RSC 2022/50
Robert Schuman Centre for Advanced Studies
The Florence School of Regulation

WORKING PAPER

The Financial Side of Energy Markets in the Low-Carbon Transition

Liebrich M. Hiemstra

European University Institute
Robert Schuman Centre for Advanced Studies
The Florence School of Regulation

The Financial Side of Energy Markets in the Low-Carbon Transition

Liebrich M. Hiemstra

RSC Working Paper 2022/50

ISSN 1028-3625

Published in June 2022 by the European University Institute.
Badia Fiesolana, via dei Roccettini 9
I – 50014 San Domenico di Fiesole (FI)

Italy

With the support of the Erasmus+ Programme of the European Union

The European Commission supports the EUI through the European Union budget. This publication reflects the views only of the author(s), and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Robert Schuman Centre for Advanced Studies

The Robert Schuman Centre for Advanced Studies, created in 1992 and currently directed by Professor Erik Jones, aims to develop inter-disciplinary and comparative research on the major issues facing the process of European integration, European societies and Europe's place in 21st century global politics.

The Centre is home to a large post-doctoral programme and hosts major research programmes, projects and data sets, in addition to a range of working groups and ad hoc initiatives. The research agenda is organised around a set of core themes and is continuously evolving, reflecting the changing agenda of European integration, the expanding membership of the European Union, developments in Europe's neighbourhood and the wider world.

For more information: http://eui.eu/rscas

The Florence School of Regulation

The Florence School of Regulation (FSR) is a partnership between the Robert Schuman Centre for Advanced Studies (RSC) at the European University Institute (EUI), the Council of the European Energy Regulators (CEER) and the Independent Regulators Group (IRG). Moreover, as part of the EUI, the FSR works closely with the European Commission.

The objectives of the FSR are to promote informed discussions on key policy issues, through workshops and seminars, to provide state-of-the-art training for practitioners (from European Commission, National Regulators and private companies), to produce analytical and empirical researches about regulated sectors, to network, and to exchange documents and ideas.

At present, its scope is focused on the regulation of Energy (electricity and gas markets), Communications & Media, and Transport.

This series of working papers aims at disseminating the work of scholars and practitioners on current regulatory issues

Florence School of Regulation - European University Institute

Via Boccaccio 121,

I-50133 Florence, Italy

FSR.Secretariat@eui.eu

+39 055 4685 878

Abstract

This article will explain the characteristics of the financial side of energy markets. It aims to clarify why financial contracts are needed in the energy sector and how such transactions are conducted by energy companies. A specific focus in this article is the low-carbon transition. This focus is also reflected in the description of the different types of financial contracts discussed herein, including derivatives relating to cap-and-trade schemes for CO2 emissions and environmental, social and governance (ESG) financial products. In addition, this article addresses how these financial contracts in the energy sector are regulated and will pay attention to anti-manipulation rules in the European Union and the United States. The low-carbon transition and climate finance is taken as a guidance in discussing the topics above and pursues to shed light on the question how financial contracts in the energy sector may contribute to a low-carbon transition.

Keywords

Energy markets, derivative trading, REMIT, ACER, ESG, CO2

Contents

1. Introduction

This article will explain the characteristics of the financial side of energy markets. It aims to clarify why financial contracts are needed in the energy sector and how such transactions are conducted by energy companies. A specific focus in this article is the low-carbon transition. This focus is also reflected in the description of the different types of financial contracts discussed herein, including derivatives relating to cap-and-trade schemes for CO2 emissions and environmental, social and governance (ESG) financial products. In addition, this article addresses how these financial contracts in the energy sector are regulated and will pay attention to anti-manipulation rules in the European Union and the United States. The low-carbon transition and climate finance is taken as a guidance in discussing the topics above and aims to shed light on the question how financial contracts in the energy sector may contribute to a low-carbon transition.

2. Energy markets and trading in financial contracts

The energy market can be seen and defined from different angles. Examples include the perspective of consumers and their off-take agreements with energy providers, the perspective of transport- and grid connections and the cross-border operators of these grids, the different sources of commodities which are used to generate electricity and the wholesale market for trading energy products. As a consequence, there is no fixed notion of the energy market. The variety of different facets is further increased by the cross-border element of trading in energy products such as coal, electricity and liquified natural gas and global interdependencies of energy prices of these products. Energy prices are highly volatile and dependent on external elements such as weather, climate policy, political developments and technology. Companies producing electricity, or trading in energy products, have an interest in pro-actively responding to these forces as they may impact the price of energy products. One of the tools to try to mitigate the impact of external factors on the price of a physical energy product, is to conduct trading in financial instruments - which value is derived from the physical energy products they trade in – simultaneously to trading in physical products. In addition, there may be other reasons why energy companies trade in financial contracts too. The paragraphs below will explain how these financial products are traded by energy companies and what the reasons and incentives are for energy companies to conduct these transactions.

2.1 How does trading in financial contracts work?

In order to investigate how trading in financial contracts work, let's first see how trading in physical energy products works. Energy companies generate electricity through gas- or coal fired power plants or through renewable sources such as wind turbines, hydrogen facilities or solar panels. In addition to such production task, many energy companies trade in energy commodities to meet an underlying demand to run a power plant - such as the trade in coal to fuel the coal fired power plant - or to meet a contractual obligation to deliver an agreed volume to a purchaser. Energy companies do not know the future price level of these commodities or the daily spot price of the electricity they generate, whilst they have a commercial interest to limit their exposure to these price fluctuations or uncertainties. As indicated above, one way to control such exposure is conducting a transaction whereby the energy company is entering into a financial contract simultaneously to the physical transaction. This is called hedging. Please see the example below on how hedging in the energy sector may work in practice.

A fictive energy company called Alpha is generating electricity through its power plant. Alpha does not want to be exposed to the daily spot price of electricity generated by its plant when selling the electricity and decides to see how it can mitigate this price risk. Alpha expects that the price of electricity on 1 January 2025 will be EUR 40 per megawatt hour. At the same time, another energy company Bravo – which is in need for electricity and therefore at the demand side of the market - expects that the spot price of electricity on 1 January 2025 will be EUR 60 per megawatt hour. Both parties agree to sell and purchase a set amount of megawatt hour for a price of EUR 50 per megawatt hour on 1 January 2025 and they both think they concluded a profitable transaction. This contract is called a forward contract with a physical delivery. What if Bravo changes its mind on the future spot price and expects this price to be lower than EUR 50 per megawatt hour? It does not want to be committed to paying Alpha the high spot price on 1 January 2025 and decides to sell the forward contract to another energy company called Charlie. The forward contract is tradable and has a value which is derived from the price of electricity: an energy derivative. Alpha, Bravo and Charlie entered into the world of energy derivative trading in order to hedge their price risks.

In case financial products have a value which is derived from the price of an energy product, the trading therein can be described as Energy Trading (Hiemstra, 2020a). Derivatives can exist in all types of shapes, but they do not identify a fixed set of financial instruments (Biggins, 2012). Energy Trading is not limited to trading in derivatives with an underlying based on the price of electricity. Energy derivatives may also be based on renewable energy products as well, such as guarantees of origin which serve as a proof for the renewable generation source of electricity or CO2 certificates (Dagoumas and Koltsaklis, 2017). Trading in energy derivatives can be conducted through multiple financial products, in multiple forms and on multiple venues. One distinction can be made between bilateral trades (so-called over the counter trades) or trades conducted through exchange platforms. Examples of exchanges where energy derivatives are traded are the European Energy Exchange (EEX) for the European Power market, Eurex as the largest derivative exchange in Europe, the Chicago Mercantile Exchange (CME), ICE Futures US (ICE) or the New York Mercantile Exchange (NYMEX). Recent developments on these exchanges show a shift in trading in sustainable derivatives. CME has launched E-mini S&P 500 ESG Index futures, a new derivative portfolio to align market participants financial goal with environmental, social and governance (“ESG”) values. Also Eurex introduced equity index futures contracts tied to ESG benchmarks. Next to the derivatives which have clear link to decarbonization, such as emission allowances, there are different classes of derivatives which measure sustainability targets or ratings: ESG derivatives. These ESG-index based derivatives are one of the fastest growing segments for exchanges and an increasingly popular hedging and trading tool (Lannoo and Thomadakis, 2020).

3. Incentives for trading

3.1 Hedging, arbitrage and speculation

There are three main reasons why energy companies trade in energy derivatives: hedging, speculation and arbitrage. This division plays a role in the regulatory exemptions at EU level for those trades conducted to mitigate the (price) risks related to the physical commodities necessary for the conduct of an energy company’s business as opposed to proprietary trading for direct gain (the so-called hedging exemption). With respect to energy companies, there are generally two risks involved in physical trading. One is the risk associated with the market price for energy (the price risk) and the other is the risk associated with the amount of energy that will be bought (the volume risk) (Hull 2012, p. 761).

It is not always clear how to distinguish hedging from other reasons for trading, such as speculation or arbitration as reasons for trading (Hull, 2012 and Partnoy, 2002). Cheng and Xiong reflect that the classification of market participants into the categories of “speculators” and “hedgers” very poorly aligns with the economically relevant distinction: reducing versus increasing risk (Cheng and Xiong, 2014). They state that many “hedgers” appear to take bets on prices that are insensitive to their current exposure. Disregarding the identity of the trader as a factor of classifying trades, and instead emphasizing the motive of a trade, may increase the difficulties in applying the distinction. It is already difficult for regulators to distinguish trading motives in a bilateral trade environment and would be much harder in an anonymous market in which orders may be split by algorithms and allocated to a wide range of counterparties (Duffie, 2014). A market participant trading in (heavily) subsidized renewable products, where margins and risks are lower than for the old and grey commodities, is less likely to enter into risky derivative trades and less likely to qualify as a speculator (Hiemstra, 2020a).

3.1.1 Hedging

Hedging plays an important role in trading in energy derivatives as prices are volatile with large price fluctuations and therefore high price risks. Hedging can be risk mitigation in order to offset an exposure. Market participants engage in hedging activities in order to manage risks for future instability in the price or rate on which a derivative is based. Hedging can therefore be considered as a form of insurance against changes in the market. Derivatives also play an essential role in helping firms to manage climate-related and transition risks. By facilitating the transfer of risks from counterparties that do not wish to have risk exposures to those that are willing to do so, derivatives offer an effective tool to hedge physical and transition risks by reducing uncertainty over future prices (ISDA, 2021). Academic literature suggests several questions: What risks do firms hedge? How much do they hedge? How far ahead do they hedge? What determines corporate hedging policy? Should firms hedge at all? Can corporate risk management create value? It is indicated that “as straightforward as it might appear, these questions are still largely unresolved” (Mackay and Moeller 2010, p.2) and that academic guidance is still lacking (Poitras 2013, p. 48). However, it is only a tool to, potentially, minimize or control a price risk, since there is no guarantee that the outcome with hedging will be better than the outcome without hedging. In addition, the risk that a counterparty defaults or may not be able to fulfill its contractual obligations is not mitigated. Hedging entails entering into multiple transactions at the same time for different prices and concluding hedging transactions is in certain aspects parallel to trading in multiple derivatives at the same time. This is because the hedge transaction is linked to a physical trade, so market participants spread the market risk. Without having a possibility to hedge, market participants would face large risks relating to price fluctuations. There is a difference, however, between hedging using future- and forward contracts or using options for hedging purposes. Since the difference between futures, forwards and options is the optionality of the possessor of the option to exercise its right to sell or purchase, the option for hedging purposes is more likely to be seen as an insurance tool.

3.1.2 Arbitrage

Arbitrage is a process whereby market participants profit from price discrepancies. This is done by simultaneously entering transactions relating to a similar product in two or more markets. Since one trade stands in for the other, arbitrage can be risk free. The possibility to arbitrage only exists if a product is priced differently on different markets or if this difference is the result of the difference in currency rates. Interesting in the process of arbitrage is that there is a short window of opportunity for market participants, since the forces of supply and demand will eventually create a balance between the different markets (Hull 2012, p. 16).

3.1.3 Speculation

Speculation is the activity where a market player takes a position in order to make profit, whilst hedgers want to avoid exposure to adverse market movements in the price of an asset. It is therefore the opposite of hedging: taking upon a risk in order to make profit instead of mitigating a risk with the objective to avoid a loss. Speculation can be a business in itself, and the return for speculators is not sure. The in-house professional execution of speculative trading is proprietary trading. The objective of these (in-house) departments is to make money and in planning to do so, they use working capital. Usually, speculators trade for their own account without a client portfolio and the activities are not related to the core business of their undertaking. As for hedgers, there is a difference in speculating with futures or options (Hull 2012, p. 15). When a speculator uses futures, the potential loss as well as the potential gain is very large. When options are used, and the speculator has the possibility to choose whether it writes the option, the loss is limited to the purchase price of the options, no matter how low the market price becomes.

3.2 Sustainable finance derivatives as a tool to reach decarbonization targets

Derivatives may play a role in pricing several energy products which may have an impact on climate change, such as a barrel of oil or guarantees of origin relating to megawatts generated by a green production facility. In that way, derivatives may help to make the true costs of climate change tangible (Futures Industry Association, 2021). This leads to the assumption that there are other reasons for energy companies or large industries to trade in sustainable finance derivatives next to the more financial driven reasons to trade - as those reflected above - and which can very bluntly be summarized as a buy low, sell high business strategy. Especially large industrial parties involved in chemical or heavy industries show a focus on the ambition to decarbonize their output and engage in purchasing renewable certificates as a tool to mitigate their carbon emissions. This comes with a risk of 'greenwashing', which implies that sustainable efforts do not reflect actual climate performance (Coen, Herman and Pegram, 2022). This would be the case if a company active in a highly polluting industry trades in emission certificates and uses this activity for marketing purposes whereby the polluting activities are reflected as ancillary to its emissions trading business. Sustainability efforts across the derivatives ecosystem differ in their details but share a common trait: they are born out of industry-led innovation and adaptability. Climate change-related innovation is evident in big efforts, like the creation of carbon marketplaces that did not exist until relatively recently (FIA, 2022).

One important tool in combating climate change is a market-based concept called cap-and-trade. In short, the idea behind the cap-and-trade approach is to help control emissions by putting a price on carbon, and providing economic incentives through an allocation of a limited number of permits that must be purchased by those who pollute more and can be sold by those who pollute less. These emission certificates or carbon credits are an interesting tool for large industries which aim to decrease their carbon footprint and contribute to a more sustainable business model. Market participants who produce less than they envisaged may sell a part of their certificates whilst a market participant who produced more than initially foreseen should purchase those certificates in the market. The value of the emission certificates is based on supply and demand and not a fixed amount. The idea behind emission certificates is that market participants have to choose between paying for the right to emit CO2 or to invest these funds in sustainable production methods which should lead to a long term decrease of CO2 emission. There is a distinction between primary- and secondary markets for trade in emission certificates (ESMA, 2022a). Primary markets consist of auctions to which most market participants whose main business relates to generating CO2 are able to participate. Here is where the emission certificates are created. Secondary markets consist of exchanges where all other parties may participate and where those emission certificates are traded (Hedges, 2009).

Hence, a separate market for the trade in these financial instruments is created which attracts investors, industrials and parties searching for trading opportunities with either hedging, speculative or arbitrage motives. In Europe, these secondary markets are EEX in Germany, ICE Endex in the Netherlands and Nasdaq Oslo in Norway. Derivatives based on US emission certificates such as California carbon allowances and RGGI (as further described in paragraph 3.2.2) are traded on ICE.

Another specific type of sustainable financial instruments are ESG derivatives, which are trades measuring certain ESG components. Although a fixed definition for ESG derivatives is lacking, ESG derivatives may have a value derived from an underlying interest rate with an additional premium in case the pre-set ESG targets are not met. The premium would turn into a discount if the targets are met. Therefore, market participants have an interest in meeting the ESG targets which are linked to the derivatives they trade in. Sustainability-linked products can attract much needed investment for research and the low-carbon transition. Derivatives play a role in these objectives as they: i) enable governments and investors to raise capital towards sustainable investments; ii) help firms hedge risks; iii) facilitate transparency, price discovery and market efficiency; and iv) contribute to long-termism (Lannoo and Thomadikis, 2020). As the route to decarbonization requires a long-term view instead of a short term incentive to make profit, derivatives are vital for investors to manage these long term risks and being able to realize the long-term goal of climate change.

3.2.1 European Union

In the European Union (EU), this cap-and-trade system for CO2 emissions is defined in the European Emission Trading Scheme (ETS), which is considered a key tool of the EU policy against climate change. It is the biggest emission trading system in the world. One emission certificate gives a market participant the right to emit one ton of CO2. The number of available emission certificates is established by the European Commission. This number is limited and decreases each year which makes investing in a sustainable business model more attractive.

In July 2021, the European Commission launched its Renewed Sustainable Finance Strategy to support meeting the commitments from the European Green Deal, which include becoming the first climate-neutral continent by 2050 and to reduce greenhouse gas emissions by at least 55% by 2030 (European Commission, 2021a). In this strategy, the European Commission emphasizes that a framework for sustainable finance can make it easier for public authorities to raise sustainable capital which is relevant as the scale of investments required to achieve the commitments as described above is well beyond the capacity of the public sector on its own. Such framework should include labels for financial instruments and sustainability derivatives could help bring clarity, transparency ad coherence to sustainable finance markets. Such label could include a reference to the energy transition or more sustainability-linked labels such as ESG. Bases on this strategy, it appears that there are very concrete tools for the EU and national governments in the EU to use financial instruments as a tool to reach the climate change and decarbonization targets.

3.2.2 United States

In the United States, there are no federal emission trading programs apart from a cross-state air pollution program and an acid rain program both monitored by the United States Environmental Protection Agency. These programs do not relate to carbon credits and therefore do not contribute to decarbonization. At state level, there are several initiatives in cap-and-trade programs, such as the Regional Greenhouse Gas Initiative (RGGI). RGGI is a cooperative effort amongst 11 states in the northeast of the United States to cap and reduce CO2 emissions from the power sector. These 11 states receive proceeds from selling RGGI allowances which have mostly been invested back into their communicates, including funding of clean energy programs and energy efficiency (RGGI, 2021).

Another regional initiative is found at a cross-border level between Canada and the US in the form of the Western Climate Initiative. This non-profit corporation aims to administer a shared trading market between California and Quebec and individual trading systems in Nova Scotia and Washington. Also, the corporation aims to support the implementation of cap-and-trade programs in other North-American jurisdictions. These participating jurisdictions represent the largest carbon market in North-America (WCI, 2020).

Next to specific emission trading programs, the interest in ESG issues is on the rise. Apart from the implementation of ESG factors in investment strategies of large industrial players, several new financial instruments relating to sustainability appear at the horizon. One of these is the so-called conservation finance instruments which are characterized by a mechanism through which a financial investment into an ecosystem is made that aims to conserve the values of that system for the long term (United Nations Environment Programme, 2016). The US financial regulator Commodity Futures Exchange Commission (CFTC) underlines that commodity derivatives exchanges could address climate and sustainability issues by incorporating sustainability elements inti existing contracts and by developing new derivative contracts to hedge climate-related risks, which may include weather, ESG and renewable generation and electricity derivatives (CFTC, 2020).

The Federal Reserve Board – the governing body with a mandate to oversee the federal reserve banks in the US - recognized climate change and climate-related risks as increasingly able to influence financial risks and US financial stability (Board of Governors of the Federal Reserve System, 2020). In addition, US regulators such as the Securities and Exchange Commission (SEC) and the CFTC have increased their focus on ESG financial products since the beginning of the Biden administration in January 2021 (SEC, 2021 and CFTC, 2021). A specific example can be found in the SEC proposed rule which would require registrants under the Securities Act and the Securities Exchange Act to include certain climate-related disclosures in their registration statements and periodic reports, including information about climate-related risks that may have impact on their business, results of operations, or financial condition (SEC, 2022). Even though this proposal is still open for comments, it is a sign that focus on climate is enlarged. However, such increased focus has not yet led to increased regulatory initiatives in this field in relation to climate change.

4. Regulation and supervision

The market for trading in energy derivatives has been subject to increased regulation since the financial crisis in 2007, with a general aim to make the market more transparent and safer for both investors and – ultimately – end consumers of electricity and gas (Lannoo and Thomadakis, 2020 and Hiemstra, 2020a). This tighter regulation includes the implementation of specific of anti-manipulation rules in the energy sector. Supervision and enforcement of these regulatory frameworks are limited to the territorial jurisdiction of specific regulatory authorities, whilst the trade in energy derivatives is characterized by cross-border relationships between market players. This section continues with an overview of the specific regulatory frameworks in the EU and the US and further investigates how these frameworks interlink with each other.

4.1 EU

4.1.1 Relevant regulatory framework

At a European level there are several regulatory frameworks to supervise energy derivative trading: Markets in Financial Instruments Directive (MiFID II), the European Market Infrastructure Regulation (EMIR), the Regulation on Wholesale Energy Market Integrity and Transparency (REMIT) and the Market Abuse Directive and Regulation (MAD/MAR). The objective of REMIT is to increase integrity and transparency in the wholesale energy market and to foster competition for the benefit of final

consumers of energy, whilst EMIR aims to reduce systemic risk by increasing market transparency and to mitigate counterparty risk by introducing a clearing obligation for OTC derivatives. MiFID II aims to make financial markets more transparent and to increase the level of protection for investors. Under MiFID II, emission allowances are listed as a specific category of financial instruments no matter where and how they are traded, which in practice means that primary markets as well as secondary markets are under surveillance of ESMA. There is discussion on activities of speculators or pure financial actors – whom may not even be based in the European Union – and whether they should be restricted from trading as certain buy-and-hold strategies may lead to a reduction of allowances available to compliance entities (Energy Post, 2022). Such buy-and-hold strategy may be the basis for anti-manipulative market behavior. Anti-manipulation rules are mostly derived from MAD/MAR and the trading in financial derivatives – including emission certificates – is subjected to statutory prohibitions of market manipulation and insider trading. More specifically, according to article 12 MAR these prohibitions entail: i) entering into transactions which are likely to secure its price at an abnormal or artificial level; ii) entering into transactions which affects the price of a financial instruments and which employs a fictitious device or any other form of deception; iii) disseminating information through media which gives misleading signals as to the supply, demand, price of the financial instrument, where the person who made the dissemination knew that the information was misleading.

4.1.2 Supervision

Market supervision of Energy Trading is not a purely national matter in the European Union. As directives form the European framework for financial regulation, the implementation and scope of regulation on a national level, as well as supervision and enforcement, may vary along the Member States. The regulatory frameworks mentioned in the previous sub-section have their own supervisory agencies; the Agency for the Cooperation of Energy Regulators ('ACER') and the European Securities and Markets Authority ('ESMA'). As the trade in energy derivatives is characterized by cross-border activities, national- and European Supervisory agencies benefit from cooperation at a horizontal (between EU supervisors or between national supervisors) and a vertical level (between EU supervisors and national supervisors) (Hiemstra (2020b).

The supervision of anti-manipulation rules under MAD/MAR takes place at different levels. The first line of defence against market abuse is at firm level, whilst the second line of defence, complementing the one at firm level, lies with market operators and investment firms operating a trading venue (ESMA, 2022a). Finally, a third line of defence is regulatory market surveillance, where national regulatory authorities with jurisdiction over carbon markets put in place their (digital) market surveillance systems.

Newly developed sustainable derivatives, which qualify as financial instruments under MiFID II, would be subjected to the same anti-manipulation rules under MAD/MAR as described above. In addition, market participants trading in these financial instruments are subjected to mandatory reporting obligations which could provide regulatory agencies at different levels with information triggers to detect suspicious market behaviour.

4.2 US

4.2.1 Relevant regulatory framework

In the US, the relevant regulatory framework at a federal level for trading in sustainable derivatives is based on the Commodity Exchange Act, which was amended in 2010 by the Dodd Frank Wall Street Reform and Consumer Protection Act. The latter increased the scope of the regulatory framework by including the types of financial products regulated by the CFTC. In addition, the regulations of the CFTC and the rules of specific exchanges where these financial instruments are traded are part of the regulatory framework.

Next to the federal Commodity Exchange act, there were several regulatory initiatives by the Obama administration to further elaborate the scope of the cap-and-trade program, such as the American Clean Energy and Security Act, though the proposal did not make it to the finish line due to the influence of several industrial organizations. One of the arguments used in criticism towards the a federal cap-and-trade program is the concern that increased costs of emissions controls will further undermine the economic competitiveness of US industry and may lead to a transfer of wealth to developing countries (LaMotte, Williamson, Hopkins, 2009). CFTC points out that the current regulatory framework – and especially the lack of common definitions and standards for climate-related data and financial products is - is not yet fit to provide regulatory authorities and market participants with the tools to monitor and manage climate risk (CFTC, 2020).

When it comes to anti-manipulation rules, the scope of the prohibitions within the US system is similar to the one in Europe under MAR. According to the Commodity Exchange Act, the following – non-limitative – list of behaviour is prohibited: i) fraud and manipulation of by using manipulating devices or providing untrue statements; ii) pre-arranged trading; iii) fictitious trades such as wash trades which lack the intention to actually execute them; iv) disruptive trading practices such as violating bids or offers or spoofing (trading with the intent to cancel the transaction before execution); and v) position limit violations.

4.2.2 Supervisory regime

The CFTC is charges with regulatory supervision in the US derivative market since 1974 and has broad authority to both supervise and enforce market manipulation and insider trading activities. The CFTC could contribute to the transition to a net-zero economy by facilitating the development of new financial products that help the private sector mitigate its climate-related risks and should ensure that these products actually provide the climate benefits they claim (Phillips, 2022). Enforcement at a federal level is shared with the Federal Energy Regulatory Commission (FERC) which has a mission to assist consumers in obtaining reliable, safe, secure and economically efficient energy services. FERC has targeted the prohibition of market manipulation in the energy sector as one of its four priorities (FERC, 2020). Under article 18 of the Code of Federal Regulations, it is unlawful for any entity in connection with the purchase or sale of gas or electricity to conduct fraudulent acts or to make untrue statements. Next to the federal CFTC and the FERC, a market participant is subjecting itself to market regulation and supervision from exchanges when it starts trading on these venues by agreeing to be bound by the exchange rules.

5. Overlap and cooperation between regulatory authorities

Trade in sustainable derivatives is not limited to national- or even continental borders. European based enterprises may enter the US Future Exchange and a New York based commodity trader may enter the EEX. From that perspective, the two regulatory systems are compatible. However, supervision and enforcement of violations of anti-manipulative actions are supervised by ESMA in the European Union and CFTC in the US. In practice this means that a cross border trading activity which conflicts with anti-manipulation rules under both MAR and the Commodity Exchange Act, might be subjected to enforcement actions of both ESMA and the CFTC. Such dual submission to supervision is not desirable form the point of view of market participants and also very inefficient from the point of view of the regulator. Such problem is partially avoided through the recognition of central counterparties established in third countries under EMIR, which implies the delegation of monitoring of some financial instruments traded via those central counterparties (ESMA, 2022b). Supervisory activities conducted outside a regulatory agency's jurisdiction might conflict with the principle of legality. This is a key principle in the protection of citizens against acts of a government (Tridimas, 2006 and Lavrijssen, 2006).

Therefore, it is vital that supervisory authorities in different jurisdictions cooperate. In 2019, a joint statement of the European Commission and the CFTC was published on cross-border derivatives regulatory issues (European Commission, 2019). This statement reflected discussions between CFTC and ESMA on regulatory developments such as the European Commission's plans to implement a new version of EMIR and the CFTC's invitation to comment on proposed rules pertaining to non-US market participants and emphasized the importance of effective supervisory oversight on both sides of the Atlantic. A more tangible initiative is the memorandum of understanding between ESMA and the CFTC signed in 2021 regarding cooperation and the exchange of information with respect to certain registered derivatives clearing organization which are recognized in both jurisdictions (ESMA and CFTC, 2021).

In the field of emissions trading, it appears that the number of emissions trading systems around the world is increasing and – next to the systems in the US and Canada as described above, additional emissions trading systems can be found in China, Japan, New Zealand, South Korea and Switzerland (European Commission,2021b). Even though cooperation between these emission trading schemes is deemed beneficial for reasons of liquidity, price stability and levelling the international playing field by harmonizing prices across jurisdictions, no specific link between the EU ETS and the US schemes is in place yet. As a consequence, it seems that coordination and supervision at a global level is lacking. Only a truly global initiative on regulation and supervision of sustainable derivatives will close the legality loophole the regulatory authorities find themselves in (Heffron, 2021). However, this is only a fictious solution which does not take into account sovereignty arguments of countries, local characteristics of supervision, enforcement and insurmountable differences between political views and legal systems. Meanwhile, cooperation initiatives between regulatory authorities are contributing to the overall goal of fighting climate change and decarbonization by making use of legal possibilities.

6. Conclusions

The Intergovernment Panel on Climate Change (IPCC, 2021) repeatedly warned that greenhouse gas emissions must decline sharply to limit global warming to 1.5°C. It is clear that industries and governments have a responsibility to cooperate to meet these targets. As seen in this article, sustainable derivatives may contribute to achieving these goals by enabling industries to mitigate their future price risks and being able to decide on large scale sustainable investments. Sustainable derivatives and secondary markets for emissions trading are not limited to national or even continental borders. This international component conflicts with the legal mandate of regulatory authorities. This legality loophole in the law will not be solved unless national parliaments agree on far reaching global regulations to facilitate the trade in sustainable derivatives and emission trading whilst adhering to principles of legality. But such legal framework remains a pipedream. Meanwhile, cooperation between governments and regulatory agencies and the willingness of investors to choose for climate change-related innovation is our best option for now.

References

Biggins, J. (2012). 'Targeted Touchdown' and 'Partial Liftoff': Post crisis Dispute Resolution in the OTC derivatives Markets and the Challenge or ISDA. *German Law Journal,* 2012 (volume 13, No. 12), p. 1299.

Board of Governors of the Federal Reserve System (2020), *Financial Stability Report*, https://www.federalreserve.gov/mwg-internal/2535425/progress?id=N2jb8R6Pf-Uk1Qwk0djd-UHCVL0F3bJigducsvm3PwE, (Accessed 9 April 2022).

Cheng, I.H., Xiong, W. (2014), Why Do Hedgers Trade So Much? *The Journal of Legal Studies,* 43 (S2), p. 207.

Coen, D., Herman, K., Pegram, T. (2022), Are corporate climate efforts genuine? An empirical analysis of the climate 'talk-walk' hypothesis. *Journal of Business Strategy and the Environment,* **(**20220329). doi: 10.1002/bse.3063.

Commodity Futures and Trading Commission (CFTC) (2020). Managing Climate Risk in the U.S. Financial System. Report of the Climate-Related Market Risk Subcommittee, Market Risk Advisory Committee of the U.S. Commodity Futures Trading Commission, https://www.cftc.gov/sites/default/files/2020-09/9-9-20%20Report%20of%20the%20Subcommittee%20on%20Climate-Related%20Market%20Risk%20-%20Managing%20Climate%20Risk%20in%20the%20U.S.%20Financial%20System%20for%20posting.pdf, (Accessed 9 April 2022).

Commodity Futures and Trading Commission (CFTC) (2021). *Interdivisional Group Will Focus on Derivatives Markets' Role in Addressing Climate-Related Risk and Transitioning to Low-Carbon Economy*, Press release 9368-21, https://www.cftc.gov/PressRoom/PressReleases/8368-21 , (Accessed 9 April 2022).

Dagoumas, A. and Koltsaklis, N. (2017). Price Signal of Tradable Guarantees of Origin for Hedging Risk of Renewable Energy Sources Investments. *International Journal for Energy Economics and Policy*, 2017 7 (4), p. 59-67.

Duffie, D. (2014). Challenges to a Policy Treatment of Speculative Trading Motivated by Differences in Beliefs, *Journal of Legal Studies*, volume 43 (2).

Energy Post (2022), Online Roundtable 31 March 2022: "Options to Reform the EU ETS", <https://energypost.eu/options-to-reform-the-eu-ets-coping-with-price-volatility-and-speculation-event-summary/> and <https://youtu.be/7bRNZwN_FIE, (Accessed 15 April 2022).

European Commission (2019). *Joint Statement of the European Commission and CFTC Following Meeting on Cross-Border Derivatives Regulatory Issues*. https://ec.europa.eu/info/sites/default/files/business_economy_euro/banking_and_finance/documents/190913-joint-statement-ec-cftc_en.pdf (Accessed 9 April 2022).

European Commission (2021a). *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Strategy for Financing the Transition to a Sustainable Economy* (COM(2021)390 final, https://eur-lex.europa.eu/resource.html?uri=cellar:9f5e7e95-df06-11eb-895a-01aa75ed71a1.0001.02/DOC_1&format=PDF, (Accessed 9 April 2022).

European Commission 2021b). *International Carbon Market* [online] https://ec.europa.eu/clima/eu-action/eu-emissions-trading-system-eu-ets/international-carbon-market_en, (Accessed 9 April 2022).

European Securities and Markets Authority (ESMA) and Commodity Futures and Trading Commission (CFTC) (2021), *Enhanced Memorandum of Understanding Related to ESMA's Assessment of Compliance and Monitoring of the Ongoing Compliance with Recognition Conditions by Certain Derivatives Clearing Organizations Established in the United States*. https://www.esma.europa.eu/press-news/esma-news/cftc-and-esma-sign-enhanced-mou-related-certain-recognized-central, (Accessed 9 April 2022).

European Securities and Markets Authority (ESMA) (2022a). *Final Report. Emission allowances and associated derivatives,* ESMA70-445-38, esma70-445-38_final_report_on_emission_allowances_and_associated_derivatives.pdf (europa.eu), (Accessed 9 April 2022).

European Securities and Markets Authority (ESMA) (2022b). *Public Statement: ESMA updates on third-country CCP recognition decisions,* ESMA91-398-4844, https://www.esma.europa.eu/press-news/esma-news/esma-updates-third-country-ccp-recognition-decisions, (Accessed 15 April 2022).

Federal Energy Regulatory Commission (2020), *2020 Report on Enforcement,* page 6 https://www.ferc.gov/sites/default/files/2020-11/2020%20Annual%20Report%20on%20Enforcement.pdf, (Accessed 15 April 2022).

Futures Industry Association (FIA) (2021). *How derivatives markets are helping the world fight climate change*. [pdf] Available at https://www.fia.org/resources/markets-need-be-part-climate-change-solution-says-fia, (Accessed 9 April 2022).

Hedges, A. (2009), The Secondary Market for Emissions Trading: Balancing Market Design and Market Based Transaction Norms, in Freestone, D. and Streck, C. (2009). *Legal aspects of carbon trading : Kyoto, Copenhagen, and beyond.* Oxford: Oxford University Press (Oxford Scholarly Authorities on International Law), https://oxford.universitypressscholarship.com/view/10.1093/acprof:oso/9780199565931.001.0001/acprof-9780199565931, (Accessed 9 April 2022).

Heffron, R. J. (2021) *Achieving a just transition to a low-carbon economy.* Cham, Switzerland: Palgrave Macmillan, p. 10.

Hiemstra, L. (2020a). Energy Trading and the Exchange of Information between Supervisors: Effectiveness of Fragmented Supervision and Information Sharing. *Journal of Energy and Natural Resources Law,* 39(2), pp. 159 – 182. 10.1080/02646811.2020.1841400.

Hiemstra, L., (2020b). REMIT: ten years and counting. An exploration of the regulatory paradigm for commodity derivative trading in the energy market. *Law and Financial Markets Review*, 2020 (14), pp.237 – 248.

Hull, J. (2012). *Options, Futures & Other Derivatives*, Harlow: Pearson.

Intergovernmental Panel on Climate Change, (2021). Summary for Policymakers. In: *Climate Change 2021: The Physical Science Basis. Contribution of the Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.* https://www.ipcc.ch/report/ar6/wg1/#FullReport, (Accessed 15 April 2022).

International Swaps and Derivatives Organisation (2021). *The Role of Derivatives in Carbon Markets*, https://www.isda.org/a/soigE/Role-of-Derivatives-in-Carbon-Markets.pdf, (Accessed 9 April 2022).

LaMotte, R., Williamson D.M., Hopkins L.A. (2009), Emissions Trading in the US: Legal Issues, in Freestone, D. and Streck, C. (2009). *Legal aspects of carbon trading : Kyoto, Copenhagen, and beyond.* Oxford: Oxford University Press (Oxford Scholarly Authorities on International Law), https://oxford.universitypressscholarship.com/view/10.1093/acprof:oso/9780199565931.001.0001/acprof-9780199565931, (Accessed 9 April 2022).

Lannoo,K. and Thomadakis, A. (2020). *Derivatives in Sustainable Finance,* CEPS – ECMI Study, Centre for European Policy Studies.

Lavrijssen,S.A.C.M. (2006), *Onafhankelijke mededingingstoezichthouders, regulerende bevoegdheden en de waarborgen voor good governance*, Den Haag: Boom Juridische Uitgevers.

Mackay, P. and Moeller, S. (2010). Corporate Risk Management: The Hedging Footprint. *SSRN Electronic Journal*, DOI: 10.2139/ssrn.1654259.

Partnoy, F. (2002). Enron and Derivatives. Available at SSRN: https://ssrn.com/abstract=302332 or http://dx.doi.org/10.2139/ssrn.302332

Phillips, T. (2002). *A Climate and Competition Agenda for the Commodity Futures Trading Commission*, Center for American Progress, < https://www.americanprogress.org/article/a-climate-and-competition-agenda-for-the-commodity-futures-trading-commission/>, (Accessed 9 April 2022).

Poitras, G. (2013). *Commodity Risk Management*. *Theory and Application*, New York: Routledge.

Regional Greenhouse Gas Initiative (2021). *101 Factsheet*, https://www.rggi.org/sites/default/files/Uploads/Fact%20Sheets/RGGI_101_Factsheet.pdf, (Accessed 9 April 2022).

Securities and Exchange Commission (2021). SEC Division of Examinations Announces 2021 Examination Priorities. Enhanced Focus on Climate-Related Risks. Press release 2021-39, SEC Division of Examinations Announces 2021 Examination Priorities, (Accessed 9 April 2022).

Securities and Exchange Commission (2022). *Proposed Rule on the Enhancement and Standardization of Climate-Related Disclosures for Investors,* Release Nos. 33-11042; 34-94478; File No. S7-10-22], < https://www.sec.gov/rules/proposed/2022/33-11042.pdf> , (Accessed 15 April 2022).

Tridimas, T. (2006) *The general principles of EU law*. 2Nd [rev.] edn. Oxford: Oxford University Press (Oxford EC law library).

United Nations Environment Programme (2016). *The State of Sustainable Finance in the United States.* https://wedocs.unep.org/bitstream/handle/20.500.11822/9828/-The_state_of_sustainable_finance_in_the_United_States-2016The_State_of_Sustainable_Finance_in_the_US.pdf.pdf?sequence=3&amp%3BisAllowed=, (Accessed 9 April 2022).

Western Climate Initiative, Inc (2020). *Annual Report – Activities and Accomplishments*, https://wcitestbucket.s3.us-east-2.amazonaws.com/amazon-s3-bucket/documents/annualreport-2020-20210512-en-1635541015.pdf, (Accessed 9 April 2022).

Author

Liebrich M. Hiemstra

PhD Candidate, Tilburg University

Senior Legal Counsel – Corporate/M&A, Vattenfall N.V.

L.M.Hiemstra@tilburguniversity.edu

liebrich.hiemstra@vattenfall.com