely sufficiently precise. In the case of timber and fish, no international control system exists, so the analysis is normally confined to customs data.

More recently, the OECD has considered trade and biodiversity issues from the point of view of the policy challenges posed by the rise in environmental crime. For instance, the OECD *Illicit Trade* series of publications includes recent reports on the topic of illegal

wildlife trade, building on analysis in East Africa and Southeast Asia[8]. It emphasises that large-scale killings of iconic wildlife are no longer the sole focus of attention. Illegal trafficking of thousands of species of birds, reptiles, fish, amphibians, mammals and plants is taking place on an unprecedented scale, damaging ecosystems and wildlife. Forestry crimes range from unregulated or illegal burning of charcoal to large-scale corporate illegal logging and timber, paper and pulp production and lead to large-scale deforestation, with grave consequences for biodiversity and climate change. Illegal fisheries are also contributing to the rise in environmental crime worldwide. The global recognition that wildlife poaching and trafficking of species has a devastating impact on ecosystems and contributes to increasing corruption and financing other illegal activities has led to calls for urgent action, notably in the framework of the SDGs. Driven by demand around the world, using complex and sophisticated transport systems, illegal wildlife trade touches nearly every country. While its impacts are felt most acutely at local level, the stakes are global and the solutions require international co-operation. These OECD reports find that illegal trade is a major factor in the lucrative nature of environmental crime, and it has a direct effect on biodiversity. This transnational dimension means that it is difficult to control exclusively at the national policy level.

Mainstreaming biodiversity and ecosystem services more effectively into national and sectoral policies is gaining momentum on the global policy agenda, as reflected in the 2018 OECD report *Mainstreaming Biodiversity for Sustainable Development* (OECD, 2018[70]). Biodiversity mainstreaming is described as enabling policies at local, national or global levels. It concerns a wide range of policy areas, including development policy, legislation, land-use planning, finance, taxation, economic incentives, international trade, capacity building, research and technology. The report also notes that international organisations have an important role to play in supporting biodiversity mainstreaming across sectors and to help ensure that messages are relayed across constituencies (beyond biodiversity). It points to OECD working parties that bring together multiple constituencies as being particularly well placed to address biodiversity mainstreaming issues, notably the Joint Working Party on Agriculture and Environment, as well as the JWPTE and the Network on Environment and Development Co-operation.

## Environmental labelling and information schemes

The OECD has a long history of influencing the development of environmental labels. Following its first report on environmental labelling in 1976, extensive reviews of existing and planned schemes were carried out in the 1980s and into the 1990s, contributing to promoting their use and effectiveness. Later work turned to interactions of Environmental labelling and information schemes (ELIS) and international trade, notably from the late 1990s. The final section of this chapter considers recent OECD work which has focused on the effect of the multiplication of such schemes, in terms of their environmental effectiveness and their trade implications.

From 2012, the JWPTE launched a multi-phase project on ELIS, following a four-step process: (i) a fact-based characterisation of labelling schemes; (ii) a survey and review of existing national and international policies around labelling; (iii) an assessment of the

[8] These publications can be consulted at https://www.oecd-ilibrary.org/governance/illicit-trade_26175835

environmental effectiveness and trade impact of the growing number of ELIS; and (iv) further analysis aimed at discussing policy challenges and options.

The project was carried out with the OECD Working Party on Integrating Economic and Environmental Policies (WPIEEP) and a Joint Task Team was created to provide informal guidance. The Secretariat has also engaged with a range of labelling professionals, for example through the Global Ecolabel Network, the ISEAL Alliance and the UN Forum on Sustainability Standards. The findings of these reports were summarised in a brochure aimed at providing public and private stakeholders, and NGOs with policy perspectives on ELIS (OECD, 2016[71]).

The first report provided a characterisation of ELIS with a comprehensive overview of the international landscape. ELIS were defined as policies and initiatives that aim to provide final users with information about one or more aspects of the environmental performance of a product or service and were classified according to the modes of communication used and the nature of the standards on which they are based (Gruère, 2013[72]). The paper analysed the multiplication in the number of ELIS using a dataset of 544 ELIS introduced between 1970 and 2012 covering 197 countries, showing a rapid increase, especially in the late 1990s and between 2007 and 2010. This growth appears to have been driven both an increase in "traditional" ELIS, such as single-issue environmental seals, and the emergence of more recent types of ELIS, including quantitative reports. There was evidence of growing competition between similar ELIS, and tension between existing schemes and new schemes, less exposed to direct competition but facing entry challenges. The dataset also showed that a multiplicity of ELIS was systematically found for all types of products and environmental areas in all countries.

The JWPTE commissioned a review on how national government policies and guidelines apply to the use of ELIS in OECD countries (Klintman, 2016[73]). It clarifies the issues involved by providing several typologies:

- A typology based on environmental claims made by ELIS, with three broad categories: specific terms referring to environmental characteristics (such as "biodegradable", "compostable" and "recyclable"), general terms referring to environmental consequences (such as "ecological", "sustainable", "environmentally friendly" and "green"), and references to production principles and processes (such as "natural" and "organic").
- Another typology devoted to false or misleading environmental claims, with four categories: those referring to measures already required by mandatory regulation, those referring to environmental claims which are only substantiated for parts of the lifecycle, those that are not backed up by data, and those that rely on environmental claims where in reality the product is merely the "lesser of two evils" in terms of environmental impact.
- A final one focused on approaches to the monitoring of compliance with rules or guidelines, notably enforcement measures used by governments to verify environmental claims made by private parties.

The report highlighted efforts that had been made towards international harmonisation on environmental criteria, mainly for eco-labelling schemes and organic agriculture standards. Cross-country certification initiatives were generally motivated by reduced administrative costs and increased trade in environmentally certified goods. Given the advantages for the private sector to be operating in a more internationally consistent environment, international harmonisation could be extended to cover rules for self-reported

environmental claims. Because many countries at least partly base their environmental claim regulations on principles drawn from ISO standards, the report concluded that the harmonisation of criteria for self-reported environmental claims is a real possibility. The current trend towards regional and bilateral harmonisation is a first step in such a process. The review called for an in-depth analysis of the overall effectiveness of legal enforcement processes in improving the quality of environmental claims since effective enforcement could reduce false and misleading environmental claims.

These two reports provided a contextual basis to evaluate the implications of having a multiplicity of schemes in two areas: domestic environmental effectiveness and market impacts, and international trade-related and environmental impacts. This work was summarised in the Trade and Environment Paper *Multiplication of Environmental Labelling and Information Schemes (ELIS): Implications for Environment and Trade* (Prag, Lyon and Russillo, 2016[74]). It found little empirical work on the environmental effect of the multiplication of ELIS. The theoretical literature on label competition can inform understanding of environmental effects, notably through modelling, but their stylised nature and the complexity of ELIS limit their policy relevance. In practice, there is evidence that label competition has led to harmonisation and market-driven convergence, for example in the forest certification sector, though effects vary by sector and label type. To maximise environmental effectiveness, the paper suggests convergence must lead to more holistic and streamlined ELIS rather than acting as a weakening influence on the stringency and quality of standards or ELIS implementation.

The multiplication of ELIS can also influence market access and competitiveness, and therefore trade. Government and non-government responses to multiplication could also affect trade if they result in the market dominance of a given label, which becomes perceived as a "de facto" market entry requirement. Nevertheless, these effects are difficult to demonstrate due to data challenges and because ELIS currently cover a relatively modest market share for most products. Stakeholders in the ELIS market have already sought to manage ELIS growth to maintain high standards, and improve transparency. Non-government actions have included mutual recognition agreements between ELIS operators, establishment of voluntary codes and development of many ELIS comparison and benchmarking tools. Government actions have included introducing "focal" ELIS (or standards on which non-government ELIS can be based) and developing criteria to guide public procurement. The report suggested that governments seeking to exert a positive influence on the growing ELIS market could collaborate to create trusted sources of transparent and comparable information across different types of ELIS. Such initiatives could build on the experience of existing international benchmarking initiatives in the public, private and public-private spheres. Inter-governmental initiatives could further promote the concept of interoperable ELIS design, given that a key determinant of the cost impact of multiplication on producers is their interoperability.

## Digitalisation, trade and the environment

The on-going and future digitalisation of the world economy is by nature a horizontal issue that touches upon many areas at the trade and environment nexus. As a result, OECD work on digitalisation that concerns trade and the environment is taking several viewpoints:

- the effect of digitalisation on competitiveness, and on the scale and nature of trade and market openness;
- its interaction with many aspects of environmental policies and the green transition;

- its impact on a range of sectoral policies, notably energy and agriculture;
- its impact on public policies more generally, notably their implementation.

One aspect of the impact of digitalisation on the trade and the environment interface that is causing concern relates to the circular economy and is therefore particularly topical. It was examined in detail in a recent OECD Environment Working Paper on *Extended Producer Responsibility (EPR) and the Impact of Online Sales* (Hilton et al., 2019[75]). The paper cites surveys of the 400 EPR systems currently in operation across the globe, most of them in OECD member countries, which indicate that these policies have clearly helped increase recycling and collection rates by making producers responsible for the environmental impact of their products throughout the product chain. They have also contributed to generating financial resources to pay for these activities. Nevertheless, governments are grappling with a number of issues that hinder their effectiveness and efficiency. The paper considers how the advent and fast expansion of online sales has created new free-riding opportunities: consumers are able to buy more easily from sellers in other countries that are not registered with national EPR schemes, hence avoiding producer and retailer/distributor obligations and costs, and undermining the whole EPR system. This imposes policy challenges in the form of the reduced competitiveness of domestic producers, obligated to comply with domestic waste regulations, and the increased cost imposed of reprocessing waste to the required standards. The report identifies some of the measures that governments and other stakeholders could consider in order to address this issue, including awareness raising, better enforcement of existing rules and the introduction of new regulatory measures.

The JWPTE contributes to the OECD Going Digital project, launched in 2017, which aims to provide policymakers with the tools they need to help their economies and societies prosper in an increasingly digital and data-driven world. The competitive changes brought about by the digital economy were highlighted in an OECD report to G20 Finance Ministers and Central Bank Governors in 2018 (OECD, 2018[76]). It argued that the digital transformation is changing business models, methods of production and distribution, and the way firms compete. Digital technologies have reduced the cost of entering some markets, even across borders, for instance allowing small firms to sell online seamlessly to foreign customers. This also raises the problem of ensuring that national standards are followed and that illegal products are not made available. The report concluded that co-operation across borders is more than ever necessary to ensure common standards are applied and information is available to regulators.

The March 2019 Going Digital Summit marked the end of the first phase of the Going Digital Project, with the release of the flagship publications *Going Digital: Shaping Policies, Improving Lives* (OECD, 2019[77]) and *Measuring the Digital Transformation: A Roadmap for the Future* (OECD, 2019[78]). The second phase is helping countries implement an integrated policy approach to the digital transformation, especially through further development of the Going Digital Toolkit (indicators, policy notes and innovative policy examples) and national reviews. It is also addressing new opportunities and challenges through analysis of frontier technologies, notably artificial intelligence and blockchain, with a focus on jobs, skills and social inclusion, and on productivity, competition and market structures.

The key message from a *Going Digital Policy Note* devoted to trade in the digital era are that digital technologies have made it easier to engage in trade, coordinate global value chains and diffuse ideas (OECD, 2020[79]). Based on the analysis published as a Trade

Policy Paper in 2019, it acknowledged that the digital transformation has had a profound impact on international trade, lowering barriers to internationalisation and contributing to growing trade competitiveness, while at the same time making international trade transactions more complex and blurring distinctions between goods and services (Casalini, López González and Moïsé, 2019[80]). Although existing trade agreements cover digital trade, the policy note argues that they need to adopt to these new realities with approaches that are more holistic, spanning goods, services and digital connectivity. Many digital infrastructures are born global, raising key challenges for domestic and international policy in a world where borders and regulatory differences between countries remain. Principles of market openness, enshrined in trade agreements, can help countries with these challenges by ensuring that key public policy goals are met while reaping the benefits of trade.

Digitalisation and the environment have become a major theme for analysis and discussion. The OECD's Ministerial Council Meeting of June 2019 featured a session on digitalisation for sustainable development and a resource efficient economy. The OECD-wide input into the 2019 G20 Ministerial Meeting on Energy Transitions and Global Environment for Sustainable Growth, summarised in a G20 Key Issue Paper, considered the diffusion of digitalisation to be a major factor in the green transition (OECD, 2020[81]). This is because alongside green technologies, digital technologies that are not strictly speaking green will be needed to achieve the green transition. The paper discusses the contribution that these technologies are making and will be increasingly making to the green transition, notably artificial intelligence (AI), the Internet of Things (IoT), and blockchain.

This last opportunity was explored in a 2020 Trade and Environment Paper on *New Digital Technologies to Tackle Trade in Illegal Pesticides* (Frezal and Garsous, 2020[82]). Global trade in illegal pesticides has been steadily growing in recent years, posing serious threats to agriculture, the environment, human health, and the economy. Evidence of this trend can be found in the increasing number of seizures of counterfeit, fake, and unauthorised pesticides, as well as their growing share in the global pesticide market. This paper identified the main drivers and enablers of this illicit trade and explored the potential of digital technologies such as blockchain to tackle this criminal activity. It also outlined the challenges in the adoption of these digital-based policy responses, essentially due to their large upfront costs and their complexity, especially for developing countries. It concluded that while digital-based solutions can identify criminal activity, other policy measures need to be implemented in parallel (e.g. raising public awareness and strengthening sanctions).

Digital technologies are improving the design and enforcement of a broad range of public policies, as documented by a recent OECD review (OECD, 2019[83]). They also hold the potential to reshape existing policies, enable innovative policy design and rigorous impact evaluation, and expand citizen engagement in policymaking. One of the issues examined in this report is how, by facilitating compliance and enforcement, digitalisation is relevant to trade and environment policy implementation. It provides several examples of existing and developing applications in this area:

- the use of digital technologies for fisheries regulation (e.g., to document fisheries catches);
- monitoring non-point source pollution (to track non-compliance, for instance in agricultural enterprises);
- the enforcement of forestry management and conservation (to control clearing and logging using almost real time satellite imagery);

- the detection of illegal waste dumping and trade (through improved continuous surveillance and tagging).

Sectoral OECD work on digitalisation is also circling several important trade and environment issues. For instance, a report recently completed on digital opportunities for trade in the agriculture and food sectors is being followed up with further analysis on insights from agri-environmental policies on digital opportunities for better agricultural policies (Jouanjean, 2019[84]). In the energy sector, the IEA has published a major study on digitalisation and energy outlining current and future uses that can improve the sustainability of energy supply and use with a potentially large impact on the transition to a low carbon economy (IEA, 2017[85]). It also pointed to the impact of digitalisation on energy trade, especially through electricity grids.

# 5. Mutually supportive trade and environment policies: indicators and quantitative analysis

The work undertaken under the auspices of the JWPTE over the last decade has highlighted the growing need for trade and environment indicators to shed light on the interaction between trade and environment policies. The development of indicators and their use in quantitative analyses in a range of policy areas is essential to much of the OECD's analytical work. Even though the availability and coverage of environmental and economic data on a wide range of topics continued to improve, the lack of a specific set of indicators on trade and the environment was holding back some aspects of empirical analysis, limiting the scope of policy-oriented messages and making it difficult to measure progress towards policy goals.

Taking a systematic approach to understanding the trade and environment interface was the motivation for defining a first comprehensive set of trade and environment indicators. The objective was to inform several areas of policymaking using specific indicators constructed with reliable, consistent and internationally available data. Trends in these indicators can be used to measure progress in a range of relevant policy areas at the interface of trade and the environment.

One of the key policy issues that necessitates indicators and quantitative analyses is the question of how environmental policies affect competitiveness. This is a central issue to JWPTE's work, and relevant to almost every aspect of the trade and environment nexus. Because of its dual expertise, the JWPTE has been able to take two different perspectives in its approach to understanding competitiveness and trade issues as they relate to environmental policies and their effectiveness.

On the one hand, the JWPTE has analysed the effects of environmental protection measures on competitiveness and trade, the two key questions being: (1) to what extent do environmental policies affect competitive advantage, specialisation and international competitiveness? And (2) what happens to competitiveness, trade and other economic characteristics when domestic industries face stiffer foreign competition because of environmental policies?

On the other hand, the JWPTE has analysed the interaction between environmental measures and trade in terms of environmental effectiveness, the key questions being: (1) to what extent do stringent environmental policies in one jurisdiction result in increased environmental impacts in other jurisdictions, displacing the issue to other countries and resulting in unsatisfactory environmental outcomes overall? (2) what policy measures can reduce any such unintended consequences of domestic environmental policies (including pollution havens and carbon leakage)?

## The OECD set of policy indicators on trade and environment

Building on a range of JWPTE reports and other OECD work on indicators and databases, a set of ten indicators was selected covering six areas of the interface between trade and the environment (Table 1) (Garsous, 2019[13]). The analysis of trends in these indicators produced some valuable insights into a range of trade and environment issues.

**Table 1. OECD set of trade and environment indicators**

| Trade-environment interface | Indicators | Sources |
|---|---|---|
| $CO_2$ emissions embodied in trade | Trade in embodied $CO_2$ (3 indicators) | OECD TECO$_2$ database |
| Raw materials embodied in trade | Raw material consumption of biomass, fossil fuel, metal ores & non-metallic minerals | UNEP International Resource Panel |
| Trade in environmental goods | Trade balances for EG<br><br>Import-weighted tariffs on EG | OECD CLEG list |
| Support for fossil fuel and renewable energy | Support for fossil fuels<br><br>Score for enabling policy and regulatory environment for renewable energy | Combined IEA-OECD estimates of fossil fuel support<br><br>World Bank score |
| Trade in waste and scrap | Value and weight of trade in waste and scrap | BACI Trade Database |
| Nutrient balances of exported grains | Nitrogen and phosphorus balances for 8 types of grain | FAO, International Fertilizer Association, BACI Trade database |

*Source*: (Garsous, 2019[13]).

Carbon emissions embodied in trade are sourced from the OECD's Trade in Embodied $CO_2$ (TECO$_2$) database, which presents a set of indicators of $CO_2$ emissions based on production (i.e. emitted by countries), $CO_2$ emissions embodied in domestic final demand (i.e. consumed by countries) and net exports of $CO_2$ emissions[9]. The geographical distribution of carbon emissions embodied in trade suggests that a subset of countries specialise in carbon intensive activities in ways that are consistent with the existence of pollution havens, with the emissions they produce sometimes disproportional to their contribution to global trade. Between 1995 and 2011, emissions embodied in goods exported from countries outside the OECD area to OECD countries increased by 91%, as more carbon intensive goods were produced in the former and shipped to the latter. Although these goods were produced using processes with a declining level of carbon emissions due to technological improvements, industrial processes in OECD countries generally remain less carbon intensive than those used in non-OECD countries.

Raw materials embodied in trade are measured by the material footprint or raw material consumption of biomass, fossil fuels, metal ores and non-metallic minerals. This indicator originates from the database of the UNEP International Resource Panel (IRP) which provides estimates of total raw materials embedded in final consumption. The volume of raw materials embodied in traded goods increased by 146% between 1990 and 2010, accounting for 36% of total material extraction. This rising trend is partly due to rapid urbanisation and increasing living standards, particularly in Asia and some parts of Europe. As a result, strong demand for cement and steel have translated into high growth rates for trade in non-metallic minerals (198%) and metal ores (162%).

The indicator on trade in environmental goods relies on the definition of environmental goods contained in the OECD CLEG list (see Chapter 2) to calculate related trade flows and import-weighted tariffs. Between 2003 and 2016 international trade in environmental

[9] The OECD TECO$_2$ data base can be accessed at https://doi.org/10.1787/6db6413b-en

goods more than doubled – from USD 531.10 billion to USD 1 261.24 billion – increasing its share in global trade from 7.2% to 8.1%. This growth was mostly driven by components for renewable energy plants, wastewater management and treatment equipment, and solid and hazardous waste management and recycling systems. It is partly the result of environmental policies which create markets for EGS, and which in turn improve the competitiveness of local firms operating in these industries.

Support for fossil fuels and renewable energy is measured by the combined IEA-OECD estimate of support to fossil fuels and a score for the enabling policy and regulatory environment for renewable energy developed by the World Bank (OECD/IEA, 2019[86]). Trends in these indicators suggest that a strong policy and regulatory environment for renewable energy is associated with an increase in net exports of equipment for renewable energy production. Conversely, countries spending a larger share of their GDP on fossil fuels subsidies have less competitive domestic renewable energy industries, particularly in countries outside the OECD area.

Trade in waste and scrap (in value and weight) is measured by constructing an indicator based on the BACI International Trade Database. Trade in waste and scrap increased by 181% in value and 47% in weight between 2003 and 2016. This trade involves a limited number of countries, with the top 20 exporters and importers accounting for 79% of total exports and 84% of total imports respectively.

The relevant indicators for measuring nutrient balances of exported grains are nitrogen and phosphorous balances for a subset of exports for eight types of grain, calculated by combining data from the Food and Agriculture Organisation, the International Fertilizer Association, the BACI international Trade Database and the OECD. Regarding agricultural products, nutrient surpluses declined between 2006 and 2014 despite an increase in grain export volume, suggesting a growing share of demand for grain is decoupled from nutrient surpluses. However, exports from some countries contribute disproportionately to the nitrogen and phosphorous nutrient surpluses of total production, indicating these countries might be increasing nutrient-related environmental pressure to meet growing demand and trade.

The JWPTE can rely on a robust body of OECD research and data in many areas that are relevant to trade and the environment. On the trade side, the OECD Services Trade Restrictiveness Index and the Trade Facilitation Indicators are now used extensively to answer empirical, policy-relevant questions, and to monitor the progress of countries toward a fair and open trading system. On the environmental side, the OECD has long been a pioneer on indicators to monitor environmental performance and the integration of environmental concerns in economic and sectoral policies, notably with the OECD Core Set of environmental indicators. A range of data and indicators have also been developed that cover the interface between environmental and sectoral policies, such as the OECD database of Agri-environmental Indicators.

These efforts often refer to, or feed into, a broader framework of policy tracking and target monitoring. For instance, since 2011 the OECD has developed set of green growth indicators that follows progress that OECD countries and G20 economies have made since 1990[10]. It is updated and extended regularly, the most recent version integrates the results of developmental work on indicator methodologies and wider country coverage. This

[10] The OECD Green Growth indicator database can be accessed at https://doi.org/10.1787/28f696fe-en

applies notably to the indicators on environmentally adjusted multifactor productivity growth, population exposure to air pollution and the related economic costs, land cover change, and technological innovation. Other indicators were refined, including demand-based $CO_2$ productivity and environmentally harmful subsidies. Greater emphasis was placed on the role of policy action, notably in the chapters on environmentally related taxes and subsidies, technology and innovation, and international financial flows (OECD, 2017[87]).

The OECD also applies its indicator tracking expertise through the OECD Action Plan on the SDGs, endorsed by the OECD Council in December 2016. It uses a unique methodology for measuring the distance that OECD countries would need to travel in order to meet the SDG targets, set with reference to the level of ambition embodied in the wording of 2030 Agenda for Sustainable Development wherever possible. Where no clear target level is indicated in the 2030 Agenda, the plan relies on international agreements and expert opinion, and on benchmarking against the top performing 10% OECD countries. The indicators were gradually expanded in coverage between 2016 and 2019, when preliminary evidence on how these indicators have changed over time was also presented (OECD, 2019[88]). They are closely aligned with those in the UN Global Indicator List drawn from OECD sources and the UN's SDG Global Database.

As shown by this overview of work carried out in the last twelve years, the context for developing trade and environmental indicators is particularly dynamic and supportive, generating a growing set of indicators from which trade and environment indicators can be selected and refined. The current set of indicators has already proved useful to advance empirical analysis on several of the issues covered in this report. These issues often intersect at the crossroads between several broad areas of study: environmental policy tools, trade policy instruments and international competitiveness, where qualitative approaches need to be bolstered by quantitative analysis and modelling. There is considerable potential to exploit existing indicators for further analytical work. In addition, some trade and environment themes could benefit from the development of new and more precise indicators to help with policy design and evaluation (see Chapter 6).

## Competitiveness and the pollution haven effect

The JWPTE's interest in the effect of environmental measures on competitiveness dates back to its inception. It completed empirical research as early as 1993 on the pollution haven effect, i.e., whether increasing the costs of polluting through environmental policies incentivises industries to relocate to countries with laxer environmental regulations or to source inputs from these countries. The last fifteen years have seen this issue pushed up the trade and environment agenda by more ambitious unilateral environmental policies and goals. In particular climate change mitigation policies, adopted or envisaged, have repeatedly been the focus for concern that unilateral measures to reduce GHG emissions could penalise domestic firms, especially those that are energy-intensive and exposed to competition from countries with lower levels of regulation.

A 2011 study for the JWPTE examined the topic of *Trade-Related Measures Based on Processes and Production Methods in the Context of Climate-Change Mitigation* (Moïsé and Steenblik, 2011[7]). The motivation for the study was that policies targeting adverse environmental impacts created in foreign lands as a result of producing goods for export were gaining prominence in the climate change debate. The ostensive purpose of PPMs is to promote better environmental outcomes and ensure that domestic climate change policies and incentives do not inadvertently undermine other objectives. Even though the

general objectives of the reviewed regulations and private schemes are comparable (e.g. the promotion of renewable-energy sources, or provision of information on the carbon footprint of goods), the approaches, level of detail, choices of instruments and targeted environmental characteristics vary considerably from country to country and from scheme to scheme. Some regulations rely more or less extensively on market mechanisms, attaching price premiums to certain types of products. Others introduce command-and-control provisions limiting the use of certain PPMs, variously defined in different countries. Still others target certain types of fuels eligible for public support, with varying eligibility criteria. Private schemes mainly use environmental sustainability claims to secure consumer preference. The choice of different instruments presumably entails different trade impacts. PPM-based trade-related instruments include:

- direct regulation such as import or export restrictions on products not conforming to certain PPM requirements;
- public authorities' market-based interventions or economic instruments, such as fiscal measures, environmental charges, taxes or subsidies, border-tax adjustments and countervailing duties;
- attempts to enable informed consumer choice that could in turn influence production patterns, notably ELIS.

The survey found provisions focussing on non-product-related PPMs in a number of climate change regulations, although by no means in the majority of them. Most of these PPM-based requirements related to the sustainability characteristics of PPMs, which generally rely on life-cycle assessments but are defined and calculated in quite a different manner in various countries. Fewer of these requirements focus on GHG emissions characteristics. Preferences in government procurement based on PPM specifications were rare in regulations and were generally applied in the context of specific calls for tender. Mandatory carbon-footprint labels were still experimental at the time of the survey and to this day they remain voluntary schemes that are not used in mandatory ELIS (see Chapter 5).

The 2013 Environment Working Paper *Addressing Competitiveness and Carbon Leakage Impacts Arising from Multiple Carbon Markets* (Lanzi et al., 2013[89]) was produced as a follow up to the *OECD Environmental Outlook to 2050* (OECD, 2012[24]). The climate change chapter of the Outlook had presented an analysis of global climate mitigation scenarios and their economic costs. It showed that lack of international co-operation on climate change could result in additional costs for reducing GHG emissions. With many of the major economies of the world contemplating unilateral or plurilateral action to restrict their carbon emissions, asymmetries in the stringency of climate policies could result in carbon leakages, with domestic emission reductions partially or wholly counterbalanced by increased emissions elsewhere in the world, undermining the effectiveness of climate policies.

This follow-up modelling assessment of the competitiveness and carbon leakage impacts arising from multiple carbon markets examined macroeconomic and sectoral competitiveness, as well as carbon leakage impacts associated with a range of stylised mitigation policy scenarios, with an emphasis on energy-related economic activities. The scenarios chosen represented carbon markets with different linkages, coverage (i.e. number of countries participating, types of emissions and sectors) and carbon pricing policies. The paper also investigated policies to address competitiveness and carbon leakage issues, including Border Carbon Adjustments (BCAs) as well as direct and indirect (offset-based)

linking of carbon markets. The results showed that in presence of multiple carbon markets, competitiveness can fall in countries that adopt climate policies, leading to carbon leakage. Competitiveness loss and leakage can be reduced when more countries and emission sources are covered, and when climate mitigation policy is harmonised across countries. It was also found that responses such as BCAs and linking carbon markets can address some, but not all, of these leakage issues. One of the findings of the report is that BCAs are more effective at addressing carbon leakage concerns than linking carbon markets, and that the latter are more effective at protecting the welfare of countries that have not implemented climate mitigation measures. Direct and indirect linking may be preferable to BCAs because it ensures that all least-cost emission reduction measures are adopted globally, suggesting that linking may be a better option from a global welfare perspective.

The JWPTE requested a literature review of BCAs and alternatives to BCAs to investigate what has been concluded about their effectiveness, from both a trade and an environmental perspective. The resulting Trade and Environment Paper *Border Carbon Adjustment and International Trade: A Literature Review* analysed BCAs proposed in the academic literature or in draft climate legislation, including levying a border tax or requiring importers to surrender carbon permits (Condon and Ignaciuk, 2013[90]). The review found little empirical evidence that BCAs have effects on leakage and competitiveness, mainly due to the fact that no BCAs had actually been implemented.

As noted in the first section of this chapter, the JWPTE has recently developed three indicators that relate to carbon emissions embodied in trade (Garsous, 2019[13]):

- the amount of carbon emissions from fossil fuel combustion embodied in imports and exports, which is useful to determine whether the relocation of the domestic production is caused by cross-country differences in environmental policy stringency;
- the hypothetical amount of carbon emissions from fossil fuel combustion embodied in imports if imported goods were produced with a carbon intensity (i.e. emissions factors) equal to that of the importing country at a given, which gives a sense of whether such a relocation occurs in more carbon-intensive countries;
- the estimated growth in imported emissions of a country derived from: (i) changes in the volume of imports; (ii) changes in the composition of imports; and (iii) changes in the carbon intensity in countries where emissions were generated. This indicator captures whether the composition of imported goods follows the pattern of specialisation predicted by pollution leakages.

Taken together, they indicate that in OECD countries, imported carbon emissions from both OECD and non-OECD countries have been growing, with the latter increasing proportionally more than the former. Imports from countries outside the OECD area are more carbon intensive than OECD domestic production and have declined more substantially. These trends suggest a pollution haven effect although more robust empirical research is needed to confirm these results.

Nevertheless, several recent OECD studies show that to date carbon pricing has not had a pollution haven effect. For instance, an OECD Environment Working Paper *Carbon Pricing and Competitiveness: Are They at Odds?* reviews ex-post empirical assessments on the impact of carbon pricing on competitiveness in OECD and G20 countries in the electricity and industrial sectors (Ellis, Nachtigall and Venmans, 2019[91]). Most of these assessments find no statistically significant effects of carbon pricing or energy prices on

different dimensions of competitiveness, including net imports, foreign direct investments, turnover, value added, employment, profits, productivity, and innovation. When statistically significant results have been found, the magnitude of such effects tends to be small - either positive or negative. Thus, concerns about negative short-term effects of carbon pricing on firms' or sectors' international competitiveness have not come to pass, at least to date. This might be because carbon price levels have been low and their effect limited by carbon tax exemptions for industry, or generous levels of free allowances to firms covered by emissions trading.

The findings of JWPTE studies on carbon leakages are consistent with those of the OECD study *Do environmental policies affect global value chains? A new perspective on the pollution haven hypothesis* (Koźluk and Timiliotis, 2016[92]). Relying on the JWPTE's work on measuring environmental stringency (Brunel and Levinson, 2013[15]) and using a gravity model of bilateral trade flows for manufacturing industries from 23 OECD and 6 BRIICS countries between 1990 and 2009, the paper studied how bilateral trade patterns are related to national environmental policies. Environmental policies were not found to be a major driver of international trade patterns, but they do have a significant effect on specialisation, in line with the pollution haven effect. An increase in the gap in environmental policy stringency between two trading countries does not have a large effect on overall trade in manufactured goods. However, by changing relative input prices, greater environmental stringency in a single country is linked to a comparative disadvantage in polluting industries and a corresponding advantage in "cleaner" industries. This effect was found to be stronger for the domestic component of exports than for gross exports.

By taking this global value chain perspective on the pollution haven effect, there appears to be some confirmation of the effect, but without there being an overall loss of competitiveness attributable to environmental policies. This is because more stringent environmental policies do reduce comparative advantage, but this loss in competitive edge in more pollution-intensive activities is compensated by a gain in less pollution-intensive activities – hence, an overall shift in specialisation patterns without an overall impact on competitiveness. This finding is consistent with other JWPTE analysis on the impact of environmental measures on EGS trade which points to a Porter effect, whereby more stringent environmental regulations, while increasing compliance costs, bring the benefit of spurring innovation, making domestic EGS industries more competitive (see Chapter 2).

A further conclusion that can be drawn from work by the JWPTE and elsewhere in the OECD is that any pollution haven effect needs to be placed in the context of the other major drivers of competitiveness. Changes in specialisation induced by stringent environmental measures have been small compared with the effects of trade liberalisation measures (Agrawala and Kozluk, 2016[93]). This limited scale effect is confirmed in an OECD study that considered the effect of energy prices (in the context of a carbon tax) on one of the possible channels of the pollution haven effect - foreign direct investment (FDI) that found that the effect of higher domestic energy prices on firms' outward stock of FDI to be significant and positive, but small in magnitude (Garsous and Kozluk, 2017[94]).

# 6. A view on the emerging context and directions for potential future work

## Key elements of the emerging context

The second decade of the 21st century closed on uncertain times for international trade and environment governance, pushing a range of issues at trade and environment nexus further up policy agendas. The statement by the OECD Secretary General at the conclusion of the COP 25 Climate Conference in December 2019 pointed to flagging trust, complex economic and environmental choices, and a short-term policy focus contributing to disappointing outcomes (OECD, 2020[95]). The conference was widely viewed as falling short of the decisive, global action required to address the climate emergency, though this setback has highlighted the magnitude of the challenge rather than fuelled complacency. Most of the Aichi targets contained in the Strategic Plan for Biodiversity 2011-2020 have notbeen achieved, heightening concern around dwindling biodiversity and the health of terrestrial and marine ecosystems.

This "ambition gap" has come to dominate public discourse around international environmental issues, in the same way that the consensus around the great environmental conferences of the 1990s and the resolve of ambitious strategies of the early 2000s marked their time. Several significant milestones could galvanise efforts to address the considerable challenges that lie ahead, starting in 2020, with the fifth anniversary of the launch of the SDGs. The COP 15 of the CBD marks a critical juncture for one of the defining global issues of our time: ambitious objectives and result-orientated policies to arrest the loss of biodiversity and ecosystems. The 30th anniversary of the Rio Declaration in 2022 will provide a focus for stocktaking and for renewed international cooperation, as will the half-way point to the 2030 Agenda for Sustainable Development in 2023.

A notable feature of the current policy context is that public and political understanding and awareness of global environmental challenges are growing. This is partly due to the greater availability of reliable data and high-quality analysis, both of which are being more widely reported outside scientific circles. It is also related to mounting evidence that environmental damage is increasingly prevalent, setting off worldwide debates on issues ranging from the impact of plastics waste pollution in the oceans and the interaction between pesticide use and insect populations, to the link between climate change, forest fires and habitat loss, to name just a few that have flared up recently. This greater awareness makes recent lack of progress in some areas more visible, which in turn increases pressure on domestic policies and international cooperation to design response strategies, with calls to rebuild the foundations for collective action stronger than ever, notably from civil society.

The emerging international trade context is uncertain and complex, with an extended period of calm and steady growth in global trade swept away as protectionism spreads, tariffs climb, and trade flows are affected by new restrictions[11]. This turbulence has been accompanied by an erosion of the rules-based global trading system and rising government support across a range of sectors, inducing disruptions in supply chains and reallocation of activity across countries. The last OECD Economic Outlook before the COVID-19 crisis

[11] Annual WTO Trade Monitoring Reports can be accessed at https://www.wto.org/english/news_e/news19_e/dgra_12dec19_e.htm

indicated that this context was contributing to delayed business investment and consumer purchases, with flow-on effects for economic activity and employment (OECD, 2019[96]). The longer term economic and trade impacts of the global recession triggered by the COVID-19 pandemic remain uncertain but substantial effects are unavoidable over the shorter term and well into the early 2020s (OECD, 2020[97]; OECD, 2020[98]).

Despite the economic growth and poverty reduction that trade has brought to many parts of the world, changing attitudes toward trade have been building for almost two decades (OECD, 2017[99]; OECD, 2017[100]). While the causes and expressions of the backlash are country- and time-specific, discontent has been fuelled by disappointment in the pace and distribution of progress promised by the trade policies introduced at the turn of the century. There are continuing controversies over whether all economies are playing by agreed multilateral rules, growing awareness of state support and behind-the-border protection that remain in key sectors, alongside doubts about international rulemaking keeping pace with structural changes and business realities, at a time when trade and investment are being transformed by digitalisation and the rise of services.

Environmental concerns have also come into play, with trade sometimes perceived as extending environmental footprints across borders, leaking pollution and $CO_2$ emissions, rather than facilitating access to environmental goods and supporting the diffusion of environmental technology and innovation. These on-going debates have not totally displaced the longer standing apprehension that environmental measures can disguise protectionism, distort trade and limit market access particularly for developing countries keen to boost value-added production and exports and diversify their economies, though it is noticeable that some of these countries are now among the most vocal advocates of the need for international cooperation to enhance environmental protection. These seemingly opposing views of the trade and environment nexus stem from a shared concern about potential trade-offs between environmental protection and trade-based economic growth. Despite converging responses that can improve both trade and environment outcomes, unresolved issues remain and return to the fore, so that one of the most striking recent trends is the persistence or re-emergence of issues that have been addressed only partially or unsuccessfully. For instance as the Brazilian Amazon burned, the link between climate action and trade policy was a top agenda item at the August 2019 G7 meeting, and several European countries cited environmental concerns as obstacles to the ratification of the EU-Mercosur Trade Agreement – the EU's largest trade deal to date.

Repeated setbacks in meeting collective goals may not be due to neglect or indifference, but rather to the complexity of the issues to be addressed, notably with respect to climate change responses. The magnitude of the task ahead may have resulted in a measure of policy paralysis, despite a groundswell of urgent public concern and instances of high-profile activism. If twelve years on from 2008, responses have been disappointing, with adaptation plans in their infancy and limited progress on moving away from fossil fuels, it is largely because measures such as carbon taxes have proved to be more challenging than when they were first widely envisaged in the early 2000s. It appears that without a framework to address the international trade and competition issues that can result from climate change responses, many policies can falter when it comes to their adoption at domestic and international level.

There has nevertheless been significant progress in the coherence of trade and environment policies, as reported in a recent high-level leadership dialogue held by WTO (WTO, 2018[101]). Rulings on WTO trade and environment disputes have affirmed that trade rules do not prevent governments from adopting and enforcing carefully crafted environmental

measures that respect core trade principles such as non-discrimination. Debates on the legal questions that previously dominated environment and trade discussions have now given way to a focus on specific problems, such as LCRs and the harmonisation of standards. At regional, bilateral and plurilateral levels, trade agreements include a range of often novel environmental provisions so that trade policy rules can be harnessed to advance environmental goals. The 2030 SDGs include numerous trade-related goals, targets and indicators. Indeed, the SDGs highlight trade as a central and cost effective "means of implementation" for the 2030 Agenda for Sustainable Development as a whole.

There is also a new willingness not to sidestep the thorniest issues, notably systemic trade-environment issues such as the effects of trade on climate and biodiversity, and the reform of government support. A central focus of the UN Climate Action Summit of September 2019 was the need to phase out fossil fuel subsidies, an issue that is also central to trade negotiations. Several developing countries are active on calls for new WTO disciplines on fisheries and fossil fuels subsidies. Indeed, many unresolved issues are being revisited because countries are increasingly open to discussion of trade and environment linkages. Some of these countries are emerging as key players in plurilateral initiatives on trade and sustainability, for instance to encourage trade in EGS.

Another striking feature of the emerging trade and environment context is that public and private stakeholders and decision makers are embracing ideas promoted by a multiplicity of initiatives at the sustainability-trade interface - on the carbon transition and decarbonisation, the circular economy, the green economy, green finance and investment, and sustainable global value chains. On the ground, there has been a proliferation of practical trade-environment efforts from a growing range of business and civil society groups, including public-private partnerships, corporate responsibility initiatives, and voluntary standards and labels using an array of sustainability criteria, carried by increasingly well informed consumers and more environment savvy businesses. These initiatives are contributing to widening the consensus that both trade and environment policies are needed to boost sustainable trade and promote innovation in and markets for sustainable goods, services, technologies and business models, with global trade in EGS projected to reach USD 3 000 billion in 2020, growing to as much as to USD 12 000 billion in 2030. At times, the slow pace of progress in the international governance of trade and environment appears out of step with the dynamism of these initiatives.

In the trade and environment community, there is widespread acknowledgement that trade policies have successfully moved from the accommodation of environmental concerns towards a deeper understanding that sustainability is central to economic choices. Yet there is an equally widespread sense that the environment-trade agenda has become more complex, dispersed and specialised. Where most of the JWPTE's existence has been defined by economic convergence, multilateral trade agreements, and ever larger and more integrated regional trading blocs, the current wave of protectionism and bilateralism risks creating a more fragmented global trading system — a system characterised by a complex web of concessions and barriers that could make cross-border trade more unpredictable and harder to navigate in the years ahead. There is also a consensus that some longstanding vexed environment-trade issues remain unresolved and that lack of progress on these issues is holding back international cooperation and policymaking. But there is also hope that the stronger environmental agenda that is likely to emerge in coming years can contribute to restoring faith in multilateralism as well as promoting the trade policies that are central to achieving important environmental outcomes.

The newfound consensus on emerging trade and environment issues will be tested by the considerable uncertainty produced by the economic fallout of the COVID-19 crisis. While this crisis may not in itself result in a major restructuring of global trade, its impact on economic activity and trade volumes will be a major feature of the global economy lasting well into the early years of the current decade. In the same way that international cooperation is essential to addressing the global crisis, so too will it be central to accelerating recovery worldwide. There are growing calls for pressing environmental considerations to be an integral part of this effort, ensuring that the post-COVID recovery integrates inclusiveness with climate and biodiversity concerns (OECD, 2020[102]). Opportunities for greening the recovery in the wake of the COVID-19 crisis were explored in a recent OECD Environment Working Paper that draws on lessons from the green stimulus packages introduced in the wake of the 2007-2008 global financial crisis (Agrawala, Dussaux and Monti, 2020[103]). The paper explores how green recovery packages could be tailored to the specificities of the COVID-19 crisis, with an emphasis on the nexus between public health and environment, and greater attention to social and distributional consequences. An important additional dimension to consider is the possible distortionary trade effects of green stimulus measures, at a time when the free flow of goods and services is ever more important (OECD, 2020[104]).

## Potential directions and options for future analysis

A major lesson of the past twelve years is the imperative need for data, analysis and policy proposals in the area of trade and the environment. Growing public and policy attention to trade and environment issues will require solid data, accessible information, and reliable analysis.

Much progress has been made and many research issues have been addressed, generating new avenues for research: as analysis deepens, areas where knowledge is lacking become more evident and new options for policy exploration open up, with guidance provided by the JWPTE's parent Committees. This momentum is checked against a changing context, particularly at a time when the trade and environment nexus is in the throes of a major transformation.

Another take-away of this retrospective of the JWPTE's work is that analytical advances are only possible with improved data, indicators and modelling, while qualitative approaches are indispensable to understand emerging issues and concerns. Typically, advances in databases and inventories (e.g., on government support), typologies (for environmental goods or environmental labelling schemes) and indicators (on emissions, raw materials or inputs embodied in trade for instance) have enabled new empirical work that has led to analytical progress on policy links and outcomes, as well as modelling that has been of particular value for prospective analysis. The work initiated by the JWPTE in the future will therefore still need to concern itself with both quantitative and qualitative analysis, with a steady interplay between the two.

As evidenced by the sum of work documented in this retrospective, trade and environment issues are often technically complex and politically arduous. In line with its mandate, the JWPTE's work will continue to be posited on the fact that trade liberalisation can contribute to, but not alone bring about, environmental benefits, and that the relationship between environment and trade is a two-way street. Policy advances stem from finding and exploiting the synergies between these two essential pillars of international co-operation. The JWPTE has a dual point of view that places it in a unique position to explore these synergies. Few trade and environment issues fit neatly within sectoral silos, and most are

multi-dimensional: they are relevant to more than one set of trade rules or environmental policy measures, they overlap with other trade-environment challenges, and they have development and equity dimensions.

Traditional approaches to categorising trade and environment priorities are likely to become less relevant with the development of international value chains, digitalisation and circular economy approaches and a broader view of sustainable resource management. Understanding the links between trade, investment and environmental regulation requires analysing how businesses are optimising global value chains using different channels of internationalisation – trade, FDI and strategic partnerships. Trade policies and co-operation will be to be revisited to take account of the fragmentation of value chains and ensure trade remains a strong driver of environmental industries and innovation, with international green investment and services playing a greater role. The expansion of the digital economy and services is multiplying interactions and indirect effects on trade and environmental outcomes. The inclusion of land use, ecosystems and biodiversity in a wider definition of natural resource use beyond the use of raw materials, water and other commodities transforms traditional policy approaches to sustainable development and trade. Green growth policies require circular economy paradigms to be founded on a new understanding of the natural resource basis of the economy and international flows, improving knowledge of the factors that drive resource use and productivity across time, countries and sectors.

The directions and options for potential future work outlined in this section follow the structure of this report and are divided into broad themes at the trade and environment nexus: reform of government support, EGS, ELIS, RTAs and the environment, policy indicators, biodiversity, the circular economy, and digitalisation (Table 2). This tentative list of options and themes is not exhaustive nor is it ascribed to a specific timeframe. All the possible options are relevant to more than one theme, providing ample opportunities for synergies in future work programmes. In addition, they intersect with horizontal themes such as innovation, subsidies, global value chains and competitiveness, that are central to the JWPTE's work, relevant to broader OECD work and high on the international policy agenda.

**Table 2. Possible options for potential future work themes**

| Trade and environment themes | GVCs | EGS | Subsidies | Competitiveness | Innovation | Circular eco. | Digitalisation |
|---|---|---|---|---|---|---|---|
| **Reform of government support** | | | | | | | |
| Database on support for metals/ other material resources | | | ✓ | ✓ | | ✓ | |
| Case studies on metal producing countries | | | ✓ | ✓ | | ✓ | |
| Value chain approach to support for material resources | ✓ | | ✓ | ✓ | | ✓ | |
| **Environmental goods and services** | | | | | | | |
| Digitalisation of environmental services | | ✓ | | | ✓ | | ✓ |
| Trade as a driver of environmental industries and innovation | | ✓ | | ✓ | ✓ | | |
| Mapping GVCs for EGS and policy interaction | ✓ | ✓ | | | ✓ | | |
| **ELIS** | | | | | | | |
| Case studies of circular economy ELIS schemes | | | | ✓ | | ✓ | |
| Multiplications of circular econ. labelling & information schemes: trade implications | | | | ✓ | | ✓ | |
| **RTAs and the environment** | | | | | | | |
| Harmonisation of regulations relating to the circular economy | | | | ✓ | | ✓ | |
| Liberalising trade in environmental services | | ✓ | | ✓ | | | |
| **Policy indicators** | | | | | | | |
| Using emissions/materials embodied in trade to study effect of env. policies | | | | ✓ | | ✓ | |
| Using waste & scrap trade indicators to model the effect of environmental policies | | | | ✓ | | ✓ | |
| Analysis of the relationship between enabling policies & regulations for renewables and trade in EGS indicators | | ✓ | | ✓ | ✓ | | |
| Analysis of the relationship between support for fossil fuels and EGS tariffs indicators | | ✓ | ✓ | ✓ | | | |
| Follow up analysis on agricultural nutrient balances and environmental impacts | ✓ | | | ✓ | | | |
| **Circular economy transition** | | | | | | | |
| Modelling export restrictions on primary & secondary materials | | | | | | ✓ | |
| Modelling embedded material in trade | | | | ✓ | | ✓ | |
| Alternatives to import restrictions for managing waste & scrap | | | | ✓ | | ✓ | |
| Potential for increased international coordination of resource efficiency through trade | | | | ✓ | | ✓ | |
| Role of trade in plastic prod. use & recycling: data survey | | | | | | ✓ | |
| **Trade and biodiversity** | | | | | | | |
| Assessment of trade-related ecosystem & biodiversity impacts | | | | ✓ | | | |
| Analysis of potential ecosystem/biodiversity leakage | | | | ✓ | | | |
| Land use & ecosystems impacts embodied in trade | | | | ✓ | | | |
| Development of trade & biodiversity indicators | | | | | | | |
| Trade impacts of policies for biodiversity conservation & sustainable land use | | | ✓ | ✓ | | | |
| **Digitalisation** | | | | | | | |
| Use of digital traceability in the greening of GVCs | ✓ | | | | | ✓ | ✓ |
| Implications of digital traceability for the circular economy transition | | | | | | ✓ | ✓ |
| Trade policies and cooperation in plastics | | | | | | ✓ | |

*Note*: The options in this list are tentative and non-exhaustive, and not allocated to a specific timeframe.

### *Reform of government support*

Major progress on analysing government support for agriculture, fisheries and fossil fuels has been made in the OECD, especially in the past decade, with more work on these topics scheduled in current work programmes (see Chapter 2). A 2013 report commissioned by the JWPTE emphasised how little attention had been devoted to quantifying government support available in other sectors (for instance in the non-energy minerals sector, see (Griffith, 2013[105])). The OECD has since developed a typology of support measures for primary and secondary metal production that was published as an Environment Working Paper in 2018 (McCarthy and Börkey, 2018[106]). Nevertheless, significant gaps remain in knowledge about government support for the metal sector and this work is at an earlier stage of development than comparable OECD assessments of government support in sectors such as fossil fuels and fisheries. Extending such work to a range of other material sources (copper and phosphorus for instance) would provide valuable input into several streams of JWPTE work, notably trade and the circular economy transition.

Recent OECD work on support measures in the aluminium value chain shows that market distortions are a concern, with implications for global competition and the design of trade rules disciplining government support, as well as for environmental outcomes, though these were not examined in detail (OECD, 2019[107]). Taking a value chain approach to government support could provide insights into areas that are often overlooked, including how they affect trade and resource efficiency. This approach is particularly valuable where patterns of support are changing due to large emerging markets joining the global economy and where global value chains expanding.

### *Environmental goods and services*

Trade in services is among the fastest growing components of world trade, far outpacing trade in manufactured goods. The JWPTE has turned its attention to this topic on several occasions over the last few years, but there remain many under-studied areas of analysis, partly because new technologies have opened up a range of possibilities to deliver environmental services across borders. As is the case for many other topics relating to digitalisation, these developments are recent and fast moving, and could benefit from more attention in terms of both surveying developments and analysing implications for the trade and environment interface.

The importance of innovation for the environment was recently highlighted in the G20 Karuizawa Innovation Action Plan on Energy Transitions and Global Environment for Sustainable Growth, which aims to address the fact that innovation in environmental technologies has slowed and that many new technologies are not deployed at scale. For instance, according to the IEA, only four out of 38 low-emission technologies fundamental to achieving the 2°C climate target are on track to penetrate markets sufficiently (IEA, 2018[108]). Addressing barriers to the deployment of existing and future technological, economic and business model innovations is a policy priority in the green transition. Under its current work programme, the JWPTE has decided to investigate whether trade drives the diffusion of the technology and specific know-how essential to a low-carbon transition. On-going work is testing empirically first mover advantage and trade benefits in the wind turbine industry. There is scope to follow up this work in other innovative sectors and technologies to gain insights into the role trade can play in furthering their diffusion.

OECD work on global value chains for EGS have revealed considerable differences in the production and market structure of EGS and the role of global value chains. Some segments, such as the wind turbine industry, benefit from geographical proximity to end-

user markets, especially for the supply of large-scale components. Some market segments (e.g., for wind turbines, solar photovoltaic modules) are characterised by high degrees of vertical integration, while others (e.g., for monitoring instruments) are not. Only some segments are capital and knowledge intensive. Taking account of these developments, many of which are on-going, it would be useful to revisit the topic of EGS from the new viewpoint of how they are integrated in GVCs, including environmental services, and explore how trade policies are interacting with their supply and markets.

### *RTAs and the environment*

There are several specific areas of analysis that can follow up on existing work on greening RTAs and support other areas of on-going work, such as market access for environmental technologies. For instance, there is scope for coordinating and providing mutual recognition of measures that are relevant to the circular economy, such as EPR schemes, standards for recyclability and reparability, as well as standards for recycled content.

In addition, the JWPTE has established a solid basis for further work on environmental services which could benefit from specific treatment in the context of work on greening RTAs, particularly in view of the growing importance of environmental services for the EGS industry as a whole. This prioritisation is relevant to the study of both environmental provisions and other provisions in RTAs.

### *Policy indicators on trade and the environment*

The 2019 report presenting a set of policy indicators on trade and the environment was intended as a first step that could identify underlying trends. It pointed to two areas where progress is needed: methodological development and addressing data gaps, both of which constitute major undertakings which can be envisaged over the medium term.

In a shorter timeframe, there are several possible avenues for further investigation using the indicators that have already been identified, and which can help understand the drivers behind trade patterns and competitiveness impacts. For instance, the indicators on carbon emissions embodied in trade can be used to model how they are affected by changes in the stringency of environmental policies, and modelling could be used to understand the drivers behind trends in indicators relating to raw materials embodied in trade or trade in waste and scrap.

### *Trade and resource efficient circular economies*

On-going work on trade and the circular economy transition has a modelling stream which could be extended in several directions that would provide a basis for analytical work on policy options, drawing on the trade and circular economy indicators (raw material embodied in trade, and trade in waste and scrap) recently developed by OECD as part of the basic set of trade and environment indicators.

Trade in waste, scrap and secondary materials, second-hand goods and remanufactured goods are emerging topics which are less well quantified and understood than trade in primary raw materials. There are several on-going OECD projects devoted to filling some of these knowledge gaps. Uncharted areas relevant to the trade and environment nexus could be of particular interest to the JWPTE, notably exploring alternatives to import restrictions and the potential for increased international co-ordination to support resource efficiency through trade.

The 2017 meeting of the OECD Green Growth and Sustainable Development Forum devoted to Greening the Ocean Economy emphasised the extreme urgency of issues related to the ocean economy (OECD, 2018[109]). It concluded that it will be crucial to align policies that are relevant to the transition to a greener ocean economy, but this requires more emphasis on policy areas that are outside core ocean policies, such as competition policy and trade policy.

With growing public and policy attention to ocean ecosystems, plastic pollution has come under the spotlight. Trade plays a central role in plastic waste and scrap management and in the global plastics economy. Recent OECD work noted that there is a lack of consistency in reporting of international trade data on recycled plastics, reducing the ability of actors to make evidence-based decisions and interventions (OECD, 2018[60]). Despite increasing efforts across the globe to address plastic pollution, the relevance of trade to the production, use and disposal of plastics has been underestimated and needs to be better understood.

### *Trade and biodiversity*

Carbon leakage, pollution havens and other trade-related potential competitiveness issues resulting from differences in the stringency of pollution and climate change mitigation policies have been the focus of much attention over the last decade. The effect on trade and competitiveness of differences in the environmental management of land use, ecosystems and biodiversity has been less studied. Trade in land use and ecosystem-relevant goods means that the land-use impacts associated with a country's consumption of goods may not reflect the land-use impacts associated with its production. To prevent remote impacts from undermining the achievement of biodiversity protection goals, upstream land-use implications of production, consumption and trade need to be better understood.

The CBD Aichi Targets expiring in 2020 provide an opportunity for governments worldwide to reinvigorate collective efforts on biodiversity and update targets even if they have not been all met. The OECD is working on the Post-2020 Global Biodiversity Framework to provide new targets, indicators and measurability. This effort can be used to explore how trade and biodiversity indicators could help understand the linkages between trade and biodiversity, and what type of data would be needed and are available to build such indicators.

An OECD report for the 2019 G7 meeting tracked the scale and types of financing for biodiversity and called for improving the integration of biodiversity goals and considerations into sectoral policies including trade (OECD, 2019[110]). OECD research estimates that the finance mobilised to conserve and sustainably use biodiversity amounts to just a tenth of only two types of subsidies that are potentially harmful to the environment (OECD, 2018[111]). The stronger biodiversity agenda that is likely to emerge beyond 2020 will imply that funding be increased. This opens up two new areas for analysis: on the one hand there is as yet little understanding of the trade effects of scaling up funding and economic instruments for biodiversity conservation and sustainable ecosystems services, and on the other there is a need to explore how to ensure that funding can be applied in a manner that optimises trade and environment outcomes.

### *Environmental labelling and information schemes*

The trade implications of the multiplication of circular economy labels and information schemes, notably business-to-business and consumer-oriented schemes, are directly relevant to the work of the JWPTE. Such schemes are a subset of the ELIS analysed by the JWPTE in the mid-2010s. Since this time their number has considerably increased, calling

for the trade aspects of the multiplication of existing and emerging circular economy labelling and information schemes to be revisited.

### *Digitalisation, trade and the environment*

There is a range of on-going OECD analysis on digitalisation, notably under the umbrella of the Going Digital project. Cross-directorate horizontal analysis on the question of how new digital technologies can enhance the traceability of trade in environmentally sensitive goods is of particular interest to the JWPTE. The 2011 JWPTE study on illegal trade in environmentally sensitive goods could be brought up to date to consider the impact and potential of digital technologies.

Building on this work, there are several aspects that deserve to be further explored within the context of trade and environment issues, such as the use of digital traceability to assist in greening value chains across countries, and the implications of digital traceability for the circular economy transition, notably with respect to trade in waste and secondary materials.

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# Annex 1: JWPTE Papers 2008-2020

## OECD Trade and Environment Working Papers[12]

No. 2020/02 New Digital Technologies to Tackle Illegal Trade in Pesticides
Clara Frezal and Grégoire Garsous

No. 2020/01 Greening regional trade agreements: Subsidies related to energy and environmental goods
Shunta Yamaguchi

No. 2019/01 Trends in Policy Indicators on Trade and Environment
Grégoire Garsous

No. 2018/03 International Trade and the Transition to a More Resource Efficient and Circular Economy
Shunta Yamaguchi

No. 2018/02 Assessing the Effectiveness of Environmental Provisions in Regional Trade Agreements
Inmaculada Martínez-Zarzoso

No. 2018/01 Assessing Implementation of Environmental Provisions in Regional Trade Agreements
Clive George and Shunta Yamaguchi

No. 2017/03 Climate change and trade policy interaction
Harro van Asselt

No. 2017/02 Trade in services related to the environment
Jehan Sauvage and Christina Timiliotis

No. 2017/01 International trade consequences of climate change
Rob Dellink, Hyunjeong Hwang, Elisa Lanzi and Jean Chateau

No. 2014/03 The Stringency of Environmental Regulations and Trade in Environmental Goods
Jehan Sauvage

No. 2014/02 Environment and Regional Trade Agreements
Clive George

No. 2014/01 Developments in Regional Trade Agreements and the Environment
Clive George

[12] These Working Papers are available at the OECD on-line publications library https://www.oecd-ilibrary.org/

No. 2013/06 Border Carbon Adjustment and International Trade
Madison Condon and Ada Ignaciuk

No. 2013/05 Measuring Environmental Regulatory Stringency
Claire Brunel and Arik Levinson

No. 2013/04 Developments in Regional Trade Agreements and the Environment
Clive George

No. 2013/03 Measures Supporting Minerals and Primary Metals Extraction and Processing
Marnie Griffith

No. 2013/02 Cross-Border Trade in Electricity and the Development of Renewables-Based Electric Power
Heymi Bahar and Jehan Sauvage

No. 2013/01 Domestic Incentive Measures for Renewable Energy with Possible Trade Implications
Heymi Bahar, Jagoda Egeland and Ronald Steenblik

No. 2011/06 Implementing Regional Trade Agreements with Environmental Provisions
Peter Gallagher and Ysé Serret

No. 2011/05 The Trade Effects of Phasing Out Fossil-Fuel Consumption Subsidies
Jean-Marc Burniaux, Jean Château and Jehan Sauvage

No. 2011/04 Trade-Related Measures Based on Processes and Production Methods in the Context of Climate-Change Mitigation
Evdokia Moïsé and Ronald Steenblik

No. 2011/03 Trade in Services Related to Climate Change
Ronald Steenblik and Massimo Geloso Grosso

No. 2011/02 Regional Trade Agreements and the Environment: Monitoring Implementation and Assessing Impacts
Clive George

No. 2011/01 Regional Trade Agreements and the Environment
Clive George and Ysé Serret

No. 2010/01 Environment and Regional Trade Agreements
Peter Gallagher and Ysé Serret

No. 2009/02 Facilitating Trade in Selected Climate Change Mitigation Technologies in the Energy Supply, Buildings, and Industry Sectors
Ronald Steenblik and Joy A. Kim

No. 2009/01 Environment and Regional Trade Agreements
Simone Gigli

No. 2008/02 Checklist for Negotiators of Environmental Provisions in Regional Trade Agreements
Cristina Tébar Less and Joy A. Kim

No. 2008/01 Trade and Environment at the OECD
Michel Potier and Cristina Tébar Less

## Other unclassified reports of the JWPTE[13]

Report on the OECD Workshop on Regional Trade Agreements and the Environment in Chile COM/TAD/ENV/JWPTE(2018)1/FINAL

Report on the OECD Workshop on "Greening Regional Trade Agreements" COM/TAD/ENV/JWPTE(2016)7/FINAL

Report on the Regional Workshop on "Regional Trade Agreements and the Environment" COM/TAD/ENV/JWPTE(2014)48/FINAL

Multiplication of Environmental Labelling and Information Schemes (ELIS): Implications for Environment and Trade COM/TAD/ENV/JWPTE(2014)26/FINAL

A Review of Public Policies Relating to the Use of Environmental Labelling and Information Schemes (ELIS) COM/TAD/ENV/JWPTE(2014)1/FINAL

Domestic Incentive Measures for Environmental Goods with Possible Trade Implications: Electric Vehicles and Batteries COM/TAD/ENV/JWPTE(2013)27/FINAL

Illegal Trade in Environmentally Sensitive Goods
COM/TAD/ENV/JWPTE(2011)45/FINAL

Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels – 2012
COM/TAD/ENV/JWPTE(2012)47/FINAL

Inventory of Estimated Budgetary Support and Tax Expenditures Relating to Fossil Fuels in Selected OECD Countries COM/TAD/ENV/JWPTE(2011)11/FINAL

Regional Trade Agreements and the Environment - Developments in 2011 COM/TAD/ENV/JWPTE(2011)43/FINAL

Promoting Energy Efficiency Through Trade COM/TAD/ENV/JWPTE(2010)7/FINAL

Reducing barriers to international trade in non-hazardous recyclable materials: exploring the environmental and economic benefits, Part 1: A synthesis report COM/TAD/ENV/JWPTE(2008)27/FINAL

Reducing barriers to international trade in non-hazardous recyclable materials: exploring the environmental and economic benefits. Part 2: Findings of five country case studies COM/TAD/ENV/JWPTE(2008)27/ANN/FINAL

[13] These documents can be found online at http://www.oecd.org/officialdocuments

OECD Workshop on Regional Trade Agreements and the Environment Tokyo, 19-20 June 2007 COM/TAD/ENV/JWPTE(2007)34/FINAL

# Annex 2: Trade and environment workshops, seminars, and policy and high-level dialogue sessions

## JWPTE workshops, seminars and policy dialogue sessions

Workshop on Regional Trade Agreements and the Environment, Tokyo, Japan, 19–20 June 2007

JWPTE Seminar on a Future Trade and Environment Agenda, Paris, 4 December 2007

Regional Workshop on Regional Trade Agreements, Santiago, Chile, 6–7 October 2008

Workshop on Regional Trade Agreements: Monitoring implementation and Assessing Impacts, Paris, 1–2 June 2010

Border Carbon Adjustment and International Trade: A Policy Dialogue, Paris, 11 June 2013

JWPTE Seminar on Long-Term Perspectives on Trade and the Environment, Paris, 10 June 2014

Regional Workshop on Regional Trade Agreements and the Environment, Hà Nội, Vietnam, 17–18 September 2014

Workshop on Greening Regional Trade Agreements: Opportunities and Insights from International Experience, Paris, 10 June 2016

Workshop on Regional Trade Agreements and the Environment: Establishing Dialogue with Regional Stakeholders, Santiago, Chile, 23–24 January 2018

Workshop on International Trade and the Circular Economy, Paris, 26–27 February 2020

## Relevant OECD workshops and high-level dialogue sessions

OECD Global Forum on Trade: Trade and Climate Change, Paris, 9–10 June 2009

23rd OECD Round Table on Sustainable Development|: Competitiveness, Leakage, and Border Adjustment: Climate Policy Distractions? Singapore, 22–23 July 2009

OECD Expert Workshop on Optimising Global Value Chains for Environmental Goods and Services, Paris, 8 June 2016

OECD Ministerial Council Meeting 2017 "Making globalisation work: Better lives for all"

35th OECD Round Table on Sustainable Development: Trade and Environment Interactions: Governance Issues, Paris, 28–29 June 2017

OECD Ministerial Council Meeting 2018 "Reshaping the foundations of multilateralism for more responsible, effective and inclusive outcomes"

37th OECD Round Table on Sustainable Development: Accelerating the Development and Diffusion of Low-Emissions Innovations, Paris, 20–21 November 2018