REVIEW OF THE EMIR CLEARING THRESHOLD FOR COMMODITIES (CCT)

Report for EFET

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EXECUTIVE SUMMARY

G20 members have committed to limit systemic risk in the financial system after the financial crisis of 2007/08. In the EU, this is implemented through the European Market Infrastructure Regulation (EMIR)[1], which came into force in 2012. EMIR specifies the obligations to central clearing, reporting, risk mitigation and bilateral margining for over-the-counter (OTC) derivative contracts. The clearing thresholds set in 2012 are currently under review by the European Securities and Market Authority (ESMA).

EFET has commissioned Frontier Economics (supported by Luther Lawfirm) to produce a study on the review of the commodity clearing threshold (CCT) in order to substantiate its members' position as utilities and energy traders which almost all are non-financial counterparties (NFCs) on a scientific basis. This study also captures insights and practical case studies from a multitude of bilateral interviews with EFET members and affiliates.

The **main findings** of our study are:

- The CCT should be **increased to at least €12bn** – Such an increase is required to facilitate the EU energy transition (Green Deal), compensate for historical energy price inflation and establish a level playing field with entities from other G20 jurisdictions. Such an increase would not jeopardise the stability of the financial system since commodity derivatives (such as energy products) are mainly traded by NFCs which do not pose a systemic risk.
- A CCT increase should be followed up by **further EMIR reforms** – An increase of the CCT to €12bn alone would only mitigate current issues for NFCs but not be sufficient to facilitate the financing of the fast-growing private renewable investments needed to achieve the Energy transition. We provide a 'toolbox' of further remedies which would make EMIR fit for the purpose of a low-carbon economy.

Increase of the CCT to at least €12bn to facilitate the financing of renewable energy investments for the Green Deal

The CCT needs to be increased from €3bn (set in 2012) to at least €12bn for several reasons:

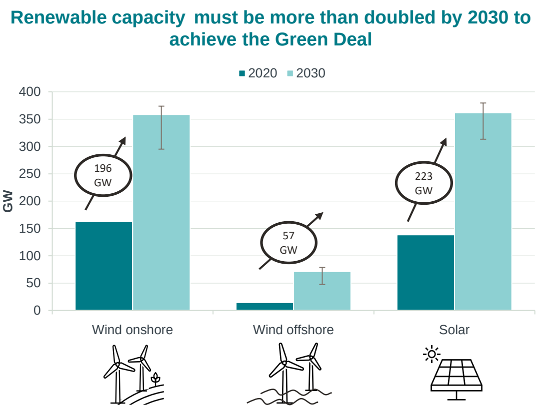
A higher CCT is necessary to finance private renewable investments for the EU energy transition (Green Deal)

- **Material expansion of private renewable investments** – The European Green Deal announced in 2020 has committed the EU to cutting GHG emissions by at least 55% until 2030, compared to 1990 levels. The European

[1] Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories.

Commission estimates that investments necessary to achieve the objectives of the Green Deal are expected to more than double compared to the 2011-2020 period, reaching around €400bn a year. [2] As part of this, renewable generation capacities must be more than doubled by 2030 to achieve the climate targets (Section 3.1).

- **OTC derivatives (such as renewable financial PPAs) are needed to enable the financing of renewable investments** – In 2012, when the €3bn CCT was set, most renewables in Europe received financial support that fully insured them against market price risks. As government support phases out (e.g. zero bid tenders for offshore in Germany and the Netherlands), the availability of market-based opportunities for reducing risks (such as renewable financial PPAs) becomes increasingly important to make new renewable investments financeable (Section 3.2).



- **Non-financial counterparties (NFCs) play a key role in providing renewable financial PPAs as hedges** – In Europe, the required longer-term renewable PPAs to facilitate the financing of renewable investments often involve utilities and energy traders as counterparties. NFCs are in a prime position to act as hedging providers for renewables since they
  - possess the sector-specific market knowledge to assess and manage commodity derivatives (such as PPAs);
  - can handle the intermittency of renewables as they often have a generation portfolio which they can use to balance the variable renewable feed-in;
  - treat derivative contract positions in a similar way to their existing physical renewable generation and are able to internalise the risks (so called ‘warehousing’); and
  - manage the market risks by trading them “away” through their access to OTC and exchange markets.

  Most financial companies, such as banks and hedge funds, have retracted from the market for commodity derivatives in recent years.

- **NFC-s cannot offer the necessary quantity of renewable hedges at the current CCT –** Entering a single large financial PPA with an offshore windfarm (which is not exempted as a hedge for the NFC- itself) would at current electricity prices already breach the CCT of €3bn (Section 3.3). Already today, NFC-s reject trading offers which would bring them above the threshold (see real-world examples in Section 4.1).

[2] European Commission (2020): Impact Assessment – 2030 Climate Target Plan, SWD(2020) 176 final, Table 46.

- Breaching the CCT and gaining **"NFC+" status is no viable option** for most NFC-s. NFC+ entities have to implement margining requirements[3], as well as risk management and regulatory reporting obligations which have significant detrimental commercial impacts:
  - significant administrative and financial efforts to upgrade to and maintain the NFC+ status for all entities in the entire group (Section 4.3);
  - constrained cash liquidity from margining requirement (Section 4.4).

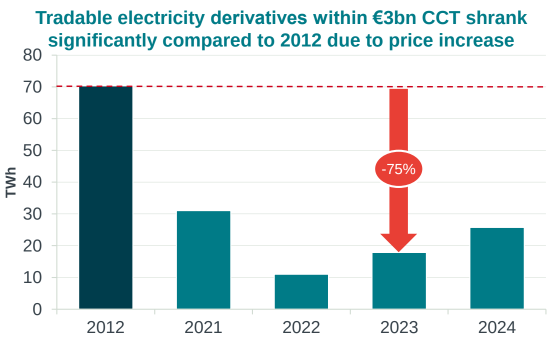
The current low CCT may lead to general energy market inefficiencies and jeopardises the achievement of the renewable targets in the Green Deal (or only achieving them at higher cost).

A €12bn CCT would at least compensate for the increase of energy prices and allow to trade comparable quantities in derivatives as in 2012

Above we have demonstrated that NFCs need to trade in derivatives (such as financial renewable PPAs) to facilitate the energy transition going forward. However, fundamental changes since 2012 – when the CCT of 3€bn was defined – are putting an increasing strain on the corresponding energy volumes that can be traded under the given CCT. This has also made it harder for NFC-s to meet the over-the-counter (OTC) hedging demand from renewable investors under the current €3bn threshold:

- Fundamental changes to the demand-supply balance in commodity markets have led to **increasing and more volatile commodity prices** since 2012, in particular for energy products (Section 2.1).
- Since 2021, as a **consequence of Brexit** and until the EU changes its assessment, UK commodity exchanges are no longer recognised as equivalently regulated. Any transactions entered on UK exchanges and centrally cleared are now treated as OTC trades and therefore counted against the CCT (Section 2.2).

As a consequence, the unadjusted CCT of €3bn is **consummated at much lower trading quantities** than in 2012. For example, the tradeable quantity[4] of electricity derivatives shrank from around 70 TWh in 2012 to 18 TWh in 2023 (see Section 2.3), a decline by 75%.



To **compensate for the increase in energy prices** since 2012, which are expected to prevail longer term, the CCT would have to **be increased to €12bn**. This would allow NFCs to trade the same

[3] Margins are collateral which is exchanged between trading parties to protect against default. There are two types of margins: Initial margin (IM) which is exchanged when the derivatives trade is executed and variation margin (VM) which is paid regularly to reflect the current market value of the trade.

[4] Quantities are derived by diving the € 3 bn CCT by the wholesale electricity price of the year (future prices as traded in March 2022).

quantities of derivatives in electricity, the key commodity for the Green Deal, at current future prices for 2023 as in 2012 (note that at 2022 prices, the CCT would even have to rise to almost €20bn to compensate for high prices in the first quarter).

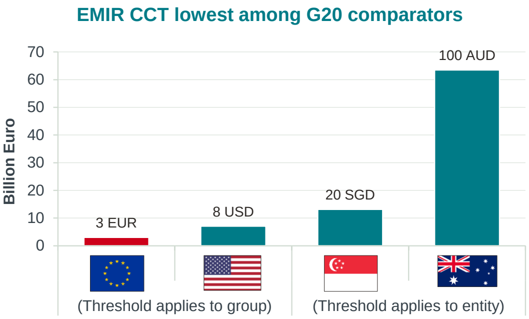
Price inflation is a normal phenomenon for most goods and services and leads to growing credit exposures in nominal terms. However, it does not automatically imply higher systemic risks. Otherwise, all large companies today would need to be considered overwhelmingly large in 1960-prices for example.

A higher CCT would also establish an international level playing field

EU NFCs are active in global commodities markets. A **benchmarking study by Luther**[5] shows that the EU EMIR regulation is stricter than other comparable G20 regulatory regimes which puts EU companies at a possible **competitive disadvantage** in non-EU markets (see Section 5):

- **EMIR with widest scope –** EMIR considers the broadest scope of products, entities and activities when counting trades against the OTC-derivative clearing threshold. Most notably, EMIR has unlimited global reach, i.e. all global derivative trades by EU entities and their subsidiaries (including outside of the EU) are captured by EMIR.

- **EMIR with lowest clearing threshold** – In addition to having the widest scope, EMIR also has the lowest commodity clearing threshold (see figure above). This further limits the ability of EU entities to trade derivatives compared to entities from other G20 jurisdictions.



A €12bn CCT would establish a **level playing field** in international competition with entities from other G20 jurisdictions (note that the US has a narrower scope than EMIR[6]) and would be **compatible with the G20 commitment** (as the international comparison shows).

A higher CCT is justified as NFCs only bear low systemic risk

An increase of the CCT to €12bn is justified due to specific characteristics of the commodity derivatives market which suggest that increasing the scope for unmargined (but collateralised through credit lines and credit support) OTC trading may increase credit risk, but not to a systemic relevant level (Section 6.4):

[5] https://www.energytraderseurope.org/documents/energy-traders-europe-memorandum-commodity-derivative-clearing-under-emir/

[6] The US DFA has a CCT of €7bn but it only considers the GNV of trades concluded in the last 12 months whereas EMIR refers to the outstanding GNV of all relevant derivative contracts (i.e. it considers the GNV in relation to the remaining lifetime of the contracts). This is particularly relevant for renewable PPAs with contract durations of 10+ years. Such contracts roll out of the DFA reference period after 12 months but accumulate under EMIR.

- **The market for commodity derivatives is very small** compared to other derivatives markets and accounted for only 1% of the outstanding notional value of derivatives in 2020.[7]
- **NFCs do not tend to be of systemic importance for the financial system** and a failure of a non-financial commodity trading firm would not trigger a “broader contagion” of the financial sector.[8]

CCT increase to €12bn needs to be followed by further EMIR reforms to facilitate the transition to a low-carbon economy

An increase of the CCT is necessary to immediately[9] mitigate the issues that NFCs approaching the CCT currently face. An increase of the **CCT to €12bn** would only offset the impact from increased energy prices. However, it would **not accommodate higher derivative quantities** (such as financial renewable PPAs) required for the European transition to a low-carbon economy.

The CCT increase therefore needs to be accompanied by **further EMIR reforms**. In Section 7 we provide a ‘toolbox’ of possible further remedies the EU legislator may want to consider in the context of the EMIR review.

Table 1 Further possible remedies in EMIR review

#	Remedy	EMIR change
1.	Exclusion of all centrally cleared derivatives by a recognized Central Counterparty	Level 1
2.	Limitation of geographical scope	Level 1
3.	Widening the application of netting in threshold calculation	ESMA FAQ
4.	Widening the hedging definition	Level 2
5.	Amending the calculation methodology (reference period)	Level 1
6.	Refine and narrow definition of derivatives	Level 1

Source: Luther and Frontier Economics.

Note: Level 2 changes can be adopted directly by the Commission, Level 1 are adopted by the European Parliament and the Council. See Annex E for suggested EMIR annotations provided by Luther.

Most remedies from the toolbox in Table 1 require Level 1 changes, i.e. they would need to be proposed by the EU Commission and adopted by the European Parliament and the Council. This process typically takes several years and would potentially hold back the energy transition. We therefore propose to progress with raising the CCT level to €12bn or higher regardless of the speed with which the further remedies are progressed.

7 ESMA, “ESMA Annual Statistical Report 2021”, p. 17, figure ASRD.4, column “CO”.

8 This view is supported by numerous independent analyses. See, e.g., from Committee of European Banking Supervisors (2007), Kerste et. al. (2014) and ESMA (2021). Commodity derivative markets have a high share of NFCs, see ESMA (2021), figure ASRD.19.

9 As a Level 2 a CCT increase can be adapted directly by the Commission.

1 THIS REPORT REVIEWS THE EMIR CLEARING THRESHOLDS FOR OTC COMMODITY DERIVATIVES

In this section we outline

- the main purpose of EMIR (Section 1.1);
- the clearing thresholds and margining rules under EMIR (Section 1.2); and
- the scope of this report (Section 1.3).

1.1 EMIR serves to limit systemic risks and prevent financial system collapses

Existing EMIR regulations in relation to derivatives trading including commodity derivatives were developed in the aftermath of the financial crisis of 2007/08 to help limit the systemic risk in the financial system that may derive from OTC financial transactions.

It is widely understood that credit derivatives contributed to the financial crisis of 2007/08: Credit derivatives spread the risk of US subprime mortgages across the financial system, while some financial firms (like AIG, for instance) accumulated a particularly high exposure. When these derivatives incurred large losses, AIG and other financial firms were bailed out by the US government, because they were so strongly interconnected with banks that a breakdown could have led to a cascade of defaults that could have brought the entire financial system to the brink of collapse. Notably, this crisis was triggered by credit derivatives and not commodity derivatives, which are the subject of this report.

In order to avoid such crises and bailouts in future, policy makers tried to improve the regulation of the derivative market in the aftermath of the crisis. At the 2009 Pittsburgh Summit, G20 leaders agreed on the following reforms to the OTC derivative market:

- obligation to central clearing and, where appropriate, reporting of all transactions to trade repositories, as well as
- higher margin requirements for non-centrally cleared transactions.

These G20 commitments have been implemented in the EU by means of the European Market Infrastructure Regulation (EMIR)[10], which came into force in 2012. The aim was to improve transparency and reduce the risks associated with the derivatives market.

[10] Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories.

1.2 EMIR implements clearing thresholds and margining rules

EMIR specifies the obligations to central clearing, reporting, risk mitigation and bilateral margining for over-the-counter (OTC) derivative contracts. Although the purpose of EMIR is to reduce the risk of the financial sector, it does not only apply to financial firms (referred to as financial counterparties (FCs) in EMIR), but also to non-financial counterparties (NFCs) who trade OTC derivatives. In order to differentiate between their level of sophistication, NFCs are requested to measure the volume of their outstanding OTC derivatives in terms of the gross notional value (GNV).[11] That GNV is then compared to defined “Clearing Thresholds”. The relevant threshold depends on the class of derivate (Table 2):

Table 2 EMIR thresholds by derivative classes

Derivative Class	Threshold
Credit derivatives	1bn €
Equity derivatives	1bn €
Interest rate derivatives	3bn €
Foreign Exchange derivatives	3bn €
Commodity derivatives and others	3bn €

Source: Commission Delegated Regulation (EU) No 149/2013, Article 11.

If the notional value of derivatives held by an NFC exceeds the threshold for only one of these derivative classes, this firm is classified as NFC+ (in contrast to NFC-s that remain below these thresholds) with regard to all derivative classes. An NFC+ becomes subject to the following additional requirements (Table 3):

[11] Since the European Commission has not declared UK exchanges as equivalent to EU Regulated Markets, all derivative contracts traded in the UK are qualified as OTC (even if traded on an exchange). They have to be included in the calculation of counterparties’ positions against the clearing thresholds (even if cleared).

Table 3 NFC+ requirements

Obligation	Description
Clearing obligation	▪ **All future derivatives in a class of derivatives declared eligible for clearing and concluded with either another NFC+ or a FC have to be cleared**[12] with a central counterparty (CCP) (Article 4 and Article 10(1)b, EMIR). Currently, the clearing obligation is restricted to certain interest rate swaps, forward rate agreements and credit default swaps, but this obligation may be extended to further derivative classes in future. ▪ NFC+s are restricted to only conclude **future derivatives transactions (which are subject to a clearing obligation) with FCs or other NFC+s on Regulated Markets**[13], organised trading facilities, multilateral trading facilities or third country trading venues (subject to EC decision on equivalence and reciprocity) (so-called **Trading Obligation**, Article 28, MiFIR).
Risk-mitigation procedures	▪ **Counterparties have to exchange two types of collateral when facing FC/NFC+ counterparties,** independently of the derivative class that reflects the volume and risk of the derivative contract:[14] □ "**Variation margin**", which is calculated daily and which reflects the current market values and the corresponding risks of the derivative contract; □ "**Initial margin**", which is additional collateral that should cover sudden adverse movements in the value of the risk exposure of the contract or the variation margin that might occur before the next update of the variation margin. ▪ **A mark-to-market valuation of all outstanding derivative contracts on a daily basis.** This does not only apply to the derivatives transactions, but also to the exchanged collateral. Where market conditions prevent marking-to-market, reliable and prudent marking-to-model must be used. (Article 11(2), EMIR) ▪ NFC+ are subject to the stricter requirements regarding timely deal confirmation and portfolio reconciliation, to the same extent as already applicable to FCs.
Reporting	▪ **Daily reporting of market-to-market and collateral.**

Source: Frontier Economics.

Note: Being qualified as NFC+ has further consequences, for example: The deadline for the confirmation[15] *of derivative trades between FCs and NFC+s is shortened from two to one days following the date of execution (see Article 12, Commission Delegated Regulation (EU) No 149/2013). NFC+s also have to perform portfolio reconciliations*[16] *with their trading counterparties more frequently than NFC-s. If two NFC+s have 100 OTC contracts outstanding between them, they have to reconcile their portfolios once a week rather than once per year), see Article 13, Commission Delegated Regulation (EU) No 149/2013.*

[12] This clearing obligation does not apply if an NFC+ trades with an NFC-, see Article 4 (1) of EMIR.

[13] As defined in Art 4 (1) no.21 MiFID II.

[14] Commission Delegated Regulation (EU) 2016/2251 of 4 October 2016 by the Joint Committee of the European Supervisory Authorities (ESAs). The detailed requirements for the collateral have been set out in a Regulatory Technical Standard (RTS) by the European supervisory authorities (ESAs).

[15] Derivatives trades are typically executed between traders by telephone or electronic messages and later confirmed with a written document.

[16] Portfolio reconciliation means that the trading counterparties bilaterally verify the existence of all outstanding trades and compare their principal economic terms, including a valuation of the contract.

According to a comparative study[17] by Luther Lawfirm, EMIR applies the strictest interpretation of the G20 commitments to regulate derivative markets compared to other jurisdictions of relevant commodity markets (see Section 5 for further details):

- EMIR has one of the lowest clearing thresholds for commodities worldwide;
- EMIR does, unlike other systems, extend to NFCs and includes physically settled instruments into the threshold calculation;
- EMIR includes even voluntarily centrally cleared OTC derivatives and physically settled third country (non-equivalent) venue traded derivatives into the threshold calculation[18];
- EMIR includes and aggregates all group transactions anywhere in the world into the applicable clearing threshold calculation; and
- Derivatives count against the EMIR clearing threshold during their entire contract duration (in contrast to the US which considers a 12-month rolling period).

Further, to exceed only one of the clearing thresholds across the asset classes implies that the NFC+ would become subject to collateralization requirements including the exchange of margins for all its OTC-derivatives in all asset classes.[19]

1.3 EFET has commissioned Frontier to review the level of the commodity clearing threshold

Regulation (EU) 2019/834 (EMIR Refit) amends EMIR and introduces a mandate for the European Securities and Market Authority (ESMA) to periodically review and – when necessary – to adapt the clearing thresholds. This shall ensure the appropriateness of the thresholds and take material market changes into account.[20]

EFET has commissioned Frontier Economics (supported by Luther Lawfirm) to produce a study on the review of the commodity clearing threshold (CCT) in order to substantiate its members' position on a scientific basis for the current review. This study focusses on:

- A review of the **clearing threshold for commodities** (CCT);
- providing a 'toolbox' of **further changes to the EMIR framework** that may be considered during the EMIR Review;
- **forward-looking developments** until 2030 for determining the appropriate level of the CCT;

[17] Luther, "Commodity derivative clearing under EMIR. A cross jurisdictional analysis", 2021.

[18] If not formally recognized as being equivalent to an EU Regulated Market, which is not the case, e.g., regarding ICE Futures Europe, London, UK.

[19] Art. 2 (2) and Art.24 CDR 2016/225. Unlike prior to the enactment of EMIR-refit, the clearing obligation itself does only apply to the asset class in which the threshold had been exceeded (for example the CCT) but not the entire OTC-portfolio, provided however, the NFC has not abstained from calculating at all. Those who fail to calculate at all still become subject to the clearing mandate for all OTC-asset classes.

[20] ESMA (2021): „Review of the clearing thresholds under EMIR", Discussion Paper ESMA70-156-5010, para. 3.

- a perspective of the energy markets and the **European energy transition** (so called "European Green Deal"[21]);
- insights and **practical case studies** from the day-to-day business of energy companies, complemented by published data and reports.

In order to capture insights and practical case studies, we have conducted bilateral interviews with EFET members and affiliates (see Annex A for more information on the scope of the interviews):

- **23 interviews** with 15 companies, covering a wide range of departments (renewables, energy management and trading, retail solutions, treasury, regulation);
- **wide geographic coverage** including companies from Central, Southern, Western, Eastern and Northern Europe; and
- **varying EMIR status** including 1 NFC+, 1 company with a financial counterparty in the group, and 13 NFC-s (with some having already analysed the implications from becoming NFC+).

The report is structured as follows:

- **Section 2** revisits fundamental changes in commodity markets (in particular for energy products) since 2012 when the current CCT level was set;
- **Section 3** discusses how the European energy transition will further increase the need for energy derivatives to enable sustainable investments;
- **Section 4** discusses why the current CCT level appears to be very restrictive and would have a detrimental effect on the energy transition and energy markets;
- **Section 5** shows that EMIR is stricter than other regulatory regimes for derivatives trading from the same G20 commitment which hamstrings EU companies in international competition;
- **Section 6** concludes that a significantly higher CCT is more appropriate considering energy price inflation and insights from international benchmarking and cannot be expected to undermine the objective of EMIR to guarantee financial stability. This remedy can be implemented immediately as it relates only to a level 2 change of EMIR.
- **Section 7** provides an overview of possible complimentary reform options of EMIR. These measures require more lead time since some of them require a Level 1 change to EMIR.

Further details are relegated to **Annexes**.

[21] https://ec.europa.eu/clima/eu-action/european-green-deal_en

2 CCT NOT INCREASED SINCE 2012 DESPITE FUNDAMENTAL CHANGES

ESMA is currently reviewing whether the EMIR clearing thresholds set in 2012 (which have not been changed since) are still appropriate today[22]. We therefore analyse the fundamental changes to the market environment from 2012 until today. Since this study focuses on the CCT, we analyse changes to the commodity markets, and energy products in particular.

EMIR governs the trading of derivatives, i.e. contracts that derive their value from an underlying (for example a specific commodity). There are different types of derivatives, for example futures, forwards, options or swaps. Prices for the different derivatives are all driven by changes in the price of the underlying (for example the price for an electricity future will depend on the expected electricity (spot) price at the time of fulfilment). In this section, we present wholesale price development of the underlying commodities rather than price development for specific derivatives.

We find that there have been significant changes to the markets. These significantly reduce the ability to trade OTC derivatives under the CCT of currently €3bn:

- Fundamental changes to the demand-supply balance in commodity markets have led to **increasing and more volatile commodity prices** since 2012, in particular for energy products (**Section 2.1**). Key drivers for the price increase have long-term effects such that higher prices are expected to persist in the future. In particular, the EU has introduced a cap-and-trade regime for CO2 emissions. It is the explicit intention of this regime to place a price on CO2 and by this to drive up prices for CO2-intensive energy supplies. Higher commodity prices imply that the CCT (which is fixed in € terms) is reached at lower trading quantities.
- Since 2021, as a consequence of Brexit and until the EU changes its assessment, UK commodity exchanges are no longer recognised as equivalently regulated. This means that any **transaction entered on UK exchanges and cleared**, which would not have counted against the CCT until 31st December 2020, is **now considered as an over-the-counter trade** and, therefore, counted against the CCT. Trading at UK exchanges, which are among the most liquid in the world, cannot be replaced by trading on EU trading venues for some products. This further limits the ability to trade OTC derivatives under the current CCT and creates competitive disadvantages (**Section 2.2**).
- Demand for non-standard derivatives has increased and is expected to grow further. This is because the energy transition requires substantial renewable investments in the coming decade. Many renewable investments will be built without subsidy payments and are therefore fully exposed to market price risks (see Section 3.1).

As a consequence of these fundamental changes, the unadjusted CCT of €3bn is **consummated at much lower trading quantities** than in 2012 (**Section 2.3**). In

[22] ESMA (2021): „Review of the clearing thresholds under EMIR“, Discussion Paper ESMA70-156-5010, para. 3.

the following we focus on the impact of price inflation since the Brexit impact is more difficult to quantify and might require other remedies (such as the recognition of UK exchanges, see Section 7).

In Section 6, we propose an increase of the CCT based on energy price inflation to compensate for some of the fundamental changes since 2012.

2.1 Commodity prices have increased and have become more volatile

Commodity prices are relevant to assess the appropriateness of the CCT since they directly affect the scope for OTC trading because they are a component of the CCT calculation (either as contract price or spot price):

- Higher commodity prices reduce the tradable quantities (in volume units, e.g. MWhs of electricity) for a given level of CCT (which is fixed in € terms) and vice versa;
- More volatile prices increase market price risks[23] and, therefore, increase the need for derivatives trading to insure against these risks (i.e. hedging) and vice versa.

In the following, we describe the commodity price developments since 2012 when the current level of the CCT was set and also provide an outlook regarding the expected price developments in the market. We **focus on electricity, natural gas and European Union Allowances** (EUA)[24] for CO2 emissions which are key commodities driving the European energy transition.[25]

Most commodity prices have risen since 2012 and today's prices for electricity, gas and EUA are many times the price level in 2012

Figure 1 shows development of short-term (spot) wholesale prices for a selection of important commodities in the energy sector. This includes energy carriers (coal, oil, gas and electricity), base metals[26] (aluminium and copper) and EUAs.

[23] Risk can for example be measured by the value at risk (VaR) of a commodity position which denotes the possible losses at a certain probability. The value at risk is higher, the more volatile prices are (which can be measured by the standard deviation) since a higher volatility means that the low prices (and therefore higher losses) are more likely to occur.

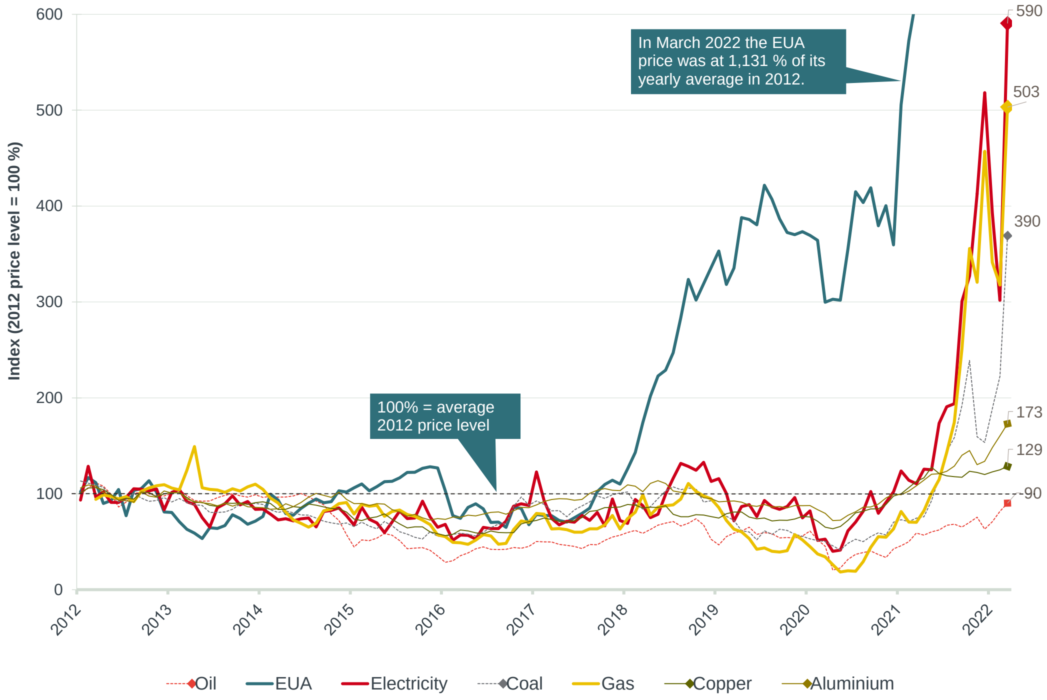
[24] European Union Allowance (EUA) denotes the tradable unit under the European Union Emissions Trading Scheme (EU ETS), giving the EUA holder the right to emit one tonne of carbon dioxide (CO2), or the CO2-equivalent amount of nitrous oxide (N2O) and perfluorocarbons (PFCs).

[25] Electricity is the backbone of the energy transition since renewable electricity can replace fossil fuels at relatively low (carbon abatement) costs. Electricity is also expected to play a major rule for decarbonising other sectors (e.g. the transport sector via e-mobility and the heating sector via heat pumps).
Gas will remain an important fuel for power generation and also recognised as sustainable under the taxonomy regulation according to a recent proposal by the European Commission, see https://ec.europa.eu/info/publications/220202-sustainable-finance-taxonomy-complementary-climate-delegated-act_en.
The European Union Emissions Trading System (EU ETS) requires electricity generators and large industrial companies to buy ETS certificates (emission allowances) to cover their CO2 emissions. Higher ETS prices mean that eco-friendly technologies that reduce CO2 emissions are more economical.

[26] Metals are for example required for the construction of renewables (wind farms) and power networks. In Section 4.1 we provide an example of risks from changes in the metal price which need to be hedged by renewable investors.

To make these prices comparable and highlight the development compared to 2012 when the current level of the CCT was set, we express prices for each commodity as an index where average 2012 prices are 100%.

Figure 1 Commodity price inflation 2012 – 2022 (index: 2012 = 100%) – most commodities trade at higher prices than in 2012



Source: See Annex B.

Note: The EUA time series is truncated after March 2021 for better graphical representation. Carbon prices continued their strong increase. In March 2022 the price index (2012 = 100%) for carbon certificates reached 1131%.

Figure 1 shows that commodity prices have been relatively stable until 2018. By the end of 2021, prices for all commodities but oil are trading at higher prices than in 2012.

Prices for electricity, natural gas and carbon allowances (EUA) have even reached many times the 2012 price level at the end of 2021. This can be explained by fundamental market drivers:

- Since 2018, the **EUA price** has increased sharply, driven by the expectation that the European Commission will further tighten the available supply of CO2 certificates (e.g. in July 2021, when the EC announced plans to lower the emissions cap and increase its annual rate of emission reductions as part of the “Fit-for-55” package[27]). By the end of 2021, the EUA price has reached more than twelve times the average level in 2012 (1214 %).
- In 2021, the **natural gas price** has increased drastically, explained by a combination of a supply and demand shock, of which we briefly mention some notable examples. On the supply side, a steady decline in gas output in the EU and the UK due to diminishing resources has been accelerated by the

[27] https://ec.europa.eu/commission/presscorner/detail/en/IP_21_3541

premature phase-out of the important Groningen gas field in the Netherlands because of security concerns related to earthquakes connected to gas production in the region. Production is also on a falling trend in Norway, the leading European supplier, while temporary production and transport outages in the North Sea, Russia and Australia have further reduced supplies. On the demand side, the post-Covid economic revival has whetted global appetites for gas, notably in China, which has imported record volumes of liquefied natural gas (LNG). As Europe functions as the swing or balancing market for LNG, the diversion of supplies to China and other Asian economies has left the continent – and the UK – with less LNG gas. At the end of 2021, the gas price was more than four times as high as in 2012 (457 %).

- The **electricity price** is determined by variable generation costs of the marginal (price setting) power plant. In periods with high power demand and low availability of renewables, the price is often set by gas-fired power plants (so called "peaking power plants"). The combination of increasing generation costs[28] for gas-fired power plants (partly driven by rising EUA prices) and a recovery of electricity demand to pre-pandemic levels[29] has also led to a strong increase in electricity prices. Electricity prices peaked in December 2021, reaching a level more than five times as high as in 2012 (518 %).

The fundamental developments above affect energy prices not only short term but are expected to have a longer-term impact. This can be seen in the futures prices for electricity, gas and emission allowances below (Figure 4).

Higher prices have been accompanied by increased price volatility

Derivatives are commonly used to hedge market risks. Market risk, i.e. the possibility that a commodity position loses in value, is driven by the volatility of commodity prices (the higher volatility, the higher the risk).

Figure 2 and Figure 3 illustrate the increased volatility for electricity, carbon certificates (EUA) and gas as measured by the standard deviation (in absolute terms and as index with average 2012 prices equating to 100%).

We observe that the price volatility of natural gas and electricity has increased significantly since 2012 while the volatility of EUA prices has remained relatively low. This can be explained by fundamental changes:

- For gas, the volatility has increased by more than 950% since 2012. This is driven by a tight demand-supply balance such that the market price reacts more strongly to new information (for example on the availability of Russian gas or potential short-term temperature-driven increase in demand). In contrast to the temporary increase in volatility in 2018, which is mainly driven by isolated price spikes, the high volatility in 2021 is a more persistent shift in price patterns.
- Electricity price volatility has more than doubled in 2021 compared to 2012. This volatility is driven by the more volatile gas price which is an input for electricity generation in gas-fired power plants. The increasing share of

[28] Variable generation costs for gas-fired power plants are mainly driven by the gas price and ETS price (albeit to a lesser extent than for coal plants which emit more CO_2 per MWh that gas-fired power plants).

[29] For example in Germany, see https://www.bdew.de/service/daten-und-grafiken/monatlicher-stromverbrauch-deutschland/

intermittent renewables also increases the volatility of electricity prices: the spot price is low if wind and solar generation in the system is abundant and particularly high during periods with low availability.

- The volatility of EUAs has been very low between 2013 and 2017 since banking and borrowing of certificates helped to even out short-term price fluctuations (while the physical storability for gas and electricity is limited and more costly). The volatility is rather driven by policy decisions which can lead to a sudden increase of the price if the long-term availability of certificates is reduced.

The increases in the volatility of the commodity prices are expected to prevail in the future, in particular for electricity since conventional electricity generation is replaced by increasing shares of intermittent renewables while conventional and dispatchable[30] power generation sources are being phased out.

Figure 2. Development of standard deviations since 2012 (€ per MWh / tonne CO2)

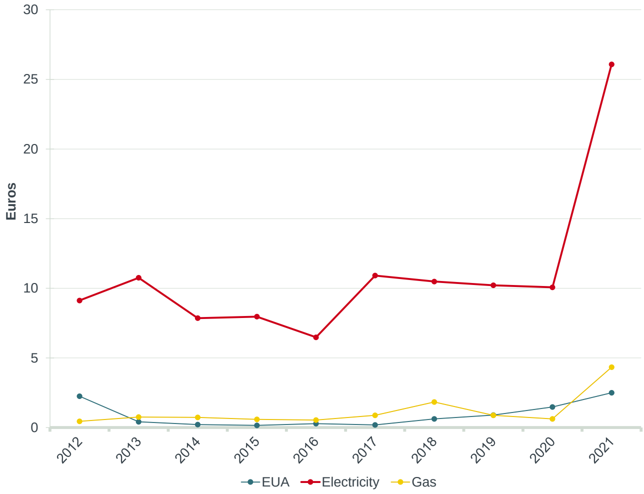
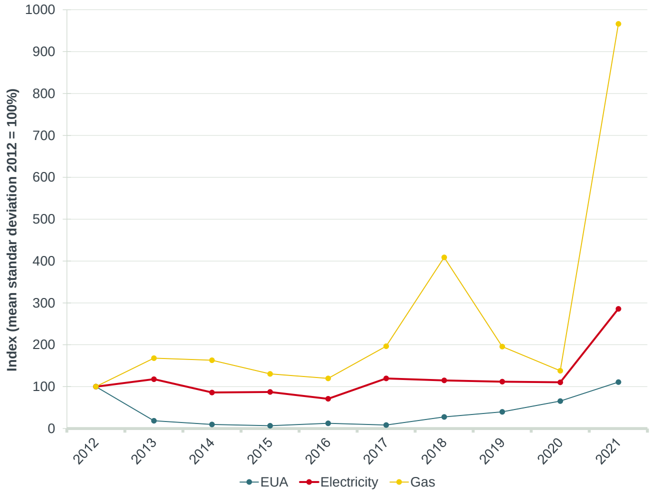


Figure 3. Development of standard deviations since 2012 (2012 = 100%)



Source: *Frontier Economics based on data provided by Energate.*

Note: *Figure 2 shows the yearly average of the standard deviation that is calculated 21 days backwards for every day of the year. The standard deviation is denoted in €/MWh for electricity and natural gas and in €/t CO2 for emission allowances. We replaced one outlier in the time series for gas (on 12 April 2013 the gas price reached 227,69 €), which leads to a sever distortion in the calculated standard deviation. An interpolated value between the adjacent dates is used instead. Figure 3 shows the standard deviation as an index where the average standard deviation in 2012 is set to 100%.*

Markets expect this price increase to prevail longer term

We have also compiled future prices for EUAs, electricity and gas to show that the historical price increase until 2021 is not just transitory but is expected to persist for the next years (albeit at slightly lower levels, i.e. the future curves are in backwardation).

Figure 4 shows that **future price levels will remain significantly higher than in 2012 long term**, despite a still visible but shrinking cool down (backwardation) in energy future prices:

- **EUA future prices** remain flat at around eleven times the price level for fulfilment in 2012 since futures are transferable within the entire trading period

[30] Dispatchable power generation means that the output pattern of plants can be adjusted to demand requirements. This is achieved by using a storable energy source as input to power production (e.g. gas, coal or nuclear fuel) in case of thermal power generation or stored up water in case of hydro storage plants. The matching of generation to power demand helps smooth price volatility across hours and days.

(2021-2030) and can be stored in the registry (at holding costs equal to the risk-adjusted capital cost).

- **Gas future prices** decline from five times the 2012-price level in 2022 to a bit less than two times by 2024. This reflects expectations that current shortages in gas supply can be alleviated in the medium-term.
- **Electricity future prices** for 2022 are more than six times the 2012-price level. The price level slightly declines for further years out, which is the result of countervailing drivers:
  - gas prices are expected to decline and more renewables (with low variable costs) are added to the system which put downward pressure on electricity prices;
  - while at the same time further conventional capacities are decommissioned (e.g. coal in Germany) which increases scarcity in the market and continued high CO2 prices (required for fossil-fuel generation which remains part of the generation mix beyond 2030) put upward pressure on electricity prices.

Figure 4. Future prices of energy commodities (index: 2012 = 100%) – energy price increase expected to prevail longer term

Source: *Frontier Economics based on data provided by Energate.*

Note: *Figure 4 shows the future prices of three energy commodities as indexed values, where the average commodity price in 2012 is set to 100%. All prices reflect the monthly averages of the traded futures from March 2022. The future price for the year 2022 is calculated as the unweighted average of futures for quarter 3 and 4 in 2022. The displayed spot market price represents the annual average price in 2021 as an indexed value (2012=100%).*

Persistently higher energy prices result in the CCT being consummated at much lower quantities, as we show in Section 2.3.

2.2 UK commodity exchange trades count towards the CCT since 2021

In the previous subsection we have shown that energy prices have been inflated which significantly limits the ability of NFCs to trade derivatives (in quantity terms) without exceeding the CCT (see Section 2.3 for further elaboration on this relationship).

Under EMIR, only OTC derivatives can count towards the CCT while derivative trades executed on Regulated Markets[31] are excluded since they do not increase credit risk. This logic, in principle, also holds for trades on third-country exchanges if they are officially recognised as equivalently regulated.[32] Until 31st December 2020, UK exchanges were EU Regulated Markets and trades there were not considered OTC derivatives and therefore did not count towards the CCT.

Since January 2021, UK exchanges are no longer Regulated Markets and are not recognised as being equivalently regulated. Transactions by EU entities on UK exchanges are now treated as OTC derivatives (despite being actually centrally cleared) and therefore consume part of the clearing thresholds (unless exempt as hedges). The opposite is the case for UK entities trading on EU exchanges. On 9th November 2020, the UK Treasury announced that EEA trading venues are considered as “regulated markets” under Article 2A of UK EMIR.[33]

EU NFCs depend on access to exchanges such as the ICE Futures Europe (IFEU) and the London Metal Exchange (LME) as there are no sufficiently liquid alternative marketplaces for commodities such as fuels, coal and base metals in the EU. Alternative markets for these products are also unlikely to evolve since most commodities are traded globally and volumes traded by EU NFCs are too small to shift liquidity to EU (or other recognised) venues.

2.3 The CCT is consummated at much lower trading volumes than in 2012 due to higher commodity prices

Commodity prices have a direct impact on the contribution of derivative trades towards the CCT:

- The contribution of an OTC derivative against the CCT is measured as the gross notional value (GNV). The GNV reflects the value of the underlying (for example the price of electricity in a forward contract) of a derivatives trade. In the text box below, we provide examples of how the contribution from derivative trades to the CCT is calculated.
- The GNV scales with the price of the underlying commodity, e.g. if the commodity price doubles, the GNV doubles as well for the same trading quantity (denoted in energy/volumetric units, e.g. MWh or tonnes).
- Since the CCT is fixed in Euros, rising commodity prices allow to trade lower quantities and vice versa.

[31] As defined in Art 4 (1) no.21 MiFID II.

[32] See EMIR, Article 2 (7).

[33] https://www.fca.org.uk/news/statements/response-treasury-equivalence#article2a.

IMPACT ON CCT – STYLISED EXAMPLES HOW TO CALCULATE THE GROSS NOTIONAL VALUE FOR DIFFERENT DERIVATIVES

Suppose 1 TWh (1 million MWh)[34] are traded in different types of derivatives across the tenor[35]. This can result in the following GNV at given prices (*disclaimer: examples below are stylised and calculation rules can be subject to interpretation*[36]):

Derivative	Price	GNV
Future	Fixed price: €100/MWh	GNV = volume x fixed price = €100m
Fixed-for-floating swap (virtual PPA[37])	Fixed price €100/MWh	GNV = volume x fixed price = €100m
Put or call option	Strike price €100/MWh	GNV = volume x strike price = €100 m *(note: irrespective of delta)*
Collar (call + put)	Call strike price €120/MWh, put strike price €80/MWh	GNV = volume x call-strike price + volume x put-strike price = €200m *(note: if considered single structure transaction, GNV could be lower volume x call-strike price = €120m)*

GNV of long and short positions may only be netted (offsetting each other) if they are identical in all details except for quantity and settlement price (e.g. a calendar year product cannot be netted against four corresponding quarterly products).

In Section 2.1 we have demonstrated that prices for almost all commodities – electricity, EUAs and natural gas in particular – have increased since 2012 when the current CCT level was set. Increasing energy prices have inflated notional values at constant volumes and only a fraction of the quantities could be traded within the same limits compared to 2012.

Figure 5 demonstrates the quantities of different energy commodities an NFC could trade without exceeding the threshold in 2012, when the CCT was set at €3bn, and the tradeable quantities at average 2021 prices and expected future price levels, respectively.

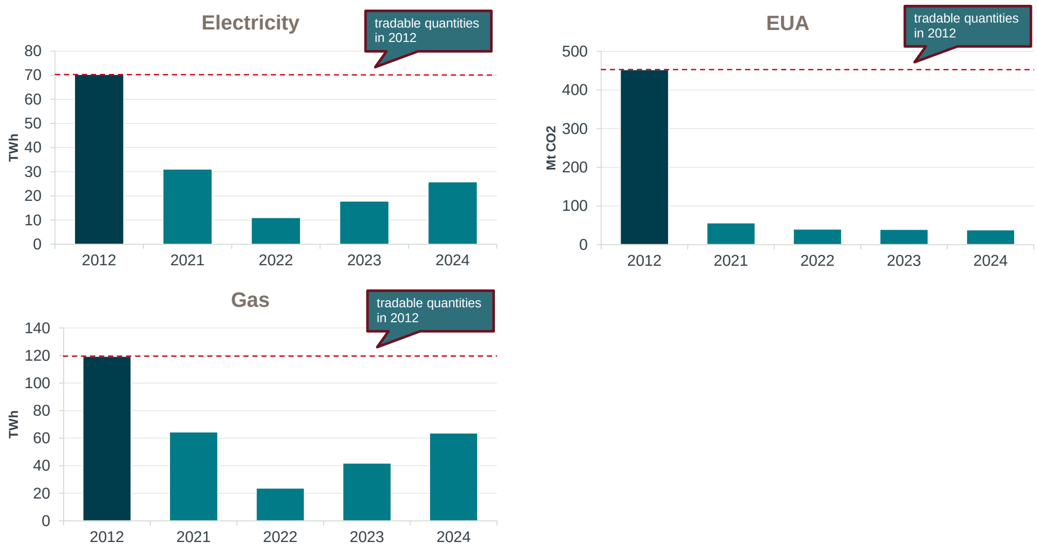
[34] For comparison, final electricity consumption in the EU is around 2,462 TWh/a according to Eurostat.

[35] The duration of derivative contracts may be signed multiple years out (see Section 3.2 for a more detailed discussion).

[36] Guidance on calculation of the GNV is set out in ESMA Q&A document: „Questions and Answers – Implementation of the Regulation (EU) No 648/2012 on OTC derivatives, central counterparties and trade repositories (EMIR)“, SMA70-1861941480-52. The ESMA guidance is not explicit for some derivatives and can be subject to interpretation and the lived practice. For example, in the futures example above we define the GNV as the fixed price x quantity since due to the daily value adjustment, it can be argued that the fixed price "resets" daily to the settlement price.

[37] PPA = Power Purchase Agreement; a form of electricity supply agreement, often with a duration of multiple years.

Figure 5. Tradable quantities under the current CCT in 2012, 2021 and in future years (based on current future prices)



Source: Frontier Economics based on data provided by Energate.

Note: Figure 5 compares the quantities that are tradable under the current CCT with commodity prices being at the yearly average seen in 2012 and 2021 or at future price levels as indicated by the monthly averages of the price futures traded in March 2022, respectively. The future price for the year 2022 is calculated as the unweighted average of the futures for quarter 3 and quarter 4 in 2022.

Figure 5 shows that the higher prices have significantly limited NFCs' ability to trade electricity, gas and EUA derivatives OTC and remain below the threshold:

- In 2012, the CCT of €3bn allowed trading approx. 70 TWh of **electricity** in OTC derivatives, while by 2022 this shrank to around 11 TWh (c. **one sixth** of the initial quantity). As we will show in Section 4.1, the quantity of trading possible under the CCT today is barely enough for NFC- to provide a long-term price hedge for a single large-scare offshore wind park.
- In relation to **EUAs**, the difference between tradable quantities under the CCT has decreased even further than for electricity: in 2012 prices, the CCT would have allowed the trade of 452 million tonnes (Mt), while in 2022 prices this is reduced around 40 Mt (**less than one tenth** of the initial quantity). For comparison, a large coal-fired power plant can emit around 10 Mt per year, i.e. the current CCT would only allow to trade the annual emissions for four such power plants.
- In relation to **natural gas**, tradeable quantities have fallen from 120 TWh in 2012-prices to 24 TWh in 2022-price (**one fifth** of the initial quantity). This corresponds to around 2% of German gas demand, the largest EU gas market.

Price inflation is a normal phenomenon for most goods and services and leads to growing credit exposures in nominal terms. However, it does <u>not</u> automatically imply higher systemic risks. Otherwise, all large companies today would need to be considered overwhelmingly large in 1960-prices for example.[38]

[38] In the United States consumer prices have increased by 815 % between 1960 and 2021. Accordingly, the nominal value of a firm has increased more than ninefold in the same time period. See U.S. Bureau of Labor Statistics (2022): Consumer Price Index (CPI) Databases, Average Price Data. Retrieved on 24 February 2022 from https://www.bls.gov/cpi/data.htm

3 THE ENERGY TRANSITION WILL FURTHER INCREASE THE NEED FOR ENERGY DERIVATIVES

The European energy system faces a decade of massive transformation. The European Green Deal[39] commits the EU to climate neutrality by 2050 and a reduction of greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. Achieving these goals requires a broad transformation of the entire energy sector within a relatively short time period. Increasing renewable electricity generation will be at the core of this initiative.[40]

Investments into renewable generation assets are exposed to several sources of uncertainty, in particular uncertainty over long-term electricity prices and volumes (intermittent production from renewables).[41] Derivative trading is an essential instrument for the energy sector to reduce (i.e. hedge) these risks and to ensure that they do not become a stumbling block on the path towards a carbon free energy system. Hedging instruments become increasingly important as new renewable investments increasingly lose protection against market risks that were previously provided through government subsidy schemes which had historically been designed to guarantee generators stable long-term revenues.

-55% GHG emissions by 2030

EU commitment to reduce GHG emissions by at least 55% compared to 1990 levels by 2030

'Renewable financial PPAs', financially settled long-term power purchase agreements for renewable electricity, are widely considered a key instrument to facilitate new renewable investments: they can provide long-term stable income necessary for financing renewable projects. Renewable financial PPAs are considered derivatives under EMIR and can count towards the CCT.[42] This is a particular issue for NFCs who provide such PPAs as hedging solutions to third parties and whose own risk exposure would often not be reduced through this transaction. NFCs are best-placed to act as hedge providers in this space since they have the necessary energy market know-how to provide tailor-made PPAs and thereby facilitate new investments into green energy.

The remainder of this section is structured as follows:

39 https://ec.europa.eu/clima/eu-action/european-green-deal_en

40 Following the Russian invasion of Ukraine the European Commission has developed plans to further increase the speed of the green transformation. Again, faster deployment of renewable electricity sources is a key measure of its REPowerEU plan to reduce Europe's dependence on Russian gas (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A108%3AFIN).

41 Renewable investments are also exposed to volume risk, ranging from project details, technical outages to weather conditions which determine power output for wind and solar PV plants.

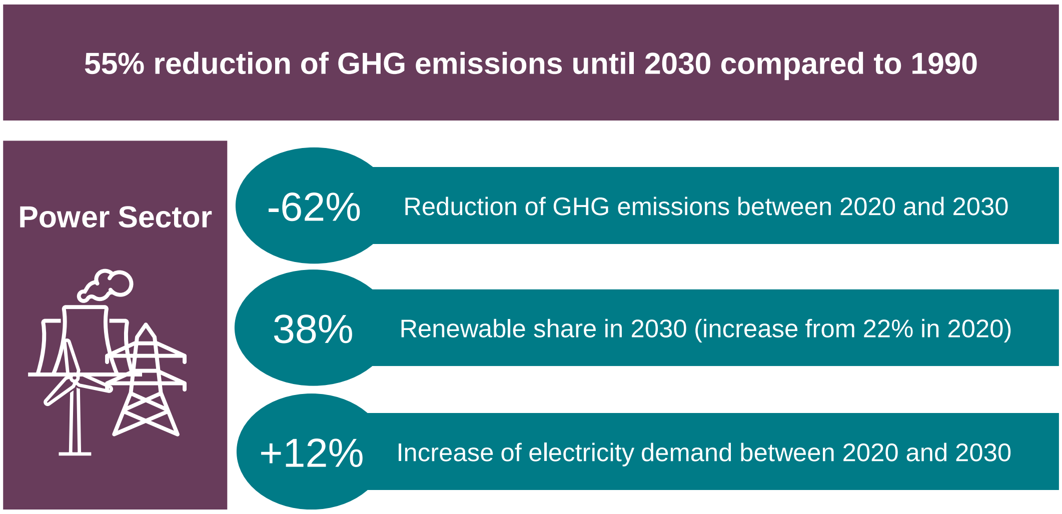
42 Renewable financial PPAs would only be exempt from the CCT if they are considered risk-reducing for the seller/buyer of the PPA.

- **Section 3.1** illustrates that the energy transition requires substantial investments in renewable electricity generation facilities in the coming decade, many of which will be built without subsidy payments and are therefore fully exposed to market price risks;
- **Section 3.2** discusses that more OTC derivatives (such as renewable financial PPAs) are needed to enable the financing of renewable investments;
- **Section 3.3** illustrates how renewable financial PPAs, which have several advantages and are common in liquid PPA markets, are captured by the CCT; and
- **Section 3.4** explains how NFCs play a key role in facilitating the energy transition, providing hedging solutions (such as renewable PPAs) for renewable producers.

3.1 The energy transition requires significant renewable investments

The European Green Deal announced in 2020 has committed the EU to cutting GHG emissions by at least 55% until 2030 compared to 1990 levels. This commitment is further detailed in the 2030 Climate Target Plan which impacts the electricity sector in several dimensions (Figure 6).[43]

Figure 6 Impacts of EU emission targets on the electricity sector



Source: *Frontier Economics based on European Commission (2020): Impact Assessment – 2030 Climate Target Plan, SWD (2020) 176 final, Figure 47.*

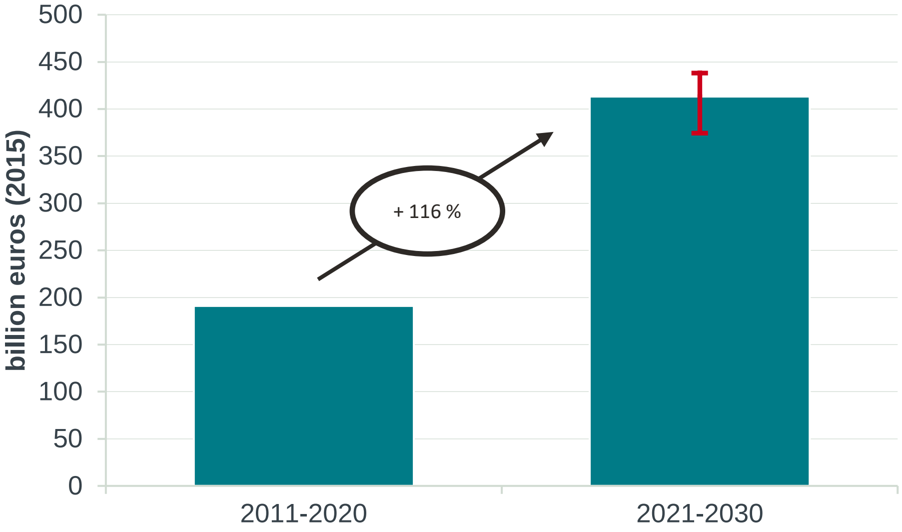
In this section we show how the energy transition requires significant renewable investments by private entities.

[43] In July 2021, the Commission has published a legislative package to achieve the 55% target – the "Fit-for-55" package, see https://ec.europa.eu/commission/presscorner/detail/en/IP_21_3541.

The energy transition requires a turnaround of the whole energy sector, with several hundred billion euros worth of investment every year

In its *Impact Assessment on the 2030 Climate Target Plan*[44], the European Commission expects a substantial increase in annual energy system investments for the period 2021-2030 compared to the last decade. Investments necessary to achieve the objectives of the Green Deal are expected to more than double compared to the 2011-2020 period, reaching around €400bn a year (see Figure 7).[45]

Figure 7 Average annual energy system investments (excluding transport)



Source: Frontier Economics based on European Commission (2020): Impact Assessment – 2030 Climate Target Plan, SWD (2020) 176 final, Table 46.

Note: The figure shows actual average annual investments in the total energy system for the time period between 2011 and 2020. For the time period between 2021 and 2030 the bar indicates the average annual investments into the total energy system across six different scenarios. The error bar indicates the total range across scenarios.

Renewable investments are an integral part of the European energy transition

Required investments relate to all parts of the energy sector,[46] ranging from private households modernising their homes, investments in power generation to TSOs investing into the power grid.

[44] European Commission (2020): Impact Assessment – 2030 Climate Target Plan, SWD(2020) 176 final, Table 46. Retrieved on 23 February 2022 from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020SC0176

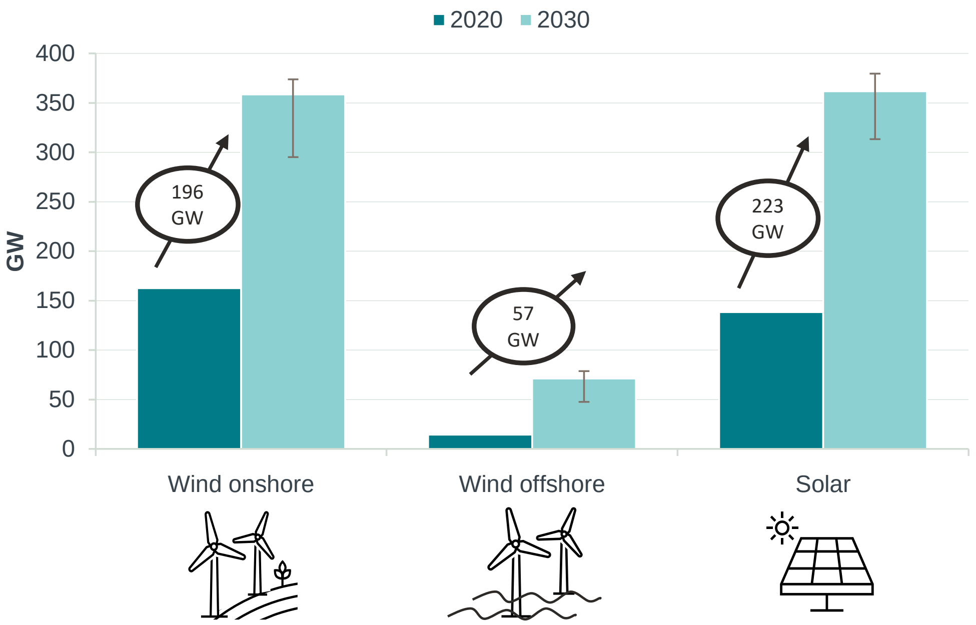
[45] Between 2011 and 2020 the average annual investment into the energy system totalled €191bn. For the upcoming decade the European Commission expects that annual investments into the total energy system (excl. transport) equal between €375bn and €438bn, depending on the scenario (indicated by the error bars in Figure 7). Adding the transport sector to the analysis, the average over all scenarios of the annual investments required in the total energy system increases to €1032.45bn per year. Compared to the previous decade the annual investments needed in the energy system then increase by €349bn.

[46] See European Commission (2020), Impact Assessment SWD(2020) 176 final, Table 46 for a detailed exposition of the average annual investment levels by different types of projects. It considers supply side

Investments into renewable generation capacities are a key element of the European Commission's 2030 Climate Target Plan.

Figure 8 illustrates that wind and solar PV capacities must more than double compared to 2020 to meet the EU 2030 climate targets. The total capacity additions sum up to 223 GW, almost as high as the total German generation capacity in 2021 (of 230 GW, including both conventional and renewable sources). In addition, the energy transition requires the building up of electrical storages[47] and new fuel production capacities.[48]

Figure 8 Renewable capacity must be more than doubled by 2030 to achieve the 2030 climate targets



Source: *Frontier Economics based on Eurostat and European Commission (2020): Impact Assessment – 2030 Climate Target Plan, SWD(2020) 176 final, Figure 47.*

Note: *The figure shows actual average installed production capacities from renewable resources in 2020. For the year 2030 the bar indicates the average installed capacities across five different scenarios. The error bars indicate the total range across scenarios.*
Additional expansion potential from other renewables such as hydro and geothermal power generation is very limited and omitted from the figure.

The energy transition means that we need to replace and reconstruct a significant part of the existing generation infrastructure. This requires private entities to make substantial investments in the sector. In the next subsection we demonstrate that many of these investments will require OTC derivatives to secure financing.

investments (separated by investments into the power grid, power plants, boilers and new fuels production and distribution) as well as demand side investments (separated by investments in the industrial, residential, tertiary and transport sector). The table clarifies that substantial investments are required across all sectors of the economy.

47 The European Commission expects 38 GW of electrical storage to be built up until 2030, see European Commission (2020): Impact Assessment – 2030 Climate Target Plan, SWD(2020) 176 final, Figure 48

48 As reaction to the Russian invasion of Ukraine the European Commission has developed its REPowerEU plan (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A108%3AFIN), which aims to quickly reduce Europe's dependence on Russian gas. The plan further increases the need for short-term investments into new fuel production and renewable resources by more than doubling the ambitions for renewable gas production and frontloading planned investments into wind and solar generation.

3.2 More OTC derivatives (such as renewable financial PPAs) are needed to finance renewable investments

In this subsection we describe the importance of OTC derivatives for financing future (private) investments in renewables. We focus on financial renewable PPAs which do not require a physical presence and supplier license for the local market of the buyer and which are common in liquid PPA markets such as Spain, the Nordics and the US (see Annex C for further details on the role of renewables financial PPAs).

OTC derivatives enable financing of renewable energy projects

Renewable plants are long-term investments with a lifetime of more than 20 years. Uncertainty about the profitability of a project (from price, volume and availability risk) can be a major impediment to the ability to finance such large-scale renewable investments. The market risk (that is the uncertainty about the profitability) implied by renewable investments is not dissimilar to large-scale conventional power plants. However, there are some important differences which make OTC derivatives even more relevant to finance renewable energy project.

Renewable investors tend to require hedging solutions

A significant share of renewable investments is brought about by different types of investors[49] who all require hedging solutions:

- relatively thinly capitalised developers who need long-term hedging solutions to secure external financing;
- well capitalised infrastructure funds who – as conservative investors have a low willingness to take on market risk from the renewable investment and therefore seek hedging solutions; and
- renewable energy producers (such as EFET members) who require to secure their investment and the financing thereof by e.g. banks by a hedge.

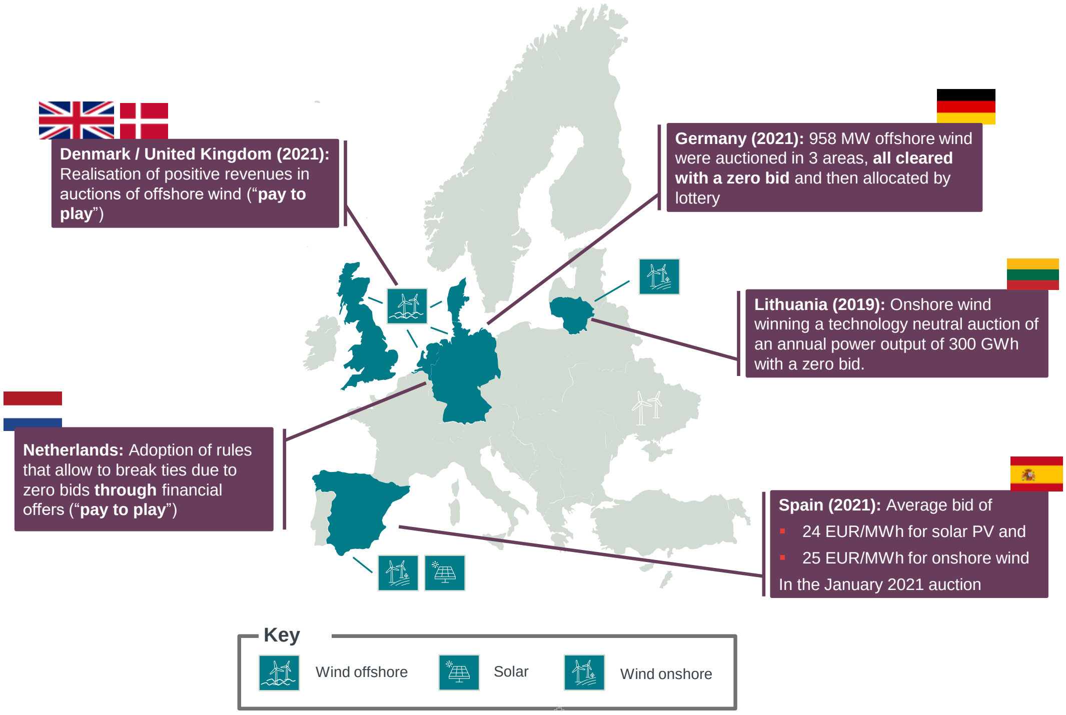
As government support phases out, the availability of hedging solutions becomes increasingly important to finance new renewable investments

Due to the phase-out of governmental support schemes, renewable investments are increasingly exposed to market price risks, which require market based hedging solutions. Historically, renewables in Europe typically received financial support via regulated feed-in tariffs that fully insured them against market price risks for the duration of the support period, which usually covered the first 15- 20 years of operation. This guaranteed investors a long-term stable revenue stream and provided access to external finance. Hedging instruments to cover commodity risk were therefore usually not required for renewables.

[49] By comparison, established energy utilities, who were the main investors into conventional power plants in the last decades, tend to invest in power generation with a view to monetise the investment through retail sales to consumers or wholesale market trades. As a result, utility investors are able to offload significant amounts of market risk and shoulder the remainder.

Renewable electricity producers are now increasingly exposed to market price risks.[50] In some cases (see Figure 30), renewable investments are even undertaken without any support payments (zero bids) or even with payments to obtain construction rights ("pay to play"/negative bids). This shows that, as government support phases out, the availability of market based hedging opportunities becomes increasingly important.

Figure 9 Examples for renewable auctions with very competitive bids and zero-bids



Source: *Frontier Economics based on Bundesnetzagentur (2021), IHS Markit (2021), 4C Offshore News (2021), FINERGREEN (2021), Recharge (2020) and AURES II (2021): D3.1., AURES II Auction Database and D3.2, Updates of auctions database.*

Note: *Boxes indicate the renewable technology for which very competitive/zero bids have occurred.*

OTC derivatives in particular are needed to enable the financing of renewable investments

Derivatives serving as hedging solutions for renewable investments are typically arranged over-the-counter based on bespoke contracts (as opposed to trading more standardised products on exchanges). This is for several reasons:

- **Long-term nature** – Long-term hedges exceed significantly[51] the 3-4year period which is liquidly tradable on exchanges. In the absence of governmental support schemes which often provide stable revenues for 15+ years, renewable investors need to rely on long-term OTC derivatives to hedge against volatile future market prices.

[50] In the State Aid Guidelines for Environmental protection and Energy (EEAG), the European Commission has emphasized its ambition to "*incentivise the market integration of electricity from renewable energy sources*".

[51] Technically, power future products on the European Energy Exchange (EEX) can be traded up to six years into the future, but liquidity is very low (low number of transactions) beyond three years.

- **Specific requirements** – OTC trading allows counterparties to bilaterally agree on a wide set of parameters (e.g. tenor length, power profile, pricing, settlement type, break clauses), which cannot be replicated on exchanges.[52]
- **Lack of direct access to exchanges** – Trading on exchanges – if at all accessible and meaningful for generators – leads to fixed costs for access and the necessary IT infrastructure (besides increasing cash liquidity risks, see Section 4.2 below). Market participants are potentially able to lower trading costs when trading OTC.
- **Renewable-specific risks from fluctuating weather conditions** – The output from wind farms and solar PV plants depends directly on fluctuating weather conditions (therefore this type of generation is called "intermittent").[53]
- **Additional credit support arrangements in OTC contracts** – OTC contracts facilitate bespoke credit support arrangements which aim at lowering credit risk without the need to post substantial collateral causing cash liquidity risks (see Section 4.2 for further discussion on this trade-off).[54] These credit support arrangements are part of a wider set of sophisticated and recurring **credit risk management** processes **employed by NFCs** to reduce credit risk from OTC trades (see Figure 10).

Figure 10 Functions of NFC's credit risk management

General Framework
Setting the credit management framework

- **Setting of internal credit policies, credit guidelines, and credit procedures**
  - Rating standards (in relation to external rating agencies and internal credit rating)
  - Exposure limits (typically set against groups of credit rating, i.e. higher limits for exposure against Investment Grade companies, low limits for exposure against high risk categories)

Pre-/On-Deal
Pre-deal assessments; risk mitigation & transfer

- **Pre-assessment of counterparties**
  - Counterparty rating (using external ratings, and/or internal ratings)
  - Exposure limit checks
- Deal-specific **risk mitigation and risk transfer** ("credit support arrangements")
  - Material adverse change clauses (may require provision of collateral after credit rating deterioration)
  - Netting agreements (e.g. close-out netting at risk of insolvency, i.e. the possibility to offset individual deals positive and negative loss contributions between two counterparties across deals & commodities)
  - Bilateral margining agreements (typically in relation to VM)
  - Risk transfer through credit insurance, bank guarantees, letters of credit, parental guarantees

Post-Deal
Portfolio review; updating of credit frameworks

- **Regular review of counterparty rating**, screening for signals of deteriorating creditworthiness
- **Monitoring of risk exposure** per counterparty and across the portfolio (incl. daily and monthly reports)
- **Managing counterparties with weakening creditworthiness** (including the stop of new business and collateral requirements)

Throughout: Functional separation between credit risk management and commercial operations up to 'C-suite'

Source: Frontier Economics

[52] See https://www.frontier-economics.com/uk/en/news-and-articles/articles/article-i6711-buying-and-selling-green-energy-don-t-overlook-the-small-print/ for further details.

[53] The intermittency of wind (or solar) plants tends to be highly correlated with other geographic proximity which can create a price/volume risk unique for intermittent renewable technologies. In contrast to standard products, bespoke OTC derivatives (such as renewable PPAs) can be designed in a way that share this risk between buyer and the seller.

[54] Examples for additional credit support arrangements are safeguards against ownership change of the asset ("change of control clauses"), or bilateral netting agreements. In addition, companies on the commodity market have sophisticated credit management processes accompanying OTC transactions.

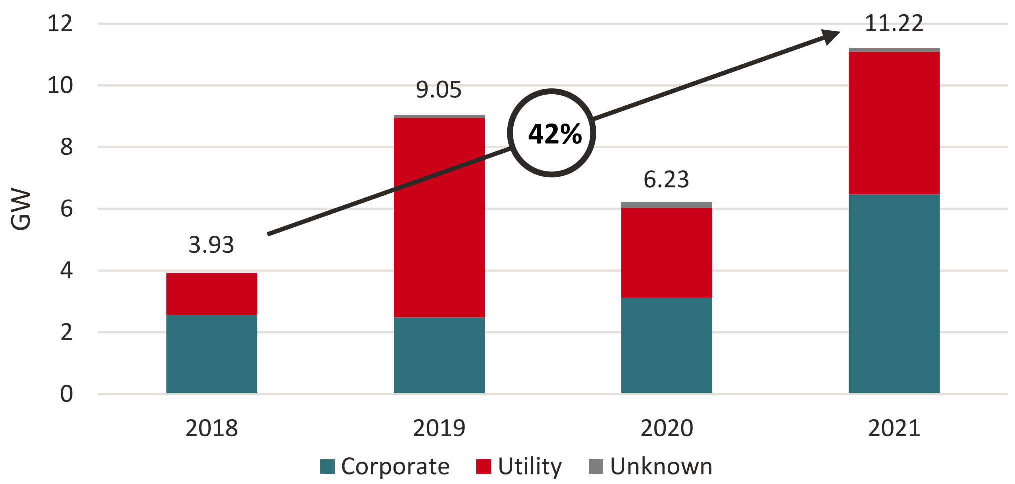
Renewable financial PPAs will be particularly important in financing the energy transition

Renewable financial PPAs are a notable example of a derivative contract that can serve to hedge market price risks for the renewable generation plant involved. This has also been reflected by statements from Energy Commissioner Kadri Simson stating that "*a wider access to renewable power purchase agreements and support them via flanking measures*"[55] is required as a short- and medium-term measure to mitigate the effects of increased price volatility in the energy market.

With an increasing number of renewable generation capacity being installed in Europe in the 2020s, renewable financial PPAs are considered to be an important financing tool due to the greater simplicity in setting them up (see Annex C).

The use of renewable PPAs[56] has increased materially in the EU in recent years (Figure 11). According to Pexapark, a software and advisory services provider specialised in PPAs, the capacity contracted under renewable PPAs increased in the EU from a total of approx. 4 GW in 2018 to more than 11 GW in 2021, therefore increasing with a compounded average annual growth rate of 43%.

Figure 11 Estimated generation capacities contracted using a PPA in Europe, 2018-2021 and by type of buyer



Source: *Frontier Economics illustration based on Pexapark, "European PPA Market Outlook 2022", p.8.*

Note: *Pexapark aims to record PPAs that have genuinely enabled the financing of new, subsidy-free capacity to come online. This excludes explicitly Route-to-market (RTM) or balancing services PPAs. The figures include both financial and physical renewable PPAs.*

The importance of PPAs is expected to grow, as underpinned by a study from DENA, a federal German energy think tank.[57] 90% of market participants responded that renewable PPAs will be an "important" or "very important" market instrument in future.

[55] Energy Commissioner Kadri Simson, European Commission Press Release dated 13th October 2021.

[56] Data sources (such as the one used for Figure 11) for renewable PPAs often do not distinguish between financial and physical PPAs.

[57] See DENA/Deutsche Energie Agentur, "Marktmonitor Green PPAs 2021. Umfrage zu Perspektiven nachfragegetriebener Stromlieferverträge".

3.3 Renewable financial PPAs can count towards the CCT

In this subsection we show how the CCT restricts the use of renewable financial PPAs:

- Renewable financial PPAs represent OTC derivatives and therefore count towards the CCT unless exempted as "hedging transactions"[58] under EMIR; and
- There are important use cases for these PPAs that are not exempt as hedging transactions under EMIR – albeit serving a **risk-reducing** purpose in the market.

Renewable financial PPAs since they are settled in cash are considered financial instruments and OTC derivatives which are therefore subject to EMIR.[59] Financial PPAs can only be exempt from the CCT if they are considered as a hedge, i.e. "*objectively measurable as reducing risks directly relating to the commercial activity or treasury financing activity of the non-financial counterparty or of that group […]*".[60]

Below we present two realistic scenarios where renewable financial PPAs would not be considered a hedge for the NFC under the current definition (see Section 7 for a possible widening of the hedging definition) and therefore count towards the CCT:

Scenario A: An offtaker offers renewable financial PPAs as a hedge to a renewable investor, however the renewable financial PPAs do not directly reduce the offtaker's portfolio risk

For example, a renewable investor seeks a renewable financial PPA (fix-for-floating swap) from an energy company (NFC) as a hedge against market price risks. The hedge is necessary to secure financing for the investment. Such a PPA would not count towards the investor's CCT as it is risk-reducing for a generation asset. However, it would count towards the NFC's CCT unless that entity has a corresponding physical position, for instance coming from its role as utility that needs to source power to serve end consumers.

We argue that such a transaction would transfer the overall market risk in the same way as a physical PPA. Moreover, the transfer of risk increases the attractiveness of the asset and increases the likelihood that the project materialises.

Scenario B: A seller uses financial PPAs to reduce exposure as part of risk management activity

NFCs (such as energy market participants) enter into long and short positions on energy markets as part of their trading and risk management activities. An NFC

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58 Hedging transactions being defined as "objectively measurable as reducing risks directly relating to the commercial activity or treasury financing activity of the NFC or of that group", see Article 10(1) in Commission Delegated Regulation (EU) No 149/2013.

59 MiFiD II, Annex I, Section C (5).

60 Article 10(1) in Commission Delegated Regulation (EU) No 149/2013.

with a short derivative position (for example from providing a hedge as in scenario A) would seek to reduce its exposure with follow-on trades. Financial instruments, such as financial PPAs, can be a means of managing such risks. However, they would not be deemed as hedging tools under EMIR (as hedging services/derivative trading are not considered a commercial activity eligible for hedging) and such trades would contribute to the CCT.

Energy regulators, such as the European Union Agency for the Cooperation of Energy Regulators (ACER) and Ofgem in the UK, measure the liquidity of energy wholesale markets (among other measures) by the "churn"[61], i.e. how often a MWh of energy is traded on average before consumed by end customers. Wholesale markets are considered more liquid, the more often a MWh is traded (i.e. the higher the churn rate).

In energy wholesale markets, high churn rates (above 1) are caused, among other things, by the dynamic re-optimization of long-term hedges for generation assets (such as renewables):

- Assets are initially hedged with the available long-term products (e.g. annual products). As an asset approaches the time of delivery, the initial hedge is unwound and replaced by a new optimal hedge. Such a re-hedging process, which can occur several times, leads to a churn rate greater than 1 as the initial hedge products with longer tenor are cascaded into shorter tenor products, e.g. a 1-year contract is cascaded into quarterly products, then into monthly and so on.
- Changes in technical conditions of a generation asset (such as the availability of renewables which depend on solar radiation or wind speeds, or revision times) and in market conditions (such as market price curves) can also lead to a re-evaluation and adjustment of the initial hedge, and in turn, to a churn rate above 1.

As an illustration, the ACER Market Monitoring Report shows that a single MWh generated tends is traded several times in major liquid European power markets. The churn rate, i.e. the number of times that a MWh would be traded, is approximately 8.5 in the German market[62], 3.0 in France, or 2.5 in the Nordics.[63] Any limitations to such trades decrease the liquidity of the market and tend to limit the efficiency of the market (see Section 4.1 for a further discussion of the importance of liquid trading markets).

[61] See ACER, "Market Monitoring Report 2020", para 222 and https://www.ofgem.gov.uk/energy-policy-and-regulation/policy-and-regulatory-programmes/electricity-wholesale-market-liquidity.

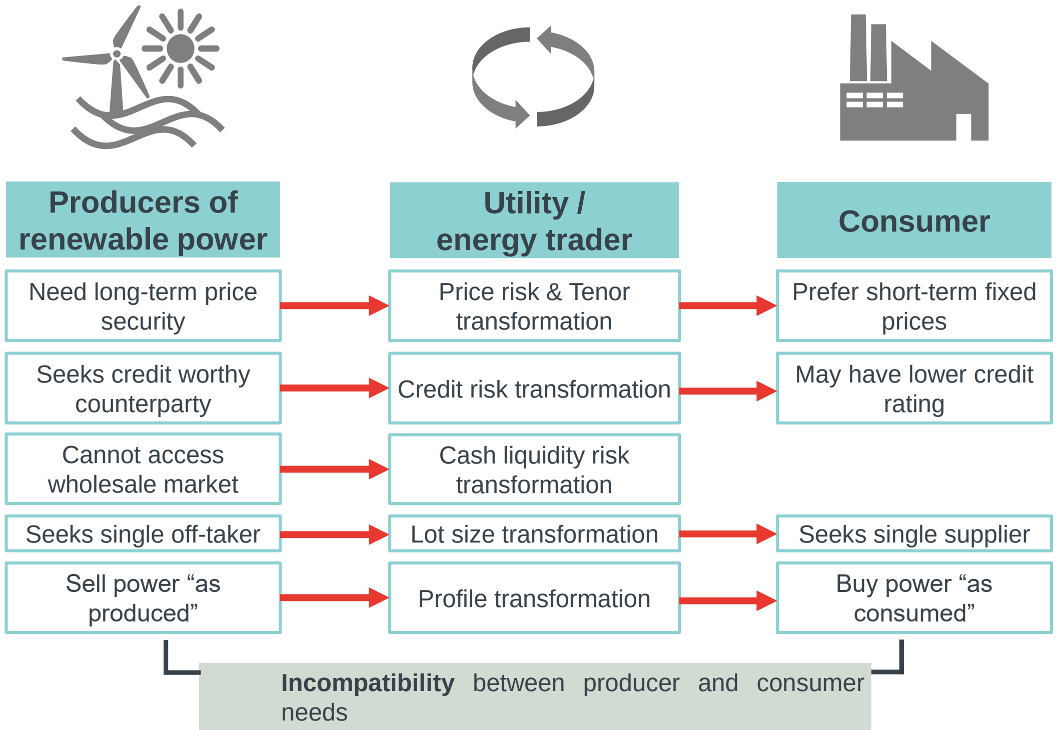
[62] The very liquid German market also serves as a "proxy hedge" for other European countries, if their prices are sufficiently well correlated with German prices. This is another reason for the particularly high churn rate in Germany.

[63] See ACER, "Market Monitoring Report 2020", Figure 35.

3.4 NFCs play a key role in facilitating the energy transition

Renewable (financial) PPAs in Europe often involve NFCs as utilities and energy traders. NFCs play a key role to balance the demand and supply of energy (see Figure 12).

Figure 12 NFCs fulfil essential role to link renewable asset generation with consumers



Source: Frontier Economics.

NFCs perform the following important tasks in the power sector:

- **Transforming market price risks:** Producers of renewable energy consumers can have different risk preferences. For example, producers of renewable energy might favour long term fixed prices in line with economic plant life, whereas consumers tend to prefer shorter fix price periods in proportion to their specific exposure or business planning cycle. Utilities or energy traders can balance different risk appetites by taking the residual price risk in their portfolio ("warehousing of risks") and reducing such risks in turn. Similarly, renewable producers and final consumers might have different preferences regarding the duration of a PPA/long-term supply agreement. Renewable investors typically ask for tenors of 10 years or more while retail supply contracts have preferences for shorter term contracts (**Tenor transformation**).
- **Transforming credit risks:** Renewable investors seeking external finance might require off-takers with high credit ratings in order to be eligible for external finance. NFCs with a high credit rating can offer such a "bankability" and sell on the financial PPA to counterparties with a lower rating (using different types of credit support in that context such as letters of credit or bank guarantees).

- **Transforming cash liquidity risks:** Exchanges require cash margins (or other eligible assets) as collateral for futures and options trades. The collateral requirements change on a daily basis, reflecting changes in the market environment. The risk of needing to post larger sums of cash in a very short time period to meet collateral requirements poses cash liquidity risk. This is particularly important for small private producers who tend to be liquidity constrained. Section 4.3 provides further detail on cash liquidity risk.
- **Lot-size transformation:** NFCs can balance differences in lot size between producers and consumers in two ways: (i) contracting large plants and supplying multiple smaller consumers, and (ii) contracting multiple smaller plants and supplying large individual consumers (industrials/utilities) or large retail portfolios.
- **Profile transformation:** Producers may have a preference to sell power "as produced", while consumers prefer "as consumed". NFCs can balance differences between the two by creating a diversified renewable portfolio and trading any remaining differences short term (down to imbalance settlements in real time).

NFCs are in a prime position to act as hedging providers. Utilities treat derivative contract positions in a similar way to physical renewable generation. They monetise these long-term positions over time through successive power sales to consumers. Energy traders without a corresponding retail portfolio manage price risk by finding an adequate hedge or warehouse (i.e. internalise) the commodity risk taken on through PPAs. This is why longer-term renewable PPAs in Europe often involve utilities and energy traders as NFC counterparties.

According to the ESMA Annual Statistical Report 2021, NFCs are the largest group in terms of notional amounts in commodity derivatives trading with (39% share of the market in Q4 2020)[64].Their share has increased by +7 ppts from Q4 2019. The NFC share is (based on information from interviews we conducted as part of this investigation) reportedly even higher for electricity derivatives, such as renewable PPAs.

Most financial companies, such as banks and hedge funds, have retracted from the market for commodity derivatives in recent years.[65] There are three reasons underlying this change.

- Banks have higher cost of capital than NFCs due to the capital requirements under the Basel III accord;
- Many commodity markets, including the power market, require specific knowledge to assess and manage commodity (physically and financially settled) derivatives. For example, banks often lack the know-how and resources to organise scheduling and balancing for physical PPAs;
- NFCs are better placed to handle the intermittency of renewable power. They often have a generation portfolio they can use to balance the required power profiles;

[64] ESMA, "ESMA Annual Statistical Report 2021", p. 17, figure ASRD.19, column "CO".

[65] See for instance Bloomberg | Quint, "Why Banks Are Exiting Trade And Commodity Finance", dated 26th August 2020.

4 THE CURRENT CCT IS TOO LOW AND IMPEDES THE ENERGY TRANSITION

In Section 3, we have illustrated the increasing need for OTC derivatives such as renewable financial PPAs to finance the substantial investments in renewables required for the European energy transition. As a consequence, NFC-s are getting increasingly close to breaching the CCT. NFC-s are left with one of **two options**:

- **Remain NFC-** and avoid breaching the threshold by making conscious commercial choices (including limiting their business and losing business opportunities); or
- **Gain NFC+ status** and implement margining requirements, as well as risk management and regulatory reporting obligations.

In this section we show that both options imply inefficiencies for the NFC, their trading partners and the wider market (see overview in Figure 13). By choosing to remain NFC- a firm may need to restrict the provision of hedges to third parties as such activity contributes to the CCT in full (unless the hedges are at the same time also risk-reducing for the NFC-). As a consequence, NFC-s offering hedging solutions are restricted in their optimisation between market risk, credit risk (in the absence of margining) and cash liquidity risk (as result of margining requirements).

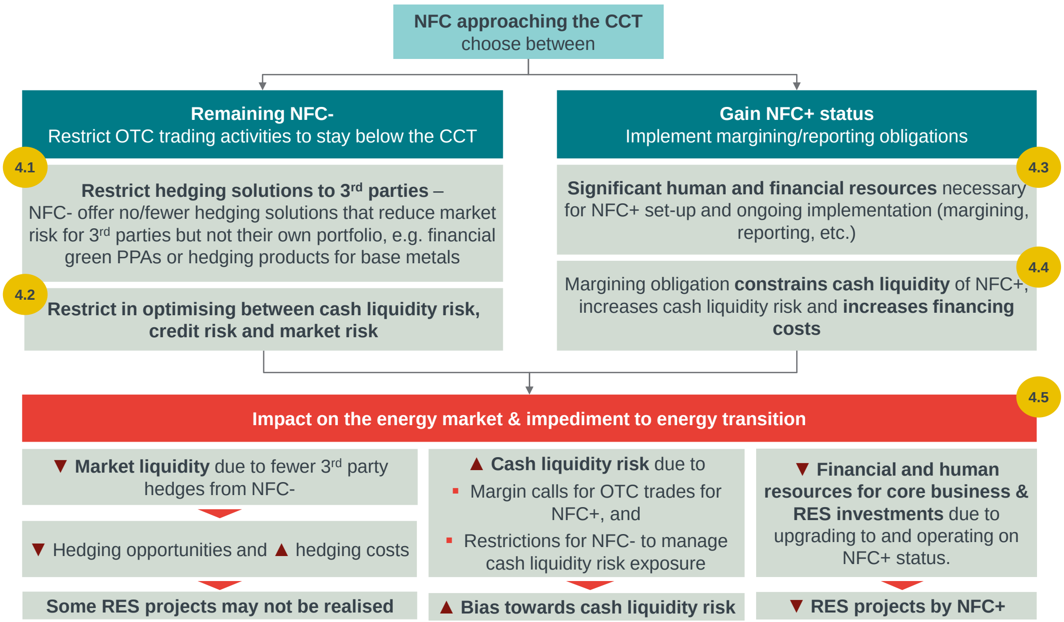
On the other hand, gaining NFC+ status has significant disadvantages for the respective companies:

- It implies significant administrative, human and financial efforts (e.g. capital expenses for margining) to upgrade to and maintain the NFC+ status.
- Additional factors, such as the increased cash liquidity risk from margining or potentially lower credit ratings (as posted margins do not enter the balance sheet as assets) represent further costs to a firm when becoming NFC+.

Both routes lead to general market inefficiencies. These include

- the increased costs of trading for all market participants,
- a decrease in cash liquidity, and
- fewer investments from utilities into renewables as margining requirements bind resources elsewhere.

Figure 13 The current CCT is too low and impedes the energy transition



Source: Frontier Economics.

The remainder of this Section is structured as follows:

- **Section 4.1** explains how NFC- may limit the provision of third-party hedging solutions to avoid breaching the CCT (including two real-world examples);
- **Section 4.2** explains how NFC- are restricted in optimising between cash liquidity risk, credit risk and market risk in trying to stay below the CCT;
- **Section 4.3** illustrates that becoming NFC+ leads to significant administrative burden (margining, reporting, etc.) and is no viable option for many NFCs (based on relevant assessments made by EFET members);
- **Section 4.4** illustrates how OTC margining obligations constrain NFC+'s cash liquidity and lead to additional financing costs;
- **Section 4.5** demonstrates that both routes not only affect the NFCs individually but may also have system-wide impact on the market and the energy transition.

4.1 NFC-s are restricted in offering hedging solutions for renewable investments

The current low CCT restricts NFC-s in meeting the OTC hedging needs of third parties since already a few or even one single large deal can lead to a breach of the CCT:

- Third party hedges, such as a single large renewable financial PPA, can consume the entire CCT (and force NFC-s to either gain NFC+ status if they execute further deals or to curtail hedge offers);
- Besides renewable financial PPAs, there are other hedging products for renewables both for output (electricity) and input (e.g. steel) prices or weather derivatives. These may not be offered by NFC-s for similar reasons. This is

further illustrated by two real world examples from interviews with EFET members.

Preventing such hedge deals is detrimental to the market since they would – if permitted – enable project financing, increase renewable energy production and foster market efficiency.

A single large renewable financial PPA deal can consume the entire CCT

Derivative trades by NFC-s which are only a hedge for their counterparty (e.g. to a renewable investor) contribute to the CCT of the NFC- (see Section 3.3). High and volatile energy prices and less protection from support schemes to renewable investors (who therefore seek hedges on the market) lead to a situation where NFC-s can easily breach the relatively low CCT.

A simple way to illustrate that is the CCT contribution of a price risk hedge for an offshore wind farm with varying capacity sizes (see Figure 14 below). We consider a renewable financial PPA ("fixed for floating"-type) that reduces the price risk of the renewable investor but is not a hedge for the NFC-. As such, the full PPA contract value is counted against the NFC-'s CCT. We make the following illustrative assumptions:

- fixed PPA price of 70 €/MWh;[66]
- tenor length of 12 years;
- 4,000 full load hours p.a.;[67] and
- varying offshore capacity (from a small slice to an entire wind farm) between 100 MW and 1,000 MW[68].

Figure 14 shows how the CCT contribution increases linearly with contracted capacity. Already a small off-shore slice of 100 MW consumes approx. 10% of an NFC-'s total CCT. Not even a single large-scale off-shore wind park with a contracted capacity of more than 900 MW[69] could be accommodated by a single NFC- under the current CCT. To put this into perspective: to achieve the goals of the *2030 Climate Target Plan,* an additional capacity of 57,000 MW would need to be commissioned until 2030 (see Figure 8 in Section 3.1), which would correspond to around 63 off-shore wind parks with a capacity of 900 MW.

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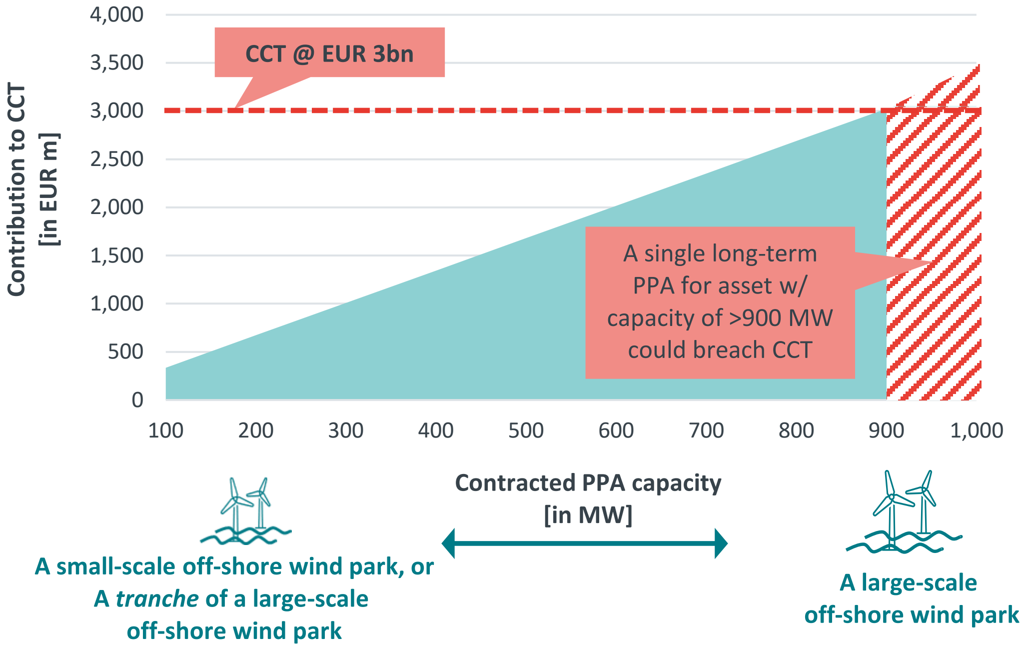
66 The floating price also specified in the PPA does not impact the GNV contribution.

67 1 MW of capacity generates an expected 4,000 MWh per year. This is a typical value for a good offshore site.

68 Referring to projects such as (i) the ***Hornsea ONE*** with a capacity of 1200 MW (see https://www.power-technology.com/projects/hornsea-project-one-north-sea/), (ii) ***Thor*** with a capacity between 800 MW – 1000 MW (https://ens.dk/en/our-responsibilities/wind-power/ongoing-offshore-wind-tenders/thor-offshore-wind-farm), or ***East Anglia One/Two/Three*** with a capacity between 800 MW – 1400 MW (https://www.iberdrola.com/about-us/lines-business/flagship-projects/east-anglia-hub-offshore-wind-complex).

69 Gross notional value of trade equals *capacity x 4,000 full load hours p.a. x 12 years x 70 €/MWh.* The 3bn threshold is reached with a capacity of approximately 900 MW.

Figure 14 CCT contribution of an offshore wind park hedged with a renewable financial PPA



Source: Frontier Economics.

The CCT contributions of such PPAs would increase further. The NFC-, that takes on such a price risk, might seek to hedge itself against this price risk via further derivatives trades (e.g. selling forward on the OTC market). Since such hedges do not qualify as a commercial activity for which NFC can claim a hedge exemption (see Section 3.3) the CCT contributions would increase. For example, if an NFC- would itself hedge 100% of the price risk exposure via OTC derivatives, this would in fact mean a doubling of the GNV contribution from the financial renewable PPA.

There are further hedging products for renewables which cannot be offered by NFC-s (illustrated by real-world examples)

With this in mind, it is not surprising that NFC- companies already today limit the provision of risk management tools and services to the market.

From interviews with EFET stakeholders, we are aware of several examples in which NFC-s were not able or prepared to offer hedging services to third parties in order to avoid a breach of the CCT. In the following we provide **two real-world examples**:[70]

- Collar hedge for electricity price to a hydro generator; and
- Proxy hedge for steel (and other inputs) for an offshore wind investment.

[70] We have adopted the names of the trades and made slight modifications to the actual contract specifications. This is to guarantee anonymity to the parties involved.

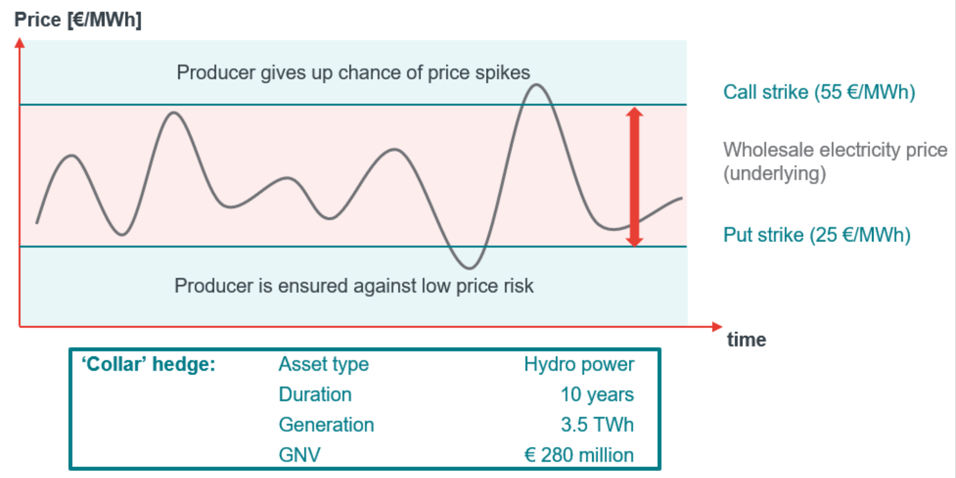
EXAMPLE 1: COLLAR HEDGE TO RENEWABLE GENERATOR

In 2021 a renewable investor approached a large European renewable asset owner, an NFC- entity, to offer a 'collar' product as a power price hedge. This trade would have involved the use of two financial derivatives (see Figure 15 below).

- Put option to secure against low price scenarios (strike price of 25 €/MWh);
- Call option which gives up upsides from high price (strike price of 55 €/MWh).

The implied GNV[71] of the trade would be up to €280m[72] (i.e. almost 10% of the NFC-'s CCT). The NFC- entity had to decline this trade due to the high GNV, despite being commercially attractive and reducing the risk exposure of the renewable investor.

Figure 15 Declined 'collar' hedge to hydro generator



Source: Frontier Economics based on a large European renewable asset owner.

71 Gross notional value, see Section 0 for details on the calculation conventions.

72 The collar is a combination of two option trades, which contribute separately to the CCT. The CCT contribution of €280m is the aggregate of (i) the call strike option [3.5 TWh * 55 €/MWh = €192.5m] and (ii) the put strike option [3.5 TWh * 25 €/MWh = €87.5m].

EXAMPLE 2: STEEL PRICE HEDGE FOR OFFSHORE WIND FARM

Renewable investors are not only exposed to output price risk (electricity prices, see example 1) but also to changes in input prices in procurement contracts.[73,74] Hedges against price changes of commodities, such as steel, may be difficult to set up and require special market know-how. Investors with no such expertise and market access may struggle to perform these hedges themselves and may require the support of an NFC- with the corresponding market expertise.

The next example considers an offshore wind investment in 2021 with a planned commissioning date of 2025. The purchase price for wind turbines and the construction costs for the foundations are linked to several specific commodity price indexes (Table 4). These price indexes cannot be hedged directly over such a time horizon. Setting up alternative 'proxy' hedges requires intimate market knowledge and market access:

- The financial market for steel indices (such as *CRU Plate*) is not well developed and direct hedge products (e.g. futures/forwards) are not available. An alternative is to construct a suitable proxy hedge. That can be a mix of other underlyings that together (imperfectly) correlate with the *CRU Plate* index.
- There are limited hedging options for raw materials to steel. While there is a direct hedge for coking coal, the costs of iron ore may only be reflected using a sophisticated proxy hedge. There is no hedge for changes in prices for blast furnace pellets.

Table 4 Hedging possibilities for steel products in a wind farm

Purpose	Underlying	Hedging tool
Steel for turbines	CRU Plate index	Proxy hedge
Raw materials for foundations	Iron ore	Proxy hedge
	Coking coal	Direct hedge
	Blast Furnace Pellets	No hedge possible

Source: Anonymised

NFC- are confined to hedge their own renewable investments (which would qualify as an exemption from the CCT). OTC derivatives that hedge the price risk of a third party (e.g. a wind park investor) would contribute to the CCT and may be declined if an NFC- is approaching the CCT.

As a result, there is lower market liquidity for hedging products and lower market efficiency

In Section 3.2 we explained how OTC derivatives enable the financing of renewable projects. NFC-s not being able to offer such hedges to third parties (or needing to significantly limit them to remain within the CCT) reduces the number

73 In a typical procurement contract of a wind farm, the final price for the wind turbines is linked to several commodity indexes. These include raw material for foundations (iron ore, coking coal, blast furnace pellets) and processed steel plates. Turbine manufacturers pass the risk from increasingly volatile commodity prices downstream to renewable investors.

74 See for example here: https://ihsmarkit.com/research-analysis/assessing-the-significance-of-steel-to-the-global-wind-industry.html – Steel prices for wind turbines have increased by over 50% in the last year.

of hedges offered and provided. Therefore the market liquidity for hedging products decreases.

By contrast, a higher CCT would allow for more provisions of hedging solutions to support renewable investments. This would foster market efficiency of wholesale energy markets for three reasons:

- The transfer of risk from investors to utilities or energy traders **tends to reduce overall market risk through risk transformation.** We explained in Section 3.3 how NFCs transform price and credit risk, as well as risks associated with marketing the generated power (e.g. lot size transformation risk, cash liquidity risk and profile transformation risk).
- **Hedging facilitates the allocation of risk to market participants best prepared to take on and manage risk.** Individual market participants have different willingness and ability to take on risk. For example, a renewable plant investor may need to limit long-term price risk to attract external financing, while a utility or an energy trader is more used to handling such a price risk.
- **Increased trading volumes strengthen the accuracy of price signals in the market.** Individual market participants may have different information (views) on the future values of energy prices. Energy wholesale markets aggregate this information through trades and re-trades which make price signals more accurate and robust. Such robust price signals are important to price PPAs (where the contract price is typically fixed long term) appropriately. Less liquid trading in derivatives also deprives the wider market of relevant market information.

See Section 4.5 for a more detailed discussing on the system-wide implications.

4.2 NFC-s cannot optimise between market, credit and cash liquidity

In this section we show that the currently low CCT constrains NFC-s to balance different types of risks:

- NFCs are optimising between market, credit and cash liquidity risk when engaging in energy trading (e.g. to hedge renewable investments);
- Increasing and more volatile energy prices have increased market risks and cash liquidity risks, whereas the CCT only seeks to minimise credit risks;
- The CCT (limiting credit risk, set under market conditions in 2012) forces NFC-s to bear inefficiently high cash liquidity or market risk since it reduces the capacity of NFC-s to engage in OTC derivative trades.

NFCs are optimising between market, credit and cash liquidity risk

There are three main types of risk in energy trading (Figure 16):

- **Market risk**: Profitability risk due to adverse market price movements. In an energy system with increasing volumes of intermittent renewable generation price is increasingly correlated with the (un)availability of renewables,[75] thereby also making combined volume and price risk an important dimension of market risk. This risk increases with price volatility.

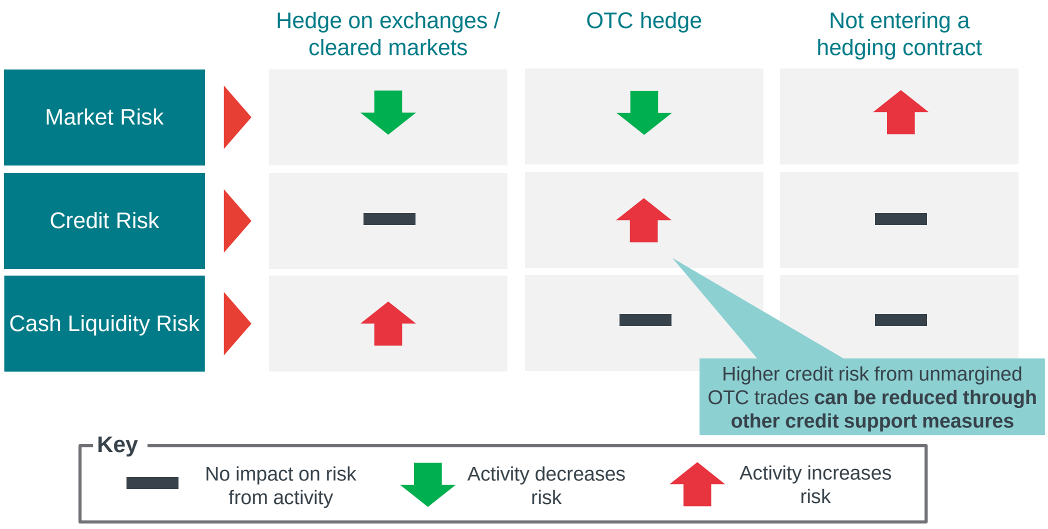
- **Credit Risk:** Risk of counterparty default on a transaction. A clearing entity with small risk profile takes on the credit risk in centrally cleared markets.
- **Cash liquidity risk**: Risk of availability of disposable cash in a very short time period to meet collateral requirements for cleared markets. In centrally cleared markets cash is usually due daily, in exceptional circumstances even intraday.

NFC-s have three basic options (Figure 16) to manage these risks (for example, to hedge risk exposure in relation to a renewable investment):[76]

- refrain from **hedging at all,** thus accepting market risk instead of credit or cash liquidity risk;
- **hedge on exchanges** (or OTC with voluntary margining) to reduce market risk and avoid credit risk in exchange for cash liquidity risk from margin requirements; or
- **hedge OTC** without margining to reduce market risk and avoid cash liquidity risk but take on some higher credit risk instead (which can be limited by credit support arrangement, see Section 3.2).

In practice, NFCs will not only consider the options above in pure form but undertake them to a different degree (e.g. hedge only 80% of the market risk of an investment, the first liquidly traded years via an exchange and the remainder on the OTC market).

Figure 16 Balancing different risks for NFC-



Source: Frontier Economics.

In the following we show how the currently low CCT limits the ability of NFC-s to optimise between these different risks.

[75] Periods of low renewable availability tend to coincide with high electricity prices and vice versa. This implies that there is increasing downward price pressure in periods when intermittent renewables do produce. It is hard for intermittent renewables to compensate this through sales at times of high electricity prices, as such times tend to coincide with low availability of renewables.

[76] Note that in practice certain trades, such as many long-term hedges, might not be traded on exchanges.

Higher and more volatile energy prices have increased market risks and cash liquidity risks

Changes in the market environment (see Section 2.1) affect the balance between market, credit and cash liquidity risk:

- The recent increase in energy price levels and volatility has increased the market risk at any given position;
- At the same time, rising and more volatile energy prices have increased the initial and variation margin requirements on exchanges (in relation to contracts signed at much lower prices),[77] consuming additional liquid assets and thereby increasing cash liquidity risk (see discussion in Section 4.4 for more detail).

NFCs continuously re-assess their exposure to different types of risk and actively adapt their positions accordingly, involving:

- **The allocation of potential new hedges,** i.e. the decision to hedge price risk exposure at all, and whether to hedge on exchanges or OTC with weaker credit support;
- **The re-allocation of existing hedges**, for example
  - Dissolving existing hedging positions (on exchanges or OTC) to take on more market risk and lower cash liquidity risk or credit risk; and
  - Shift existing exchange traded hedges to OTC (margined with other type of credit support, see Figure 10) to reduce the exposure to cash liquidity risk (or vice versa to reduce credit risk).

NFCs choose the optimal mix of risks, given current prices and subject to internal risk limits enshrined in their risk management policies.

The low CCT (set under market conditions in 2012) forces NFC-s to bear inefficiently high cash liquidity and/or market risk

In addition to limiting the number of available counterparties for OTC derivative trades (see Section 4.1), the low CCT constrains NFC-s to optimise between different risks. Absent speculative liquidity in the OTC market, market risk needs to be largely hedged by exchange traded derivatives, thus implying cash liquidity risk.

Under the extreme price spikes we currently observe, this leads to the following challenges for energy market participants:

- **A low CCT can lead to higher cash liquidity risk –** As explained above, an NFC-s can increase OTC trading in order to reduce cash liquidity risk exposure from centrally cleared transactions. A low CCT limits this option for an NFC- approaching the CCT. As a result their risk exposure is likely to be skewed towards higher cash liquidity risk.
- **Reduced hedging activity leads to higher market risk exposure and lower market liquidity.** Alternatively, NFC-s may reduce their hedging activities (to avoid cash liquidity risk) at a time with increasing market risks due to very

[77] Note that a similar effect would prevail if energy prices were to fall again at a later stage, but if derivative contracts had been signed at higher prevailing energy prices.

volatile energy prices. This would reduce overall market liquidity at a time when more liquidity is needed to facilitate investments in and to manage risks for renewable investments.

From a systemic risk perspective (on which the rationale for CCT is based) it seems questionable whether an increase in cash liquidity or market risks on a system wide level should be preferred over the higher credit risk on OTC derivatives.

4.3 NFC+ status leads to significant administrative burden and is no viable option for many NFCs

Becoming an NFC+ is not a trivial undertaking for energy companies. It requires significant implementation efforts and resources, even for large and sophisticated energy players, and the process triggers significant costs (Table 5):

- **Initial set-up costs** for new IT systems, enhanced regulatory reporting and the renegotiation and managing of credit support annexes (CSA) with all FC and NFC+ counterparties, with the result of significantly increased operational effort to manage portfolios. Moreover, the posting of IM is likely given the current low thresholds for IM to apply and the calculation methodology set out in the EMIR margining RTS[78]. In this case, an entire new operational set-up with custodian banks (Clearstream, Euroclear etc.) has to be implemented which is fundamentally different to exchanging collateral bilaterally.
- **Ongoing annual costs**, which mainly relate to the costs of cash liquidity, administrative costs for regulatory reporting as well as ongoing operations (annual costs).

Annex D provides further detail on these cost categories.

Table 5 Types of initial setup and ongoing annual costs when becoming NFC+

Initial set-up costs, including	Ongoing annual costs including
Intragroup Exemptions & Reporting	Additional Interest cost through engaging with a wider set of lenders
CSA renegotiations & system upgrades	Cost of capital for additional capital requirement
Variation Margin management systems	Liquidity management
Initial Margin management systems	Ongoing administrative effort and costs for additional staff to meet the requirements

Source: Frontier Economics based on large European energy player.

Note: CSA = Credit Support Annexes. A detailed explanation of those costs can be found in Annex D.

The case study for a large European energy company below shows that these costs can be material, with estimated implementation costs of €10m and ongoing costs of €25m p.a.

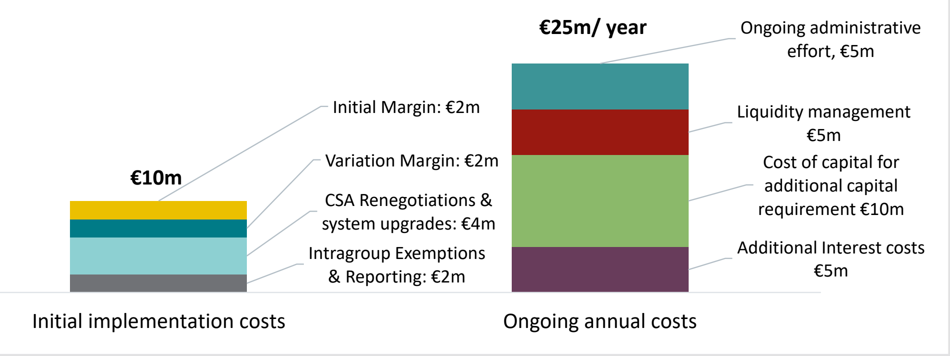
[78] Commission Delegated Regulation 2016/2251.

CASE STUDY: NFC+ COST ESTIMATES FROM AN INTERNAL IMPLEMENTATION PROJECT BY A LARGE EUROPEAN ENERGY COMPANY

Figure 17 provides cost estimates from an internal NFC+ implementation project[79] conducted by a large European energy company that has been evaluating a move to NFC+ status if the current €3bn CCT were to remain broadly unchanged:

- The implementation processes would take more than 18 months and would cost at least €10m for the set-up. This includes hiring of at least 10 additional staff members, the use of external consultants and legal counsels and require close and ongoing Board attention.
- Significant ongoing annual costs of around €25m which consist of additional interest costs for project financing of new assets, cost of capital for maintaining initial margin for uncleared derivatives, liquidity management costs through additional liquidity reserved for collateral and ongoing administrative costs.

Figure 17 NFC+ initial implementation and ongoing annual costs



Source: Frontier Economics based on estimates provided by a large European energy company, see Annex D for details.

The **burden is not only financial** and not all processes may be outsourced to external providers. The enhancement of processes requires significant administrative efforts and attention from key managerial staff **across all entities in a group**. The company, on which the case study is based, expects that attention to other core business activities would be to some extent limited during implementation but also to keep on adhering to reporting obligations.

NFC+ costs can vary across companies, depending on size and trading activity:

- **Initial setup costs** depend on the available internal expertise and resources as well as the organisational set-up prior to becoming NFC+. Large and sophisticated energy players rather have lower setup costs as they already have sophisticated organisational conditions in place (see case study below). Setup costs might be significantly higher for smaller energy players.[80] In

[79] The strategic feasibility project lasted for several months and involved many staff members from different departments, including the commercial teams, Risk, Legal, Trading, Back Office, IT and Treasury. The project outcome was presented to Senior Management at the highest level of the company.

[80] It is worth keeping in mind that the purpose of utilities is primarily the production of electricity. The group structures typically reflect this.

particular if there is a large number of small subsidiaries and joint ventures, and if trading activities are spread more widely than in the specific case here.

- **Ongoing costs** typically depend on the size and type of the company and its trading activities. While ongoing annual costs are larger for companies with extensive trading activities, those costs may be lower for smaller energy companies that implement NFC+ requirements.

4.4 OTC margining requirements further constrain cash liquidity for NFC+s

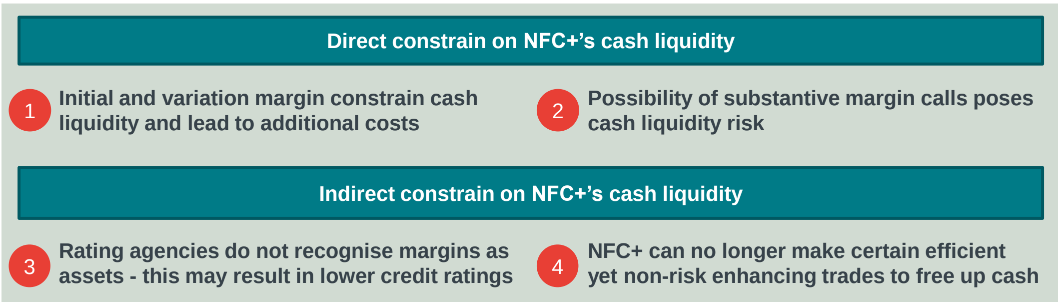
In addition to significant implementation efforts and costs, gaining NFC+ status materially increases the need for liquidity to continue their OTC hedging activities.

As we explained in Section 3.2, margins of non-cleared trades serve as collateral that cover (parts of) the credit risk of the counterparty. NFC+ (and FC) counterparties are required to post margins for OTC derivatives[81] when the other counterparty is an NFC+ or FC.[82]

Margin requirements may present a significant challenge for companies, in particular in the current market environment with high and volatile prices. A lack of liquidity may even lead to limitations in NFC+s' commercial activities since cash liquidity is costly and may be limited in the short run.

In the following we highlight the **four challenges** for cash liquidity through margin requirements.

Figure 18 Four challenges for NFC+'s cash liquidity



Source: Frontier Economics.

OTC initial and variation margin requirements further constrain cash liquidity and lead to additional costs for NFC+

Margin requirements (from non-cleared OTC trades) directly draw upon cash liquidity through two channels:

- **Initial margin (IM)**: IM is a form of collateral that covers potential future portfolio losses originating from the default of the counterparty. The IM is exchanged

[81] The requirement to post initial margin is supposed to kick-in in a phased approach according to Art. 36 CDR 2016/2251, however, in light of the applicable aggregate average notional amount (AANA) of non-centrally cleared derivatives, it is safe to assume that an NFC- which passes the Clearing Threshold will likewise pass the threshold to become eligible for submitting initial margin.

[82] For completeness, note that NFC-, NFC+ and FC are all required to post margins when trading derivatives on exchanges.

once when entering a contract.[83] IM remains subject to further adaptations driven by market volatility (margin parameters). The size of the IM is typically proportional to the transaction volume. By way of approximation, an IM tends to be in the magnitude of 15% of the gross notional value of the trade at the time of conclusion.

- **Variation margin (VM):** VM is a payment to settle the mark-to-market moves on open positions. As such VM reflects the price moves of the market and the commercial situation of the counterparties. VM is updated daily responding to so called 'margin calls'. Margin calls can result in both an increase and a decrease of the posted margin. The materiality of margin calls varies.

Cash and other liquid assets are scarce and costly[84] resources for a firm. Margin requirements can either pose a liquidity constraint on companies (with adverse impacts on business operations) or come at additional costs, which would be passed on in competitive markets.

OTC margin requirements further increase the liquidity challenge posed by margin calls

Margin calls could have major implications for the liquidity management of counterparties and exposes them to cash liquidity risk. While also NFC-s are to some extent exposed to this risk through exchange trading, OTC margin requirements further increase the exposure of NFC+s.

Margin calls present a cash liquidity risk because of the **combination of two factors**:

- **Materiality of margin calls.** High levels of market volatility, just as one has observed following the outbreak of the Corona crisis, may result in a significant increase in margin calls from derivative positions; and
- **Extremely short response windows.** When margins are called, NFCs need to respond to such margin calls usually intra-day due to EMIR requirements.

Under normal market circumstances with moderate price volatility, a hedged NFC entity, i.e. an entity with low risk exposure[85], should be able to find sufficient working capital to meet margin calls. There is however a practical issue to access the liquidity needed to meet excessive margin calls within very short time windows of few days. Liquidity buffers and revolving credit facilities may help to some extent but are costly and are usually not designed to meet the requirements of rare (but possible) excessive margin calls. The inability to meet margin calls may lead to forced liquidation of other open positions, or the exclusion from the trading platform.

[83] And only after the counterparty threshold of €50m is exceeded.

[84] For example, in the case study above, the costs of capital for cash liquidity are assumed to be 1% p.a.

[85] In particular, utility companies with generation assets who may benefit from increasing energy prices and whose credit rating should improve as a consequence.

High volumes of posted cash collateral may result in lower credit ratings and higher financing costs

There is also an important indirect effect from higher liquidity requirements on the credit rating (and thus finance costs) of NFC+s. When an NFC+ uses debt to provide collateral, the debt ratio would increase as a consequence. Rating agencies classify the substantial collateral posted for margins as a receivable which is at risk. And, under the international accounting standard IFRS, NFC+ should not include IM or VM in the balance sheet.[86] This can lead to a lowering of the credit rating, which increases the costs of financing for an NFC+ entity. For completeness, NFC-s would also be affected due to their activity on exchanges, but the OTC margin requirements add to the challenge for NFC+s.

Lower credit ratings can have detrimental consequences for the energy transition since it is more difficult for NFC+s to finance renewable projects and makes renewable investments more costly. For balance sheet financed projects, the costs will be higher and/or fewer projects will be executed.

NFC+s can no longer make certain efficient yet non-risk increasing trades to free up cash

NFC+s cannot engage in certain efficient and non-risk increasing trading activities, compared to NFC-s. For example, NFC-s can release cash liquidity by converting an exchange commodity position (subject to clearing/margining) into an equivalent OTC position (without IM margining with cash). Section 4.2 discusses the relevance of this type of trade.

4.5 Detrimental impact on the energy transition

We have laid out in the previous subsections how a low CCT negatively impacts NFCs in several ways:

- NFC-s may no longer be offering (or offering less) hedging solutions to third parties (Section 4.1) and NFC-s take on high cash liquidity risks and market risks (Section 4.2); and
- NFC+ status leads to significant administrative burden (Section 4.3) and constrains cash liquidity and increases financing costs for NFC+s (Section 4.4).

Section 4.5 shows how this translates into inefficiencies in the energy market and impedes the energy transition in three ways:

- **Reduced market liquidity** due to fewer third-party hedges from NFC-s[87]. This would lead to fewer hedging opportunities in the market and to higher transaction costs for hedges. This in turn would cause additional costs for the investors, and, in some cases, a renewable investment may not be followed through. Moreover, lower market liquidity leads to a weakening of price signals on the energy market, which are key for business decision making such as renewable investments.

[86] https://www.eba.europa.eu/single-rule-book-qa/-/qna/view/publicId/2014_1039

[87] See discussion in Section 4.1.

- Market participants are likely to carry a **higher level of cash liquidity risk**, i.e. the risk to run out of cash needed for day-to-day business activity. This risk arises from (i) NFC+ being exposed to cash liquidity risk from certain OTC trades[88], and (ii) NFC- not being able to free up cash in the short term by shifting positions from exchanges to the OTC market.[89] Contrary to the best intention of EMIR, cash liquidity risk in the energy/commodity market is likely to increase.
- **Companies upgrading to and operating on NFC+ status face administrative[90] and financial costs[91]**. In practice this means that companies have fewer financial and human resources available to undertake core business activities, such as the development of renewable energy assets.

[88] See discussion in Section 4.4.

[89] See discussion in Section 4.2.

[90] See discussion in Section 4.3.

[91] See discussion in Section 4.3 and 4.4.

5 EU NFCS ARE DISADVANTAGED IN INTERNATIONAL COMPETITION

In this section, we show that EU NFCs, which are subject to EMIR, are disadvantaged in international competition:

- **EMIR** leaves EU entities with the **lowest headroom for trading OTC derivatives** in international comparison to other G20 developed commodity markets (**Section 5.1**). While the coverage of entities and products is the widest under EMIR and thereby leading to an easier breach of the CCT, the EMIR clearing threshold is the lowest compared to other derivatives trading jurisdictions.

  EMIR also considers transactions over their whole lifecycle. It does not exclude them from its scope after a reference period, which is particularly important regarding long term financial PPAs. This does not apply in the same way to the regulatory regimes of other jurisdictions which we compare in Section 5.1.

  These findings stem from a **benchmarking study by Luther** available here: https://www.energytraderseurope.org/documents/energy-traders-europe-memorandum-commodity-derivative-clearing-under-emir/

- EU NFCs are active in other global commodities markets as well. Stricter EU regulation under EMIR puts these companies at a possible **competitive disadvantage** in non-EU markets (**Section 5.2**). EMIR influences worldwide competition of EU NFCs groups with local entities due to its global reach. Under EMIR, the clearing threshold is applied to all OTC derivative transactions by EU entities and their subsidiaries worldwide (even if a subsidiary and its counterparty are both located outside the EU and absent any market impact to EU markets). By this, the EU Entity is not only disadvantaged in the market abroad but also at home since its available CCT threshold is eaten up by not EU-relevant transactions.

5.1 EMIR’s scope for mandatory OTC derivatives clearing is widest amongst comparable jurisdictions

As mentioned in Section 1, lawmakers and financial authorities across the globe have reacted to the financial crisis by introducing new regulation on OTC derivatives trading to reduce the systemic risk. The aim of these regulations was formalised in the “G20 commitment”, when countries pledged to reform OTC derivatives markets to improve their transparency, prevent market abuse and reduce systemic risks. The agreement included the obligation to introduce mandatory clearing of certain OTC derivatives[92]. The relevant lawmakers and financial authorities subsequently went on to design regulation implementing these commitments in practice, arriving at very different results and concepts.

[92] See Financial Stability Board, “OTC Derivatives Reforms Progress. Report from the FSB Chairman for the G20 Leaders”.

In a comparative study[93] for EFET in October 2021, Luther Lawfirm compares EMIR to OTC-regulation under other jurisdictions, focussing on clearing and collateralization requirements for commodity derivatives and the treatment of non-financial market participants. The Luther study takes into account other G20 countries that have implemented the regulatory aims which have been agreed at the G20 summit. In particular, the focus is on the USA, Australia and Singapore.[94]

Each of the other jurisdictions share the objective of reducing the systemic risk by mandatory clearing and of determining the market participants relevant for the clearing mandate. However, there are significant differences in how the various regimes intend to achieve these goals.[95] In the following we summarise the main findings from the Luther study.

EMIR considers the widest set of products, activities and entities

The Luther study compares the scope of EMIR with regulation implemented in other G20 jurisdictions that are

- members of the Financial Stability Board,
- comparable with regards to the size of the market and the number of international market participants, and
- importantly, have been certified full compliance with the G20 commitments.

Luther finds that of all international regimes analysed **EMIR takes the widest scope** for mandatory clearing into account, i.e. the widest set of products, activities and entities:

- **NFCs fully considered** – several jurisdictions, such as Singapore and Australia, limit the application of OTC-clearing regulation **entirely to financial institutions** and do not consider NFCs. Those regimes which include NFCs, in particular the US and the EU, offer privileges for hedging transactions which are not considered for the clearing threshold. However, the definition of eligible risks for hedging under EMIR is rather restrictive and the privilege correspondingly narrow (see various reform options discussed in Section 7).
- **Physical products not excluded** – most of the compared jurisdictions limit their application to financially settled transactions in the first place. Commodity clearing thresholds are in these cases not consummated by physical business. Consequently more headroom is available for the remaining financially settled transactions.
- **Unlimited global reach** – only EMIR applies its regime to global trading activities without any geographical restriction or impact assessment regarding the home jurisdiction (“global reach”);

[93] Luther, “Commodity derivative clearing under EMIR. A cross jurisdictional analysis“, 2021.

[94] The Luther study focuses on jurisdictions which are members of the Financial Stability Board and have largely complied with the G20 commitments of the Pittsburgh summit.

[95] The Luther study finds differences in relation to the following criteria: the exact clearing thresholds, what entities are in scope, which products and activities are in scope, the extraterritorial reach of the regulation; which transactions contribute to the thresholds, and what exemptions from the threshold calculation exist (e.g. hedging exemptions).

- **Cleared derivatives included in threshold** – only EMIR includes centrally cleared third country exchange traded derivatives into the threshold calculation absent a case-by-case equivalence decision
- **Scope of legacy trading activity considered** – in the CCT calculation, EMIR considers the outstanding GNV exposure of all existing relevant trades for their entire lifetime. In contrast, regimes like the US only consider the GNV of relevant trades from the previous 12 months on a rolling basis. This matters particularly in a context where OTC commodity derivative contract have a lifetime of often more than 10 years and consummate the CCT much longer than they would in the US.

The differences in how the regulatory regimes are worked out are particularly notable as they all aim to put into practice the same set of G20 commitments. Here, EMIR takes the widest scope (i.e. considers the broadest scope of products, entities and activities) into account when counting trades against the OTC-derivative clearing threshold for commodities.

At the same time, EMIR also has the lowest clearing threshold.

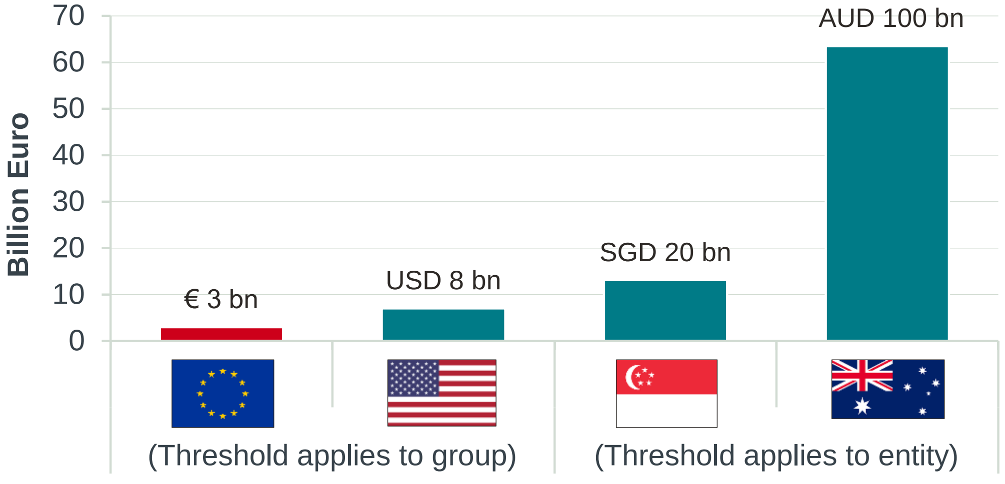
In the EU and the US, where the thresholds apply on a group level, EMIR considers a commodity derivative clearing threshold of €3bn, compared to USD8bn (approx. €7.1bn) per group per year in the US. However, the US scope of group is narrower since it only encompasses transactions or entities that are either US persons or have a US nexus by presenting a risk to US markets or circumventing US legislation.

On a per entity basis[96], Singapore considers a threshold of SGD20bn (€13.1bn) and Australia considered a threshold of AUD100bn (€63.5bn).[97] Figure 19 below provides a direct comparison.

[96] Which consequently means that a group can transact **multiple times** the entity value if it maintains more than one trading entity.

[97] Clearing thresholds were converted into € based on the respective exchange rates from 21 February 2022 (0.8820 €/USD, 0.6551 €/SGD, 0.6349 €/AUD).]

Figure 19 Comparison of commodity derivative clearing threshold in the EU, USA, Singapore and Australia (in bn € and original currency values as labels)



Source: Frontier Economics based on Luther study, p. 5.

Note: Clearing thresholds of non-European countries were converted into € based on the respective exchange rates from 21 February 2022 (0.8820 €/USD, 0.6551 €/SGD, 0.6349 €/AUD).

5.2 EMIR disadvantages EU energy companies in international competition

The international comparison in Section 5.1 is relevant since EU NFCs compete in various markets around the world:

- **Global commodity markets** – Commodity markets are global, and EU NFCs compete globally for the supply of various commodities (Figure 20). EU NFCs are not only buyers in these markets but also sellers, as they are active in oil and gas exploration or renewable electricity generation for example.
- **Worldwide markets for energy deliveries and energy services** – EU NFCs are active in various energy markets around the world. This regards different levels on the value chain, ranging from power generation (in particular large-scale offshore wind projects), wholesale and retail supply and energy trading.

Figure 20 Global network of commodity derivatives trades involving EEA30 counterparties

Source: ESMA Annual Statistical Report on EU Derivatives Markets 2021, Figure ASRD-S.20.

Note: Undirected network of total notional amount outstanding. The size of the bubbles is proportional to the total notional amount outstanding for counterparties domiciled in the Member State. The thickness of the line is proportional to the total notional amount outstanding between counterparties from the two Member States.

Commercial activities in non-EU jurisdictions represent a significant business opportunity for European energy investors and traders. For example, some EFET members are active as producers and suppliers of electricity and gas in the US. Other members invest in the development of renewable energy in the Americas and Asia.

EMIR applies to all trading activities around the globe without restriction within a group. As such it has two key implications for international subsidiaries – in both cases, the global scope of EMIR can limit the subsidiaries competitiveness on the local (international) markets.

EU NFC- companies may need to limit their offering on international markets to remain below the CCT

International subsidiaries contribute to the EMIR CCT of the group through their OTC commodity derivative trading activities. Consequently, the group may decide to curtail its international activity to remain below the CCT of €3bn (see case study below). This puts them in a competitive disadvantage to companies that are bound by local financial regulation, which is in most cases not as restrictive as EMIR, and that are able to enter into a higher volume of OTC commodity derivative trades.

CASE STUDY – DISADVANTAGES FOR EU NFC IN THE US DUE TO EMIR

We have shown in Section 5.1 that EMIR is stricter than the Dodd Frank Act (DFA[98]) in the US, e.g. in relation to a lower CCT and the treatment of VPPAs. This affects several EU NFCs who have a subsidiary in the US and who may be in a disadvantaged position in the local market.

For example, subsidiaries of EU NFCs may not be able to effectively compete for VPPA contracts. VPPAs are widely adopted in the US, in particular in wholesale markets with financial settlement like the North-Eastern PJM99 Energy Market. EU NFCs are mainly willing to offer physical only in order not to use up the EMIR CCT which also covers US trades – unless they can qualify a VPPA as risk-reducing.

This prevents EU NFCs from doing business in financial regional US markets and with certain types of US customers:

- **Insurance companies** – they are keen to take financial risk, however, do not want to engage in the physical side of trading. Insurance companies want to manage the risk from the variability in production (P50 vs. P99 production)[100] and offload the relatively certain P99 production to energy companies. Such a financially settled deal would not qualify as a risk hedge and would count towards the EMIR CCT. EU NFCs may refrain from such deals, and by implication, from markets where financial settlement is the preferred option.
- **Integrated companies** – Tax credits are a main driver for the business case of renewable investments in the US. Typically, energy companies/project developers would build a renewable plant and sell an equity stake to investors (e.g. hedge funds and big Tech). In cases where an EU NFC acts as a developer and sells an equity stake (sufficient to deconsolidate the investment) to a third party, it would not be able to hedge the entire renewable generation of this plant anymore. In hedging the entire generation an NFC would hedge more than its own generation (i.e. it would inevitably cover the generation allocated to the third-party investor who bought an equity stake).

Margining requirements may increase the liquidity costs for the international activity of EU NFC+ companies

The financial regulation under **EMIR extends to international subsidiaries**. In practice, an NFC+ company would therefore be required to post (costly) IM and VM (see discussion in Section 4.4) for OTC derivative traded with third country NFC+ or FC equivalent companies[101] (and potentially for intragroup transactions

[98] Dodd Frank Wall Street Wall Street Reform and Consumer Protection Act.

[99] PJM = electricity wholesale market of the States of Pennsylvania, New Jersey and Maryland, the predominant regional electricity market in the US.

[100] The P50 (P99) production describes the annual aggregated production level that is being exceeded with a probability of 50% (99%).

[101] I.e. an entity established in a third country that would be subject to the clearing obligation if it were established in the Union (FC equivalent); or non-financial entities established in a third country that would

absent any equivalence decision). This creates a competitive barrier for subsidiaries of EU NFC+ companies compared to local peers on two grounds:

- Local peers would not be affected by margining requirements at the same derivative trading level as subsidiaries of EU companies. Therefore, they are less likely to be classified as an NFC+ (or equivalent status in other regimes[102]) and avoid the liquidity costs associated with posting initial and variation margins. However, EU NFC+ companies would incur these costs. In order to remain competitive, they either need to lower their profitability of the subsidiary (if incremental costs are not passed on) or make an offer at a higher price (if incremental costs would be passed on).
- Margining requirements extend to the local counterparties in case they have an NFC+ equivalent or FC status. Therefore, NFC+ or FC equivalent companies would tend to avoid trading with EU NFC+ companies altogether, as they have the option to trade with local companies not subject to EMIR and staying below any comparable national threshold and thus have no margining requirement. Peers in international markets would not be affected by margining requirements as early as subsidiaries of EU NFC+ companies. This creates a disadvantage for these subsidiaries.

not meet the conditions of Article 10(1)(b) of Regulation (EU) No 648/2012 if they were established in the Union.

[102] For instance, “Swap-Dealers” under DFA.

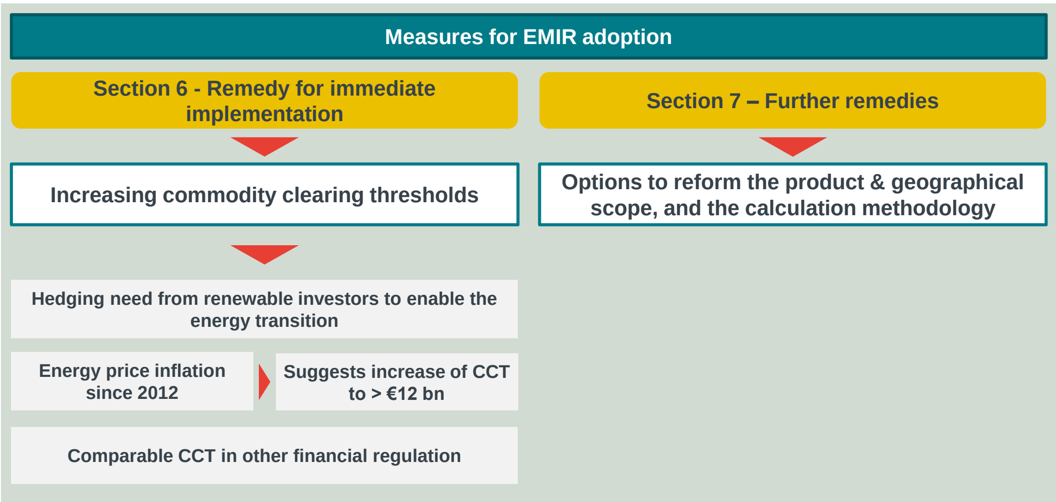
6 SIGNIFICANT CCT INCREASE AS AN IMMEDIATE REMEDY

Our report finds that the current CCT level of €3bn is too low, given the fundamental market changes since 2012 when the level was originally set (Section 2) and the future needs for OTC derivatives, such as renewable PPAs, for financing renewable investments for the energy transition (Section 3). If kept at the current level, the CCT would impede the energy transition (Section 4) and disadvantage EU-based NFCs in international competition (Section 5).

In the next sections we discuss two types of remedies (Figure 21):

- **Increase of the CCT for short-term implementation: (Section 6)** – ESMA's current review of the EMIR clearing thresholds[103] presents an opportunity to adapt the CCT to fundamental market changes and the international development of comparable regulation since 2012. The CCT level would need to be raised significantly to at least €12bn such that EMIR facilitates the energy transition, enhances European competitiveness and improves market functioning, whilst safeguarding transparent and safe financial markets.
- **Further remedies for longer-term implementation (Section 7)** – An increase of the CCT constitutes a Level 2[104] adjustment to EMIR that can be implemented short-term. In addition, we outline further remedies that would require to implement Level 1 changes to the EMIR framework. Level 1 changes require more time to implement.[105] A wider reform is necessary to make EMIR fit for the energy transition which requires an increased use of energy derivatives in the sector.

Figure 21 EMIR remedy options



Source: Frontier Economics.

103 https://www.esma.europa.eu/sites/default/files/library/esma_70-156-5010_review_of_the_clearing_thresholds_under_emir.pdf

104 https://ec.europa.eu/info/business-economy-euro/banking-and-finance/regulatory-process-financial-services/regulatory-process-financial-services_en

105 First, a proposal needs to be made by the EU Commission. It would then need to be reviewed and adopted by the European Parliament and Council.

6.1 Significant CCT increase required to facilitate the material renewable investments for the energy transition

The CCT needs to be increased from €3bn (set in 2012) to at least €12bn (see Section 6.2) to finance the material private renewable investments required for the EU energy transition:

- **Material expansion of private renewable investments** (see Section 3.1) – The European Green Deal announced in 2020 has committed the EU to cutting GHG emissions by at least 55% until 2030, compared to 1990 levels. The European Commission estimates that investments necessary to achieve the objectives of the Green Deal are expected to more than double compared to the 2011-2020 period, reaching around €400bn a year. [106] As part of this, renewable electricity generation capacities must be more than doubled by 2030 to achieve the EU climate targets.
- **OTC derivatives (such as renewable financial PPAs) are needed to enable the financing of renewable investments** (see Section 3.2) – In 2012, when the €3bn CCT was set, most renewables in Europe received financial support that fully insured them against market price risks. As government support phases out, the availability of market based hedging opportunities (such as renewable financial PPAs) becomes increasingly important to make new renewable investments financeable.
- **NFCs play a key role in providing renewable financial PPAs as hedges** (see Section 3.4) – In Europe, the longer-term renewable financial (and physical) PPAs (required to facilitate the financing of renewable investments) often involve utilities and energy traders as counterparties. NFCs are in a prime position to act as hedging providers for renewable investors since they
  - possess the sector-specific market knowledge to assess and manage commodity derivatives (such as renewable PPAs) and their (market) risks through OTC and exchange markets;
  - can handle the intermittency of renewables as they often have a generation portfolio which they can use to balance the variable renewable feed-in;
  - treat derivative contract positions in a similar way to their existing physical renewable generation and are able to *either* internalise the risks (‘warehousing’) or externalise risk by aggregating it and externalising it through exchange trading (or further OTC derivative trading).

  Most financial companies, such as banks and hedge funds, have retracted from the market for commodity derivatives in recent years.
- **NFC-s cannot offer the necessary quantity of renewable hedges at the current CCT** (see Section 4.1) – Entering a single large financial PPA with an offshore windfarm (which is not exempted as a hedge for the NFC- itself) would at current electricity prices already breach the CCT of €3bn. Already today,

[106] European Commission (2020): Impact Assessment – 2030 Climate Target Plan, SWD(2020) 176 final, Table 46.

NFC-s reject trading offers which would bring them above the threshold (as illustrated by the real-world examples in Section 4.1).

- Breaching the CCT and gaining **"NFC+" status is no viable option** for most NFCs (see Section 4.3). NFC+s have to implement margining requirements (including for intragroup), as well as risk management and regulatory reporting obligations which has significant detrimental impacts:
  - significant administrative and financial efforts to upgrade to and maintain the NFC+ status for the entire group;
  - constrained cash liquidity from margining requirement.

6.2 CCT increase to €12bn would compensate for rise in energy prices since 2012

The EMIR clearing thresholds for commodities and other asset classes were set in 2012 and have not been reviewed since. At the time, ESMA argued however the CCT levels would need to be reviewed once updated data was available. "*[…] the level of granularity and completeness of data available is not sufficient to have a detailed view on the OTC derivative market […]. In this respect, it is important to note that the clearing threshold will be reviewed on a regular basis*".[107]

It is worth recalling the main findings from Section 2.1, where we analysed the fundamental changes to the commodity markets, and energy products since 2012:

- Energy prices (including power, gas and EUA prices) have been inflated to a multiple of their values in 2012;[108]
- This results in a drastic decline in tradable quantities under the current CCT compared to 2012.[109]

ESMA needs to take the significantly increased energy prices into account when evaluating the adequacy of the clearing threshold level. Assuming that the initial CCT of €3bn reflected the market environment of 2012 (including commodity prices at the time), this could be done by applying energy price inflation to the initial €3bn threshold. This results in a CCT level which allows to trade the same quantities of commodity derivatives as in 2012. In Section 6.4 we discuss that an adjustment based on energy price inflation is unlikely to increase systemic risk.

Table 6 below presents hypothetical CCT levels that would compensate for energy price inflation of the last decade focussing on power, gas and EUAs derivatives. For example, considering the increase in power price levels between 2012 and 2022 the CCT would need to be set at €19.2bn to enable the same extent of trading as was possible under the CCT in 2012. Table 6 shows that

- **Higher price levels are here to stay**. Currently observable future prices suggest that wholesale energy prices will stay on a high level at least until 2024 (see also Figure 4). Short-run effects (such as a tighter demand-supply balance

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[107] See ESMA, https://www.esma.europa.eu/sites/default/files/library/2015/11/2012-600_0.pdf, p. 19, paragraph 76.

[108] See Figure 1 andFigure 4.

[109] See Figure 5.

and the war in Ukraine, see Section 2.1) lead to particularly high prices in 2022. EUAs are expected to remain at a multiple of their value in 2012 until at least 2024. A return to 2012 price levels cannot be expected for any of the energy commodities.

- **ESMA may look to increase the CCT to at least €12bn**, which would allow to trade power, the key commodity for the energy transition, for the year 2023 in the same quantities as in 2012. If 2022 prices and other energy commodities are taken into account, the CCT would need to rise further, reaching as much as €33.9bn (to trade the same quantity of EUA as was possible in 2012).

Table 6 Hypothetical CCT accommodating the same volumes of electricity, natural gas and EUA to be traded as in 2012

[in € bn]	2021	2022	2023	2024
Power	6.8	19.2	11.8	8.2
Natural Gas	5.6	15.1	8.6	5.6
EUA	24.1	33.9	34.6	35.5

Source: Frontier Economics based on Energate

Note: Future Prices for 2022, 2023 and 2024 are monthly averages of the futures traded in March 2022.

This analysis relies on the assumption that 2012 trading quantities would still be adequate today. However, for reasons explained in Section 3, the need for derivatives trading is expected to increase significantly on three grounds:

- The past decade has not only seen energy price inflation, but also an increase in price volatility. To manage higher market risks, energy companies rely even more on hedging with derivatives (see discussion in Sections 2.1 and 3.2).
- All trades on UK commodity exchanges (like all other non-equivalent exchanges outside the EU) count towards the CCT since 2021. The affected exchanges are key trading platforms and still form the centre for exchange commodity trading, even after Brexit. NFC-s activities on these exchanges did not contribute to the threshold in 2012 but would need to be considered now (see discussion in Section 2.2).
- The energy transition will further increase the need for hedging in the energy sector. The energy transition implies a huge scale-up of renewable generation capacity. Reduced public support schemes will increase the need for market-based hedging in the energy sector. It is the expressed intention of the European Commission that renewable support schemes should be phased out over time.[110] This will require investors to rely more heavily on derivative-type contracts to manage market risks (see Section 3.2). Long-term hedges, such as renewable PPAs (see Section 3.2) have already gained popularity in the segment and are expected to grow further.

With this is mind, the €12bn CCT level may accommodate the quantities traded in 2012 at today's prices, but it may not yet account for the increase hedging need in the market. Therefore, we present further remedies which can accompany a higher CCT in Section 7.

[110] European Commission (2014): Guidelines on State aid for environmental protection and energy 2014-2020 (2014/C 200/01), Recital 108: "[…] Notably, it is expected that in the period between 2020 and 2030 established renewable energy sources will become grid-competitive, implying that subsidies and exemptions from balancing responsibilities should be phased out in a degressive way. […]"

6.3 Increase to at least €12bn would also help to establish an international level playing field

As discussed in Section 5, EMIR is one of several regulatory regimes implementing the G20 commitment from the Pittsburgh Summit 2009. When comparing different elements of regulation, EMIR consistently appears to be among the most restrictive regulatory regimes. For example, EMIR has the lowest CCT among comparable jurisdictions.

Comparing CCT levels across international regulatory regimes **suggests that an increase of the EMIR CCT to at least €12bn** would not induce systemic credit risk since these systems were all set up to prevent exactly that in the aftermath of the financial crisis 2007/08:

- Singapore sets the CCT at €13.1bn (in 2018, i.e. much later than EMIR and at higher commodity prices than in 2012) and Australia sets the CCT at €63.5bn (in 2013) whereas in Singapore and Australia NFCs are fully out of scope and these regulations are considered compliance with the Pittsburgh summit.
- The US DFA has a CCT of €7bn but it only considers the GNV of trades concluded in the last 12 months whereas EMIR refers to the outstanding GNV of all relevant derivative contracts (i.e. it considers the GNV in relation to the remaining lifetime of the contracts). This is particularly relevant for renewable PPAs with contract durations of 10+ years. Such contracts roll out of the DFA reference period after 12 months but accumulate under EMIR.

Finally, the restrictiveness of EMIR disadvantages EU energy companies with global operations. This is because EMIR regulation also extends to international subsidiaries of EU companies. As a result, the competitiveness of international operations may be impeded (see Section 5.2 for a detailed discussion). Matching the EMIR CCT with that of local regulatory regimes would allow for a more level playing field on those markets.

6.4 Significant CCT increase justified since NFCs tend to bear low systemic risk

When considering increasing CCT, the EU legislator will presumably compare the efficiency gains from increasing the CCT (or other adoptions to the EMIR framework discussed in Section 7) with a possible increase in systemic credit risk – the containment of which is a key objective of EMIR.[111]

There are two specific characteristics of the commodity derivatives market which suggest that increasing the scope for unmargined (but collateralised through credit lines and credit support) OTC trading may increase credit risk, but not to systemic relevant level for the wider financial markets:

- **The market for commodity derivatives is small compared to other asset classes.** The size of the commodity derivatives markets is very small compared

[111] While we agree with the principle of comparing benefits and risk when considering changes to the current system, we stress that such analysis is not in the scope of this report.

to other derivatives markets. According to the ESMA Annual Statistical Report 2021, commodity derivatives accounted for only 1% of the outstanding notional value of derivatives in 2020.[112] Asset classes such as interest rate derivatives have a much larger weight. The stability of the financial sector – a key objective of EMIR – is ,therefore, mainly dependent on asset classes other than commodities.

- **NFCs do not tend to be of systemic importance for the financial system**. A failure of a non-financial commodity trading firm would not trigger a "broader contagion" of the financial sector, for example, triggering the failure of a systemically important financial institution. This view is supported by numerous independent analyses. See, for example, from Committee of European Banking Supervisors (2007)[113], Kerste et. al. (2014) and ESMA (2021)[114]. Commodity derivative markets have a high share of NFCs.[115]

[112] ESMA, "ESMA Annual Statistical Report 2021", p. 17, figure ASRD.4, column "CO".

[113] See Advice of the Committee of European Banking Supervisors ("CEBS") of 10th October 2007 to the EU Commission

[114] https://www.esma.europa.eu/sites/default/files/library/esma_70-156-5010_review_of_the_clearing_thresholds_under_emir.pdf

[115] ESMA, "ESMA Annual Statistical Report 2021", p. 17, figure ASRD.19, column "CO".

7 FURTHER REMEDIES FOR EMIR REVIEW

In the previous section we concluded that the CCT has to be increased significantly and permanently to facilitate the energy transition and provide an international level playing field for EU entities. An increase of the CCT is necessary to mitigate the issues that NFC-s approaching the CCT currently face. As a Level 2[116] measure a CCT increase can be proposed by ESMA and adopted directly by the Commission.

Increasing the level of the CCT should be accompanied by additional measures to make EMIR fit for purpose. Below we provide a **'toolbox' of further remedies to the EMIR framework** which the EU legislator may want to consider in the context of the EMIR review.

Most remedies from the toolbox require Level 1 changes[117]. As such, they would need to be proposed by the European Commission and adopted by the European Parliament and the Council. This legislative process typically takes several years and would potentially hold back the energy transition. This is because renewable investments require several years from planning to production, i.e. the renewable projects to meet the 2030 targets need to be developed in the upcoming years.

Table 7 below sets out **six remedies and proposed amendment options**, which we discuss in more detail in the remainder of this section. This analysis benefitted from the support of Luther Lawfirm. Luther provided **suggested annotations to the EMIR framework for each amendment option**, which can be found in Annex E of this report.

Table 7 Overview of further possible remedies in EMIR review

#	Remedy	Amendment option	Change in EMIR
1	Exclusion of already centrally cleared derivatives	Exclusion of all derivatives cleared by a recognized Central Counterparty (CCP).	Level 1
2	Limitation of geographical scope	Option 2a: General exclusion of derivatives concluded between non-EU-entities from the clearing threshold calculation of affiliated EU-counterparties.	Level 1
		Option 2b: Limited exclusion of derivatives concluded between non-EU-counterparties for the clearing threshold calculation of affiliated EU-counterparties, unless such derivatives are booked in the EU or have a direct, substantial and foreseeable effect to the EU internal market.	Level 1
3	Widening the application of netting in threshold calculation	Clarify the calculation methodology to allow for netting of contracts of equal type and underlying, irrespective of maturity, between a pair of counterparties.	ESMA FAQ

[116] https://ec.europa.eu/info/business-economy-euro/banking-and-finance/regulatory-process-financial-services/regulatory-process-financial-services_en

[117] See footnote 116.

4	Widening the hedging definition	Extending the hedging definition to cover derivatives that reduce risks associated with holding commodity derivative contracts.	Level 2
5	Amending the calculation methodology regarding the reference period	The calculation of the GNV should be based on concluded contracts during a reference period instead of the entire outstanding exposure from existing contracts held at specific points in time.	Level 1
6	Refined and narrow definition of OTC derivatives	Excluding all physical settled commodity instruments from the derivative definition by amending/deleting references to Annex I C 6 and C7 MiFID II.	Level 1

Source: *Frontier Economics based on Luther Lawfirm.*

Note: *See Annex E for suggested annotations to the EMIR framework for each amendment option.*

Remedy #1 – Exclusion of all centrally cleared derivatives by a recognized CCP

We support ESMA's recent proposal to adapt EMIR to "*move from the current approach of whether a derivative is OTC or not to the approach of whether a derivative is cleared or not.*"[118]

It would only be consequent for EMIR to exclude centrally cleared derivatives from the scope of derivatives that contribute to the CCT. EMIR and similar international regulation promoted the use of central clearing to increase the stability of financial markets and reduce systemic risk.[119] The consequence that derivatives that are already cleared by a recognised CCP[120] may count towards the CCT under EMIR seems to be an internal contradiction of the EMIR framework.

Currently, even cleared OTC derivatives count towards the CCT. This includes the following cases: (i) voluntarily cleared OTC derivative trades; (ii) cleared OTC derivatives executed on MTFs, OTFs or comparable third country trading venues; and (iii) centrally cleared derivatives executed on third country regulated exchanges that are not recognised as equivalent to (EU) Regulated Markets (e.g. UK-based commodity exchanges).

ESMA may therefore consider the following Level 1 amendment to the EMIR framework, which we set out in further detail in Annex E:

- **Exclusion of all derivatives cleared by a recognized Central Counterparty (CCP).**

Remedy #2 –Limitation of geographical scope

EMIR (unlike other international financial regulation) applies its regime to global trading activities without any restriction. As shown in Section 5.1, this element of

[118] See ESMA letter to the EC in response to the "European Commission's targeted consultation on the review of the EU central clearing framework", dated 1st April 2022.

[119] By stepping between bilateral counterparties, a central counterparty absorbs credit exposure in exchange of a handling fee and margin collateral.

[120] As defined by ESMA, see https://www.esma.europa.eu/sites/default/files/library/third-country_ccps_recognised_under_emir.pdf

the EMIR regime leads to disadvantages for EU energy companies in international competition.

ESMA may consider one of the following two Level 1 amendments to the EMIR framework, which we set out in further detail in Annex E:

- **Option 2a) General exclusion of derivatives concluded between non-EU-entities from the clearing threshold calculation of affiliated EU-counterparties.** Similar to the new de minimis threshold in MiFID II for the calculation of the ancillary activity exemption, we would suggest restricting the threshold calculation to EU-entities and their activities. The required change in wording is limited; or
- **Option 2b) Limited exclusion of derivatives concluded between non-EU-counterparties for the clearing threshold calculation of affiliated EU-counterparties,** unless such derivatives are booked in the EU or have a direct, substantial and foreseeable effect to the EU internal market.

Remedy #3 –Widening the application of netting in threshold calculation

The gross notional value of OTC-derivatives that a counterparty maintains towards another counterparty is currently determined while largely neglecting netting effects in the portfolio. Only contracts between the counterparties of the same type, underlying and maturity can be set off against each other.[121]

This tends to overstate the factual credit exposure as calculated in a real close out situation (e.g. in case of an insolvency of a firm and the dissolution of positions). In an insolvency case all non-settled commodity contracts under master trade agreements between two counterparties would be closed out and netted against each other. Netting is possible across different underlyings (for example power, gas and CO2) and different maturities – contrary to the narrow netting practice allowed under EMIR.

All EMIR relevant OTC derivative contracts represent by definition financial instruments and thus benefit from close-out netting privileges, such as German sec. 104 InsO[122] – even in ambiguous netting jurisdictions. Therefore, considering netting effects at the very minimum relating to the same commodity as underlying regardless of maturity (as any contract would in fact be automatically terminated upon an insolvency event regardless of remaining tenure) would more accurately reflect the real exposure the counterparty presents to the market.

For completeness, in a real close-out situation not only all derivatives under the same agreement irrespective of its commodity underlying, but, in most cases, even those under other master agreements with the same counterparty would be netted and set-off against each other entirely.

[121] ESMA stated with respect to Art.10 EMIR: "*In order to determine whether it is above or below the clearing thresholds, the counterparty should first net their positions per counterparty, including where the counterparty is a CCP, and contracts and then add up the absolute notional value of all these net positions (calculated based on the notional amounts of the contracts). Netting per contracts and counterparty should be understood as* ***fully or partially offsetting contracts having exactly the same characteristics (type, underlying, maturity, etc.)*** *with the only exception being the direction of the trade and notional amount (in case of partial offset) concluded with the same counterparty.*"

[122] InsO is the German Insolvency Statute, see https://www.gesetze-im-internet.de/englisch_inso/englisch_inso.html#p0012.

A simple amendment at the FAQ level may suffice to clarify the calculation of the per counterparty risk exposure position. See Annex E for a suggested annotation:

- **Clarify the calculation methodology to allow for netting of contracts of equal type and underlying, irrespective of maturity, between a pair of counterparties.**

Remedy #4 – Widening the hedging definition

The current hedging definition in Art. 10 CDR 149/2013 suggests that financial instruments are not part of the commercial activity of a group and are therefore not eligible for hedging. As a result, EMIR fails to classify derivatives that cover risks from holding other commodities derivatives as hedges. Restrictions to perform such hedges, e.g. to hedge and mitigate the risk associated with a financial PPA, in particular to avoid consummating the CCT, can lead to increased systemic risk and other market inefficiencies (see Section 4.1).

ESMA may consider widening the hedging definition as a Level 2 change, which we set out in further detail in Annex E:

- **Extending the hedging definition to cover derivatives that reduce risks associated with holding commodity derivative contracts.**

Remedy #5 – Amending the calculation methodology regarding the applicable reference period

Unlike international regulatory benchmarks, which tend to consider the <u>trading activity</u> during a reference period in their threshold calculation, EMIR considers the overall <u>outstanding exposure</u> as single reference and does not refer to the associated trading activity. Therefore, in particular long term PPAs tend to consummate huge portions of the available threshold because they need to be considered for their entire lifetime as opposed to the reference year when they had been concluded (as is the case under the DFA in the US).

ESMA may consider the following Level 1 amendment, which we set out in further detail in Annex E:

- **The calculation of the GNV should be based on concluded contracts during a reference period instead of the entire outstanding exposure from existing contracts held at specific points in time.**

The amendment would ensure that pre-existing contracts drop out of the calculation on a rolling basis.

Remedy #6 – Refined and narrow definition of derivatives

EMIR does not exclude physically settled commodity derivatives. ESMA may consider the following Level 1 amendment, which we set out in further detail in Annex E:

- **Excluding all physical settled commodity instruments from the derivative definition** by amending/deleting references to Annex I C 6 and C7 MiFID II.

ANNEX A. INTERVIEW SET-UP

This Annex provides some further details on how Frontier collected feedback from EFET members and affiliates in the context of this study.

Interview set up

Depending on the special expertise of the interview partner, we have discussed specific questions in more detail or explored other relevant aspects.

Interviews lasted for 60 – 90 minutes and were conducted as videoconferences. We have provided a written summary after each interview which enabled interview partners to correct or amend the information we gathered.

Evidence from the interviews is used in anonymous form since it may relate to sensitive and confidential business information.

Questionnaire for interview partners

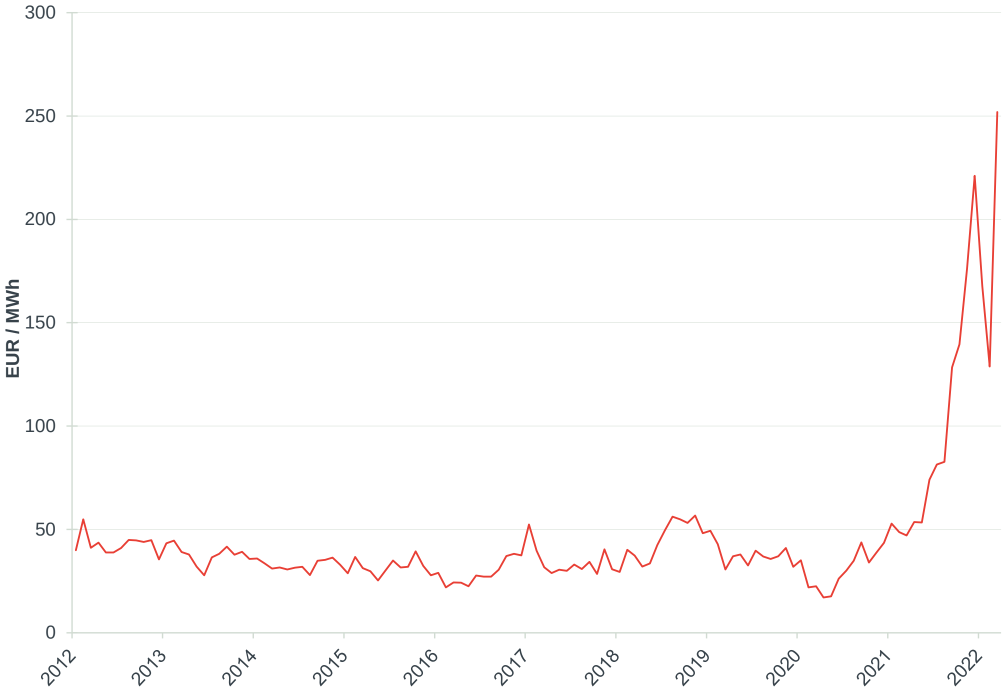
We have provided interview partners with the following set of questions:

- What types of **green investments projects** are you planning?
  - Please explain how you typically set up such a project (e.g. JV, etc.)
  - Please share information on your pipelines of green investments
- What **role do commodity derivatives** play for sustainable energy investments?
  - Which types of assets and commodities (e.g. renewable power, green H2, green fuels, energy infrastructure, storage)?
  - Which types of derivative products (green financial PPA, options, forwards, weather instruments etc.)?
  - What are example deal structures for green investments and how easy is the current €3bn CCT breached?
  - What additional activity would be undertaken if thresholds were lifted or (hypothetically) abandoned?
- What is the **role of different players** (project developers, commodity traders, FCs, energy suppliers, etc.) in facilitating these investments?
- How are you **currently affected by the CCT**? What is your **perspective** for the next couple of years if the threshold remains unchanged?
- What are the **consequences of exceeding the CCT**? Have you considered **becoming NFC+**? Have you run an internal project of becoming NFC+?
- What is the **impact on competition** on activities inside and outside the EU with entities from within the EU and/or entities from other jurisdictions (e.g. with more lenient regimes like in the US)?
- **How high would a CCT increase** need to be (we would like to discuss concrete examples, e.g. based on a realistic PPA volume)?

ANNEX B. COMMODITY PRICE DEVELOPMENT SINCE 2012

The figures below (from Figure 22 to Figure 28) show the development of short-term (spot) wholesale prices for energy carriers (coal, oil, gas and electricity), base metals (aluminium and copper) and CO2 emission allowances (EUA). These prices (in currency per unit) build the basis for the analysis used in Figure 1 in Section 2.1 (which compares the price trajectory relative to 2012 prices).

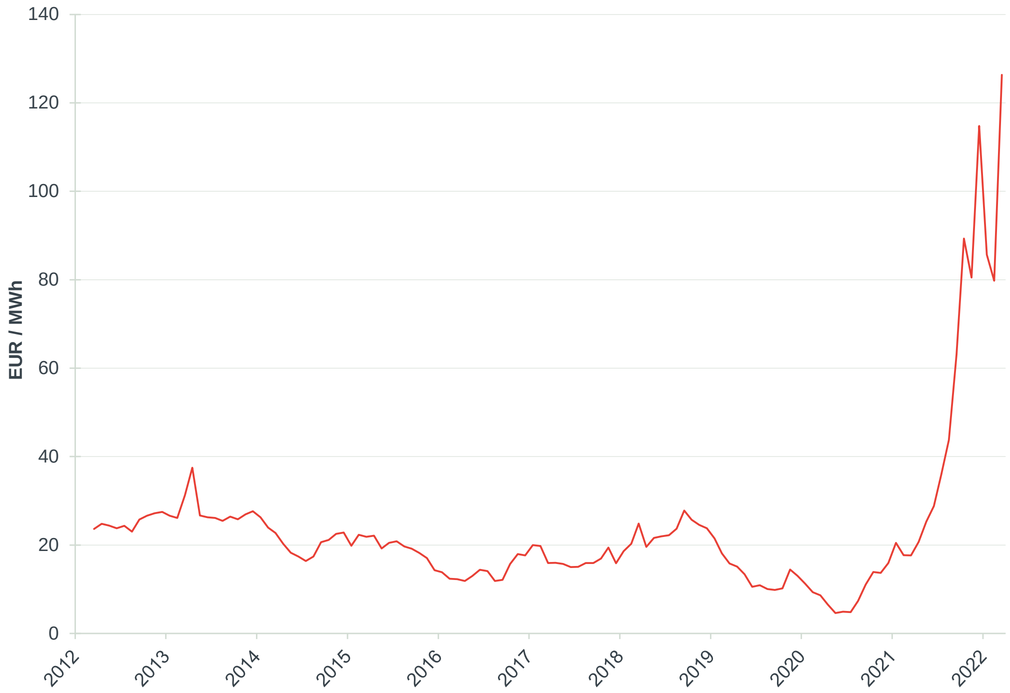
Figure 22 Evolution of electricity prices in Germany



Source: *Frontier Economics based on data from Energate*

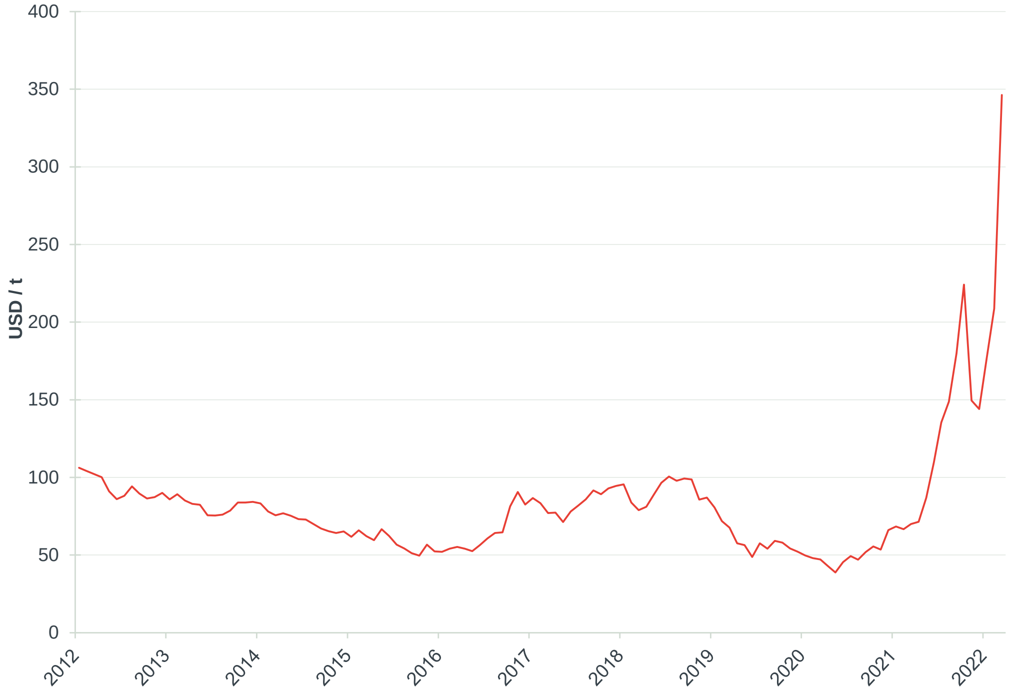
Note: *Data represents baseload prices from the EPEX spot market for the German/Austrian/Luxembourg bidding zone until 30 September 2018, and for the German/ Luxembourg bidding zone thereafter.*

Figure 23 Evolution of gas TTF prices traded on EEX



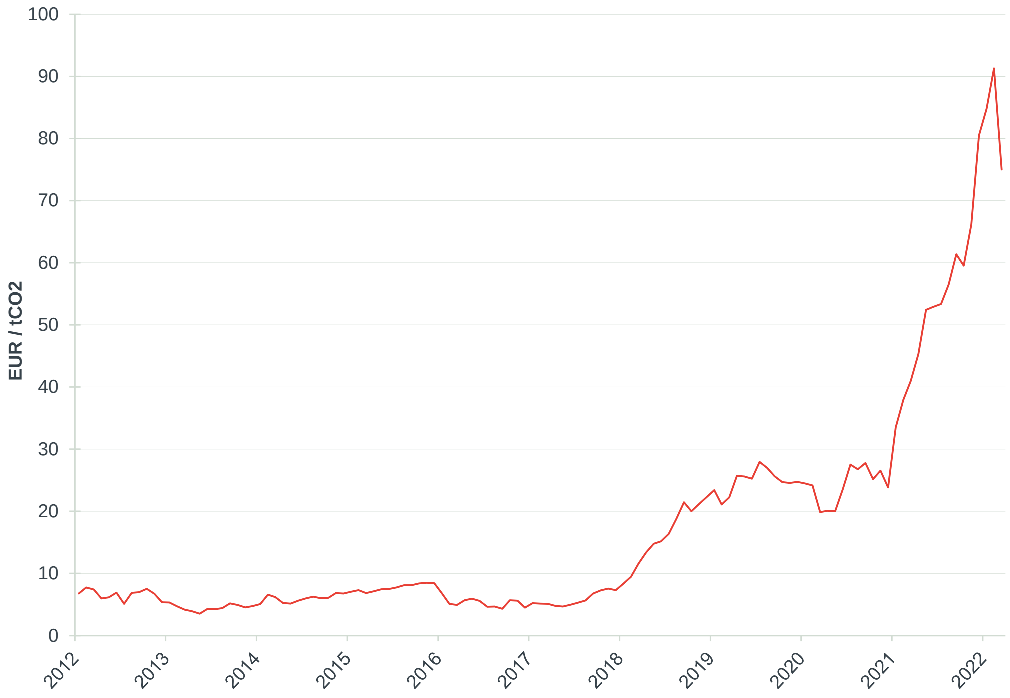
Source: Frontier Economics based on data from Energate

Figure 24 Evolution of delivered cost of coal into Rotterdam



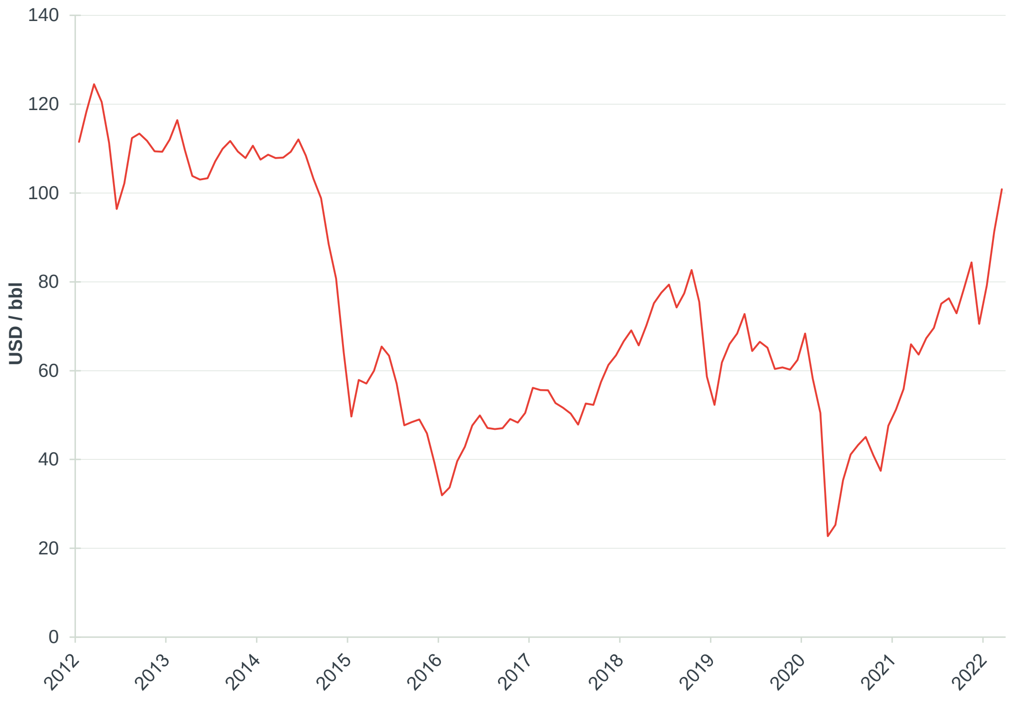
Source: Frontier Economics based on data from Energate

Figure 25 Evolution of EUA price



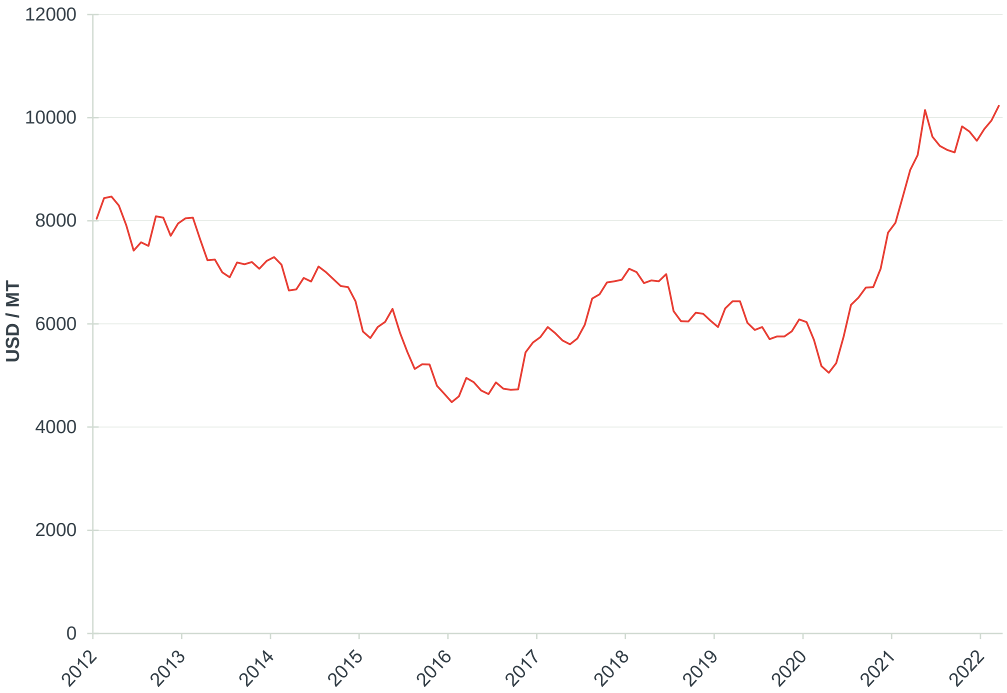
Source: Frontier Economics based on data from Energate

Figure 26 Evolution of oil prices (ICE Brent Index)



Source: Frontier Economics based on data from Energate

Figure 27 Evolution of copper cash prices



Source: Frontier Economics based on data provided by an EFET member

Figure 28 Evolution of aluminium cash prices

Source: Frontier Economics based on data provided by an EFET member

ANNEX C. THE ROLE OF OTC DERIVATIVES, IN PARTICULAR RENEWABLE FINANCIAL PPAS

In this section we provide further details why OTC derivatives, and renewable financial PPAs in particular, are relevant in financing the energy transition. This Annex thus provides further detail to the discussion in Section 3.2.

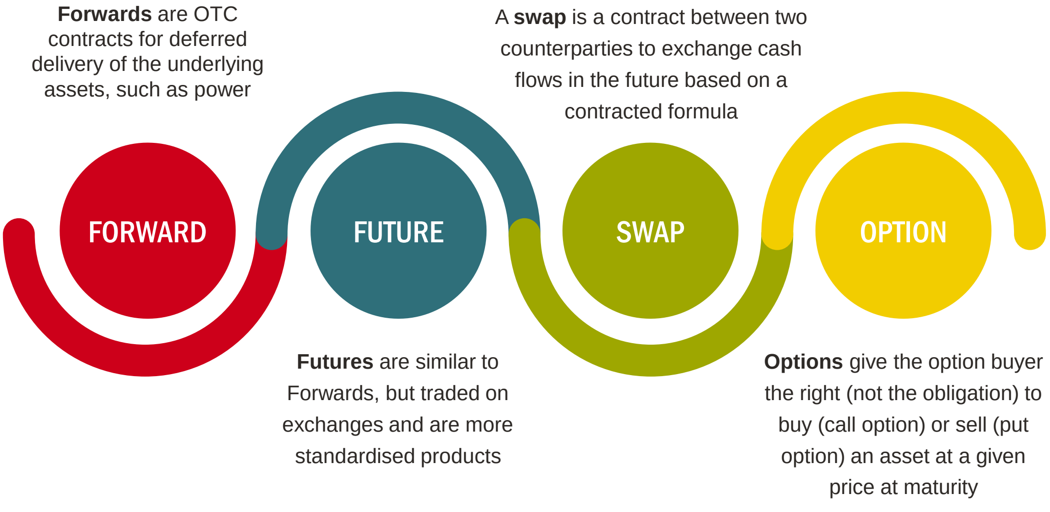
In the following, we discuss:

- Derivatives, which serve as such hedging solutions for renewable investments, are often traded OTC. These bespoke contracts help to address the long tenor length required by renewable investors and the specific risk from the "intermittency" of renewable generation;
- Renewable investments are increasingly exposed to market risks due to the phase-out of governmental support and require market based hedging solutions;
- Renewable PPAs, which can be settled financially or physically, are ideally suited as hedging solutions for renewable investments; and
- What renewable financial PPAs are and why they are becoming increasingly relevant as a project financing tool.

Derivatives, which serve as such hedging solutions for renewable investments, are often traded OTC

Derivatives are contracts whose value depends on the value of the underlying asset or some benchmark index. This value can change over the contract life of the derivative. The following four types of derivatives are most common in energy markets (Figure 29):

Figure 29 Most common types of energy derivatives



Source: Frontier Economics

Note: *A cash-settled **power purchase agreement** (PPA) or **contract-for-difference** (CfD), is a type of swap contract with financial settlement where parties exchange a "floating" wholesale price against a fixed price.*

Long term[123] derivatives play a crucial role in reducing the level of price risk to which (renewable) investors are exposed. Such derivatives allow to lock in prices or to keep them within a certain range. They can thus provide the level of certainty on the future profitability that is required for private entities to actively invest and attract external finance ("bankability").

There are two ways of trading commodity derivatives:

- Derivatives can be traded on **regulated markets, most notably on exchanges**. Exchange-traded derivatives are **standardised and transparent**, with terms defined by the trading venue. Trades on exchanges are subject to a clearing obligation, i.e. counterparties enter an agreement with a third party (a "clearer") which guarantees the settlement of the derivative contract. As part of this process the counterparties post margins, i.e. collateral to cover their credit risk.
- **Over-the-counter** (OTC) are bilaterally negotiated trades. As OTC derivatives are arranged and negotiated bilaterally, they are able to provide participants with a **bespoke and flexible solution for their trading and hedging needs**. There is no clearing obligation for OTC commodity derivative trades. OTC contracts tend to involve a variety of credit support instruments, potentially, but not necessarily, including bilateral margining. A bilateral margining obligation exists for trades amongst FC and NFC+ companies (see Section 1.2).

Derivatives employed to hedge renewable investments are typically arranged OTC for several reasons (as set out in Section 3.2):

- **Long-term nature** – Long-term hedges exceed the 3–4-year period significantly[124] which is liquidly tradable on exchanges. In the absence of governmental support schemes which often provide stable revenues for 15+ years, renewable investors need to rely on long-term OTC derivatives to hedge against volatile market prices.
- **Additional credit support arrangements in OTC contracts** – OTC contracts facilitate bespoke credit support arrangements which aim at lowering credit risk without the need to post substantial collateral causing cash liquidity risks (see Section 4.2 for further discussion on this trade-off).[125] Credit support arrangements are part of a wider set of sophisticated and recurring credit risk management measures that limit the credit risk exposure from OTC transactions (see Figure 10 in Section 3.2).
- **Renewable-specific risks from fluctuating weather conditions** – The output from wind farms and solar PV plants depends directly on fluctuating weather

[123] The duration of contracts varies. There are short-term contracts, which are mainly used for volume risk management (optimisation and balancing). Short-term contracts are usually physically settled, e.g. relate to the trading of the underlying. Derivative contracts including forward/futures and options generally have a longer tenor and they can be physically or financially settled.

[124] Technically, power future products on the European Energy Exchange (EEX) can be traded up to six years into the future, but liquidity is very low (low number of transactions) beyond 3 years.

[125] Examples for additional credit support arrangements are safeguards against ownership change of the asset ("change of control clauses"), or bilateral netting agreements. In addition, companies on the commodity market have sophisticated credit management processes accompanying OTC transactions.

conditions (therefore this type of generation is called “intermittent”). Although a degree of diversification of weather risks exists across regions, the intermittency of wind (or solar) plants tends to be highly correlated with other geographic proximity which creates a price/volume risk unique for intermittent renewable technologies. In contrast to standard products, bespoke OTC derivatives (such as renewable PPAs) can be designed in a way that share this risk between buyer and the seller.

- **Specific requirements –** OTC trading allows counterparties to bilaterally agree on a wide set of parameters (e.g. tenor length, power profile, pricing, settlement type, break clauses), which cannot be replicated in an exchange traded derivative.[126]
- **Lack of direct access to exchanges** – Trading on exchanges – if at all accessible and meaningful for generators – leads to fixed costs for access and the necessary IT infrastructure, while increasing liquidity risks. Market participants are potentially able to lower trading costs when trading OTC.

In brief, OTC trading allows counterparties to (i) flexibly address the requirement of long-term prices fixes (beyond liquid markets timescales), (ii) build in corresponding credit support safeguards without large working capital requirements, (iii) and address the specifics of renewable power production (price/volume risk). Combining these elements is practically impossible to replicate using exchange traded derivatives.[127]

Renewable investments are increasingly exposed to market risks and require market based hedging solutions

Renewable plants are long-term investments with a lifetime of more than 20 years. Uncertainty about the profitability of a project can be a major impediment to the ability to finance such large-scale investments. Renewable investments imply market risk that is not dissimilar to large-scale conventional power plants. However, there are some important differences which make OTC derivatives even more relevant for renewables.[128]

Historically, renewables in Europe typically received financial support via regulated feed-in tariffs (FIT) that **fully insured them against market price risks** for the duration of the support period, which usually covered the first 15-20 years of operation. This guaranteed investors a long-term stable revenue stream and provided access to external finance. Hedging instruments to cover market risk were therefore usually not required for renewables.

Renewable electricity producers are **now increasingly exposed to market price** risks. Through the State Aid Guidelines for Environmental protection and Energy

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126 See https://www.frontier-economics.com/uk/en/news-and-articles/articles/article-i6711-buying-and-selling-green-energy-don-t-overlook-the-small-print/ for further details.

127 See https://www.frontier-economics.com/uk/en/news-and-articles/articles/article-i6711-buying-and-selling-green-energy-don-t-overlook-the-small-print/ for further details.

128 As all investors in generation assets renewable investors are exposed to market risk, i.e. the profitability risk due to adverse market price movements. However, their exposure is somewhat higher than that of an investor in a conventional power plant. In an energy system with increasing volumes of intermittent renewable generation price is increasingly correlated with the (un)availability of renewables (intermittency), thereby also making combined volume and price risk an important dimension of market risk. This risk increases with price volatility.

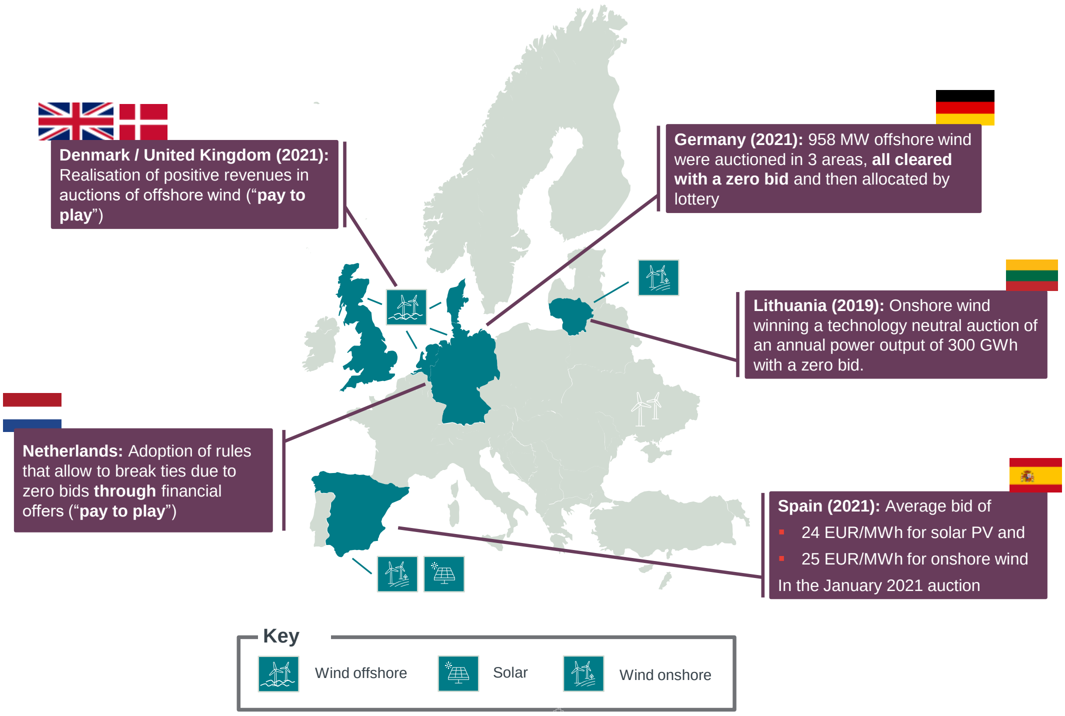
(EEAG), the European Commission has emphasized its ambition to "*incentivise the market integration of electricity from renewable energy sources*".[129] Particularly, the shift from administrative to auction based procedures as the dominant tool to determine support levels has paved the way for a gradual phase out of support programmes. In fact, the European Commission "*expected that in the period between 2020 and 2030 established renewable energy sources will become grid-competitive*".[130]

Renewable investors submit bids in public tenders

- for the right to install renewable generation, get access to the power grid (typically relevant for seabed rights in the context of offshore wind parks), and
- to potentially receive a subsidy element in the form of a market premium, i.e. an added payment on top of market-based revenues.

Figure 30 illustrates that already today auction bids can be very competitive. In some cases, renewable investments are undertaken without any support payments (zero bids) or even with payments to obtain construction rights ("pay to play" / negative bids).

Figure 30 Examples for renewable auctions with very competitive bids and zero-bids



Source: *Frontier Economics based on Bundesnetzagentur (2021), IHS Markit (2021), 4C Offshore News (2021), FINERGREEN (2021), Recharge (2020) and AURES II (2021): D3.1., AURES II Auction Database and D3.2, Updates of auctions database.*

[129] See CEER (2016): Key support elements of RES in Europe: Moving towards market integration, p. 10. Retrieved on 6 January 2022 from https://www.ceer.eu/documents/104400/3728813/C15_SDE-49-03+CEER+report+on+key+support+elements_26_January_2016.pdf/28b53e80-81cf-f7cd-bf9b-dfb46d471315.

[130] Recital 108 in European Commission (2014): Guidelines on State aid for environmental protection and energy 2014-2020 (2014/C 200/01). Retrieved on 6 January 2022 from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014XC0628(01)&from=EN

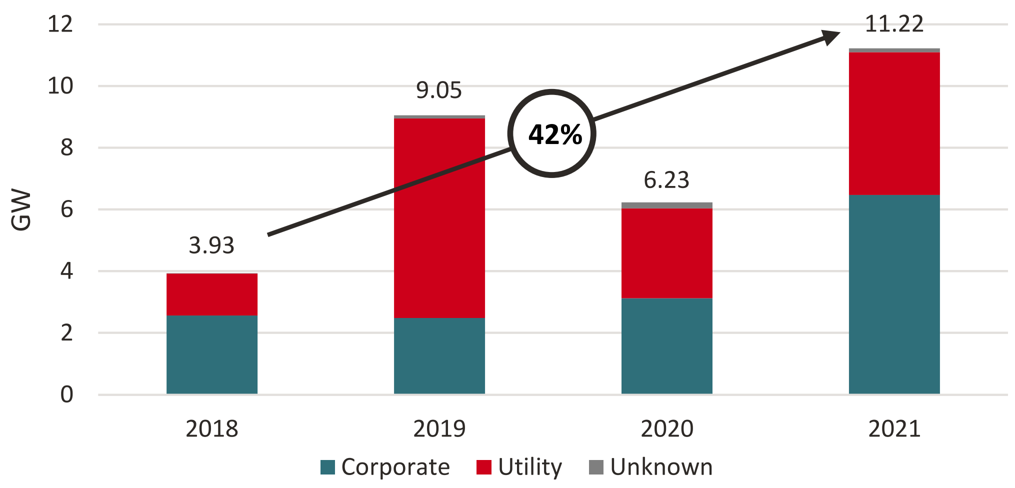
Note: Boxes indicate the renewable technology for which very competitive bids and zero bids have occurred respectively.

As government support phases out the renewable investors become more exposed to market risk. Hence, the availability of market based hedging opportunities becomes increasingly important.

Renewable PPAs, which can be settled financially or physically, are ideally suited as hedging solutions for renewable investments

The use of renewable PPAs has increased materially in the EU in recent years (Figure 31). According to Pexapark, a software and advisory services provider specialised in PPAs, the capacity contracted under renewable PPAs increased in the EU from a total of approx. 4 GW in 2018 to more than 11 GW in 2021, therefore increasing with a compounded average annual growth rate of 43%.

Figure 31 Estimated generation capacities contracted using a PPA in Europe, 2018-2021 and by type of buyer



Source: Frontier Economics illustration based on Pexapark, "European PPA Market Outlook 2022", p.8.

Note: Pexapark aims to record PPAs that have genuinely enabled the financing of new, subsidy-free capacity to come online. This excludes explicitly Route-to-market (RTM) or balancing services PPAs.

The importance of PPAs is expected to grow, as underpinned by a study from DENA, a federal German energy think tank. [131] 90% of market participants responded that (renewable) PPAs will be an "important" or "very important" market instrument in future.

Renewable PPAs can be differentiated between physical and financial PPAs referring to how the contracts are settled (Figure 32 illustrates the cash and power flows):

- In a **physical PPA**, buyer and seller are physically connected via the grid and the seller physically delivers electricity (plus guarantees of origin, "GoOs", which reflect the renewable property) in exchange for a contracted price from

[131] See DENA/Deutsche Energie Agentur, "Marktmonitor Green PPAs 2021. Umfrage zu Perspektiven nachfragegetriebener Stromlieferverträge"

the buyer. This is comparable to a physically settled forward trade. A physical PPA is **not considered to be an OTC derivative**.

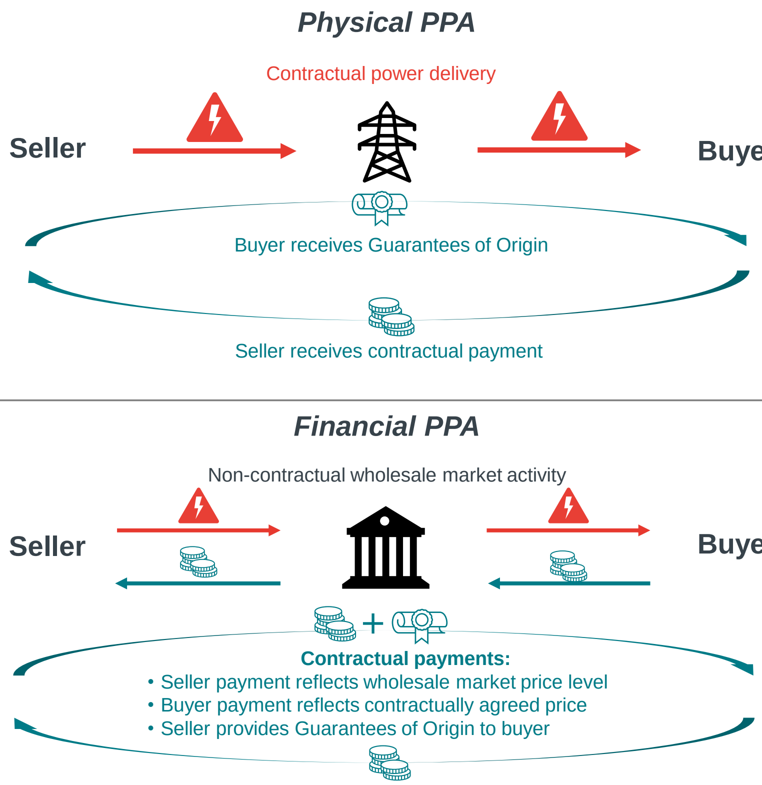
- A **financial PPA** financially replicates the mechanism of a physical PPA, but without the requirement for seller and buyer to be connected to the same power grid and the seller to physically deliver electricity directly to the buyer.[132] A "fixed-for-floating" swap where the seller receives a fixed contract price is most common for financial PPAs.
  - The seller markets[133] the power production on the wholesale market (e.g. spot market) and the buyer purchases power from either the wholesale market or an energy supplier. These transactions are not in scope of the agreement ("non-contractual wholesale market activity").
  - Under the financial PPA, the seller makes payments that reflect the wholesale price level. In practice, the seller effectively passes on the wholesale market revenues (that it generates separately from sales of physical power) to the buyer. In return, the buyer pays the contractually agreed price to the seller. In practice the buyer and seller would net off the cashflows against each other in order to reduce the liquidity costs. This results in a positive payment from the buyer to the seller if the contract price is higher than the wholesale price (which is typically the case) and vice versa. The parties may also agree that the buyer also receives the GoOs from the seller to prove the green property.
  - As a result, the seller receives the agreed contract price (typically fixed). Within the non-contractual wholesale market activity the buyer can purchase electricity from the connected grid at the spot market price. This mirrors the outcomes of a physical PPA without having the need for a direct physical link.

  The financial PPA is essentially a swap (or contract for differences where the fixed contract price acts as a strike price). It is therefore **an OTC derivative**.

[132] The labels "virtual" or "synthetic" PPAs are often used (albeit slightly inaccurately) synonymously with "financial PPAs".

[133] The asset owner may not have direct market access which is provided by a service company ("aggregators", i.e. direct marketing companies) which handles the scheduling and balancing activities.

Figure 32 Illustration of cash and power flows in physical and financial PPAs

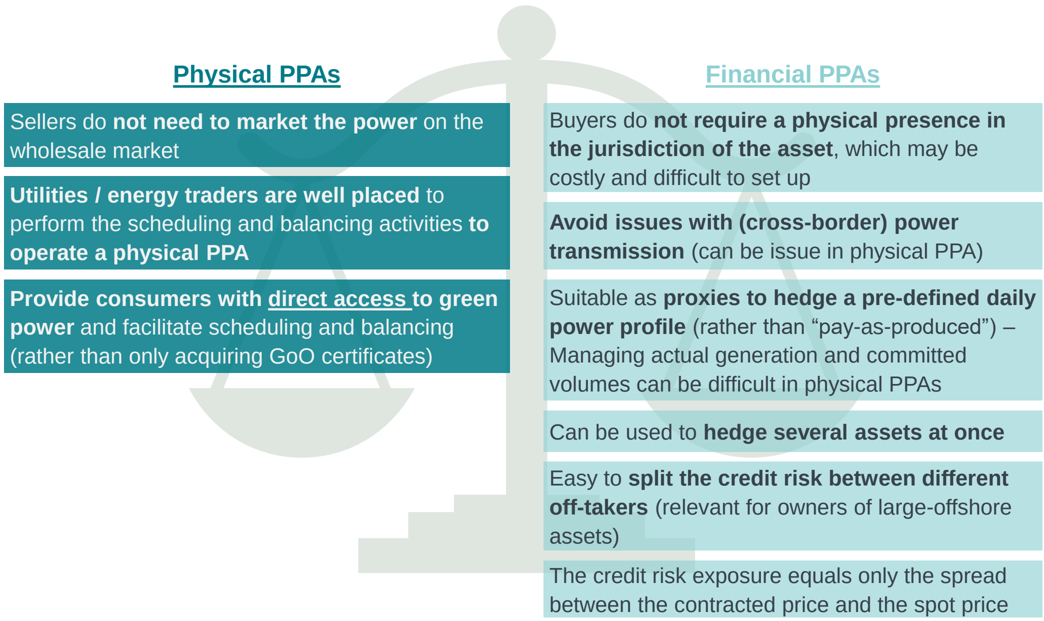


Source: Frontier Economics

Note: Financial PPA illustrated above corresponds to a financially settled "fixed-for-floating" swap

Physical and financial PPAs have their own set of advantages for the counterparties involved (see Figure 33 below).

Figure 33 Comparison of advantages between physical and financial PPAs



Source: Frontier Economics

Renewable financial PPAs will be particularly important in financing the energy transition

A key advantage of financial PPAs is that sellers do not require a physical presence and supplier license for the local market of the buyer. This fact makes it easier for NFCs to enter a PPA in a market, in which they do not have said physical presence (which can be costly and burdensome as shown in the textbox below). Thus, financial PPAs facilitate the cross-border trade of renewable energy, which is an important step towards an internal market for renewable electricity in Europe.

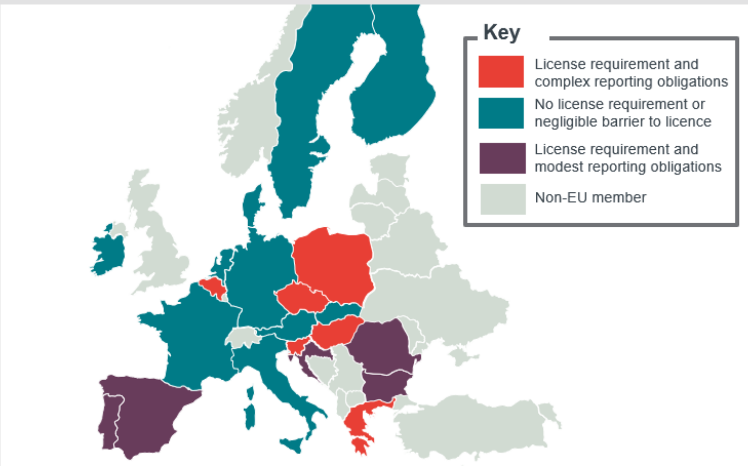
BARRIERS TO ACCESS EUROPEAN POWER MARKETS AS A SUPPLIER

To engage in a physical PPA deal, firms need a physical presence and recognition as electricity supplier in the market where the buyer is located. There are different requirements for suppliers:

- **Supply license** – In some countries, the company has to establish a branch to be able to obtain the license. It is worth noting that corporate or tax law, not only energy law, may be the source of this requirement.
- **Reporting obligations** linked to a license – Such reporting obligations are often in the local language and may be only vaguely defined and create additional administrative costs.
- **Licence costs** – suppliers need to pay an annual license fee in some countries.

Regulations for suppliers differ between European countries (see Figure 34). Some countries have only modest licensing requirements which reduce cost of entering these markets while others impose substantial licensing costs or complex reporting obligations. These differences come from a trade-off between strict regulations which provide a higher degree of quality and reporting control for energy suppliers and the resulting administrative burden on suppliers.

Figure 34 License requirements and reporting obligation for energy suppliers vary in Europe

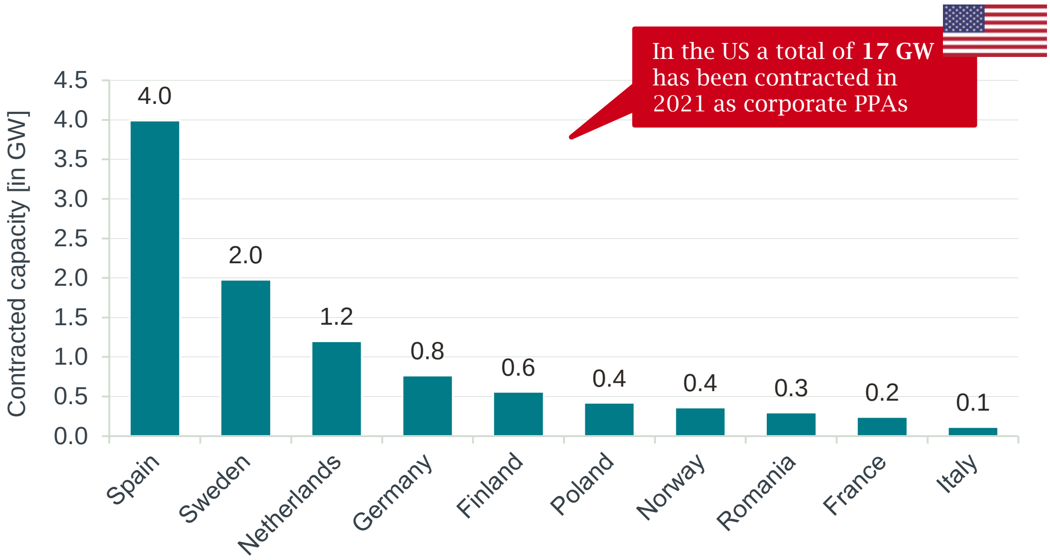


Source: Frontier Economics based on EFET stakeholder input

The importance of renewable financial PPAs in particular is likely to increase in power markets. With an increasing number of renewable generation capacity being installed in Europe in the 2020s, financial PPAs are considered to be an important financing tool due to their greater simplicity in setting them up.

Financial PPAs are currently most common in markets with the highest uptake of renewable PPAs: the Iberian Peninsula, the Nordics[134] and the US[135] (see Figure 35).

Figure 35 Top 10 EU countries by contracted PPA capacity of signed PPA contracts in 2021



Source: *Frontier Economics based on Pexapark, "European PPA Market Outlook 2022", p. 12; and BloombergNEF "Corporate Clean Energy Buying Tops 30GW Mark in Record Year".*

Note: *The total contracted capacities relate to corporate (i.e. a PPA signed between the asset owner and a large corporation) and utility PPAs (i.e. a PPA signed between the asset owner and a utility/energy trader) for the ten European countries with the largest contracted capacity and corporate PPAs for the United States.*

Spain, the Nordics and Germany are the regions with the highest take-up of PPA contracts in Europe (Figure 35). Spain and the Nordics as well as the US are also the largest markets for financial PPAs.

[134] Despite being in a leading position with regards to the take up of renewable PPAs, market participants in Norway recently cited the lack of liquidity in the hedging market as a commercial challenge. See Norwegian Energy Regulatory Authority article dated 25 June 2021, accessed on 1st April 2022, https://www.nve.no/reguleringsmyndigheten/nytt-fra-rme/nyheter-reguleringsmyndigheten-for-energi/50-onsker-bedre-muligheter-for-prissikring-i-kraftmarkedet/

[135] See for example https://www.epa.gov/greenpower/green-power-partnership-long-term-contracts

ANNEX D. NFC+ IMPLEMENTATION COSTS

Figure 17 in Section 4.3 provides cost estimates from an internal NFC+ implementation project conducted by a large European energy company that is considering becoming NFC+ if the current €3bn CCT remains unchanged. The strategic feasibility project lasted for several months and involved many staff members from different departments, including the commercial teams, Risk, Legal, Trading, Back Office, IT and Treasury. The project outcome was presented to Senior Management at the highest level of the company. Below describes the assessment of cost positions in more detail.

Implementation costs of around €10m consist of:

- Costs for **intragroup exemptions & reporting [€2m]:** The costs associated with intragroup exemptions & reporting arises through the requirement to seek approval from regulators for an intragroup exemption. This will be done in part by demonstrating that internal risk management is generally centralized and consistent. If this exemption is not granted, intra-group financial hedging would result in a liquidity charge and Initial Margin would need to be posted against relevant intra-group positions. As a European Utility at the heart of a Global sustainable energy transformation with renewable energy projects around the world, the number and variety of intra-group positions is expected to be high.
- Costs for **Credit Support Annex** (CSA) **renegotiations [€4m]:** Costs for CSA renegotiations relate to contractual discussions and agreement between up to 100 different FC and NFC+ counterparties. This would require material effort of for internal legal teams, the hiring of costly external legal counsel to assist and the whole process is estimated to take up to 18 months. Reclassifying as NFC+ would also require material changes to existing collateral and clearing processes and systems, and the purchase of additional systems (e.g. Acadia) to manage Custodian Bank interactions.
- Costs for **implementing Variation Margin requirements [€2m]:** Costs associated with implementation of the additional Variation Margin requirements relate to process re-engineering and system upgrades to ensure that VM can be posted faster for FC and NFC+ CPs. Additional Back Office resource would need to be hired to manage the additional workload.
- Costs for i**mplementing Initial Margin requirements [€2m]:** Initial Margin costs will be incurred through developing a Group-wide Governance and operating model that manages the allocation of relevant OTC transactions across a wide pool of CPs. In addition, a Custodian Bank (or Banks) will need to be onboarded at significant setup and ongoing cost. The internal legal effort to manage this process is estimated at 12 months.

Following implementation, the company estimates an annual cost of around €25m:

- **Additional interest costs [€5m/year]:** The Renewables division of the firm expects additional interest costs for project financing of new assets as a result of reclassifying as NFC+. This is because of the need to spread borrowing requirements across a wider pool of Banks to ensure that the €50m IM exemption per counter party isn't breached unnecessarily. Any breach would require IM to be posted, further impacting on the liquidity position (and costs) of the group.

- **Cost of capital for maintaining IM at the Clearing House [€10m/year]:** NFC+ status negates the liquidity management toolkit in extreme circumstances. Recent short-term price shocks have impacted large asset hedge positions on exchanges and one practical tool to maintain liquidity viability is to flexibly make use of OTC markets to transfer hedge positions. The availability of OTC hedge partners reduces with other NFC+s and FCs becoming unviable hedge partners (due to the margining obligation, see Article 4(1) of EMIR, whereas there is no such obligation with NFC-s). It is estimated that the additional cost of capital for maintaining IM at the Clearing House is €10m.
- **Liquidity management costs [€5m/year]:** Liquidity management costs arise through additional liquidity reserved for collateral and is estimated as 1% of locked up liquidity. With a minimum volatility buffer of €400m (depending on EUA prices and volatility), this results in costs of approximately €5m of liquidity management costs.
- **Administrative costs [€5m/year]:** Ongoing administrative costs of €5m for increased regulatory scrutiny and reporting requirements, limit monitoring, additional licences (IT, Finance), additional legal support etc.

ANNEX E. SUGGESTED ANNOTATIONS TO THE EMIR FRAMEWORK

This annex builds on the further remedy proposals provided in Section 7. It draws upon support from Luther Lawfirm, who provided suggested annotations to the EMIR framework for each remedy proposal.

The suggested annotations to the EMIR framework are set out in the table below. Changes to the existing text are marked in red for additions or deletions).

Ref.	Subject	Required change	Level of change
1	**Exclusion of all centrally cleared derivatives**		
	Exclusion of all derivatives cleared by a recognized Central Counterparty (CCP)	*7)[136] 'OTC derivative' or 'OTC derivative contract' means a derivative contract the execution of which does not take place on a regulated market within the meaning of Article 4(1)(14) of Directive 2004/39/EC or on a third-country market ~~considered to be~~ equivalent to a regulated market or which is not subject to central clearing by a recognized Central Counterparty ~~in accordance with Article 2a of this Regulation~~;*	Level 1 change in EMIR
2	**Limitation of geographical scope**		
2a)	General exclusion of derivatives concluded between non-EU-entities for the clearing threshold calculation of affiliated EU-counterparties	*3.[137] In calculating the positions referred to in paragraph 1, the non-financial counterparty shall include all the OTC derivative contracts entered into by the non-financial counterparty or by other non-financial counterparties ~~entities~~ within the group to which the non-financial counterparty belongs, which are not objectively measurable as reducing risks directly relating to the commercial activity or treasury financing activity of the non-financial counterparty or of that group.*	Level 1 change in EMIR
2b)	Limited exclusion of derivatives concluded between non-EU-counterparties for the clearing threshold calculation of affiliated EU-counterparties, unless such derivatives are booked in the EU or have a direct, substantial and foreseeable effect to the EU internal market.	*3.[138] In calculating the positions referred to in paragraph 1, the non-financial counterparty shall include all the OTC derivative contracts entered into by the non-financial counterparty or by other non-financial entities within the group to which the non-financial counterparty belongs, which are booked in the EU or have a direct, substantial and foreseeable effect within the Union and which are not objectively measurable as reducing risks directly relating to the commercial activity or treasury financing activity of the non-financial counterparty or of that group.*	Level 1 change in EMIR
3	**Widening the application of netting in threshold calculation**		
	Clarify the calculation methodology to allow for netting off of contracts of equal type and underlying (but not maturity) between a pair of counterparties	<u>Amendment on FAQ-level:</u> *Netting per contracts and counterparty should be understood as fully or partially offsetting contracts having ~~exactly~~ the same characteristics regarding ~~(~~type and underlying ~~, maturity, etc.) with the only exception being the direction of the trade and notional amount (in case of partial offset)~~ concluded with the same counterparty.*	Change in ESMA FAQ
4	**Widening the hedging definition**		

136 Art. 2 (7) EMIR.

137 Art.10 (3) EMIR.

138 Art. 10 (3) EMIR.

	Extending the hedging definition to cover derivatives that reduce risks associated with holding commodity derivative contracts	Amendment in Regulation No 149/2013, Art. 10: *1. An OTC derivative contract shall be objectively measurable as reducing risks directly relating to the commercial activity or treasury financing activity of the non-financial counterparty or of that group, when, by itself or in combination with other derivative contracts, directly or through closely correlated instruments, it meets one of the following criteria:* *(a) it covers the risks arising from the potential change in the value of assets, services, inputs, products, commodities, commodity derivatives or liabilities that the non-financial counterparty or its group owns, produces, manufactures, processes, provides, purchases, merchandises, leases, sells or incurs or reasonably anticipates owning, producing, manufacturing, processing, providing, purchasing, merchandising, leasing, selling or incurring in the normal course of its business;*	Level 2 change in EMIR-CDR 149/2013
5	**Amending the calculation methodology regarding the applicable reference period**		
	The calculation of the GNV should be based on concluded contracts during a reference period instead of the entire outstanding exposure from existing contracts held at specific points in time.	*3.[139] In calculating the positions referred to in paragraph 1, the non-financial counterparty shall include all the OTC derivative contracts entered into within the 12 months calculation period referred to in paragraph 1 by the non-financial counterparty or by other non-financial entities within the group to which the non-financial counterparty belongs, which are not objectively measurable as reducing risks directly relating to the commercial activity or treasury financing activity of the non-financial counterparty or of that group.*	Level 1 change in EMIR
6	**Refined and narrow definition of derivatives**		
	Excluding all physical settled commodity instruments from the derivative definition by amending/deleting references to Annex I C 6 and C7 MiFID II.	*5)[140] 'derivative' or 'derivative contract' means a financial instrument as set out in points (4), (5), and (9) to (10) of Section C of Annex I to Directive 2004/39/EC as implemented by Article 38 and 39 of Regulation (EC) No 1287/2006;*	Level 1 change in EMIR (presumably affecting subordinated regulation)[141]

Source: Luther Lawfirm

[139] Art. 10 (3) EMIR.

[140] Art. 2 (5) EMIR.

[141] Best way forward may be to delete categories C(6) and (7) already in MiFID II entirely.

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