



**Sustainable
Stock Exchanges**



wfe WORLD FEDERATION
OF EXCHANGES

How derivatives exchanges can promote sustainable development

An action menu



Note

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The views expressed in this paper are those of UNCTAD, UN Global Compact, UN Environment, the PRI and the WFE unless otherwise stated; the paper does not necessarily reflect the official views of individual members of the advisory group or their respective organisations.

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About the SSE

The SSE initiative is a UN Partnership Programme organised by UNCTAD, UN Global Compact, UNEP FI and the PRI. The SSE's mission is to provide a global platform for exploring how exchanges, in collaboration with investors, companies (issuers), regulators, policy makers and relevant international organisations can enhance performance on environmental, social and corporate governance issues and encourage sustainable investment, including the financing of the UN Sustainable Development Goals. The SSE seeks to achieve this mission through an integrated programme of conducting evidence-based policy analysis, facilitating a network and forum for multi-stakeholder consensus-building, and providing technical guidelines, advisory services and training.

About the WFE

The WFE is the global industry group for exchanges and clearing houses around the world, representing over 250 market infrastructures ranging from those that operate the largest financial centres to those that run frontier markets. Founded in 1961, the Federation was set up to contribute to the development, support and promotion of organised and regulated securities markets in order to meet the needs of the world's capital markets in the best interests of their users.

FOREWORD

Sustainability has moved from the fringes of the financial sector to the mainstream in recent years. The industry has increasingly embraced a transition to a more sustainable and inclusive economic model, with support from governments, regulators, investors, and the broader society.

As core marketplaces for the design and trading of new products, exchanges must be at the heart of the focus on sustainability for genuine change to take place.

The 2009 launch of the Sustainable Stock Exchanges (SSE) initiative represented a major step forward. The SSE's work on sustainable finance, ESG disclosure, responsible investing, risk mitigation, and benchmarking has provided a template on sustainability for stock exchanges worldwide.

This report represents the first work by the SSE to extend beyond equity markets and stock exchanges into listed derivative markets, a welcome next step.

The report reviews the current approaches of derivatives exchanges in sustainability and suggests areas of further work and reflection. Without the risk management products and the forward price discovery that exchanges can bring, a transition to a more sustainable future will be more difficult, costly, and significantly less efficient.

CME Group is proud to support this effort and honoured to have served as chair of the derivatives Advisory Group that included distinguished colleagues from derivatives exchanges around the globe and the World Federation of Exchanges (WFE).

We believe that this report will help derivatives exchanges consider how best to embed sustainability within their operations. We recommend it to our colleagues within the derivatives ecosystem and congratulate all involved in its preparation.



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Chief Commercial Officer,
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EXECUTIVE SUMMARY

While the role of stock exchanges and equity markets has been well-explored over the past decade, the potential role of derivatives and derivatives markets is less understood. This document provides an overview of the role of derivatives markets generally, presents some of the things derivatives exchanges are already doing in relation to sustainability, and highlights ways in which these exchanges can support the transition to more sustainable development pathways.

The report identifies an action menu of opportunities for all exchanges. Some of these actions (e.g. product development) may happen in response to market signals and opportunities created by regulatory developments. Others will depend on an exchange's assessment of where it is able to have impact given its operating environment and level of support from participants in its ecosystem. Ultimately there are opportunities for all exchange operators to ensure their markets are responding to the sustainability imperative.

An action menu for derivatives exchanges to promote sustainable development

- 

Engage in Partnerships
Participate in multi-stakeholder dialogue to build consensus on sustainable finance in derivatives markets.
- 

Drive Standardization
Promote market agreement on reference standards for sustainability themed products.
- 

Enhance Transparency
Provide solutions to enhance transparency about the sustainability attributes of traded products and market participants.
- 

Link Market Participation to Sustainability
Can range from requiring sustainability reports to requiring demonstrated alignment with agreed sustainability practices.
- 

Introduce ESG Data Products
Introduce sustainability-aligned data products that support the functioning of the traded market and can be the basis for new tradeable products.
- 

List Tradeable ESG Products
Meet emergent demand for new sustainability aligned derivatives products across all asset classes.

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1. INTRODUCTION

In June 2020, the United Nations Secretary-General Antonio Guterres said: “The pandemic has demonstrated the fragility of our world. It has laid bare risks we have ignored for decades: inadequate health systems; gaps in social protection; structural inequalities; environmental degradation; the climate crisis.”¹ The scope and scale of the sustainability challenges he points to are such that no single body or entity can address them alone while the nature of many of these challenges means that addressing them is becoming increasingly urgent. In addition to action from government, business and civil society, finding solutions to these global challenges also requires the support of the finance sector.

This report begins by setting out the sustainable development policy and investment context, and provides an introduction to derivatives and how derivatives exchanges operate (primarily for those unfamiliar with these markets). It highlights specifically the price risk hedging and price transparency functions performed by derivatives products, which supports the effective functioning of the underlying markets.

The next section explores existing sustainability-linked exchange activities. Many of these respond to changes in the underlying market (whether changes in demand or in the regulatory environment) and cover a full spectrum of initiatives from the introduction of products such as equity index derivatives developed specifically to cater for a growing focus on sustainable investment and energy and carbon-linked products for entities subject to emerging regulatory regimes to the introduction of responsible sourcing requirements for commodity producers.

The report concludes with an exploration of additional ways in which derivatives exchanges can contribute to sustainable development and finds that these exchanges, similar to stock exchanges, have several opportunities in this regard.

2. SUSTAINABILITY AND DERIVATIVES MARKETS

2.1 The sustainability challenge

Since the launch of the United Nations Sustainable Development Goals (SDGs) in 2015, integrating environmental and social sustainability into global production systems and international trade and investment has shifted into the mainstream. Whether viewed narrowly through the lens of the business case, or more broadly as part of a moral imperative, there is general recognition that current economic pathways are unsustainable. Climate change, an existential risk, provides perhaps the starkest example of this. While progress has been made in reducing emissions, even the more “optimistic” emissions trajectory suggests the global climate is still heading for three degrees of warming by 2100.² The best available science, through the Intergovernmental Panel on Climate Change, indicates that the impacts of this global warming (including sea level rise and extreme weather events) will lead to catastrophic events affecting our interlinked environmental, social and economic ecosystems.³ In 2020, the COVID-19 pandemic has raised awareness of the impacts of human activity on the destruction of natural habitats. The pandemic also highlighted persistent and in some cases, worsening, economic inequities.

In response to this growing appreciation of planetary boundaries and social imperatives, policymakers, regulators and private sector actors are placing greater emphasis on environmental and social sustainability and the funding required to achieve this. In addition to focused public sector investment, there is a need for a significant mobilization

¹ United Nations Secretary-General (2020) [Secretary-General's Nelson Mandela Lecture: “Tackling the Inequality Pandemic: A New Social Contract for a New Era” \[as delivered\]](#).

² Hausfather, Z. and Peters, G. (2020) ‘Emissions – the “Business as Usual Story Is Misleading”.

³ ‘UN emissions report: World on course for more than 3 degree spike, even if climate commitments are met’ (2019).

and reorientation of private finance. UNCTAD estimates that the annual investment gap between existing and required levels of investment to meet the SDGs in developing countries alone is in the order of \$2.5 trillion per year.⁴ As a consequence, various bodies have, over the past decade, promoted the role of insurers, banks, asset owners, asset managers and stock exchanges in driving this reorientation and mobilization of financial flows. In addition to various UN supported initiatives (the Principles for Responsible Investment, the Principles for Sustainable Insurance, the Principles for Responsible Banking and the Sustainable Stock Exchanges initiative) the European Union has said that it would seek “to mainstream the Sustainable Development Goals in the European policy framework”⁵ and has developed the Sustainable Finance Action Plan aimed at “reorienting financial capital to more sustainable investments”.⁶ Central banks and supervisors have meanwhile established the Network for Greening the Financial System (NGFS) “to enhance the role of the financial system to manage risks and to mobilize capital for green and low-carbon investments in the broader context of environmentally sustainable development”⁷ while the International Organisation of Securities Commissions (IOSCO) has announced that it will “step up its efforts to address issues around sustainability and climate change”.⁸ Since its launch in December 2017, the NGFS has grown from eight to 69 central bank members from around the world.⁹

The result of this effort is evident in the growth of sustainable investing.¹⁰ UNCTAD estimates that as at end 2019, sustainability-dedicated investments totalled around \$1.25 trillion. This is made up of green bonds (approximately \$260 billion, up from less than \$50 billion in 2015), sustainability-themed equity funds (about \$900 billion), social bonds (\$50 billion), and COVID-19 response bonds (\$55 billion).¹¹ If broadened to include “responsible investment” funds, the total size of the market increases to over \$30 trillion.

Box 2.1 Regulatory developments in sustainable finance

Regulators around the world are increasingly integrating sustainability considerations into financial markets and are looking to drive greater harmonisation and standardisation across sustainability definitions and frameworks. It is not possible within the bounds of this report to provide a comprehensive overview of what is happening but it is worth highlighting some of these developments to illustrate this growing global trend.

European Union: Since the adoption of the recommendations of the High Level Expert Group on Sustainable Finance at the end of 2018, the EU has introduced a range of regulatory initiatives aimed at mobilising private capital to support the European Green Deal and ensuring the reorientation of financial flows towards more sustainable outcomes. These include:¹²

- The publication of the Taxonomy Regulation for climate change mitigation and adaptation, which gives regulatory effect to the EU taxonomy for sustainable activities. The Taxonomy sets out criteria for economic activities that can contribute positively to climate change mitigation or adaptation, while avoiding significant harm to other environmental objectives. Under the regulation, financial market participants will be required to disclose the alignment (or otherwise) of their products with the EU taxonomy. Companies that are subject to the EU’s existing sustainability disclosures (the Non-Financial Reporting Directive - under review as at time of writing) will be required to disclose how, and to what extent, their activities are associated with taxonomy-aligned activities.
- Regulation on sustainability related disclosures in the financial services sector which requires financial market participants to publish how they take sustainability risks into consideration in their investment decision-making and the negative sustainability impacts of their investments. Where they do not take negative consequences into account, they will be required to disclose the reasons for not doing so. Where a financial market participant offers a product with sustainability objectives, the firm is required to disclose how those objectives are met including to what extent derivatives are used and how these specifically meet the stated sustainability objectives.

⁴ UNCTAD (2014) [World Investment Report](#).

⁵ European Commission (2016) ‘[Sustainable Development: EU sets out its priorities](#)’.

⁶ European Commission (2018) ‘[Commission Action Plan on Financing Sustainable Growth](#)’.

⁷ NGFS, ‘[Network for Greening the Financial System](#)’.

⁸ IOSCO (2020) ‘[IOSCO steps up its efforts to address issues around sustainability and climate change](#)’.

⁹ As at 24 July 2020.

¹⁰ The term “sustainable investing” includes a number of subcategories such as ESG integration, sustainability themed investing, impact investing, etc. For full definitions of sub-categories of sustainable finance see GSIA (2018) [Global Sustainable Investment Review](#), p7

¹¹ UNCTAD (2020) [World Investment Report](#). See Chapter 5 for a full explanation of how the categories of “sustainability-lined” and “responsible investment” are defined.

¹² [Overview of EU efforts to embed sustainability into financial policy](#).

- The Benchmark Regulation which sets out minimum criteria for EU Climate Transition Benchmarks and EU Paris-aligned Benchmarks and requires all benchmarks (other than currency and interest rates) to explain how ESG factors are considered.

The EU has also established an International Platform on Sustainable Finance with the objective of working with international policy makers to “scale up the mobilisation of private capital towards environmentally sustainable investments”.¹³

Singapore: The Monetary Authority of Singapore (MAS) is working to position Singapore as a sustainable finance hub.¹⁴ Over the course of 2020, MAS was consulting on the introduction of requirements for financial firms (banks, insurers and investment managers) to consider and manage environmental risk as part of their business activities.¹⁵

China: In May 2020 the People’s Bank of China (PBOC) and the National Development and Reform Commission (NDRC) proposed merging their green bond criteria (established in 2015) to create a unified green bond taxonomy.¹⁶ Part of the discussion includes considering whether to exclude so-called “clean coal” projects from eligibility which would bring Chinese green bond standards more in line with international definitions.

United States: In September 2020 the Commodity Futures Trading Commission (CFTC) released its report on “Managing Climate Risk in the US Financial System”.¹⁷ The CFTC report further notes that derivatives markets have a role to play in providing risk mitigation instruments. The recommendations, while not binding, include:

- That the US establish a price on carbon;
- That financial regulators should include climate-related risks in their monitoring and oversight activities;
- That regulators pilot climate-risk stress-testing; and
- That material climate risks be disclosed.

Japan: Regulators have been working with industry to encourage and support uptake of the TCFD Recommendations. For example, The Financial Services Agency co-hosted two TCFD symposiums with Japan Exchange Group in 2019 while the Ministry of Economy, Trade and Industry (METI) published a TCFD Guidance for companies in December 2018, and the Ministry of the Environment published a Practical Guide for Scenario Analysis in line with the TCFD Recommendations in March 2020.

For more examples, please see the SSE report [How securities regulators can support the Sustainable Development Goals](#)¹⁸ and the SSE online regulator database: sseinitiative.org/regulation.

2.2 The role of exchanges in promoting sustainable development

Stock exchanges are seen as particularly important enablers of change inasmuch as they are key market infrastructures sitting between listed companies and investors and actively engaged with securities market regulators. A 2017 WFE and UNCTAD report¹⁹ identified several areas where stock exchanges can play a role in promoting sustainable development (box 2.2), including promoting ESG disclosure by listed entities and promoting sustainable finance products.

Box 2.2 The role of stock exchanges in fostering economic growth and sustainable development

UNCTAD-WFE research on the role of stock exchanges in fostering economic growth and sustainable development identifies two main mechanisms through which stock exchanges can contribute to development:

1) Mobilising resources for sustainable economic growth and development:

- a. Well-functioning exchanges facilitate the mobilisation of domestic resources and foreign portfolio flows.

¹³ EU [International Platform on Sustainable Finance](#).

¹⁴ Monetary Authority of Singapore (MAS) [Sustainable Finance](#).

¹⁵ MAS (2020) [Consultation Paper on Proposed Guidelines on Environmental Risk Management for Asset Managers](#).

¹⁶ Climate Bonds Initiative (CBI) (2020) [China’s top regulators announce they will exclude fossil fuels from their green bonds taxonomy. It’s a major development!](#)

¹⁷ CFTC (2020) [Managing Climate Risk in the U.S. Financial System](#).

¹⁸ UN SSE (2018) [How securities regulators can support the Sustainable Development Goals](#).

¹⁹ World Federation of Exchanges and UN Conference on Trade and Development (2017) [The Role of Stock Exchanges in Fostering Economic Growth and Sustainable Development](#).

- b. Exchanges around the world are increasingly focused on improving SME access to finance, as evidenced by the dramatic growth in the number of dedicated SME markets.
- c. A number of exchanges offer sustainability-themed products and services, from ESG-themed indices and funds to green bonds. These assist in promoting companies that better manage ESG issues and mobilising funds towards addressing sustainability challenges.

2) Promoting good governance in business practices:

- a. Many exchanges are promoting greater ESG disclosure among listed companies via voluntary guidance, listing rules, and training activities.
- b. SME development is about more than access to finance. Some stock exchanges have introduced programmes to help SMEs to develop their management capacity, strengthen their governance structures and innovate and grow.

Until 2020, little work had been done to understand the role of derivatives exchanges in supporting the sustainability transition (for one of the few exceptions to this, see the WFE whitepaper). However, during the course of 2020 both the CFTC (box 2.1) and the Futures Industry Association (FIA) have acknowledged the role of derivatives markets, specifically in addressing climate change and associated risks.²¹ This document looks to build on that work by exploring the opportunities for derivatives exchanges in more detail.²² More specifically, this document considers:

- What derivatives exchanges do, how they operate and the actors involved (section 2.3);
- Some of the ways in which derivatives markets are already engaging with sustainability issues (section 3); and
- How these markets might evolve, given sustainability imperatives (section 4).

This work is aimed at both policymakers and derivatives market operators who are interested in understanding the role that derivatives exchanges (and exchange groups) can play in supporting the sustainability transition. While there are many actors in the exchange ecosystem (figure 2.3) that enable the exchange to perform this function and who may independently take measures to support greater sustainability, this paper focuses specifically on the role of the exchange.

2.3 Background: what are derivatives and derivatives markets?

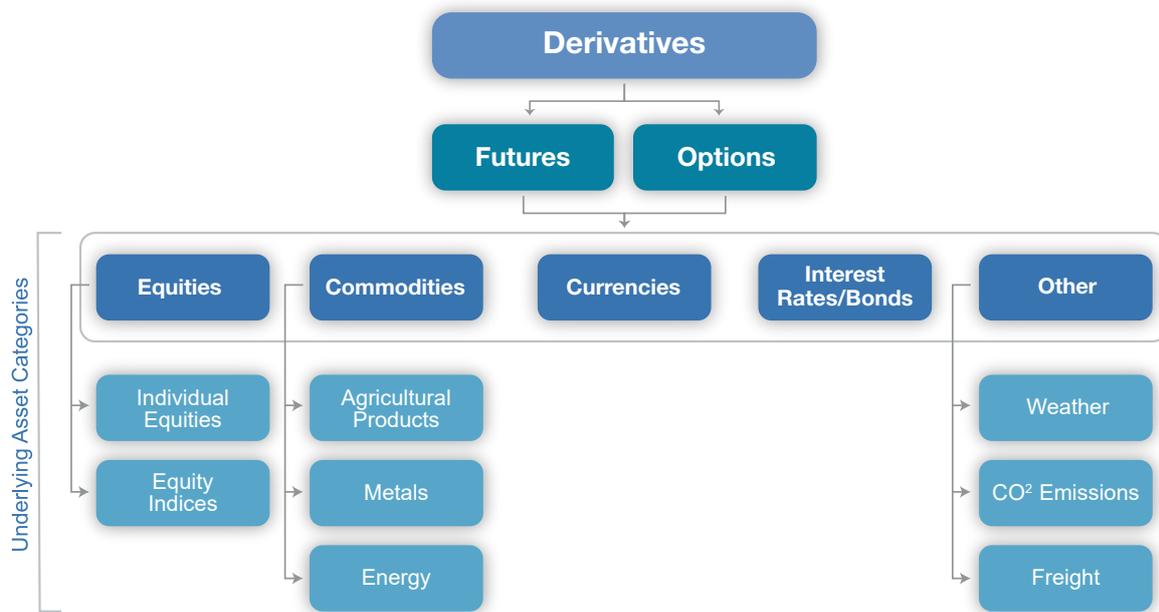
To appreciate where derivatives fit into the broader sustainable finance landscape, it is necessary to understand how derivatives markets work and what derivatives products do.²³ A derivative is a financial instrument that derives its value from some underlying product/asset (figure 2.1). The underlying can be anything from an individual equity to an index or a currency, to physical assets such as a metal or an agricultural product. Depending on the nature of the underlying, the buyer may take delivery of the underlying asset although it is also possible to 'cash-settle' derivatives against a reference price. Derivatives that are traded on an exchange generally take the form of either a future or an option. A future creates an obligation to buy or sell the underlying at the agreed price at a specified future date. An option gives the buyer the right to buy the underlying as specified but does not create an obligation. (The seller of an option is obliged to perform in terms of the contract if the buyer chooses to exercise the option.)

²¹ FIA (2020) [How Derivatives Markets are Helping the World Fight Climate Change](#).

²² The CME, the Chair of the SSE Advisory Group on Derivatives Exchanges, is also a member of the CFTC Climate-related Market Risk Subcommittee and a member of the FIA.

²³ It is beyond the scope of this paper to provide a comprehensive overview of derivatives markets. For more information about derivatives markets and how they work, see for example Heckinger, R., Mengle, D., Steigerwald, R., Ruffini, I. and Wells, K., (2013) [Understanding Derivatives: Markets and Infrastructure](#); Hull, J.C. (2003) *Options futures and other derivatives*. Pearson Education India. Boyle, P. and McDougall, J., (2018) *Trading and pricing financial derivatives: A guide to futures, options, and swaps*. Walter de Gruyter GmbH & Co KG.

Figure 2.1 Categories of exchange-traded derivatives



Source: UNCTAD

Note: Each major product category can be divided into subcategories, e.g. energy could be divided into renewable and non-renewable. This list is indicative and is not intended to be comprehensive.

Derivatives on all sorts of underlying assets are bought and sold daily on derivatives exchanges. The instrument that is traded is called a **contract** and it is through the process of trading that the parties agree the price for the underlying asset. The contract specifies the key attributes of the instrument, namely:

- The underlying asset (including so-called quality attributes, if relevant);
- The quantity of the asset;
- The delivery location or settlement mechanism; and
- The delivery date.²⁴

Derivatives serve several purposes, including:

- *Price risk hedging:* They enable entities that are exposed to price movements in the underlying asset (regardless of the type of asset) to hedge against the risk of that price movement. Thus, for example, a wheat farmer can protect against the risk that the price of wheat may fall between the time that the wheat is planted and the time that it is ready to sell by using derivatives to lock-in a future price for the wheat (section 2.4);
- *Price transparency and price discovery:* By virtue of being traded through markets (whether over-the-counter (OTC) or on-exchange) and being forward-looking, derivatives provide additional price information and insights that are not always as easily available in the underlying market. In more liquid markets, price discovery may happen in the derivative with price convergence happening when the contract is settled; and
- *Investment management:* They provide investment managers with cost-effective means of gaining exposure to the financial performance of an asset or set of assets. Rather than incurring the costs of buying the underlying assets, the asset manager can replicate the financial performance of the underlying through the use of derivatives.

2.4 Commodity trading, derivatives and the real economy

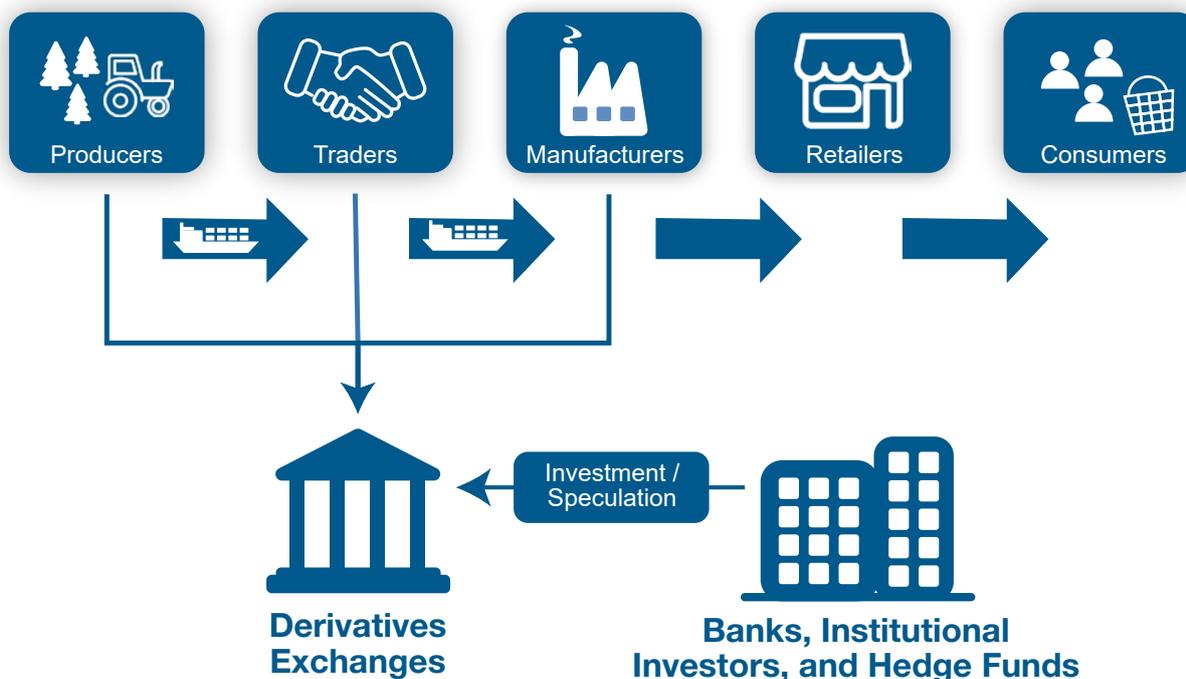
As a consequence of globalization and specialization, many commodities now form part of global supply chains where the raw commodity is grown/extracted in one place, shipped to another for refining/processing and shipped

²⁴ CME Group. [Learn About Contract Specifications](#). Other contract attributes may include currency, contract size and relevant clearing organisation.

somewhere else to be consumed (figure 2.2). While this globalisation of supply chains has the potential to create enormous benefits for both producers and consumers, it also introduces additional complexity and risk. Various entities in the supply chain face the risk that prices will move in a way that negatively impacts their returns. There are a wide range of factors that may impact the available supply of or demand for commodities. Examples include (to name just a few) changes in technology, changes in government policy, and adverse weather events.²⁵

The ability to manage the price risk (to 'hedge' it) through the use of standardised, liquid derivatives contracts is one of the factors that enables these underlying markets to function. These price risk hedging tools and the price information they provide, support the operation of the underlying markets.

Figure 2.2 Example of a commodity supply chain with price risk hedging



Source: UNCTAD, based on work by the Banking Environment Initiative convened by the Cambridge University Institute for Sustainability Leadership

The link to the real economy is maintained through the ability of many derivatives contracts (particularly in commodities markets) to be physically settled (i.e. to take delivery of the actual commodity). While it happens infrequently, buyers have the option to take delivery of the product specified in the contracts that they have bought. This ability to take delivery ensures ongoing convergence between the derivatives and the underlying market. Where products are cash settled only, the link to the underlying market may be maintained through incorporation of a credible spot market reference price in the settlement price.²⁶

2.5 Benefits of derivatives exchanges and how they work

Derivatives can be bought and sold OTC, but there are several advantages of trading via exchanges:

- The products that are traded are standardised. This means they are potentially more liquid and consequently more cost-effective than their OTC counterparts;
- Trade information (prices and volumes) is transparent, providing users with an indication of what the market is doing;
- Exchange trading is subject to regulatory rules and oversight that contribute to a more secure trading environment; and
- All exchange-traded derivatives are cleared via a central counterparty (CCP) – this limits the counterparty risk that participants are exposed to, thereby also reducing systemic risk.

²⁵ [Futures Fundamentals - Derivatives Made Simple](#). This online resource provides a very basic overview of derivatives markets and how they operate.

²⁶ See, for example, the New Zealand Exchange's [Dairy Futures and Options](#), which are used to manage price risk and are cash settled.

While derivatives exchanges sit at the centre of the exchange-traded market, they form part of a broader ecosystem. In addition to the investors, speculators and the hedgers (the end-users) there are several other participants that are required for the market to function, namely the CCP, the brokers, and the clearing members. In the case of commodity markets, warehouse operators are also a core part of the market functioning. Other very important players are price reporting agencies (PRAs - specific to commodity markets)²⁷ and index operators, who provide reference prices for the underlying market, independent software vendors (ISVs), who develop the software that enables trading and clearing, and data providers who ensure information dissemination and provide additional analytics (figure 2.3).

Figure 2.3 Participants in the derivatives exchange ecosystem²⁸



Source: UNCTAD

Given the number of participants involved in the operation of the market, and the terms that need to be considered in the creation of a contract, the exchange cannot unilaterally list a new contract or amend the specifications of existing contracts. Typically, a contract must focus on a widely relevant (and widely followed) indicator, in such a way that it can form a basis for interaction between hedgers and a range of other users. To achieve this, an exchange will not only specify the underlying asset (including criteria such as quality and delivery point) but also standardise certain economic terms (notably, how much to deliver and when). This makes the contract targeted enough for end users, while simultaneously supporting liquidity by making the contract readily tradable. More specifically, for an exchange to consider launching a new tradeable product:

- *Balance between standardisation and specificity:* It must be possible to create a contract that is sufficiently standardised to be liquid, yet sufficiently specific to hedge the risk that the user is exposed to;
- *Clear standards.* The underlying asset and the relevant quality attributes need to be clearly defined and identifiable. This means that there needs to be a set of clear and agreed standards or specifications that can be incorporated either directly or by reference into the contract;
- *Verification.* There must be a way of verifying that these standards are being adhered to;

²⁷ Johnson (2018). [The Price Reporters](#). London: Routledge.

²⁸ Some of these entities are specific to commodity derivatives exchanges. Note also that this figure is not intended to show all participants involved in derivatives markets but to provide an indication of which participants would typically be involved and/or consulted in the introduction of a new product or amendment of an existing product.

- **Reference price.** Generally, there must be a mechanism for determining a reference price for the underlying (for example, a credible spot market, an index or a PRA). It is also possible with physically settled contracts that the contract itself determines the reference price, but this requires significant liquidity, making contracts like these more challenging to launch successfully; and
- **Stakeholder support.** The product needs to be supported by relevant stakeholders in the ecosystem beyond just the exchange. Thus, for example, entities that are responsible for delivering into the contract must be in a position to meet the contract requirements and there must be clearing members who are prepared to clear the product at a reasonable cost.

Derivatives are widely-used around the world. Nearly 35 billion futures and options contracts were traded on derivatives exchanges around the world in 2019.²⁹ Ultimately, derivatives products (with their risk management and price discovery functions) and the exchanges that facilitate their trading play a critical role in supporting the functioning of the underlying markets.

3. EXISTING SUSTAINABILITY-RELATED PRODUCTS AND INITIATIVES

The sustainability transition presents derivatives exchanges with both opportunities and challenges. A primary challenge for exchanges where fossil-fuel energy contracts account for a large proportion of traded activity is that fossil fuels are expected to be significantly phased out over the coming decades (box 3.1). On the positive side, the transition also presents opportunities for all derivatives exchanges, including those specialising in financial derivatives, to work with the participants in their ecosystem to offer products and services that are aligned with a sustainable development scenario.³⁰ A number of exchanges are already doing this and as the CFTC notes in its report on climate risk, “(t)he need for new products likely will grow.”³¹ Some of this activity is linked to emergent market demand, some a response to regulatory or policy developments and some an attempt to proactively address sustainability issues. This section explores some specific illustrative examples across all of these.

Box 3.1 The fossil-fuel challenge

Meeting the Paris Agreement target of keeping global warming to “well-below 2oC” would require achieving net zero emissions globally by around 2050.³² As phasing out of fossil fuels is integral to achieving this net-zero target, governments can be expected to increasingly implement policies to support the required transition away from fossil fuels (what the PRI refers to as the “inevitable policy response”).³³ The International Energy Agency’s sustainable development scenario forecasts a significant shift in capital spending away from fossil fuels to renewables and other low-carbon sources during the period 2019 to 2050.³⁴ Fossil-fuel related trading revenue therefore can be expected to come under increasing downward pressure.

Source: UNCTAD

3.1 ESG index derivatives

Index derivatives provide investors with a cost-effective mechanism of gaining exposure to the underlying index. These products are used by institutional investors to hedge the risks of price movements in their equity portfolios, to structure investment product offerings or to speculate on price moves of the index.³⁵ ESG index derivatives perform the same hedging or investment functions but are specifically targeted at investors that have an ESG investment mandate or preference. The primary difference between an ‘ordinary’ and an ESG index derivative is the underlying index that the derivative references.

The first ESG index (the Domini 400 Social Index) was created in 1990.³⁶ Since then, enabled by increases in data availability, technological advancements, and increasing investor demand, the number of ESG indices has

²⁹ Data extracted from the [WFE’s statistics portal](#).

³⁰ For a more extensive discussion of the opportunities to link OTC-derivatives and sustainability, see Lannoo and Thomadakis (2020) [Derivatives in Sustainable Finance](#) and Box 3.1 in this report.

³¹ CFTC (2020) [Managing Climate Risk in the U.S. Financial System](#) pg 111.

³² International Energy Agency (IEA) (2019) [World Energy Outlook](#).

³³ PRI (2019) [The Inevitable Policy Response](#).

³⁴ IEA (2019) [World Energy Outlook](#).

³⁵ ASX (2020) Website webpage on [Index Derivatives](#).

³⁶ Kjellberg, Pradhan, and Kuh (2018) [An Evolution in ESG Indexing](#).

grown to over one thousand (box 3.2).³⁷ These indices cover companies in markets around the world and use a variety of ESG approaches, from negative screening to best-in-class ESG performance to thematic investing. Starting in 2018, several exchanges (such as Cboe, CME, Euronext, ICE and Nasdaq) have responded to investor demand for ESG-adjusted index products by launching futures and options on these indices (box 3.3).³⁸

As the relevant product set expands to include more geographies, indices and ESG preferences, users will have greater ability to manage their portfolio risks and exposures. This enables the creation of tailored ESG investment products and more overall investment into ESG-aligned companies.

Box 3.2 ESG indices explained

There is no uniform definition of what constitutes an ESG index. At its broadest, an ESG index is an index of listed companies that have been evaluated for their performance against a range of environmental, social and governance criteria. Some ESG indices exclude companies in certain sectors, for example tobacco or oil and gas (so-called negative screening); others will evaluate the ESG performance of companies in an existing index benchmark and adjust the index to take account of this assessment (best-in-class); others may construct an index to focus on specific ESG issues such as addressing climate change or promoting female leadership³⁹ (thematic).

Even within best-in-class or benchmark indices there is variation in what ESG factors are considered and what weight is given to those.⁴⁰ Thus, even when dealing with the same set of underlying companies, different indices may have different companies included in the index or assign different weightings to the companies that are included. This is essentially attributable to different perspectives on which ESG factors are most relevant in combination with other index construction elements (such as the desire to align quite closely with a particular benchmark).

Source: UNCTAD

These types of products are also relatively easy for derivatives exchanges to introduce (assuming user demand). Index derivatives are well-established and widely-used in many markets and several exchanges already have ESG indices on the companies listed in their market.⁴¹ The index provider (possibly the exchange or a third party index provider such as Dow Jones, FTSE Russell, MSCI or Standard and Poor's) is responsible for the index construction and the ongoing index valuation. This provides the necessary reference standard and price information required to create the derivatives contract (the traded instrument). The contract specifications will stipulate the relevant underlying index. The exchange can also partner with an ESG ratings agency to create a bespoke variation on an index and associated investment product.

Box 3.3 Examples of listed ESG index derivatives

The OMXS30 ESG Futures are futures based on an ESG-screened version of the benchmark OMX Stockholm 30 Index. Companies that derive more than a certain proportion of their revenues from defined activities (e.g. alcohol, tobacco, fossil fuels, pornography) are excluded from the index. The ESG screening is done by a third party ESG provider.

The MSCI World ESG Screened Index Futures listed on the Intercontinental Exchange (ICE) are based on the MSCI World Index as adjusted to exclude companies that are associated with weapons and tobacco, that derive revenues from thermal coal and oil sands extraction and that are not compliant with the United Nations Global Compact principles. This allows investors to gain broad ESG exposure while still largely tracking the benchmark index.

The EURO STOXX@50 Low Carbon Futures products were developed in consultation with market participants in response to anticipated EU regulation aimed at reducing CO2 emissions. According to the exchange (Eurex) insurance companies were particularly interested in the product and the exchange expects asset manager and pension fund interest to grow over time. The underlying index is the EURO STOXX 50 index adjusted for the carbon intensity of the constituent companies.

³⁷ Kjellberg, Pradhan, and Kuh (2018) [An Evolution in ESG Indexing](#).

³⁸ See Eurex Exchange, 'ESG Derivatives'; CME Group, 'E-Mini S&P 500 ESG Futures' for more information about these products, their purpose and how they function.

³⁹ See, for example, the MSCI Japan Empowering Women Index which incorporates gender diversity elements into its index composition.

⁴⁰ Moreolo (2019) [The Origin of ESG Indices](#).

The S&P500 ESG Index Options offered by Cboe and E-mini S&P500 ESG Futures offered by CME are based on the S&P500 ESG Index, adjusted to exclude certain companies (similar to the MSCI index above) with the remaining companies included by industry according to their ESG performance and the worst-performing companies excluded from the index. This product allows investors to retain exposure to performance of the S&P 500 index while screening out poor ESG-performers.

The Euronext Eurozone ESG Large 80 Index Futures were developed in partnership with Vigeo Eiris (an affiliate of Moody's) and with input from market participants. The objective was to establish a Eurozone ESG benchmark with ESG exclusions and a specific focus on the energy transition, that provides investors with a tool to implement ESG investment strategies but also to provide feedback to corporates about their energy transition performance. Euronext has appointed dedicated market makers, incentivised through a revenue sharing model, to provide contract liquidity.

Source: UNCTAD

Index derivatives create a supportive environment for greater ESG investment by:

- Providing transparency around the performance of the ESG index relative to the benchmark;
- Providing more information about the level of demand for ESG-aligned products; and
- Enhancing the ability of investment managers to provide ESG-aligned investment products.⁴²

The activity in the market for ESG index derivatives is still relatively low. For example, as at end October 2020 the average daily volume in the ESG variant of the STOXX EUROPE 600 futures contract was roughly 4% that of the benchmark contract. However in the 18 months since the launch of the ESG version of the contract, the total number of contracts traded has nearly doubled (from 440,000 in 2019 to over 850,000 in 2020).⁴³ The expectation is that the market will continue to grow, driven by regulatory pressures and growing demand in the underlying market.⁴⁴

3.2 Commodity derivatives

Derivatives exchanges have also explored the impact of sustainability imperatives on their commodity derivatives offerings. The specific sustainability drivers range from changes in market norms and expectations all the way to regulatory changes. Different exchanges have adopted different approaches including:

- Embedding sustainability requirements for producers participating in the traded market (e.g. CME, LME);
- Introducing transparency elements that enable greater traceability (e.g. Bursa Malaysia);
- Listing new products specifically aligned with sustainability objectives, such as those supporting the transition to a low-carbon economy (e.g. CME, ICE, EEX);
- Listing new products that support a transition to less polluting fuels (e.g. CME, ICE); and
- Listing new products that enable better risk management of climate-related events (e.g. CME, EEX).

Examples of these approaches are discussed in more detail below.

3.2.1 Introducing sustainability requirements for producers

London Metal Exchange (LME) is one of the largest derivatives trading venues for industrial metals. Products available for trading include derivatives on steel rebar, copper, aluminium, lead, nickel and cobalt. As with many of the world's major commodity derivatives markets, the link to the real economy is maintained through the ability to take physical delivery of the traded product.⁴⁵ Therefore, in addition to overseeing the trading and clearing aspects of the market, the exchange also takes responsibility for aspects of the underlying market such as approving warehouse and storage facilities. The exchange also specifies the requirements for producers and the brands (product) they wish to deliver into the contract for physical settlement.

Until recently, brand approval was dependent on the producer meeting certain capacity requirements and the

⁴² In a [webinar](#) held on 29 April 2020, Magnus Linder, Head of Derivatives, Swedbank Robur claimed that they had pushed derivatives exchanges such as Eurex and ICE to list ESG index derivatives after his firm had determined that all investments should be ESG-aligned.

⁴³ See [Eurex monthly statistics](#) for underlying data.

⁴⁴ Eurex and Bloomberg Media Group (2019) [The Changing Shape of Derivatives Markets](#).

⁴⁵ As noted in Section 1 of this report, the link to the real economy can be maintained either through the ability to take physical delivery of the traded product or through incorporation of a credible spot price in the settlement price in the case of cash settled contracts.

brand meeting the required metallurgical standards. At the end of 2019 LME expanded the requirements to include “responsible sourcing” elements. In explaining the decision, LME says it was the result of a combination of ethical, commercial and leadership imperatives. More specifically the exchange states that it “cannot accept a situation where consumers are required to take delivery of metal which is not responsibly sourced”⁴⁶ and that concerns about sourcing practices could result in LME metals trading at a discount. Through the introduction of these responsible sourcing requirements, LME has essentially embedded responsible sourcing as a quality requirement in the contracts that are traded on its market and ensured that responsibly sourced metals (or at least metals sourced by producers adhering to certain standards and reporting on those) become the benchmark for the metals traded in its market.

The LME’s introduction of responsible sourcing requirements, with its focus on transparency and disclosure, is analogous to stock exchanges requiring their listed companies to disclose ESG information. However, it goes further inasmuch as the LME also links meeting these requirements to the ability to participate in the market.

The LME’s decision follows the example of the LBMA (London Bullion Market Association, the industry association representing the OTC market for precious metals) which introduced responsible sourcing requirements for gold in 2012. All gold refiners wishing to be included on the LBMA’s “good delivery” list were required to demonstrate audited compliance with the LBMA’s Responsible Gold Guidance.⁴⁷ In 2015 COMEX (part of the CME Group) amended its rules for producers delivering into its gold derivatives contracts to specify that they had to comply with the LBMA Responsible Gold Guidance. These types of initiatives can potentially have significant sustainability impacts on the underlying metals market.

3.2.2 Promoting greater traceability

Transparency and traceability are important components of a move to greater sustainability in supply chains, and are essential elements within sustainable commodity certification schemes such as the Malaysian Sustainable Palm Oil (MSPO), the Marine Stewardship Council and the Forest Stewardship Council initiatives. The MSPO Certification Scheme is the national scheme in Malaysia for oil palm plantations, independent and organised smallholdings, and palm oil processing facilities to be certified against the requirements of the MSPO Standards.⁴⁸

In 2018, as a first phase in moving towards having delivery of certified sustainable crude palm oil (CPO) via the exchange, Bursa Malaysia introduced a traceability requirement for the benchmark Crude Palm Oil Futures (FCPO) contract where sellers of the futures contract are required to submit a traceability document when they deliver CPO to the exchange-approved Port Tank Installation⁵⁰ (PTI). The traceability document⁴⁹ requires the following information to be provided: (i) Name of the Parent Company of the Seller; (ii) Mill Party; (iii) Mill Address; (iv) Mill Coordinates: Latitude and Longitude and (v) Quantity of CPO received in Metric Tonnes. The PTI is responsible for confirming that the traceability documents are submitted and that the quality of CPO delivered meets the requirements stipulated by the exchange. The introduction of the traceability document provides greater transparency into the supply chain, particularly while nationwide MSPO certification is still underway.⁵¹ According to the exchange, as of 12 October 2020, 425 out of 452 (or approximately 94%) of mills have been MSPO certified by the Malaysian Palm Oil Certification Council (MPOCC).

3.3 Other derivatives

3.3.1 Supporting carbon emissions markets and lower-carbon energy markets

Meeting the objectives of the Paris Agreement (thereby avoiding the worst impacts of climate change) requires significant reductions in carbon emissions enabled at least partly by a rapid move away from carbon-intense energy sources (fossil fuels). Even prior to the Paris Agreement, several jurisdictions had introduced regulatory mandates underpinned by market-based trading mechanisms aimed at supporting the achievement of these outcomes. The existence of regulated, underlying markets makes it relatively straightforward for exchanges to offer derivatives on the underlying as the product is clearly defined and well-understood by the target users. As a result, exchanges such as CME and ICE have fairly extensive derivatives offerings linked to existing carbon and renewable energy markets (discussed in more detail below). While trading in these derivatives does not

⁴⁶ [Overview of LME Responsible Sourcing](#) at pg 4.

⁴⁷ LBMA (2020) [Responsible Gold Guidance](#).

⁴⁸ As noted later in the document, for some commodities there is more than one applicable sustainability standard with attendant differences in relevant sustainability attributes. See Efeca (2016) [Comparison of the ISPO, MSPO and RSPO Standards for an overview of key differences between the main palm oil standards](#).

⁴⁹ Bursa Malaysia (2018) [Crude Palm Oil Futures \(FCPO\) Revamp Frequently Asked Questions \(FAQs\)](#).

⁵⁰ A PTI is a facility where palm oil is stored until it is collected by the buyer.

⁵¹ Traceability can be understood as: “The ability to identify and trace the history, distribution, location and application of products, parts and materials, to ensure the reliability of sustainability claims, in the areas of human rights, labour (including health and safety), the environment and anti-corruption.” - BSR and United Nations Global Compact (2014) [A Guide to Traceability: A Practical Approach to Advance Sustainability in Global Supply Chains](#).

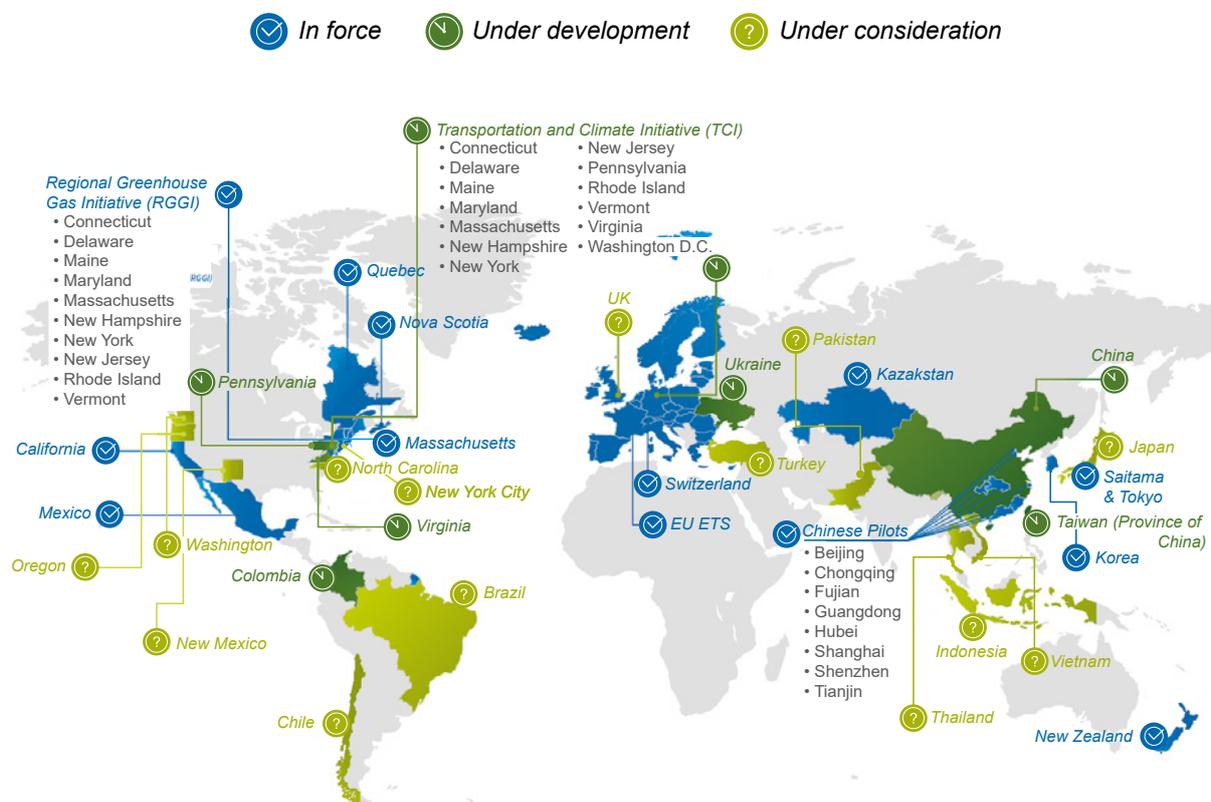
directly drive emissions reduction, by giving users of the underlying market more effective price risk hedging mechanisms and in some instances, providing price signals, they support the functioning of the market overall.

Carbon emissions trading

Emissions Trading Schemes (ETS - sometimes referred to as cap-and-trade schemes) are a market-based mechanism aimed at reducing greenhouse gas emissions. Under an ETS structure, an upper limit is set on allowable emissions and scheme participants are given certain emissions allowances. Participants that are more effective at reducing their emissions can sell their allowances to those participants for whom reducing emissions is more costly. In theory this achieves the overall emissions reduction target (the “cap”) while allowing market participants to determine the most cost effective way of doing so.

Both the Paris Agreement and its predecessor, the Kyoto Protocol provide for the international trading of emissions allowances or emissions reductions as a mechanism to support the achievement of emissions reduction targets. While the structure of an international carbon market under the Paris Agreement is yet to be agreed, the number of emissions trading schemes around the world is increasing (figure 3.1) with national or subnational ETS established, or in the process of being established, in Canada, China, the European Union, Japan, New Zealand, South Korea, Switzerland and the United States.⁵² Carbon markets were given a further boost with the September 2020 launch of the Taskforce on Scaling Voluntary Carbon Markets.⁵³

Figure 3.1 Overview of global emissions trading schemes for greenhouse gas emissions



Source: International Carbon Action Partnership (ICAP)

Several exchanges, such as CME and ICE, offer trading in a range of futures and options based on European Union allowances, and Certified Emissions Reductions associated with the European Union ETS.⁵⁴ Both exchanges also offer derivatives on allowances issued under the US-based Regional Greenhouse Gas Initiative ETS and the California Cap and Trade program.⁵⁵ In New Zealand, a joint initiative of the New Zealand Exchange (NZX) and the European Energy Exchange (EEX) was selected to develop and operate a newly introduced auction service for New Zealand’s Emissions Trading Scheme.⁵⁶ Meanwhile, in South Africa the JSE has for several years been exploring the introduction of a carbon offset trading platform.⁵⁷

⁵² European Commission, [International Carbon Market](#).

⁵³ [Taskforce on scaling voluntary carbon markets](#), 2020.

⁵⁴ ICE [Energy - Environmental](#); CME Group [Environmental Products](#).

⁵⁵ ICE [Energy - Environmental](#); CME Group [Environmental Products](#).

⁵⁶ EEX (2020) NZX / [EEX partnership selected to provide emissions auctions for NZ Government](#) and New Zealand Ministry for the Environment (2020) [Auctioning in the New Zealand Emissions Trading Scheme](#).

⁵⁷ South African Builder (2015) [Carbon offset trading infrastructure now in place at JSE](#).

Renewable energy

A core component of the drive towards decarbonisation is reduction in the carbon intensity of existing energy sources with an ultimate transition towards entirely renewable energy sources. In the US, the Renewable Fuel Standard aims to reduce greenhouse gas emissions by requiring diesel or gasoline refiners or importers to replace or reduce their transportation fuel, heating oil or jet fuel with a specified amount of renewable fuel.⁵⁸ Renewable Identification Numbers (RINs) are tradable credits that are used to track compliance with the Fuel Standard.⁵⁹ ICE offers futures and options on the variety of RINs recognised under the fuel standard as a tool for managing price volatility.

Renewable Energy Certificates (RECs) are similar to RINs but for electricity markets. Many US states have introduced regulatory requirements for utilities to derive a larger proportion of their energy from renewable sources. RECs are a mechanism for demonstrating compliance with these requirements. Both ICE and Nodal exchanges offer futures and options on RECs for several US states' renewable energy programmes.

In Europe, EEX has identified that the removal of renewable energy subsidies in many EU markets gives rise to a need among renewable energy producers to have access to financial products that enable them to manage their price risk. To support this, EEX is educating producers about how current products can be used to address their needs while also adjusting existing products (e.g. through enabling longer term hedging) and considering the introduction of new products.⁶⁰

3.3.2 Supporting less polluting fuels and more sustainable metals

With effect from January 2020, the International Maritime Organization (IMO) specified that the upper limit on the sulphur content of fuel oil for ships would be reduced to 0.50% (from 3.50%). The purpose is to reduce the emissions of sulphur dioxide from shipping thereby lessening harmful environmental impacts associated with SO₂ emissions. Both CME and ICE responded to these regulatory changes by launching a suite of cash-settled "IMO 2020-aligned" derivatives contracts to assist end-users in managing anticipated price volatility.

In 2016, China introduced changes to its Environmental Protection Law which imposed stricter caps on environmental pollution. This increased demand for higher purity iron ore which is associated with lower emissions. The Singapore Exchange introduced 65% iron ore contracts at end 2018 to support effective price risk management associated with this shift in demand.⁶¹

3.3.3 Providing risk mitigation instruments for climate change adaptation

Climate change is already affecting average temperatures in locations around the world and this is likely to become more severe over time. Weather derivatives can provide a risk hedging mechanism for industries exposed to associated weather related fluctuations such as amount of rainfall (droughts, flooding), and extreme weather events. Indeed, trends in weather markets follow climate model predictions fairly closely, suggesting that weather derivatives are already serving as an economic adaptation (not mitigation) mechanism.⁶²

CME listed its first weather derivatives products over two decades ago. The purpose of these products is to provide users with a means of managing price risk associated with changes in weather (specifically, average temperatures). The products that are traded on CME are based on indices that track the extent to which the average temperature in a specified area drops above or below a predefined temperature. The reference index is determined and calculated by an external party. Eurex Exchange launched hurricane futures in 2009 as a form of exchange-traded hurricane insurance product (though these were delisted in 2014 due to low liquidity).⁶³

3.4 Data products and increased information availability

In addition to providing products for trading, many exchanges also have dedicated data offerings. Leveraging this capability, some are already providing sustainability-aligned data products and services. ICE, for example, has launched several sustainability data products, some of which are tied to the derivatives markets which ICE operates, while others are linked to equity and bond markets. For example, in January 2020 ICE announced that it would be partnering with BofA Global Research to provide subscribers with ESG data points for listed companies. This builds on the existing company data (so-called 'reference data') that ICE provides. In April, ICE announced that it was partnering with risQ to create ICE Climate Risk — an offering that provides climate risk

⁵⁸ EPA [Renewable Fuel Standard Program](#).

⁵⁹ McKinsey Energy Insights [RIN](#).

⁶⁰ Ciancibello (2020) [Renewable Energy Price Risk Management at the Energy Exchange](#).

⁶¹ Theo (2020) [Liquidity spikes for SGX 65% Fe iron ore contract](#).

⁶² Schlenker, and Taylor (2019) [Market Expectations About Climate Change](#). NBER Working Paper No. 25554.

⁶³ See Bouriaux and Tomas (2014) ["Why Do Insurance-Linked Exchange-Traded Derivatives Fail?"](#) for a discussion of some of the challenges of products listed at the time and suggestions as to how to address these.

data and analytics for the municipal bond market. At the same time ICE launched a Global Carbon Futures Index made up of price data from EU and US carbon markets that it operates. This is in addition to market-specific carbon indices that ICE has also launched on each of the underlying markets.

In the interests of promoting greater awareness and transparency about sustainability, Hong Kong Exchanges and Clearing Limited (HKEX) established the HKEX Sustainable and Green Exchange (STAGE) in June 2020. This will serve as a data repository and information hub on sustainable and green finance investments in the region.⁶⁴

While some of the offerings described above are not specific to derivatives exchanges they acknowledge the fact that many derivatives exchanges are part of larger exchange groupings that also encompass equity and debt markets. These types of data products and transparency initiatives support the underlying market through increasing the availability of relevant information.

4. TAKING UP THE SUSTAINABILITY CHALLENGE

The previous section set out the variety of ways in which derivatives exchanges are already engaging with the topic of sustainable development. This section builds on the examples set out earlier as well as lessons learned from the stock exchange experience to explore additional opportunities for derivatives exchanges to contribute to sustainable development. These cover the full spectrum from product innovation (including modification of existing products) to working with stakeholders to further expand the sustainable finance market.

The specific activities that derivatives exchanges undertake, and are able to undertake, will depend on a range of factors such as an exchange's own perception of relevant sustainability issues, the exchange's relative size in a market, the integration of sustainability considerations into the underlying market, and the regulatory drivers of change. Taken together these factors will determine an exchange's sphere of influence and which opportunities it chooses to pursue.

Box 4.1 Driving behaviour change - sustainability-linked products

The bespoke nature of the OTC derivatives market has allowed for the creation of customised products that are specifically linked to sustainability outcomes. For example, in August 2019 ING Bank launched what it claimed was the world's first "sustainability improvement derivative" (SID).⁶⁵ The sustainability component was built into an interest rate swap that SBN Offshore had purchased to hedge the interest rate risk of the construction of one of its "Floating Production Storage and Offloading facilities". The credit spread of the swap worsens or improves depending on SBN Offshore's ESG performance as measured by an independent ESG ratings firm.

These types of products draw their inspiration from sustainability linked loans (SLL) and bonds (SLB). For SLLs the interest rate associated with the loan is tied to the ESG performance of the borrower/debt issuer. The first SLL was issued in 2017 (also by ING, to the electronics company Philips). Since this first issuance, the market has grown from \$4.3 billion in 2017 to over \$130 billion in 2019.⁶⁶ In March 2019 the Loan Market Association, the Asia Pacific Loan Market Association and the Loan Syndicated and Trading Association issued the Sustainability Linked Loan Principles (SLLP) in an attempt to standardise the market. The SLLP specifies that "one of the aims of sustainability linked loans is to encourage ambitious, positive change through incentives".⁶⁷

With SLBs a structural element of the bond (e.g. the coupon payment) is tied to the achievement or otherwise of certain predefined sustainability outcomes. In 2019, energy company Enel followed up several prior green bond issuances with the issuance of an SLB where the coupon was dependent on Enel reaching predefined installed renewable energy targets. Enel hedged the currency and interest rate risk with an "SDG-linked" cross-currency swap where the transaction cost was reduced due to the sustainability nature of the associated bond.⁶⁸ It is expected that the launch in June 2020 by the International Capital Markets Association (ICMA) of the voluntary Sustainability-Linked Bond Principles⁶⁹ will support the growth of this market.⁷⁰

⁶⁴ HKEX [Stage](#).

⁶⁵ ING (2020) [ING provides world's first sustainability improvement derivative to SBM Offshore](#).

⁶⁶ Financial Times (2020) [Food businesses bank on sustainability-linked loan](#).

⁶⁷ APLMA, LMA, LSTA (2019) [Sustainability Linked Loan Principles](#).

⁶⁸ EOnline (2019) [Enel launches the world's first "general purpose SDG linked bond", successfully placing a 1.5 billion U.S. dollar bond on the U.S. market](#).

⁶⁹ ICMA (2020) [Sustainability-linked Bond Principles](#).

⁷⁰ BBVA (2020) [How sustainability-linked bonds will breathe life into the market](#).

4.1 Integrating sustainability into commodity derivatives markets

Commodity derivatives markets provide a direct link to the underlying market and therefore present a unique opportunity for supporting sustainable development. The products that are traded in these markets are both exposed to sustainability risks (such as climate change and biodiversity loss/destruction of ecosystem services) and contributors to such risks. The production of these commodities can be both a source of economic development as well as having negative environmental and social impacts. Operators of commodity derivatives markets have an opportunity to contribute to achievement of sustainable development outcomes. There are a few opportunities in this regard. First, the exchange could set mandatory requirements that producers delivering product into the market have to meet, for example reporting requirements (section 4.1.1). The exchange could also consider embedding sustainability characteristics into the derivatives contract itself, for example requiring that the product delivered into the contract is certified as having met certain sustainability standards (section 4.1.2). Each of these approaches has pros and cons which are discussed in more detail below.

4.1.1 Focusing on producer conduct and transparency (mandatory reporting)

One approach is to focus on the producer (or trader) that is allowed to deliver the commodity into the contract. In simple terms, the exchange could stipulate that only producers (traders) who are able to demonstrate commitment to certain sustainability principles and report how they are managing these are eligible to deliver product into the contracts that are traded. This does not guarantee the sustainability of the underlying product but sets certain expectations and provides greater transparency around how traders and producers operating in these markets conduct themselves. Variations on this include the incorporation by COMEX of the LBMA Responsible Gold Guidance into their producer requirements and the LME's introduction of Responsible Sourcing Principles.

The LME acknowledges that the introduction of the Responsible Sourcing Principles sits on the border between following the market (what the exchange sees as its traditional role) and leading the market. The exchange points out that there were a specific set of circumstances that made it possible, if not necessary, to introduce the measures that they did:

- When it started the process the market was particularly receptive to such developments because the conflict mineral provisions of the United States Dodd-Frank Wall Street Reform and Consumer Protection Act had already raised market users' awareness of sustainability issues with sourcing of certain metals traded on the market;
- This awareness was further increased by an Amnesty International report highlighting controversial sourcing practices of one of the LME cobalt brands;⁷¹
- Around the same time the price of LME-traded cobalt deviated significantly from the underlying reference price; and
- The LME is a key market for metals trading which gives it a degree of market responsibility.

The above provides an indication of the confluence of factors that may be necessary to enable other markets to adopt a similar approach. Market stickiness (or limited ability to defect) could be an additional key factor. Derivatives markets tend to be highly concentrated with the benchmark contract typically being confined to a single exchange. However, the mere fact that the exchange is the primary venue for the trading of a particular derivative product does not mean that it will act without a clear legal or market imperative such as regulatory pressure, price divergence or clear market demand.

If an exchange were to consider the introduction of reporting requirements, another consideration would be the relevant reference standard. While there are some sustainability issues that are relevant across commodities (e.g. labour practices) others tend to be specific to certain commodities (e.g. deforestation and palm oil). Some producers/commodity traders are only active in a single commodity, while others (for example large traders such as Olam or Louis Dreyfus Company) will participate in a range of commodities (and potentially trade across multiple exchanges). The exchange would therefore want to specify a standard (or set of standards) that best caters for this difference while still ensuring meaningful transparency and demonstrated identification and management of sustainability issues.

Where there is less of an immediate drive for change, and/or where there are large numbers of smaller producers that make it more challenging to introduce new requirements, the exchange may be less able to act. In these instances, exchanges could consider initiating conversations with participants in relevant markets about the core sustainability issues and options for supporting more sustainable production practices.

⁷¹ Amnesty International (2016) '[This is what we die for: Human rights abuses in the Democratic Republic of Congo power the global trade in cobalt](#)'.

4.1.2 Embedding sustainability characteristics into the derivatives contract (certified products)

Another opportunity for exchanges, as highlighted in both the CFTC and FIA reports, is to “seek to incorporate sustainability and climate related elements into existing contracts”⁷² or introduce a new version of a contract that has sustainability elements. In addition to traditional quality requirements, the contract would also stipulate certain process and production methods (PPMs) aligned with relevant social and environmental requirements. Where the product is physically settled, this would specify that only product that met all of these requirements would be eligible for delivery into the contract (for example, a cocoa contract could specify that cocoa must be certified as complying with a recognised sustainability standard, such as Fairtrade or Rainforest Alliance).⁷³ Exchanges could also introduce a cash-settled “sustainable” version of the benchmark product or embed sustainability characteristics into the core, cash-settled product.

Exchanges have highlighted certain challenges with including these types of quality attributes into commodity contracts. These are summarised in table 4.1, together with potential ways of addressing these.

Table 4.1 Perceived challenges and potential solutions of introducing sustainability characteristics ⁷⁴	
Perceived Challenges	Potential Solutions
<p>Lack of consensus around standards. There may not be wide agreement as to what the relevant sustainability characteristics are for a particular product/commodity. While there are sustainability standards for a range of commodities such as sugar, cocoa, fish, palm oil, timber, rubber,⁷⁵ etc., there is not necessarily consensus amongst users of a particular commodity about the relevant standard with which that product must comply.</p>	<p>In the case where there are competing standards, rather than the exchange specifying a single standard, it may be possible to indicate a range of acceptable industry standards and certification schemes.⁷⁶ While providing greater latitude, this may also introduce additional complexity:</p> <ul style="list-style-type: none"> ■ For warehouse operators and clearing members who would need to understand what constitutes proof of compliance across a range of standards; and ■ For companies (users) who wish to make certification claims aligned with a particular standard. <p>In the case where there is no standard, the exchange could potentially work with relevant standard setting bodies and other stakeholders to promote the development of a standard.</p>
<p>Challenge of verifying compliance with standards. The exchange would need to be able to verify that any product delivered is certified as adhering to the relevant sustainability standard and be prepared to take enforcement action in the event of non-compliance. Failure to do this exposes the exchange to allegations of ‘greenwashing’.</p>	<p>Compliance can be demonstrated through the delivery of acceptable evidence in line with the relevant compliance standard similar to the delivery of the traceability document in the Bursa Malaysia palm oil contract, or evidence of certification from an acceptable certification body such as the Round Table for Responsible Soy in the case of soybean contracts. The exchange would need to work with other actors in the ecosystem (such as warehouse operators and the clearing house) to establish a process for this.</p>

⁷² CFTC (2020) [Managing Climate Risk in the U.S. Financial System](#) at 112

⁷³ [Fairtrade](#) sets social and environmental standards for companies as well as farmers and workers across multiple commodities. The [Rainforest Alliance](#) assesses farms and farm groups against a sustainable agriculture standard and companies against a chain of custody standard.

⁷⁴ The [LME Sustainability: Discussion Paper](#) (2020) provides some practical examples of how the LME was thinking about some of these issues in relation to the possible introduction of a low carbon aluminium contract. Recent feedback on the LME’s proposal highlights a range of challenges with attempting to create a sustainable commodity contract including concern that an excess focus on low carbon excludes other sustainability issues and that “blending” low carbon standards results in the bar being set too low: [Sanderson \(2020\)](#) LME’s ‘green aluminium’ plan faces producer opposition.

⁷⁵ There have been intensive discussions among related stakeholder groups such as the Global Platform for Sustainable Natural Rubber (GPSNR) to set industry-wide sustainable standards aiming at mitigating environmental and social impacts associated with natural rubber production.

⁷⁶ The LME has also proposed the introduction of a spot market for “low-carbon” aluminium. In the absence of clear standards/criteria for “low carbon” this platform would operate as a voluntary market where participants would include information about the product (such as Aluminium Stewardship Initiative certification or recycled content) that they believe would allow them to make claims to “low carbon”. The LME has suggested an initial list of types of information to be provided but has indicated that this could be expanded. The addition of some form of evidence to support the claims is encouraged. [LME Sustainability: Discussion Paper](#). (2020)

Perceived Challenges	Potential Solutions
	<p>Several standards schemes will publish a list of the businesses that are certified against their standard and undertake ongoing market surveillance to minimise fraudulent claims. Exchanges could additionally stipulate that having these systems and processes in place is a precondition for inclusion as a recognised standard.</p>
<p>Insufficient demand. While several large users such as Nestle, or Unilever or Barry Callebaut have indicated support for more sustainably produced commodities like sugar, cocoa and palm oil, this is not necessarily the same as saying there is large-scale demand.⁷⁷</p>	<p>It may be possible to “test” demand, as set out below. Also, there is evidence of growing pressure across the value chain to address sustainability issues associated with commodity production, such as deforestation and loss of biodiversity.⁷⁸ It seems likely that whether pushed or pulled, demand is likely to increase.</p>
<p>Insufficient supply to establish a benchmark. Following to a certain extent from the point above, the extent to which traded commodities are certified as being sustainably produced is still quite limited (recognising this varies across commodities and geographies). This means the available product in the underlying market may be too small to serve as the benchmark.⁷⁹ Attempting to shift the market before there is sufficient capacity in the underlying market may also have unintended consequences (this is equally relevant to the point discussed below).</p>	<p>Where there is not a large quantity of the sustainably produced product available in the underlying market (e.g. Bonsucro certified sugar), one option may be to incorporate the sustainably produced version into the benchmark contract at a premium to the benchmark. This assumes that it is possible to determine a reference source for the price. This is not unusual in commodities markets. For example, the ICE Robusta Coffee Contract specifies that “Class 1” quality coffee trades at the contract price and other qualities will trade at predefined premia or discounts.⁸⁰</p> <p>Another option may be to introduce a sustainably produced version of the contract in addition to the benchmark. While this could have the effect of splitting liquidity and increasing the price for users it could also contribute to price discovery for sustainability attributes (see below).</p>
<p>Risk of excluding producers. Introducing a sustainably produced version of a product as the benchmark may have the effect of excluding certain producers (depending on their size and/or business model) if the costs associated with moving to more sustainable production are too prohibitive.</p>	<p>Regardless of the approach adopted, the introduction of new products or amendment of existing products would need to be done with due consideration of the state of readiness of the underlying market. In addition to existing ecosystem participants, the exchange should also engage other stakeholders such as NGOs and sustainability standard setting bodies to identify the most suitable interventions and how to approach them.</p>
<p>Price premiums may or may not exist. It is unclear that there is a price premium for sustainably produced commodities (or at least for agricultural commodities such as sugar that are inputs to other products).⁸¹ In the absence of a price differential, it is unclear that there will be demand for sustainability attributes to be incorporated into the contract. If there is a price differential, it is necessary to establish a reference source for this pricing information as an independent, credible price benchmark is critical for the creation of a derivatives contract.</p>	<p>In instances where the primary challenge is enabling price discovery in the underlying market, exchanges could potentially partner with relevant actors (such as sustainability standards setters and certification entities) to create a platform to support such price discovery. For example, Bonsucro already operates a credit trading platform for Bonsucro-certified sugar credits. There may be opportunities to work with organizations such as Bonsucro on this or to extend this to other product categories, such as coffee or cocoa.</p>

⁷⁷ WWF (2020) '[Palm Oil Buyers Scorecard](#)'.

⁷⁸ For example, Ceres has recently released its [Investor Guide to Deforestation and Climate Change](#).

⁷⁹ For example, in their [2018 Report](#), Bonsucro indicated that certified production amounted to “over 4 million tonnes”. Total global production for the same period was [194.5 million tonnes](#). Thus, certified production amounted to 2% of total for the year.

⁸⁰ Available at: The ICE: [Robusta Coffee Futures](#).

⁸¹ A representative from Bonsucro, which operates a trading platform for Bonsucro certified sugar credits, said that there did not appear to be a price premium for certified sugar. Interviewed April 2020.

When considering the introduction of a new product (whether replacing the benchmark with a sustainable version or introducing variations on the benchmark) the exchange will assess the level of support and readiness of the market. This includes at a minimum consultation with the commodity producers and traders, the warehouses in their network, and the users of the derivatives products.⁸²

Euronext, for example, which trades non-GMO⁸³ rapeseed and corn contracts (the benchmark product in the EU, in accordance with EU regulation) has indicated that, based on experience with these products, it is currently studying the feasibility of introducing cash-settled agricultural products with sustainability attributes.

4.2 Listing new products that meet emergent demand

A more straightforward opportunity for derivatives exchanges is to list new contracts that respond to growing demand driven by the transition to a low carbon future. As set out in the market review in section 2, exchanges are already responding to market demand for sustainability-aligned products and this is set to continue. For example, the LME has adopted a strategy to develop derivatives contracts that support price risk management for battery materials and electric vehicle industries. As part of this, LME is working with the market to develop a suitable lithium futures contract. Having effective price risk management tools will support the development of this market thereby contributing positively to a low-carbon transition.

Another example is the Used Cooking Oil (UCO) and Used Cooking Oil Methyl Ester (UCOME) futures that began trading on CME in September 2020. UCO is a feedstock for UCOME, a lower-carbon intensity input to biodiesel. As the EU looks to further increase the road transport blending target from renewable fuels in 2021, demand for these products is similarly set to increase. These futures products will assist traders in managing their price risk and provide additional price transparency.

There are similar opportunities in other derivatives markets. Regulatory developments, such as the EU taxonomy for sustainable activities, will undoubtedly create demand for new products particularly when coupled with regulatory incentives for investors to ‘green’ their portfolios. These could include demand for new types of taxonomy-aligned index derivatives. As the green, social and sustainability bond markets continue to expand (and regulated reference standards emerge, supporting the further development of these markets) there will likely be similar opportunities in the interest rate market, either in the form of bond index derivatives or green, social or sustainability-linked interest rate derivatives products (box 3.1 shows examples of what is already happening in the OTC derivatives market). The demand for instruments that allow for greater management of climate-related risks is also likely to increase. For example, CME launched water futures in December 2020. The product, based on the Nasdaq Veles California Water Index, is intended to provide users exposed to the California water market with a price risk hedging mechanism.⁸⁴

Data products are another opportunity. As demand grows for information to support the analysis of sustainability-related risks and opportunities, exchanges may consider where they can play a role in meeting this demand. Possibilities include ESG reference data and customised indices. This can be developed in-house, by building data offerings on existing products or through partnering with service providers with relevant expertise. New technologies — such as artificial intelligence and blockchain — potentially provide new data sources for products (thereby reducing the disclosure burden on market participants and enhancing the reliability of the data) and mechanisms for enhancing traceability.⁸⁵

4.3 Supporting greater transparency and information availability

Transparency is an integral part of a functioning market and a central benefit provided by markets. It is generally accepted that a lack of agreement as to what constitutes sustainability as well as a lack of data on ESG performance can both act as barriers to a sustainability transition. Beyond data products, exchanges can explore opportunities

⁸² ICE Futures US is a member of the [Global Coffee Platform](#), a body that claims to be working to increase the sustainability of the global coffee market.

⁸³ Product containing no genetically modified organisms or containing genetically modified organisms whose presence is adventitious or technically unavoidable, in accordance with requirements in force under EU Regulations - EC regulation n° 1829/2003 of the European Parliament and the Council of the 22 September 2003 on genetically modified food and feed (OJEU 18-10-2003).

⁸⁴ Bloomberg (2020) [CME's First Water Futures are Coming as the U.S. West Burns](#).

⁸⁵ HSBC (2019) [Blockchain - Gateway for sustainability linked bonds](#).

to improve the availability of ESG information as it relates to the participants in their markets. In the same way that stock exchanges encourage or require their listed companies to disclose relevant ESG information, derivatives exchanges could encourage market participants to provide information about their own sustainability credentials or performance. This could initially be done on a voluntary basis, with the exchange providing a 'window' where this information is collated.

In markets where there are as yet no agreed standards for sustainability attributes, exchanges could facilitate greater availability of information about currently traded instruments. For example, the LME is consulting about the possibility of extending its 'LMEpassport' initiative (an initiative aimed at streamlining and simplifying information provided upon delivery of metals into the market) to include sustainability disclosures. The proposal is that members, listed warehouse companies or producers of its listed brands could use the platform to voluntarily upload information such as "the environmental criteria of their brands, certification by an industry scheme, recycled content, use of carbon offsets, or water or tailings management schemes".⁸⁶

As sustainable finance evolves, banks and institutional investors will increasingly come under pressure to consider the sustainability impact (both positive and negative) of their activities. Borrowing from these examples, derivatives exchanges could start to consider disclosing the ESG profile of the products that they list.

4.4 Collaborating around the development of the underlying market

Exchanges are important conveners of the markets that they operate. This provides opportunities to encourage collaboration around, for example, the agreement of standards where these are seen as necessary for the development of the market or even the definition of the underlying market. For example, exchanges could participate in consensus building activities focused on sustainable finance in their jurisdiction. The objective of such activities would be to ensure that the possible role of derivatives markets is understood and that the exchanges similarly understand the opportunities associated with the development of the sustainable finance industry. Exchanges can work with market participants to highlight emerging sustainability issues, particularly where these are linked to concerns around financial stability. Recent examples of sustainability issues that have been associated with financial stability risks include water stress, human rights and biodiversity loss.⁸⁷ Increasingly, as regulators (including financial regulators) across the world start to consider sustainability issues, it will be important for derivatives markets operators and relevant members of the ecosystem to ensure they are part of the conversation.⁸⁸

5. CONCLUDING REMARKS — THE WAY FORWARD

Between 2019 and 2020, the topic of sustainability has gone from virtually unconsidered in derivatives markets to the subject of four industry papers. Exchanges, market participants and regulators looked at sustainability topics from various angles — from the potential impact on markets to the role derivatives markets can play in meeting the sustainability imperative. The sustainability challenges of the modern world are such that addressing them requires concerted effort from all actors, including all elements of the finance sector. As both the Futures Industry Association and the CFTC note, derivatives exchanges are an important part of the overall solution, whether as providers of relevant products and services, contributors to greater data availability and transparency or as conveners of the market to address barriers to change.

As derivatives exchanges look forward, there are a number of areas where they can support the sustainability agenda. These can be summed up in the following **action menu**:

- **Engage in partnerships** to build consensus on sustainable finance: exchanges should ensure they are participants in the evolving field of sustainable finance to ensure agreed solutions are suitable for market deployment.
- Use the exchange's convening power to help **drive market standardisation** where this is necessary to develop the market for sustainability themed products — exchanges can use their position within the market ecosystem to reach market agreement around reference standards.

⁸⁶ LME (2020) [LME Sustainability: Discussion Paper](#).

⁸⁷ De Nederlandsche Bank (2019) [Dutch financial sector also faces environmental and social risks](#).

⁸⁸ FIA (2020) [How derivatives markets are helping the world fight climate change](#).

- Provide mechanisms to **enhance transparency** about the sustainability attributes of products traded on markets and market participants: transparency is a core attribute of market-functioning and as an intermediate step exchanges may consider providing a platform that enables market users to report on their sustainability practices and initiatives.
- **Link market participation to sustainable market practices** (particularly relevant in the case of commodities markets): exchanges may stipulate that participation in certain markets is predicated on meeting additional sustainability-aligned requirements. This could range from requiring the publication of a sustainability report to requiring demonstrated alignment (through reporting) with agreed sustainability practices.
- **Introduce sustainability-aligned data products** that support the development of the underlying markets: data products and services support the functioning of the traded market and can also be the basis for the development of new tradeable products.
- **List new tradeable sustainability-aligned products** to meet emergent demand whether driven by regulatory changes, or customer requirements e.g. products that support a low-carbon transition. This also includes introducing or amending commodities contracts to specifically incorporate sustainability considerations (process and production methods): exchanges can support the development of the underlying market by listing products that enable price discovery of more sustainably-produced versions of commodities or support the shift of the market towards more sustainably-produced commodities.

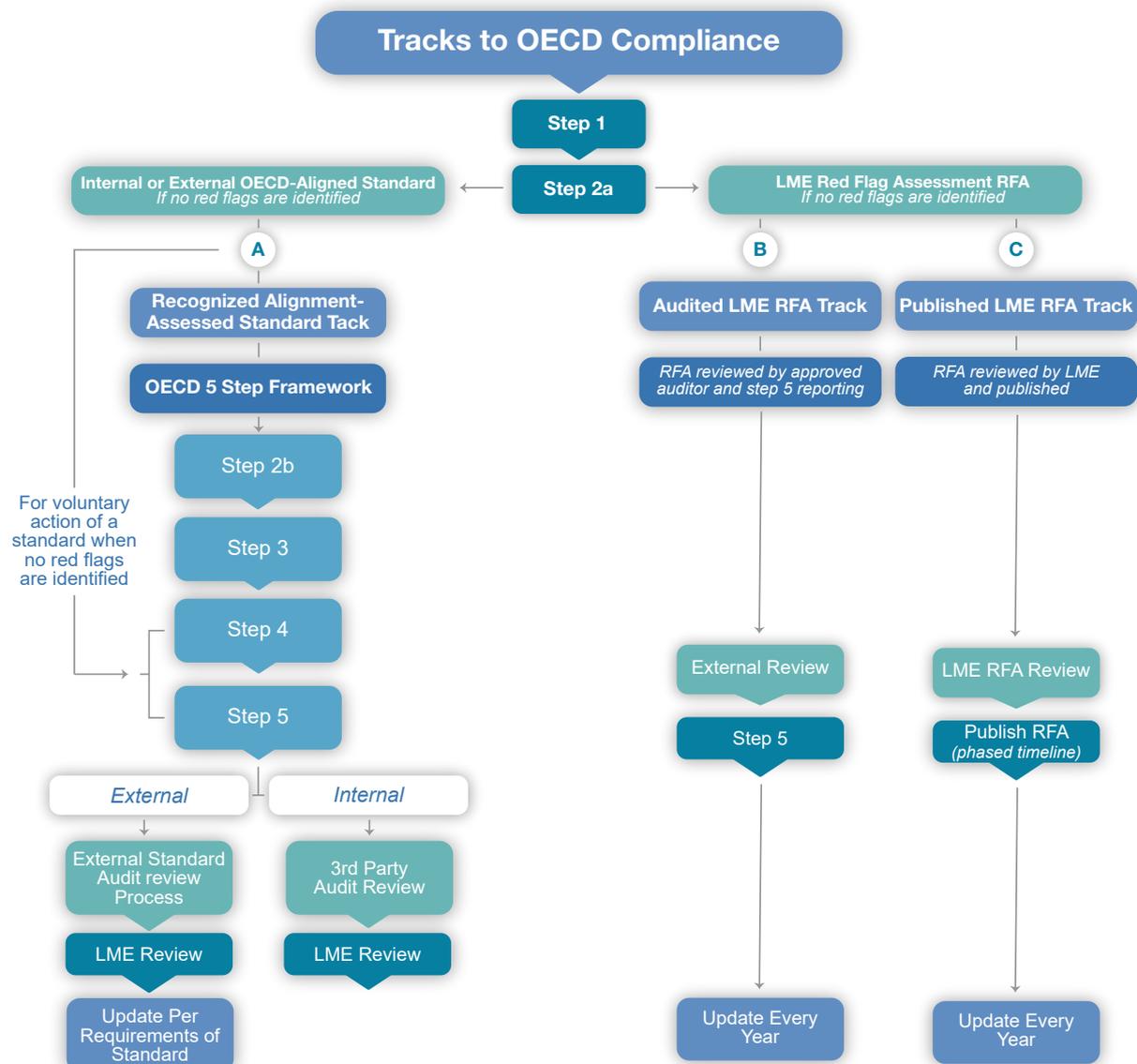
The range of opportunities is such that every exchange can and should be able to contribute in some way. The SSE and WFE will continue to work with derivative exchanges to assist them in their efforts to promote sustainable development. More generally, exchanges can be supported in this work through ongoing research, facilitation of peer-learning exercises and identification of examples of best practice. Providing a central repository of exchange initiatives in this area can also provide a useful point of reference and inspiration.

ANNEX I: ADDITIONAL INFORMATION ON LME RESPONSIBLE SOURCING PROGRAMME

How does LME define “responsible sourcing”? LME states that its requirements are structured around the elements of transparency and compliance with established standards. For this purpose, LME uses the OECD *Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas* as the framework for its responsible sourcing approach. The LME provides producers of brands with optionality as regards how they comply with the requirements including which standard they adhere to (as long as the standard is aligned with the OECD guidance) and when demonstrated compliance with a standard is not necessary (figure A.1).

Regardless of the compliance model adopted, LME requires all producers to disclose information about their alignment with the appropriate standards or aspects relevant to their supply chain due diligence process. These requirements will be introduced in a phased manner to give market participants the opportunity to adjust and to avoid disadvantaging smaller producers. Full compliance is required by 2023.

Figure A.1 Different compliance models for meeting LME responsible sourcing requirements



ANNEX II: SSE ADVISORY GROUP MEMBERS

The SSE and WFE gratefully acknowledge the valuable inputs to this document made by the experts listed here.

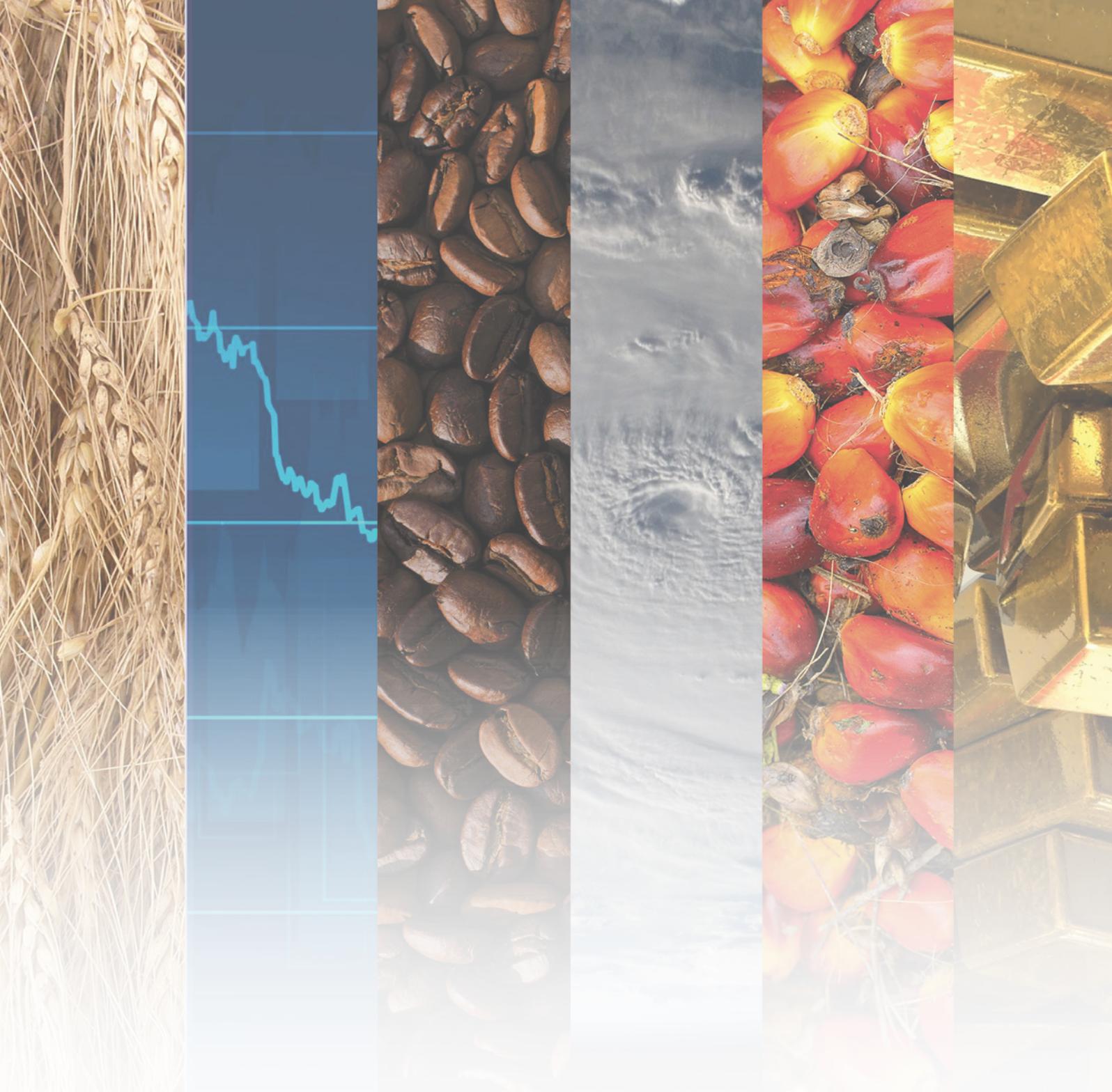
Special thanks goes to the Co-chairs of the SSE Derivatives Exchanges Advisory Group, Ms. Julie Winkler, Chief Commercial Officer, CME Group and Mr. Owain Johnson, Global Head of Research, CME Group & Vice-Chair of the WFE's Sustainability Working Group.

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*These exchanges are also WFE members.

Note: The views expressed in this paper are those of UNCTAD, UN Global Compact, UN Environment, the PRI and the WFE unless otherwise stated; the paper does not necessarily reflect the official views of individual members of the advisory group or their respective organisations.



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