



FACULTY OF LAW
Lund University

Torge Hildebrandt

Towards green EU State aid law?

The Guidelines on State aid for Climate, Environmental protection and Energy 2022 in light of the European energy transition

JAEM03 Master Thesis

European Business Law
30 higher education credits

Supervisor: Julian Nowag

Term: Spring 2022

Table of Contents

<i>Summary</i>	<i>1</i>
<i>Abbreviations</i>	<i>2</i>
<i>1 Introduction</i>	<i>3</i>
1.1 The European energy transition	3
1.2 Problem formulation, aim and research questions	5
1.3 Delimitations	6
1.4 Method and material	7
1.5 Disposition	9
<i>2 The notion of State aid</i>	<i>10</i>
2.1 Rationale	10
2.2 The prohibition of State aid under Article 107(1) TFEU	11
2.3 State aid exemptions and CEEAG assessment criteria	12
<i>3 Preventative integration – environmental degradation from fossil fuels</i>	<i>13</i>
3.1 Introduction	13
3.2 New aid category – decarbonisation measures	14
3.2.1 Scope and supported activities	14
3.2.2 Technology neutrality – the regulatory tool	15
3.2.3 Exceptions	16
3.3 New aid category - compensations for the closure of coal activities	17
3.3.1 Scope and rationale	17
3.3.2 The German and Dutch coal cases	20
3.4 The CEEAG and fossil fuel ‘business as usual’ scenarios	23
3.4.1 Natural gas	23
3.4.2 Hydrogen	25
3.5 Conclusions on <i>preventative integration</i>	27
<i>4 Supportive integration – promoting the development of renewable energies</i>	<i>28</i>
4.1 Introduction	28
4.2 New forms of aid: CCfDs on national level for industrial decarbonisation	29
4.2.1 Rationale and design	29
4.2.2 Case study – CCfD mechanism for renewable hydrogen pilot projects	31
4.2.2.1 Existence of State aid under Article 107(1) TFEU	31
4.2.2.2 Commission decisions on CfDs for renewable electricity	32
4.2.2.3 Compatibility with the internal market pursuant to Article 107(3)(c) TFEU	35
4.3 Zero-subsidy bids in offshore wind auctions	38
4.3.1 The market situation for offshore wind energy	38
4.3.2 Price floors and caps	39
4.4 Conclusions on <i>supportive integration</i>	40
<i>5 Concluding remarks</i>	<i>41</i>

<i>Table of cases</i>	<u>44</u>
<i>Table of legislation</i>	<u>45</u>
<i>Guidelines, Communications and other Union documents</i>	<u>47</u>
<i>Bibliography</i>	<u>49</u>

Summary

The European energy transition entails opportunities to mitigate two of the EU's most pressing current challenges: climate change and the energy crisis due to the dependency on fossil fuel imports. The EU has committed to limiting global warming to 2°C (preferably 1.5°C), compared to pre-industrial levels. In the context of the European Green Deal, the EU has set the objective to reach climate neutrality by 2050. The Russian aggression against Ukraine in 2022 makes the urgency of the transition even clearer. Therefore, it requires massive investments from the public sector to enable the transformation from coal, oil and natural gas to wind and solar energy.

Against this background, this essay deals with the EU's State aid framework for the European energy transition. It focusses on the recently adopted *Guidelines on State aid for Climate, Environmental protection and Energy 2022* ('CEEAG'). The CEEAG specify the assessment criteria of the European Commission for the compatibility of State aid with the internal market pursuant to Article 107(3)(c) TFEU. The essay asks whether the Commission has committed to 'green State aid law', i.e. whether there is coherence between the State aid rules and the EU's climate protection commitments. Moreover, it asks whether the CEEAG create loopholes that allow for State aid to fossil fuels.

The essay applies the classification method of *supportive and preventative integration* of environmental protection requirements. This concept distinguishes between State aid that may be applied in a way as to enable beneficial environmental measures and State aid that may be applied in a way as to prevent environmental degradation. Accordingly, the essay is divided between the analysis of rules to incentivise the development of renewable energies and rules that may prevent or hinder the use of fossil fuels.

The essay finds that on the one hand, the CEEAG enable support for the uptake of renewable energies in various sectors. On the other hand, State aid for fossil fuels creates financial barriers for renewables, which illustrates the interdependence between *supportive and preventative integration*. The essay shows that the State aid rules specified in the CEEAG allow for aid to fossil fuels, e.g. natural gas. In this respect, the CEEAG's safeguards are unsatisfactory. Considering the Union's climate protection commitments, the essay concludes that the Commission's Guidelines do not constitute green State aid law.

Abbreviations

CCfD	Carbon Contract for Difference
CCS	Carbon Capture and Storage
CCU	Carbon Capture and Use
CEEAG	Climate, Environmental protection and Energy Aid Guidelines 2022
CfD	Contract for Difference
CJEU	Court of Justice of the European Union
EEAG	Environmental protection and Energy Aid Guidelines 2014-2020
EU	European Union
EU ETS	EU Emissions Trading System
GBER	General Block Exemption Regulation
GC	General Court
GDP	Gross domestic product
GHG	Greenhouse gases
IEA	International Energy Agency
IPCC	The Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
PPA	Power Purchase Agreement
RED II	Renewable Energy Directive (recast)
TEU	Treaty on European Union
TFEU	Treaty on the Functioning of the European Union
UK	United Kingdom

1 Introduction

1.1 The European energy transition

‘We need to work with nature, not against it.’¹

Sir David Attenborough

The European energy transition plays a crucial role for combatting two major crises: climate change and the energy market disruption stemming from the Russian invasion of Ukraine in 2022. For one thing, the phase-out of fossil fuels and the roll-out of renewable energies are at the centre of climate protection. The EU has ratified the Paris Agreement and committed to limiting global warming to well below 2°C (while pursuing efforts to limit global warming to 1.5°C) compared to pre-industrial levels². The latest scientific findings of the IPCC report show that the urgency to drastically phase-out fossil fuels has never been greater in light of the climate crisis³. In this regard, the objective of the European Green Deal to achieve climate-neutrality by 2050 constitutes the EU’s overarching strategy.⁴ On the pathway, the European Climate Law sets a reduction target for greenhouse gas emissions of 55 % by 2030 compared to 1990 levels.⁵ Secondly, the Russian aggression against Ukraine in 2022 moreover illustrates the energy transition’s importance. More than 40 % of the EU’s total natural gas consumption, 27 % of oil imports, and 46 % of coal imports come from Russia.⁶ This dependency on fossil fuel imports from anti-democratic regimes poses many problematic questions. How could the EU have fallen into the ‘fossil trap’⁷ and have failed to realise that for decades, it has financed the Russian army?⁸ In addition, the high prices for oil and gas have severe economic

¹ Olivia Lai, ‘Key takeaways from Prince William’s The Earthshot Prize: Repairing our Planet’ (2021) <<https://earth.org/key-takeaways-from-prince-williams-the-earthshot-prize-repairing-our-planet/>> accessed 18 May 2022.

² Council Decision (EU) 2016/1841 of 5 October 2016 on the conclusion, on behalf of the European Union, of the Paris Agreement adopted under the United Nations Framework Convention on Climate Change [2016] OJ L282/1, Article 1.

³ See IPCC, 2022: ‘Summary for Policymakers’, in: P.R. Shukla, J. Skea and Others (eds), *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment of the Intergovernmental Panel on Climate Change*, p. 36 (World Meteorological Organization 2022).

⁴ Commission, ‘Guidelines on State aid for climate, environmental protection and energy 2022’ [2022] OJ C80/1, recital 1.

⁵ Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 (‘European Climate Law’) [2021] OJ L 243, Article 4.

⁶ Commission, ‘REPowerEU: Joint European Action for more affordable, secure and sustainable energy’ (Communication) COM(2022) 108 final, p. 1.

⁷ See Bernd Ulrich, ‘Sag mir, wo noch Blumen sind’ (2022) <<https://www.zeit.de/2022/20/klimapolitik-krieg-ukraine-lng-terminals-energiewende>> accessed 20 May 2022.

⁸ Ibid.

repercussions since the rise in food and transport costs increases risks of poverty.⁹ This poses the question how the EU can allow Russia to use fossil fuels as an ‘economic and political weapon’¹⁰. Hence, a self-sufficient and sustainable energy supply is at the heart of public discussions and renewables play a vital role as ‘the energy of freedom’¹¹ to combat the two crises. In this regard, fossil fuel subsidies constitute a major barrier to the uptake of renewable energies.¹² These consist of direct funds (e.g. grants and loans), fiscal support via budgetary transfers and tax breaks; as well as capital investment by fossil fuel-related State-owned enterprises.¹³ Based on conservative estimates, reforming fossil fuel subsidies could amount to a quarter of the emissions reductions pledged under the Paris Agreement.¹⁴ Moreover, redirecting these financial flows towards renewable energies would enable even higher emissions reductions.¹⁵ Fossil fuel subsidies are thus in the spotlight of political discussions because they hamper the transition to renewable energies¹⁶.

The EU scrutinises subsidies under its State aid regime, which is unique to the Union.¹⁷ In this regard, the definition of ‘State aid’ applies to a wide range of measures, not limited to subsidies.¹⁸ The European Commission oversees the application of the State aid rules and issues Guidelines that specify the design of aid measures upon its approval.¹⁹ In January 2022, the Commission adopted revised assessment criteria for the compatibility of State aid pursuant to Article 107(3)(c) TFEU. Against this background, the *Guidelines on State aid for Climate, Environmental protection and Energy 2022* (‘CEEAG’) could play a vital role to kick-start the European energy transition and set strict criteria on Member State’s support for fossil fuels.

This essay analyses the CEEAG’s coherence with the EU’s climate commitments, focussing on two crucial components of the European energy transition: the phase-out of fossil fuels and the promotion of renewable energies. Considering the urgency to mobilise investments, this essay argues that the CEEAG’s rules are not rigorous enough. It moreover suggests that the

⁹ Commission, (n. 6), p. 1.

¹⁰ See Ulrich (n. 7).

¹¹ Reuters, ‘Germany to present renewable energy expansion measures’ (2022)

<<https://www.reuters.com/article/germany-politics-energy-idAFL5N2W35JP>> accessed 2 May 2022.

¹² European Court of Auditors, ‘Review01/2022: Energy taxation, carbon pricing and energy subsidies’, p. 26.

¹³ Ipek Gençsü and Others, ‘Phasing out public financial flows to fossil fuel production in Europe’ (2020), in: *Climate Policy* 20:8, p. 1012.

¹⁴ Jakob Skovgaard, *The Economisation of Climate Change* (Cambridge University Press 2021), p. 79.

¹⁵ Ibid.

¹⁶ European Court of Auditors (n. 12), p. 5.

¹⁷ Kelyn Bacon, *European Union Law of State Aid* (3rd edn OUP 2017), p. 4 f.

¹⁸ Julian Nowag and Others, ‘Phasing out fossil fuel subsidies in the EU?’ (2021), in: *Climate Policy* 21:8, p. 1039.

¹⁹ Bacon (n. 17) p. 6.

Guidelines allow for comprehensive rules on the promotion of renewable energies in various sectors and have therefore included new aid forms, e.g. Carbon Contracts for Difference ('CCfDs'). However, it argues that the CEEAG apply an ambiguous approach to fossil fuels. On the one hand, the Guidelines acknowledge the need to phase-out fossil fuels. On the other hand, the essay suggests that the application of problematic provisions of the CEEAG, such as granting State aid for natural gas, could undermine the integration of environmental protection requirements into EU State aid law.

1.2 Problem formulation, aim and research questions

State aid for coal, oil and natural gas creates financial barriers for wind and solar energy, which proves problematic because the latter requires significant investments. According to Commission estimates, the EU's 2030 climate, energy and transport targets will require € 390 billion of additional annual investment compared to the levels in 2011-2020²⁰, with a further yearly amount of € 130 billion for the other environmental objectives estimated previously²¹. In contrast, the European Court of Auditors estimates that, in 2019, Member States spent € 21 billion on fossil fuel subsidies.²² These are under the obligation to adapt their existing aid schemes to comply with the CEEAG by 2024.²³ The question arises under which conditions Member States can grant State aid within the revised framework to enable the transformation to climate-neutrality. Additionally, investment security must be ensured to provide long-term stability and, in this respect, new features of the CEEAG could create legal uncertainty. Thus, since the CEEAG play a central role to facilitate or hamper the European energy transition, it is necessary to analyse whether they clearly follow the EU's climate protection self-commitments.

The aim of the essay is to clarify the conditions for the approval of State aid in climate, environmental protection and energy. It asks whether the CEEAG includes loopholes for fossil fuel investments which could hinder the deployment of renewables. Moreover, it is questionable whether the Commission has chosen assessment criteria that are rigorous enough, in view of the urgency of the European energy transition. In this respect, the essay poses the question of

²⁰ Commission, 'The EU economy after COVID-19: implications for economic governance', (Communication) COM(2021) 662 final, p. 17.

²¹ Ibid.

²² European Court of Auditors (n. 12), p. 25.

²³ CEEAG (n. 4), point 468(a).

whether the Commission has chosen ‘green State aid law’, i.e. ensuring coherence between the State aid rules and the EU’s climate protection commitments.

1.3 Delimitations

The CEEAG do not set limit dates for fossil fuel phase-outs, for instance with regards to coal activities.²⁴ Providing limit dates is a contentious topic. Without going into detail, the Commission’s reluctance may – among other factors – be explained by the Treaty’s provisions on energy competences. According to Article 4(2)(i) TFEU, energy policy is a competence shared between the EU and its Member States. Article 194(2) TFEU enshrines the right of the latter to determine their own energy mix²⁵. However, as has been argued by some, Article 194(2) TFEU does not include an absolute right for Member States to grant State aid to fossil fuels. This is explained with Article 194(1) TFEU providing that the Union’s energy policy shall have ‘regard to the need to preserve and improve the environment’. It is argued that a fossil fuel energy system pollutes the environment and thus goes against the objective to preserve and improve it²⁶. Consequently, the Commission may adopt State aid rules or take State aid decisions in the energy sector, taking into account Article 194(1) TFEU and 11 TFEU (see *infra* 1.4).²⁷ To that end, the essay will not further discuss the EU’s competence to set out specific limit dates for Member States’ fossil fuel activities. However, it will give reference to Commission documents highlighting that certain energy sources must be phased out urgently in light of the climate crisis. Consequently, these documents and the EU’s self-commitments are significant for analysing the CEEAG provisions, e.g. regarding the compensation for the closure of coal activities.

Since the essay focusses on State aid law, EU legislations to qualify sustainable private investments, such as the Taxonomy Regulation²⁸, will not be analysed in detail. Moreover, the CEEAG do not apply to nuclear energy and its role in the European energy transition will not

²⁴ Client Earth, ‘Briefing on the CEEAG’ (2021) <<https://www.clientearth.org/media/yubbv4od/clientearth-briefing-on-the-ceeag-24-12-2021.pdf>> accessed 28 April 2022, p. 10.

²⁵ ‘(...) Such measures shall not affect a Member State’s right to determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply (...).’

²⁶ Client Earth, ‘A State Aid Framework for a Green Recovery: Mainstreaming climate protection in EU State aid law’ (2020) <<https://www.clientearth.org/media/c45naoms/2020-09-30-a-state-aid-framework-for-a-green-recovery-coll-en.pdf>> accessed 8 May 2022, p. 40.

²⁷ *Ibid.*

²⁸ Regulation (EU) 2020/852 of the European Parliament and of the Council on 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088.

be discussed further in this essay²⁹. The CEEAG contains thirteen sections, so-called aid categories. These categories refer to components that receive aid measures, e.g. clean mobility³⁰ or energy infrastructure³¹. Furthermore, eligible aid forms for these categories specify the concrete instruments for the aid, i.e. the means of providing support. In this respect, the essay does not provide for an extensive analysis of all aid categories and forms that contribute to climate protection. Despite the importance of different components for the European energy transition, e.g. energy efficiency³², the examination puts emphasis on new aid categories and forms relevant for the phase-out of fossil fuels as well as the promotion of renewable energies including renewable-based technologies, e.g. renewable hydrogen.

1.4 Method and material

The analysis focusses on EU State aid control, i.e. measures that fall within the scope of Article 107(1) TFEU. In a first step, a doctrinal method is used to establish the law or *de lege lata* with regards to EU State aid rules. The essay will refer to the CEEAG, issued by the European Commission that plays a central role in the State aid field. According to Article 108 TFEU and the Procedural regulation³³, it oversees the application of the State aid rules.³⁴ Following Member States' notification of State aid under Article 108(3) TFEU, the Commission adopts decisions by determining whether aid is compatible with the internal market pursuant to the exemption under Article 107(3) TFEU. These decisions are legally binding but may be appealed to the Union courts.³⁵

The CEEAG replace the EEAG that have been in force since 2014³⁶. According to Article 288 TFEU, the Guidelines do not constitute binding Union law. However, they have an indirect legal effect, constituting 'soft law'³⁷. In practice, Member States can expect the Commission to comply with its soft law documents.³⁸ The CJEU recognises the Commission's Guidelines as

²⁹ CEEAG (n. 4), point 13 (d).

³⁰ Ibid., section 4.3.

³¹ Ibid., section 4.9.

³² Commission, 'REPowerEU Plan' (Communication) COM(2022) 230 final, p. 3.

³³ Council Regulation (EU) 2015/1598 of 13 July 2015 laying down detailed rules for the application of Article 108 of the Treaty on the Functioning of the European Union (codification) [2015] OJ L 248/9.

³⁴ Philipp Werner and Vincent Verouden (eds), *EU State aid Control: Law and Economics* (Kluwer Law International 2017), p. 14f.

³⁵ See Articles 288, 263 and 265 TFEU.

³⁶ Commission, 'Guidelines on State aid for environmental protection and energy 2014-2020' [2014] OJ C200/1 as corrected [2016] OJ C290/11.

³⁷ Herwig C H Homann and Claire Micheau (eds), *State Aid Law of the European Union* (OUP 2016), p. 226.

³⁸ Ibid.

valuable points of reference, and these constitute important sources of law within the State aid field³⁹. Literature on the CEEAG is scarce due to their recent adoption in January 2022. Comments on the EEAG's revision process, which included public consultations, highlight several points of criticism regarding the modernisation of the State aid framework. Furthermore, previous Commission decisions on State aid serve as the basis for new features of the CEEAG. The investigation conducted in this paper will thus be based on the analysis of these decisions, taking into account the CJEU's case-law.

The essay applies a concept developed by *Nowag* to classify the obligation of integrating 'environmental protection requirements' into Union policies and activities. This obligation is specified in Article 11 TFEU:

'Environmental protection requirements must be integrated into the definition and implementation of the Union's policies and activities, in particular with a view to promoting sustainable development.'

The ratification of the Paris Agreement, the EU's environmental legislation as well as the European Green Deal create self-commitments for the Union. These constitute environmental protection requirements under Article 11 TFEU.⁴⁰ Hence, the Commission must consider them in all decisions concerning the functioning of the internal market.⁴¹ In this context, *Nowag* distinguishes between *supportive and preventative integration* of environmental protection requirements.⁴²

'While *supportive integration* encompasses beneficial measures, *preventative integration* covers cases where competition, State aid, or fundamental-movement rules are applied in such a way as to prevent detrimental measures, that is, measures that lead to environmental degradation.'⁴³

Applying this concept to the CEEAG enables the analysis of two vital components of the energy transition: the phase-out of fossil fuels and the promotion of renewable energies.

³⁹ C-310/99, *Italy v Commission*, EU:C:2002:143, para 52. See also Paul Craig and Gráinne de Burca, *EU Law: Text, Cases and Materials* (7th edn, OUP2020), p. 1148 ff.

⁴⁰ Client Earth (n. 24), p. 35.

⁴¹ *Ibid.*

⁴² Julian Nowag, *Environmental Integration in Competition and Free Movement Laws* (OUP 2016), p. 11.

⁴³ *Ibid.*

Fossil fuel activities lead to environmental degradation⁴⁴. In the context of *preventative integration*, State aid may thus be applied in a way as to prevent fossil fuels, that go against the integration of environmental protection requirements. In contrast, the roll-out of renewable energies reduces environmental pressure as it replaces fossil fuels⁴⁵. Therefore, in the context of *supportive integration*, State aid may be applied in a way as to promote renewable energies for the integration of environmental protection requirements.

1.5 Disposition

Accordingly, commencing with an establishment of ‘the law’ for State aid in the EU, this paper is structured as follows. The first part on *preventative integration* concerns CEEAG provisions that may be applied to prevent or hinder fossil fuel investments for environmental protection requirements. It analyses new aid categories in the Guidelines, i.e. the section on decarbonisation measures with a discussion on technology neutrality as the guiding principle in aid for environmental protection and energy. The first part of the essay also scrutinises State aid criteria for the closure of coal activities. Finally, a thorough analysis of the CEEAG’s safeguards for fossil fuel aid is provided, investigating the role of natural gas and hydrogen as two of the most controversial examples.

The second part analyses *supportive integration* in the CEEAG, focussing on the promotion of renewable energies to fulfil environmental protection requirements. It analyses new aid forms, such as CCfDs to support the industrial decarbonisation and incentivise the production of renewable hydrogen. After presenting the rationale and the design, a case-study is conducted to show how the Commission would assess such instruments considering the CEEAG. The case-study concerns a national CCfD mechanism for renewable hydrogen in industry (existence of State aid, compatibility with the internal market under Art. 107(3)(c) TFEU etc.). The last chapter on *supportive integration* introduces ‘zero-subsidy bids’, i.e. situations where undertakings do not receive State support for the development of offshore wind energy, which creates discussions on revenue stabilisation systems. Eventually, the concluding remarks encompass the most important findings of the analysis and point towards further research areas.

⁴⁴ Cf. Skovgaard, (n. 14), p. 79.

⁴⁵ See IPCC (n. 3), p. 52.

2 The notion of State aid

2.1 Rationale

EU State aid control is closely tied with protecting trade and the functioning of the internal market.⁴⁶ The CEEAG emphasise that competitive markets contribute to creating efficient results in terms of prices, outputs and use of resources.⁴⁷ In this respect, the Commission deals with various State aid matters, from regional aid to research and development or environmental protection and energy. State aid control aims to ensure level-playing for the undertakings active in the Single European Market.⁴⁸ Furthermore, it aims to prevent ‘subsidy races’⁴⁹. These occur when a state increases its support for national producers and the other Member States might be triggered to follow, thus undermining the functioning of the internal market.⁵⁰ However, *Bacon* points out that the aim of EU State aid control has shifted to promoting economic efficiency and budgetary discipline⁵¹.

State intervention might be needed to facilitate the development of certain economic areas that might not develop at all or at the same pace, or under the same conditions in the absence of aid⁵². Environmental externalities, information imperfections and coordination failures must be taken into account in the context of environmental protection. This entails that the costs and benefits of an economic activity might not fully be considered by market participants when taking consumption, investment and production decisions. Those market failures, hence, situations in which markets remain untouched and are unlikely to produce efficient outcomes, do not lead to optimal welfare for consumers and society at large. Consequently, the CEEAG recognise that State intervention could be needed to prevent insufficient levels of environmental protection in relation to the economic activities.⁵³

⁴⁶ Nowag (n. 18), p. 1039.

⁴⁷ CEEAG (n. 4), recital 9.

⁴⁸ Commission ‘State Aid Action Plan Less and better targeted State aid: a roadmap for State aid reform 2005-2009’, (Consultation document) COM(2005) 107 final, para 7.

⁴⁹ Hussein Kassim and Bruce Lyons, ‘The New Political Economy of EU State Aid Policy’ (2013), *Journal of Industry, Competition and Trade* 13:1, p. 9.

⁵⁰ Bacon (n. 17), p. 5.

⁵¹ *Ibid.*, p. 10.

⁵² CEEAG (n. 4), recital 9.

⁵³ *Ibid.*, recital 10.

2.2 The prohibition of State aid under Article 107(1) TFEU

The general prohibition of State aid is codified in Article 107 (1) TFEU:

‘Any aid granted by a Member State, or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, in so far as it affects trade between Member States, be incompatible with the internal market.’

In principle, all kinds of measures could be deemed State aid. In this respect, the CJEU has held that the definition of State aid under Article 107(1) TFEU must be based on its effects instead of the reference to its causes or purposes.⁵⁴ Consequently, measures may still fall within the scope of Article 107(1) TFEU if they are of a fiscal character, pursue economic/social aims or public interest goals, such as environmental protection.⁵⁵ Under Article 107(1) TFEU, ‘an undertaking’ is every entity engaged in an economic activity⁵⁶. This refers to offering goods and services on a market.⁵⁷ To constitute an economic advantage, the measure must lead to an improvement in the economic and/or financial position of the undertaking.⁵⁸ It needs to constitute a benefit for the undertaking that it would not have had under normal market conditions.⁵⁹ The Commission therefore uses the ‘private investor test’⁶⁰ to assess whether a private operator in a market economy would have invested as well⁶¹. According to Article 107(1) TFEU, the measure also needs to be granted by a Member State or through State resources. The CJEU has emphasised that these conditions are to be interpreted as cumulative, rather than alternative⁶². State resources are referred to as ‘entailing a burden on the public finances either of expenditure or of reduced revenue’⁶³. A measure must be selective, targeting certain undertakings or the production of certain goods. It must be liable to distort competition

⁵⁴ C-81/10 P, *France Télécom*, EU:C:2011:811, para 17.

⁵⁵ Bacon (n. 17), p. 19f.

⁵⁶ C-172/03, *Heiser*, EU:C:2005:130, para 26.

⁵⁷ T-347/09, *Germany v Commission*, EU:T:2013:418, paras 48 and 53.

⁵⁸ C-71/09 P, *Comitato ‘Venezia vuole vivere’*, EU:C:2011:368, para 63.

⁵⁹ Commission, ‘Notice on the notion of State aid as referred to in Article 107(1) TFEU’ [2016] OJ C262/1, para 66.

⁶⁰ C-124/10 P, *Commission v EDF*, EU:C:2012:318, para 30.

⁶¹ *Ibid.*, paras 103–104.

⁶² C-126/01, *GEMO*, EU:C:2003:622, para 24.

⁶³ C-82/77, *Van Tiggele*, EU:C:1977:205, p. 52 (Opinion of AG Capotorti).

and affect trade between Member States⁶⁴ or should at least be capable of having that effect.⁶⁵ Member State are under the obligation to notify aid to the Commission under Article 108 (3) TFEU if all conditions of Article 107(1) TFEU are fulfilled. In case the Member State does not fulfil its obligations under this provision, the aid is considered unlawful.⁶⁶ Exemptions apply for measures that fulfil the conditions of the General Block Exemption Regulation ('GBER')⁶⁷. The GBER lays down *ex ante* compatibility conditions on the basis of which Member State can implement State aid measures without prior notification to the Commission.⁶⁸ Moreover, the Commission has set rules for aid measures that fall below a certain threshold. Such *de minimis* aid also constitutes an exemption from the notification requirement in Article 108(3) TFEU.⁶⁹

2.3 State aid exemptions and CEEAG assessment criteria

Despite the general prohibition of State aid under Article 107(1) TFEU, aid can be deemed compatible with the internal market pursuant to Article 107(2) and (3) TFEU. Article 107(2) TFEU provides for exemptions that are *automatically* lawful and which the Commission must declare compatible if the conditions are satisfied.⁷⁰ These include aid having a social character, aid to make good the damage caused by natural disasters or aid related to the reunification of Germany.⁷¹ The Commission, however, has wide discretion when it comes to applying Article 107(3) TFEU.⁷² Under Article 107(3)(c) TFEU, an aid measure can be declared compatible with the internal market if it fulfils two conditions: one positive and one negative. The positive condition is that the aid must facilitate the development of an economic activity. The negative condition is that the aid may not adversely affect trading conditions to an extent contrary to the common interest.⁷³

⁶⁴ C-148/04, *Unicredito Italiano*, EU:C:2005:774, para 55; C-393/04, *Air Liquide Industries Belgium*, EU:C:2006:403, para 34.

⁶⁵ C-387/92 *Banco Exterior de España*, EU:C:1994:100, para 15; C-480/09 P *AceaElectrabel v Commission*, EU:C:2010:787, para 102.

⁶⁶ Council Regulation (EU) 2015/1589 of 13 July 2015 laying down the detailed rules for the application of Article 108 of the Treaty on the Functioning of the European Union (codification) [2015] OJ L 248/9.

⁶⁷ Commission Regulation (EU) 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty [2014] OJ L 187/1.

⁶⁸ Article 6 of the GBER.

⁶⁹ Commission Regulation (EU) No 1407/2013 of 18 December 2013 on the application of Articles 107 and 108 TFEU to *de minimis* aid [2013] OJ L352/1, Article 3 (1).

⁷⁰ Bacon (n. 17), p. 91.

⁷¹ See Article 107 (2) TFEU.

⁷² Bacon (n. 17), p. 99.

⁷³ CEEAG (n. 4), recital 8.

The points 22(a) and 22(b) CEEAG list aspects that are significant when assessing the positive and negative condition under Article 107(3)(c) TFEU. As regards the positive condition, the Commission analyses three aspects⁷⁴. First, the identification of the economic activity which is being facilitated by the measure, its positive effects for the society at large and, where applicable, its relevance for specific policies of the Union. Second, the incentive effect of the aid, i.e. whether it induces the beneficiary to engage in more environmentally-friendly behaviour.⁷⁵ Finally, the third aspect constitutes that there is an absence of breach of any relevant provisions of Union law. The analysis of the negative condition contains six aspects⁷⁶. These include the need for State intervention, the appropriateness of the aid, the proportionality of the aid (aid limited to the minimum necessary to attain its objective) including cumulation, the transparency of the aid, the avoidance of undue negative effects of the aid on competition and trade as well as a balancing exercise to weigh up the positive and negative effects of the aid.

3 Preventative integration – environmental degradation from fossil fuels

3.1 Introduction

The transition to a climate-neutral continent requires a phase-out of fossil fuels.⁷⁷ Providing support for fossil fuels today will trigger further costs in the future, as these lead to environmental degradation, e.g. local air pollution⁷⁸. In line with the concept of *preventative integration*, the CEEAG's provisions on fossil fuels play a crucial role in applying State aid in a way as to prevent environmental degradation. A new aid category has been developed in the CEEAG to cover the reduction of greenhouse gas emissions and organise multi-technology tenders. This chapter will critically discuss this approach, considering in this regard the relevance of the technology-neutrality principle. Furthermore, the CEEAG set rules for the compatibility of aid with regards to the closure of coal power plants. An analysis of this new aid category is required to highlight the rationale, relevant case-law, and the assessment details for an aid category that is often considered crucial for the success of the energy transition⁷⁹.

⁷⁴ CEEAG (n. 4), point 22(a) f.

⁷⁵ Ibid., point 22 (a) (ii).

⁷⁶ Ibid., point 22 (b) f.

⁷⁷ Ibid., recital 4.

⁷⁸ See Skovgaard (n. 14), p. 79.

⁷⁹ CEEAG (n. 4), point 420.

Lastly, the first part of the essay will investigate ‘business as usual’ scenarios for natural gas and the rules on hydrogen.

3.2 New aid category – decarbonisation measures

3.2.1 Scope and supported activities

A new aid category in the CEEAG entails ‘aid for the reduction and removal of greenhouse gas emissions including through support for renewable energy and energy efficiency’⁸⁰. This novel approach encompasses several ‘decarbonisation measures’. It targets support to two sets of technologies: renewable energies, biofuels, bioliquids, biogas, and biomass fuels if compliant with sustainability criteria⁸¹, waste and renewable hydrogen. Secondly, technologies that contribute to the reduction of emissions such as low-carbon hydrogen, synthetic fuels using low-carbon energy, energy efficiency including high-efficiency cogeneration, CCS/CCU⁸², demand response, energy storage. However, these two groups are subject to the same regime (aid intensity, etc.). The aid should in general be granted through a competitive bidding process.⁸³ In principle, all technologies are equally supported and compete against each other in multi-technology tenders in order to decarbonise in the most cost-effective way.⁸⁴ In the EEAG, the assessment of such measures was divided into distinguishable categories.⁸⁵ The Commission argues that the approach taken in the CEEAG increases flexibility and streamlines the existing rules by introducing a simplified assessment of cross-cutting measures under a single section.⁸⁶ However, the aid category is criticised for setting technologies with different learning curves on an equal footing and thus undermining the focus on a full decarbonised energy system⁸⁷.

⁸⁰ See CEEAG (n. 4), section 4.1.

⁸¹ These are to be defined in so-called delegated acts of the REDII, see CEEAG (n. 4), point 80.

⁸² Carbon Capture and Storage; Carbon Capture and Use. Cf CEEAG (n. 4), definition 13 and 14. See Chapter 3.4 of this paper.

⁸³ CEEAG (n. 4), point 103.

⁸⁴ *Ibid.*, point 104.

⁸⁵ See, EEAG (n. 36), section 3.3 – Aid to energy from renewable sources.

⁸⁶ Commission press release, ‘State aid: Commission endorses the new Guidelines on State aid for Climate, Environmental Protection and Energy’ (12 May 2020)

<https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6982> accessed 11 April 2022.

⁸⁷ CAN Europe, ‘Response to public consultation on the revised CEEAG’ (2021)

<https://caneurope.org/content/uploads/2021/08/CAN-Europe-response-to-State-Aid-CEEAG-revision-public-consultation_20210802.pdf> accessed 11 April 2022, p. 4.

3.2.2 Technology neutrality – the regulatory tool

The organisation of multi-technology tenders under a single section adds another aspect to the ongoing discussions on future-proofing EU State aid law, as the CEEAG shall remain into force until the end of 2027⁸⁸. It concerns the use of the technology neutrality principle, one of the guiding regulatory tools applied by the Commission to achieve a decarbonised energy system. There is a growing interest in applying multi-technology auctions among the Member States.⁸⁹ In this respect, technology-neutral auctions are often considered cost-efficient because the contracted volume per technology is set by the market and the liquidity of the market should be higher.⁹⁰ Some authors have pointed out that technology neutrality is never a goal in itself but rather a means to achieve non-discrimination between different technologies with similar functions. It is meant to ensure that legislation does not force or favour the use of any particular technology over another, in present or future scenarios.⁹¹ However, ‘an important factor in determining whether technology-neutral drafting is possible is the extent to which the legislator understands the technology’⁹². On top, even a comprehensive understanding of the technologies does not guarantee that there will be ‘no consequences from unanticipated changes to that technology’⁹³. Assumptions taken for the application of this regulatory tool might disregard the complex interdependent elements of the energy system which favours slow changes⁹⁴. Moreover, it is worth considering that the energy sector is a large technical system that is characterised by long-term investments. Once investment decisions have been taken, it is difficult to alter the course of action, leading to a high risk of technological lock-in.⁹⁵

In addition, externalities and other market failures impact technology-neutral regulation. Hence, the incentive to invest in new technologies may also be reduced by the fact that investors have

⁸⁸ With a caveat for earlier revision, see CEEAG (n. 4), points 469 and 470.

⁸⁹ Vija Pakalkaite, ‘Technology-neutral auctions, myth or reality’ (2019) <https://www.strommarkttreffen.org/2019-04-12_Pakalkaite_RES_auction_designs_and_results-comparison_across_EU.pdf> accessed 17 April 2022, p. 5.

⁹⁰ Matthias Buck and Others, ‘Making State Aid Work for Europe’s Decarbonisation. A critical assessment of the EU Guidelines on aid for renewable energy’, <<https://www.clientearth.org/media/cfln4kxc/workshop-presentation-making-state-aid-work-for-europes-decarbonisation-20-november-2019-coll-en.pdf>> accessed 17 April 2022.

⁹¹ Lyria B. Moses, ‘Recurring Dilemmas: The Law’s Race to Keep up with Technological Change’ (2007), 2 University of Illinois Journal of Law, Technology and Policy, p. 273.

⁹² Chris Reed, ‘Taking Sides on Technology Neutrality’ (2007) 4(3) SCRIPT-ed, p. 265.

⁹³ Ibid., p. 279.

⁹⁴ Cf. Renske Giljam: ‘Implementing Ecological Governance in EU Energy Law: The role of technology neutral legislative design in fostering innovation’ (2018), in: European Energy and Environmental Law Review 27:6, p. 249.

⁹⁵ Ibid.

to take the (financial) risk while others may be part of the benefit as well.⁹⁶ A reluctance to drastic changes to the energy system seems additionally motivated by fear of societal repercussions in terms of energy prices and security of supply considerations.⁹⁷ In the new aid category, the Commission chooses a stakeholder-oriented approach with the use of public consultations from 2023 onwards for projects where the estimated annual aid to be granted is at least 150 million per year.⁹⁸

3.2.3 Exceptions

As an exception to the multi-technology tenders, it is possible to organise technology-specific tenders for renewables, energy efficiency and renewable hydrogen to meet EU targets enshrined in legislation.⁹⁹ For instance, a Member State can continue to organise renewable-only tenders, or even solar-only or offshore wind-only tenders, upon justification. It is also possible to limit tenders to certain regions to address network stability issues.¹⁰⁰ The justifications must be based on relevant circumstances, for example efficiency or costs.¹⁰¹

In many multi-technology auctions in the past years, one technology tends to dominate the results¹⁰². Technology-specific auctions for renewables ensure that a balanced mix of renewables with complementary generation profiles (diversification) is deployed in order to achieve system benefits. For example, the output of wind and solar power is complementary to each other in many regions of Europe in the short-term and seasonally. Consequently, the overall system cost of variable renewable energy deployment may be reduced. Against this background, Member States have both the incentives and tools to shape the action results, for instance for grid connection requirements.¹⁰³ Making informed choices about different design features while ensuring technology diversity and thus serve the security of energy supply is complex. This requires balancing trade-offs between different policy objectives.¹⁰⁴ Most authors prefer a combination of technology neutral and technology specific regulation.

⁹⁶ Ibid., p. 247.

⁹⁷ Cf. Ibid., p. 247.

⁹⁸ See point 98 f. CEEAG. The consultation includes the possibility to cover the method and estimate of subsidy per tonne CO₂ equivalent avoided with the project. This approach could enable thorough assessments of cost-efficiency combined with CO₂ reductions in the energy sector.

⁹⁹ CEEAG (n. 4) point 96 (a).

¹⁰⁰ Client Earth (n. 25), p. 4.

¹⁰¹ CEEAG (n. 4), point 95.

¹⁰² See Pakalkaite (n. 89), p. 9.

¹⁰³ CEEAG (n. 4), point 96 (e).

¹⁰⁴ Leonore Haelg, 'Promoting technical diversity: How renewable energy auction designs influence policy outcomes' (2020), in: *Energy Research & Social Science* 69, p. 17.

Thus, ‘the optimal set of (. . .) policies likely also includes instruments designed explicitly to foster innovation and possibly technology diffusion, as distinct from environmental policies that stimulate new technology as a side effect of internalising environmental externalities.’¹⁰⁵ Others argue that to foster innovation functional or performance norms must be adopted, instead of determining specific techniques.¹⁰⁶ Nevertheless, it will require time until all technologies of this aid category will compete against each other as renewable energies are the cheapest form of energy and experience drastic cost reductions.¹⁰⁷ Thus, the bundling under one category might displace investments into renewable energy sources.¹⁰⁸

3.3 New aid category - compensations for the closure of coal activities

3.3.1 Scope and rationale

The CEEAG include a new aid category for the closure of power plants using coal, peat or oil shale and of mining activities relating to coal, peat or oil shale extraction.¹⁰⁹ In 2021, the top ten emitters of the EU Emissions Trading System (‘EU ETS’) have been hard coal or lignite power plants.¹¹⁰ The CEEAG recognise that phasing out of coal is critical for decarbonisation and that a ‘just transition’ must be ensured. This term is mostly used in the context of the European Green Deal for ‘addressing the social and economic effects of the [energy] transition, focussing on the regions, industries and workers who will face the greatest challenges’¹¹¹. Since the closure of a coal mine can lead to the loss of thousands of direct and indirect jobs in a mining region¹¹², employees might require early pensions or retraining. However, especially the CEEAG’s criteria concerning the early closure of profitable activities particularly merit a critical analysis.

¹⁰⁵ Adam Jaffe and Others, ‘A tale of two market failures: Technology and environmental policy’ (2005), in: *Ecological Economics*, 54:2, p. 169.

¹⁰⁶ Cf. Bryony Worthington, ‘Why Europe must back a technology-neutral energy policy’ (2015) <<https://www.friendsofeurope.org/insights/why-europe-must-back-a-technology-neutral-energy-policy/>> accessed 10 April 2022.

¹⁰⁷ IRENA, ‘Majority of New Renewables Undercut Cheapest Fossil Fuel on Cost’ (2021) <<https://www.irena.org/newsroom/pressreleases/2021/Jun/Majority-of-New-Renewables-Undercut-Cheapest-Fossil-Fuel-on-Cost>> accessed 10 April 2022.

¹⁰⁸ See CAN Europe (n. 87), p. 3.

¹⁰⁹ CEEAG (n. 4), section 4.12.

¹¹⁰ Harriet Fox, ‘Top 10 EU emitters all coal power plants in 2021’ (2022) <<https://emberclimate.org/insights/research/top-10-emitters-in-the-eu-ets-2021/>> accessed 10 April 2022.

¹¹¹ Commission, ‘The Just Transition Mechanism: making sure no one is left behind’ (website) <https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/finance-and-green-deal/just-transition-mechanism_en> accessed 11 April 2022.

¹¹² Commission, ‘Stepping up Europe’s 2030 climate ambition. Investing in a climate-neutral future for the benefit of our people’ (Impact Assessment), SWD(2020) 176 final, section 9.11.4, p. 203.

Distinguishing between the early closure of profitable and uncompetitive activities, the CEEAG recognise that Member States are under the obligation to reduce emissions and that they set certain dates to prohibit the generation of power based on these fossil fuels.¹¹³ The Commission will rely on the phase-out dates set by the Member States in laws or policies, to assess whether a coal plant or mine is scheduled to close earlier with aid than it would have under normal market conditions. This assessment includes the evolution of carbon prices and climate policies. Nevertheless, the Commission expects coal to become marginal in final energy demand in 2030.¹¹⁴ Hence, all aid given to coal operators beyond 2030 could prolong coal-based power production by incentivising a late phase-out, which would become a major hurdle for the ambitious climate policies. It could moreover fail to complement the market dynamics (the increase of ETS prices that pushes investors away from coal).¹¹⁵

Profitable activities can be compensated for closure, based on justified foregone profits, as well as ‘additional costs’ for the closure, related to additional social and environmental costs. However, ‘additional costs’ are not specified, despite the insistence of NGOs during the revision process.¹¹⁶ Uncompetitive activities can receive aid for covering a list of costs, detailed in Annex II of the CEEAG.¹¹⁷ Among others, they include costs related to the decontamination of sites¹¹⁸ (subject to compliance with the polluter pays principle¹¹⁹), the cost of paying social welfare benefits resulting from the pensioning-off of workers before they reach their statutory retirement age¹²⁰, retraining of workers¹²¹, or the cancelling of ongoing contracts.¹²²

The CEEAG clarify that plants must be profitable to receive aid for early closure, and the coal power plant must close no later than three years from the award of the compensation that should facilitate the assessment of profitability calculations.¹²³ However, it does not explain what the assessment of profitability entails. In addition, the question arises if coal power plants can be profitable in times of rising carbon prices in the EU. The EU ETS follows a ‘cap-and-trade’

¹¹³ CEEAG (n. 4), point 424.

¹¹⁴ Commission (n. 112), figure 37, p. 51.

¹¹⁵ CAN Europe (n. 87), p. 9.

¹¹⁶ Ibid.

¹¹⁷ CEEAG (n. 4), point 442.

¹¹⁸ CEEAG (n. 4), Annex 2, point 1(i).

¹¹⁹ Cf. Ibid., point 443. The polluter pays principle entails that the costs of pollution or other environmental damage, including the costs of restoring the environment after damage, shall be borne entirely by whoever has caused them. See David Langlet & Said Mahmoudi, *EU Environmental Law and Policy*, (OUP, 2016), p. 55 and CEEAG (n. 4), definition (58).

¹²⁰ CEEAG (n. 4), Annex 2, point 1(a).

¹²¹ Ibid., point 1(d).

¹²² Ibid., point 1(k).

¹²³ Ibid., point 433.

approach: the EU sets a cap on how much greenhouse gas pollution can be emitted each year, and companies need to hold emission allowances for every tonne of CO₂ they emit within one year. They can receive, buy or trade these permits. The system is for CO₂ emissions from large-scale facilities in the power sector, energy-intensive industries (e.g. oil refineries, steelworks, and producers of iron, aluminium, cement, paper and glass) and civil aviation.¹²⁴ The ETS price has risen more than 200 % since the start of 2021.¹²⁵ Even before this rally, four in five EU coal plants were considered unprofitable due to their higher costs than renewables.¹²⁶ As a consequence, coal plants' accelerated loss of profitability in the market conditions proves that the technically estimated economic lifetime of coal plants does not mean that they are profitable until the end. Thus, the Commission needs to thoroughly scrutinise the profitability claims by coal and lignite operators, accounting also for the opportunity cost of not operating those plants.¹²⁷

Although this was not in the draft submitted to public consultation, the CEEAG aim at facilitating the replacement of coal by gas capacity in Member States with low GDP. Therefore, the coal capacity must close before 2026, the Member State does not have security of supply measures in place and the replacement is part of a credible and ambitious decarbonisation strategy, including the prevention of stranded assets¹²⁸ in view of the 2030 and 2050 targets. This regime will be available until 31 December 2023¹²⁹ and presents another example of increasing the dependence on fossil fuels instead of incentivising the switch to renewable energies.

The chapter does not include stringent transparency rules for coal closure compensation cases. Transparency requirements could have been set as to the amount of greenhouse gas emissions effectively reduced by the aid, calculation of amounts, and adjustment parameters to avoid

¹²⁴ Ludiwg Krämer, *EU Environmental Law* (8th edn, Sweet & Maxwell 2016), p. 33f.

¹²⁵ Nina Chestney and Others, 'Europe's carbon price nears the 100 euro milestone', <<https://www.reuters.com/business/energy/europes-carbon-price-nears-100-euro-milestone-2022-02-04/>> accessed 10 April 2022.

¹²⁶ Carbon Tracker Initiative, 'Four in Five EU Coal plants unprofitable as renewables and gas power ahead', <<https://carbontracker.org/four-in-five-eu-coal-plants-unprofitable-as-renewables-and-gas-power-ahead/>> accessed 10 April 2022.

¹²⁷ CAN Europe (n. 87), p. 10.

¹²⁸ In the context of climate change, stranded assets refer to fuel energy and generation sources that, at some time prior to the end of their economic life (as assumed at the investment decision point), are no longer able to earn an economic return (i.e. meet the company's internal rate of return) as a result of changes in the market and regulatory environment associated with the transition to a low-carbon economy, see Carbon Tracker Initiative, 'References & resources: Key terms', <<https://carbontracker.org/resources/>> accessed 10 April 2022.

¹²⁹ CEEAG (n. 4), point 422. See also Client Earth (n. 24) p. 10.

overcompensation. CEEAG provisions that refer to transparency and increasing incentives for stakeholder participation¹³⁰ could have been included in this chapter.¹³¹

3.3.2 The German and Dutch coal cases

The new aid category in the CEEAG builds on case practice for the closure of coal power plants in the Netherlands and Germany.¹³² Before the adoption of the CEEAG, there were no provisions in the environmental aid guidelines to compensate for the closure of electricity generation plants. Against this background, the Commission's decisions are considered particularly relevant because of the criteria that are being applied. Whereas the Dutch scheme was approved, the Commission opened an in-depth investigation into compensation for the early closure of lignite-fired power plants in Germany, questioning the proportionality of the compensation payments.

On 11 December 2019, the Netherlands adopted a law prohibiting the use of coal for the production of electricity as of 1 January 2030 at the latest.¹³³ Whilst four coal-fired power plants were granted a transition period of five to ten years, the Hemweg power plant as the biggest and oldest in the Netherlands had to close before 1 January 2020 without any transition period. The law gave Vattenfall as the operator of the Hemweg power plant the possibility to request compensation for its early closure and the government agreed with the company to compensation of € 52.5 million.¹³⁴ Even though the Commission refrained from deciding whether the measure provided the operator with an advantage over its competitors and whether it thus constituted State aid, it concluded that the measure would in any event be compatible with the EU's Single Market.¹³⁵ In particular, the Commission found that the payment adequately compensated Vattenfall for the profits it would have been able to make if it would have continued operating.¹³⁶ The Commission concluded that in view of the limited distortions of competition and trade resulting from the envisaged nature, the overall balance with regard to

¹³⁰ See chapter 3.2.2 of this essay.

¹³¹ CAN Europe (n. 87), p. 11.

¹³² See Client Earth (n. 24), p. 10.

¹³³ Commission Decision of 12 May 2020 in SA.54537 (2020/NN) – Netherlands, para 3.

¹³⁴ Ibid., para 14.

¹³⁵ Ibid., para 49.

¹³⁶ Ibid., para 82.

the increased level of environmental protection in the form of CO₂ emission reductions, was positive.¹³⁷ Hence, the aid was approved.¹³⁸

The discussions about the assessment of the profitability criterion are also evident in the German lignite phase-out case. It concerns the closure of lignite installations of energy companies LEAG and RWE in Germany against a compensation.¹³⁹ The Commission explicitly raised doubts whether the measure is in line with EU State aid rules and initiated a procedure under Article 108(2) TFEU.¹⁴⁰ According to the German closure law, the use of coal to generate electricity will have to phase-out by 2038.¹⁴¹ Germany decided to enter into agreements with the main producers of lignite-fired electricity, RWE and LEAG, to encourage the early closure of lignite-fired power plants. The Member State notified the Commission of its plan to compensate these operators with € 4.35 billion.¹⁴² The compensation shall account for foregone profits, as the operators would not be able to sell electricity on the market, and additional mine rehabilitation costs resulting from the anticipated closure.¹⁴³ Of the total € 4.35 billion, € 2.6 billion are foreseen for the RWE lignite installations located in the Rheinland and € 1.75 billion for the LEAG installations in the Lausitz region.¹⁴⁴

The German government's compensation plans face criticism for various reasons. The Commission's view is that the German measure is likely to meet the cumulative criteria for the existence of aid and therefore constitutes State aid under Article 107(1) TFEU.¹⁴⁵ Furthermore, the Commission has doubts that the measure is compatible with the internal market. This concerns the proportionality of the compensation payments and puts into question whether compensating operators for profits they would have made until 2040 in the case of LEAG and 2051 in the case of RWE corresponds to the minimum required.¹⁴⁶ The Commission also expresses doubts regarding certain input parameters of the model used by Germany to calculate the foregone profits, including fuel and CO₂. Germany's model considers that installations

¹³⁷ Ibid., para 87.

¹³⁸ Commission press release, 'State aid: Commission approves compensation for early closure of coal plant in the Netherlands', (12 May 2020), <https://ec.europa.eu/commission/presscorner/detail/en/ip_20_863> accessed 11 April 2022.

¹³⁹ Commission Decision of 2 March 2021 in SA.53625 (2020/N) – Germany – Lignite phase-out, para 16.

¹⁴⁰ Ibid., para 140.

¹⁴¹ Federal Ministry of Justice (Germany), 'Kohleverstromungsbeendigungsgesetz vom 8. August 2020 (BGBl. I S. 1818), das zuletzt durch Artikel 13 des Gesetzes vom 16. Juli 2021 (BGBl. I S. 3026) geändert worden ist', Article 2(2).

¹⁴² Commission Decision of 2 March 2021 in SA.53625 (2020/N) – Germany – Lignite phase-out, para 115.

¹⁴³ Ibid., para 29.

¹⁴⁴ Ibid., para 25.

¹⁴⁵ Ibid., para 114.

¹⁴⁶ Ibid., para 123.

would have run for 48 to 70 years in the absence of the closure law. The last LEAG and RWE installations would have closed in 2061 according to the model used by Germany.¹⁴⁷ These lifespans can be questioned from a technical and an economic perspective, considering the EU ETS. A direct impact of the current increase in the EU ETS price is that it shrinks the profitability of lignite-fired power plants in Germany beyond 2024, leading to almost half of the country's lignite fleet losing cash, based on current expectations¹⁴⁸. Whilst the Commission acknowledges that additional mine rehabilitation costs that result from the early closure of the lignite plants could justify compensation for RWE and LEAG, it has doubts about the information received, in particular on the counterfactual scenario used in the case of LEAG. The Commission thus currently carries out an in-depth investigation to determine whether its initial concerns can be confirmed.¹⁴⁹

When thoroughly assessing the measure under EU State aid rules, it is likely that the Commission will find it not compatible with the internal market. For LEAG, studies show that the gap between the rule-based compensation and the planned flat-rate compensation from Germany amounts to approx. € 1 billion. For RWE, there is a similar gap of € 0.9 billion if the documented costs for the lignite mine adjustments amount to approx. € 1 billion; if costs of € 2 billion are assumed here, compensation of approx. € 2.66 billion could be justified.¹⁵⁰ Corresponding sensitivity calculations show that there may be substantially larger increases in carbon prices in the context of the European Green Deal than in electricity market revenues in the next two years, which would tend to make it necessary to decrease the compensation payments.¹⁵¹ In view of the above, the planned flat-rate compensation for the decommissioning of German lignite-fired power plants must be regarded as a significantly misguided model, both conceptually and in terms of the levels of compensation payments envisaged, and the transition to rule-based compensation is urgently recommended.¹⁵²

Accordingly, another problematic feature of the new aid category in the CEEAG is that the exact maximum aid intensity is not specified. Hence, the compensation could amount to 100%

¹⁴⁷ Ibid., para 124.

¹⁴⁸ Argus Media, 'German lignite plant margins halve from 2024', <https://www.argusmedia.com/en/news/2195015-modern-german-lignite-plant-margins-halve-from-2024?utm_campaign=Oktopost-free-news-coal&utm_content=Oktopost-twitter&utm_medium=social&utm_source=twitter&utm_term=coal> accessed 12 April 2022.

¹⁴⁹ Commission Decision of 2 March 2021 in SA.53625 (2020/N) – Germany – Lignite phase-out, para 140.

¹⁵⁰ Felix Matthes and Others, 'Einordnung der geplanten Entschädigungszahlen für die Stilllegungen deutscher Braunkohlekraftwerke im Kontext aktueller Entwicklungen' (2020), p. 5.

¹⁵¹ Ibid.

¹⁵² Ibid.

of the plant's claimed foregone profits and/or so-called 'additional' or 'exceptional' costs. From the perspective of a just transition, this can be recommended for exceptional costs related to workers (early pensions, retraining, and other social costs).¹⁵³ Nevertheless, for other costs, it could fail to incentivise coal closure dates compatible with the EU's self-commitments.

Moreover, the Commission's assessment will set the tone for further decisions to follow. Many EU countries such as Poland, Romania, Czech Republic, Slovenia, and Bulgaria have not yet provided coal phase-out plans. Due to the fact that they might spend large amounts of aid for the closure of coal activities, the German lignite case can serve as an example for others and its outcome will be key to providing stringent criteria on compensation.¹⁵⁴

3.4 The CEEAG and fossil fuel 'business as usual' scenarios

3.4.1 Natural gas

Despite aiming to facilitate the fossil fuel phase-out¹⁵⁵, the CEEAG allow for support for natural gas, which is problematic for numerous reasons. According to the CEEAG, coal, diesel, lignite, oil, peat and oil shale constitute the 'most polluting fossil fuels'¹⁵⁶ and these are unlikely to pass the balancing test conducted under Article 107(3)(c) TFEU.¹⁵⁷ This can be seen as a step towards preventing aid to fossil fuels. However, State aid for natural gas may be granted, even though its extraction and transmission does not only emit CO₂ but also methane¹⁵⁸. The GHG has a 25 times stronger global climate warming potential than CO₂ over a 100-year timeframe¹⁵⁹. Global methane emissions account for 18 % of global GHG emissions from energy supply.¹⁶⁰ Thus, despite the danger of undermining the climate protection objectives, the Commission considers natural gas as a transition fuel. This approach was already criticised

¹⁵³ See CAN Europe (no. 87), p. 9.

¹⁵⁴ CAN Europe, 'Contribution to State aid SA.53625 (2020/N) Germany, Compensation for RWE and LEAG for lignite phase-out' <<https://caneurope.org/can-europe-contribution-to-state-aid-sa-53625-2020-n-germany-compensation-of-rwe-and-leag-for-lignite-phase-out/>> accessed 12 April 2022, p. 4.

¹⁵⁵ CEEAG (n. 4), recital 4.

¹⁵⁶ Ibid., point 128.

¹⁵⁷ Ibid., point 128.

¹⁵⁸ Ibid., point 74 and footnote 52.

¹⁵⁹ IPCC, 'Global Warming Potentials (IPCC Fourth Assessment Report)' <<https://unfccc.int/process-and-meetings/transparency-and-reporting/greenhouse-gas-data/frequently-asked-questions/global-warming-potentials-ipcc-fourth-assessment-report>> accessed 19 April 2022.

¹⁶⁰ See IPCC (n. 3) p. 37.

amidst the adoption of the EU Taxonomy of environmentally sustainable economic activities that provides classifications for private investments.¹⁶¹

The CEEAG allow for aid for high-efficient cogeneration¹⁶², investments in CCS and CCU¹⁶³, the production of low-carbon hydrogen¹⁶⁴, gas infrastructure¹⁶⁵, gas-fired district heating and cooling networks¹⁶⁶ among others. Moreover, the Guidelines establish safeguards for the assessments. The Member State must demonstrate that the aid contributes to achieving the EU's climate targets in 2030 and 2050, in particular how the 'lock-in effect' of natural gas will be avoided and how gas investments do not displace investments into cleaner alternatives that could be available on the market.¹⁶⁷ Generally, carbon lock-in describes a situation where once carbon-intensive development pathways are chosen and capital-intensive investments are made, fossil fuel dependence and the carbon emissions resulting from it can become very hard to change.¹⁶⁸ Accordingly, this makes it difficult to move to clean alternatives that would reduce climate risks.¹⁶⁹ However, the CEEAG do not provide for or give reference to a definition of the 'lock-in effect'. The Commission lists binding commitments by the beneficiary to implement decarbonisation technologies (CCS/CCU), the replacement of natural gas with renewable or low-carbon hydrogen or to close the plant on a timeline consistent with the climate targets.¹⁷⁰ In this context, it is unclear whether the Member States must prove that aid does not cause a lock-in to greenhouse gas emissions. Moreover, the Commission does not provide guidance whether a lock-in to GHG emissions or to natural gas-fired energy production, referring to 'stranded assets'¹⁷¹ and financial issues, should be prevented.¹⁷²

The question therefore arises how investments into natural gas within an interconnected energy system favouring long-term investments can be justified and which transition is to be pursued with natural gas as fuel. In case the Commission refers to the energy transition, it has acknowledged that 'by 2050, the unbated use of natural gas will become incompatible with the

¹⁶¹ Regulation (EU) 2020/852 of the European Parliament and of the Council on 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088.

¹⁶² CEEAG (n. 4), point 83.

¹⁶³ Ibid.

¹⁶⁴ Ibid., point 87.

¹⁶⁵ Ibid., point 36(b).

¹⁶⁶ Ibid., point 397.

¹⁶⁷ Ibid., point 74 and footnote 52.

¹⁶⁸ Peter Erickson and Others: 'Carbon lock-in from fossil fuel supply infrastructure' (2015), in: SEI Discussion Brief, p. 1.

¹⁶⁹ Ibid.

¹⁷⁰ CEEAG (n. 4), point 74 and footnote 52.

¹⁷¹ See the definition provided in n. 128 of this essay.

¹⁷² CAN Europe (n. 87), p. 5.

climate-neutrality objective and its use (must) be reduced by 66-71 % compared to 2015¹⁷³. Studies conducted before the Russian invasion of Ukraine and the RePowerEU plan show that Europe already risks € 87 billion in stranded natural gas assets if all the planned public and private investment increases in gas infrastructure (including gas pipelines, LNG terminals, etc.) are implemented, threatening to emit greenhouse gases well beyond 2050.¹⁷⁴ Hence, by leaving the door open to support natural gas, the Commission risks contradicting the EU's climate protection commitments.

Moreover, the criteria to demonstrate that there is no lock-in effect must also be called into question. Among others, the CEEAG list binding commitments by the beneficiary to implement decarbonisation technologies like CCS/CCU.¹⁷⁵ They refer to the set of technologies in which CO₂ can be captured from a production plant, liquefied, and finally stored underground or transported to a consumption or utilisation site for full usage of that CO₂.¹⁷⁶ Companies are currently testing this in pilot plants, for example at cement works. In theory, with CCS, unavoidable emissions can be captured and help reduce emissions, as in cement production. However, these decarbonisation technologies are still at the early stage of development and the vast majority of projects in the past were prematurely terminated or put on hold.¹⁷⁷ Furthermore, the CEEAG could have provided for a stronger monitoring and liability regime.¹⁷⁸

3.4.2 Hydrogen

The EU views hydrogen as an essential energy carrier to achieve its climate protection objectives. However, it is still very sparsely produced in the EU and it is thus to be boosted from less than 2 % to 13-14 % of the energy mix by 2050.¹⁷⁹ Currently, 96% of the EU's hydrogen is produced through natural gas, emitting significant amounts of greenhouse gas emissions in the process.¹⁸⁰ The cost decline of renewable energies, technological

¹⁷³ Commission, 'Stepping up Europe's 2030 climate ambition. Investing in a climate-neutral future for the benefit of our people' (Impact Assessment), SWD(2020) 176 final, section 9.4.2.4, p. 61.

¹⁷⁴ Mason Inman and Others, 'Europe Gas Tracker Report' (2021) <<https://globalenergymonitor.org/wp-content/uploads/2021/03/GEM-Europe-Gas-Tracker-Report-2021.pdf>> accessed 19 April 2022, p. 3.

¹⁷⁵ CEEAG (n. 4), point 74, footnote 52.

¹⁷⁶ Carbon Capture and Storage; Carbon Capture and Use. See CEEAG (n. 4), definition 13 and 14.

¹⁷⁷ Nan Wang et al, 'What went wrong? Learning from three decades of carbon capture, utilization and sequestration (CCUS) pilot and demonstration projects' (2021), in Energy Policy 158, p. 1.

¹⁷⁸ Agora Energiewende, '12 insights on hydrogen', <https://static.agora-energiewende.de/fileadmin/Projekte/2021/2021_11_H2_Insights/A-EW_245_H2_Insights_WEB.pdf> accessed 19 April 2022, p. 45.

¹⁷⁹ Commission, 'A hydrogen strategy for a climate-neutral Europe', (Communication), COM(2020) 301 final, p. 1.

¹⁸⁰ Ibid.

developments, and the urgency to drastically reduce greenhouse gas emissions open up new possibilities for renewable hydrogen that is produced by water electrolysis using renewable electricity. This renewable hydrogen is expected to play a key role in replacing fossil fuels in carbon-intensive industrial processes, for instance in the steel or chemical sectors.¹⁸¹ The low amounts of hydrogen in the EU's energy system are reflective for the lack of a hydrogen infrastructure.¹⁸² The CEEAG therefore come into play because scaling up hydrogen requires large amounts of investments and the support of Member States. Despite enabling technology-specific auctions to achieve the objectives for renewable hydrogen,¹⁸³ the provisions on hydrogen in the CEEAG mark another example to undermine the objective of a fully decarbonised energy system.

The CEEAG allow for support to gas infrastructure if the Member State can demonstrate that the infrastructure is

‘(...) ready for the use of hydrogen and leads to an increase of the use of renewable gases or, if this is not the case, the reason why it is not the case and how the project does not lead to a lock-in of natural gas and the investment contributes to achieving the EU's 2030 and 2050 climate targets.’¹⁸⁴

The cited provision has been criticised for potentially allowing Member States to first grant aid for gas that is not ready for the use of hydrogen, to later grant new aid to repurpose that same gas infrastructure into hydrogen infrastructure.¹⁸⁵ In addition, instead of focussing on renewable hydrogen, the CEEAG also refer to the production of ‘low-carbon hydrogen’ without providing any definition for it¹⁸⁶. It is very likely, however, that the Commission recognises low-carbon hydrogen as the production of hydrogen through natural gas coupled with CCS technologies.¹⁸⁷ Consequently, the Guidelines could have set strict conditions for low-carbon hydrogen with regards to standards for these technologies and methane leakage.¹⁸⁸ *Rosenow* and *Lowes* argue

¹⁸¹ Ibid.

¹⁸² Agora Energiewende (n. 178), p. 15.

¹⁸³ See Chapter 3.2.3. of this essay.

¹⁸⁴ CEEAG (n. 4), point 382 (c).

¹⁸⁵ See Client Earth (n. 24), p. 9.

¹⁸⁶ CEEAG (n. 4), point 193.

¹⁸⁷ Also referred to as ‘blue hydrogen’, see Jan Rosenow & Richard Lowes, ‘Will blue hydrogen lock us into fossil fuels forever?’ (2021), in: *One Earth* 4, p. 1527.

¹⁸⁸ Agora Energiewende (n. 178), p. 45.

that ‘hydrogen should be supported only where it clearly has systemic value and if it comes from truly sustainable sources.’¹⁸⁹

3.5 Conclusions on *preventative integration*

With reference to the CEEAG, State aid may be applied in a way as to prevent environmental degradation from fossil fuels. However, this part of the essay highlighted several problematic provisions that could stand in the way of a fossil fuel phase-out. The Commission’s attempt of future-proofing State aid law resulted in the organisation of multi-technology tenders, despite different learning curves. In this respect, the exceptions for technologies with binding EU targets ensure that the focus is primarily on emissions reductions rather than technology-neutrality.

Furthermore, the new aid category on compensation for the closure of coal activities highlights the importance of the German lignite phase-out case for future decisions in this regard. The Commission expresses its doubts regarding the proportionality of the aid and the calculation methods. It is likely that the Commission will find the measure not to be compatible with the internal market. The calculation methods are intransparent and the carbon price evolutions illustrate the fact that the State aid measure may not be limited to the minimum necessary.

Finally, loopholes for fossil fuels in the CCEAG are evident in the case of natural gas. Throughout the CEEAG, natural gas is treated differently to other ‘most polluting fossil fuels’, despite methane leakage. The CEEAG’s safeguards prove to be unsatisfactory, considering the urgency to reduce emissions. When requiring binding commitments from the beneficiaries to implement CCS/CCU for circumventing the lock-in effect, the Commission expresses its hope in technologies that cannot be rolled out on a commercial scale yet. Moreover, the analysis of *preventative integration* shows that it does not amount to an efficient allocation of resources to grant State aid for natural gas projects whilst closing them on timelines consistent with the climate targets.

¹⁸⁹ See Rosenow & Lowes (n. 187), p. 1529.

4 Supportive integration – promoting the development of renewable energies

4.1 Introduction

In line with the concept of *supportive integration*, this chapter focusses on the CEEAG's provisions for measures that are beneficial to the environment. The CEEAG emphasise the significance of building renewable energy capacities for various sectors to reach climate neutrality by 2050. In light of the energy market disruption amid the Russian invasion of Ukraine in 2022, the EU plans to get 45 % of its energy from renewable sources by 2030¹⁹⁰. The roll-out of renewables is not solely driven by developments in the power sector but moreover by the instalment of heat pumps in buildings, renewable-based industrial processes as well as further electrification of transport¹⁹¹. For instance, the steel sector emits significant amounts of GHG¹⁹² and the process of primary ironmaking (from which steel is derived) is responsible for over 80 % of those emissions¹⁹³. However, due to increased operational and investment costs compared to conventional technologies, renewable-based processes in the steel sector are not yet commercially viable.¹⁹⁴ Consequently, both energy-intensive industries and the Commission call for an active policy approach that supports strategic value chains such as steel. The Commission expects that around 30 % of EU primary steel production will be decarbonised with renewable hydrogen by 2030, requiring investments of € 18-20 billion.¹⁹⁵

Against this background, further tools could be needed to support the industrial decarbonisation and, in this regard, the chapter will analyse new features of the CEEAG. The Guidelines recognise Contracts for Difference ('CfDs') and CCfDs as new eligible aid forms.¹⁹⁶ Whereas CfDs are already in place in Member States for the generation of renewable electricity, CCfDs could be designed to bridge the cost gap between renewable and conventional fossil hydrogen production in energy-intensive industrial processes, i.e. refineries, circular steel, or basic chemicals¹⁹⁷. Due to their novelty and their interplay with the EU ETS, a case-study will be carried out on the compatibility of a national CCfD mechanism for renewable hydrogen pilot

¹⁹⁰ Commission, (n. 6), p. 6.

¹⁹¹ Ibid.

¹⁹² IEA, 'Renewable Energy for Industry. From green energy to green materials and fuels' (2017), p. 39.

¹⁹³ Valentin Vogl and Others, 'The making of green steel in the EU: a policy evolution of the early commercialization phase' (2021), in: *Climate Policy*, 21:1, p. 79.

¹⁹⁴ Jörn Richstein and Others, 'Carbon Contracts for Difference. An assessment of selected socio-economic impacts for Germany' (2021), p. 2.

¹⁹⁵ Commission, (n. 6), p. 9.

¹⁹⁶ CEEAG (n. 4), point 121 and footnote 69.

¹⁹⁷ Commission, (n. 179), p. 13.

projects with EU State aid law. Moreover, this chapter will highlight ‘zero-subsidy bids’ that occurred in offshore wind auctions in the last years. The emergence of these bids without public support lay the foundation for further discussions on the most suitable instrument to incentivise the development of renewable energies. This chapter will thus focus on the rationale for zero-subsidy bids and their practical implications.

4.2 New forms of aid: CCfDs on national level for industrial decarbonisation

4.2.1 Rationale and design

A high enough and stable carbon price is crucial for the financials of green technologies entering the market relative to conventional ones. It enables the private sector to incentivise investments in deep emission abatement and ensure the profitability of the energy transition.¹⁹⁸ CCfDs can constitute a hedging instrument that guarantees stable carbon prices for producers.¹⁹⁹ Despite the recent rally, the EU ETS in its current form does not provide sufficiently high prices, and its volatility makes investments into capital-intensive projects risky. In addition, as technologies are not yet commercial and associated infrastructure is not in place, first movers face high technological risk and large investments.²⁰⁰ Thus, while the EU ETS plays an important role in driving the adoption of best available technology, it is not sufficient to remove the risks for first-of-a-kind investments into low-emission primary production technologies.²⁰¹ By reducing the firm’s uncertainty with regard to the carbon price path, CCfDs can increase the financial viability of a decarbonisation project and thus lead to investments in clean technology.²⁰²

A CCfD is concluded between a public counterpart and the investing company²⁰³. The EU ETS serves as the reference market. When the realised carbon price is below the CCfD price level (strike price) the public counterpart pays the industrial company a premium on the EU ETS price. On the other hand, when the carbon price exceeds the strike price, the company pays the difference back to the public counterpart.²⁰⁴ If, for example, a firm were to compare two investments – the refurbishment of its conventional blast furnace versus the construction of a

¹⁹⁸ Olga Chiappinelli, & Karsten Neuhoff, ‘Time-consistent carbon pricing: The role of carbon contracts for differences’ (2020). DIW Discussion Papers N° 1859, p. 2.

¹⁹⁹ Richstein (n. 194), p. 9.

²⁰⁰ Vogl (n. 193), p. 81.

²⁰¹ Ibid.

²⁰² Richstein (n. 194), p. p. 22.

²⁰³ See chapter 4.2.2.1 of this essay on the existence of State aid under Article 107(1) TFEU.

²⁰⁴ Richstein (n. 194), p 3.

renewable hydrogen-based process – and it would realise the latter with a carbon price of € 70 per tonne CO₂, this would be the strike price needed. Consequently, the company would receive the difference between the strike price and the average annual carbon price in the EU ETS for each tonne of CO₂ that is not emitted as the result of the low-emission investment option.²⁰⁵ Thereby, CCfDs act as hedging instruments by reducing the carbon-price risk for the companies and allowing for long-term financial planning.²⁰⁶

Another positive effect is the improvement in the learning curve as well as related knowledge spillovers associated with the support of low-carbon technologies included in CCfDs. In this regard, the contracts constitute commitment devices that increase welfare by endorsing the importance of innovation.²⁰⁷ This is particularly important given that decarbonising industry will require a massive rollout of clean technologies that entails the existence of business models.²⁰⁸

However, CCfDs to incentivise investments into renewable hydrogen in energy-intensive industrial processes also present disadvantages. This refers to competitive bidding and overcompensation. When tendering on the national level, the expected number of bidders will be rather low, since many Member States only include a small number of companies that could take part in such tenders, for instance primary steelmakers. Consequently, national tenders could include several sectors to reach the necessary scale.²⁰⁹ The CCfD have the potential to overcompensate when the producers pass-through costs while the strike price remains the same. This becomes even more relevant in light of the industry's moves towards decarbonising technologies and growing end consumers' demand, for instance for green steel.²¹⁰ Furthermore, the length of the contract periods is to be scrutinised. Despite aiming for investment security, it presents a difficult task to choose between the uncertainty created by policies that can discourage technology investment²¹¹ and obligating future administrations and generations with subsidies.²¹²

²⁰⁵ Vogl (n. 193), p. 84.

²⁰⁶ Richstein (n. 194), p. 5.

²⁰⁷ Chiappinelli (n. 198), p. 4.

²⁰⁸ Timo Gerres & Pedro Linares: 'Carbon Contracts for Difference: their role in European industrial decarbonization' (2020), p. 3.

²⁰⁹ Vogl (n. 193), p. 85.

²¹⁰ Ibid.

²¹¹ Jörn Richstein: 'Project-based Carbon Contracts: A Way to Finance Innovative Low-Carbon Investments' (2017), p. 1.

²¹² Vogl (n. 193), p. 85.

Therefore, CCfDs can lead the way to the commercialisation of breakthrough technologies.²¹³ They create investment security, allow higher carbon prices than the ones currently existent in emissions trading, reduce financing costs because revenue streams are guaranteed, and provide incentives for emissions reductions. It has been suggested, however, that CCfD should be complemented with electricity price guarantees, since these constitute crucial factors in the costs of renewable-based industrial processes and can significantly reduce the strike price.²¹⁴ This could however entail issues with regards to the cumulation of aids. In general, the stabilisation of cashflows for certain sectors raises questions about the compatibility of CCfDs with EU State aid law.

4.2.2 Case study – CCfD mechanism for renewable hydrogen pilot projects

In the following, it will be assessed whether granting a CCfD in a Member State for renewable hydrogen pilot projects in industrial processes would constitute State aid under Article 107(1) TFEU. Moreover, whether it could be compatible with the internal market under Article 107(3)(c) TFEU in light of the provisions of the CEEAG. However, a thorough Commission State aid assessment would depend on the specific design of the instrument.²¹⁵

4.2.2.1 Existence of State aid under Article 107(1) TFEU

A CCfD mechanism on a national level for pilot projects for renewable hydrogen in industrial processes is likely to constitute State aid under Article 107(1) TFEU. For the beneficiaries, a steady stream of revenues is contractually guaranteed by receiving payments of the difference between a strike price set in the contract and the reference price, where the reference price falls below the strike price.²¹⁶ Competitors not benefitting from a CCfD, however, are not protected from price volatility. Hence, the CCfD entails a selective advantage to undertakings in basic materials production.²¹⁷

²¹³ Vogl (n. 193), p. 89.

²¹⁴ Richstein (n. 194), p. 11.

²¹⁵ Council Regulation (EU) 2015/1589 of 13 July 2015 laying down the detailed rules for the application of Article 108 of the Treaty on the Functioning of the European Union (codification) [2015] OJ L 248/9.

²¹⁶ Commission Decision of 8 October 2014 in SA. 34947 (2013/C) – United Kingdom – Hinkley Point C, para 296.

²¹⁷ Ibid.

The competition could be distorted, because due to the stabilisation of their incomes, the favoured undertakings gain a competitive advantage over other undertakings that do not receive support with similar instruments. The measure also strengthens the position of the favoured undertakings over others and is thus likely to affect trade. However, it is questionable whether the measure is implemented ‘by a Member State’ or ‘through State resources’.²¹⁸ This depends on the financing included in the CCfD. A grant from public resources is recognised if the payments from the CCfD are financed directly from budgetary resources. A different outcome, however, might be achieved where the payments are refinanced through an allocation organised under private law – like in the German EEG surcharge.²¹⁹ According to the ECJ, the EEG 2012 does not amount to State aid since the State in the context of these provisions cannot dispose of the funds obtained from the EEG surcharge. The transmission system operators managing the payment and administration of the funds were not under State control.²²⁰ Consequently, if the payments from the CCfD would be refinanced with a similar mechanism, the measure is less likely to constitute State aid.²²¹

4.2.2.2 Commission decisions on CfDs for renewable electricity

However, in case the CCfD mechanism for renewable hydrogen in industrial processes constitutes State aid under Article 107(1) TFEU, it can still be compatible with the internal market under Article 107(3) (c) TFEU. The CEEAG can be invoked here since they include provisions on CCfDs, giving reference to CfDs.²²² Such contracts regarding the generation of electricity from renewable energies have already been applied across the Union and approved by the Commission, other than CCfDs that specifically focus on stabilising carbon prices in energy-intensive industrial processes. The CfD decisions will be reviewed to reflect on the assessment and its repercussions for the case-study. However, it is to be kept in mind that CfDs for the generation of electricity from renewable sources target the wholesale electricity prices and differ from CCfDs by leaving out carbon prices under the EU ETS.

²¹⁸ Agora Energiewende: ‘Making renewable hydrogen cost-competitive. Legal evaluation of potential policy support instruments’ (2021), p. 8. See also C-379/98, *PreussenElektra*, EU:C:2001:160, para 58.

²¹⁹ *Ibid.*

²²⁰ C-405/16 P, *Germany v Commission*, EU:C:2019:268, para. 48 f.

²²¹ Agora Energiewende (n. 218), p. 8.

²²² CEEAG (n. 4), point 121 and footnote 69.

The UK's proposal for a 'CfD scheme' in 2014 was one of the first to be presented in the EU as renewable technologies across the whole spectrum were eligible for the support, incl. combined heat and power, offshore wind, tidal stream. The scheme took the form of a

'variable premium calculated as the difference payment between an administratively pre-fixed price (the strike price) and a measure of the market price for electricity (the reference price). Generators will earn money from selling their electricity into the market as usual, but when the average wholesale price of electricity is below the strike price, generators will receive a top-up payment from suppliers, through a UK Government-owned counterparty, Low Carbon Contracts Company Ltd (the "CfD Counterparty"), for the difference. (...) The support level for each group will be established on a competitive tender process. However, the maximum support level is capped for each technology at the strike price.'²²³

The Commission found that the measure constituted State aid in the meaning of Article 107(1) TFEU. It therefore assessed the scheme on the basis of the general compatibility provisions of the EEAG. After having confirmed the necessity of the aid and the appropriateness of the instrument to address the objective of achieving the renewable energy and climate protection targets²²⁴, the Commission noted that the aid had an incentive effect²²⁵. It then went on to assess the proportionality of the aid. On the one hand, it acknowledged that the mechanism put the operator at a certain risk when the electricity price would be below the reference price. On the other hand, the beneficiary could not benefit from high electricity prices because it would always have to pay the difference to the CfDs counterparty when the reference price exceeded the strike price.²²⁶

In addition, the Commission accepted the UK's arguments in favour of organising separate bidding processes for less established technologies, and allocate dedicated budgets for them, due to their longer-term potential and considering the need to achieve diversification²²⁷. It deemed the duration of the support which was limited to 15 years and the non-cumulation of

²²³ Commission Decision of 23 July 2014 in SA.36196 (2014/N) – United Kingdom – Electricity Market Reform – Contract for Difference for Renewables, para 17 f.

²²⁴ Ibid., para 59.

²²⁵ Ibid., para 61.

²²⁶ Ibid., para 63.

²²⁷ Ibid., para 72.

the aid with any other support to be in line with EU State aid law.²²⁸ The Commission concluded, that the ‘effect of the aid will in principle not be viewed as an undue distortion of competition’²²⁹ since it was linked to the EU’s objectives related to the uptake of renewable energies and climate protection. The aid measure was found to be compatible with Article 107 (3)(c) TFEU.²³⁰

The Commission's assessments of the Danish (2021²³¹), Irish (2020²³²) and Italian (2019²³³) CfD schemes were similar. In the Danish case, the measure was deemed to be proportionate because of its competitive bidding process which was awarded based on the lowest price²³⁴. Also, the Commission acknowledged that the tenders would limit the duration of aid to 20 years and that the overall payments of the CfDs were capped.²³⁵ With regards to the Irish renewable energy support scheme, the Commission stressed that EU State aid law allowed for competitive bidding processes to be limited to particular technologies under certain conditions. As in the British CfD case, this included where the selected technologies had long-term potential, where there was a need to achieve diversification and linked to system costs. For these reasons, it found that the preference categories for solar energy and renewable energy communities were compatible with EU State aid law.²³⁶

To conclude, the assessed CfD schemes for renewable energies were in line with EU State aid law. In the cases presented, the Commission emphasised the need for competitive bidding processes that address many tenderers to bid, a total cap on payments and the prevention of cumulation of aids. The latter could be problematic for plans to combine CCfDs for industrial processes with electricity price guarantees.

²²⁸ Ibid., para 77.

²²⁹ Ibid., para 79.

²³⁰ Ibid., para 98.

²³¹ Commission Decision of 3 March 2021 in SA.57858 (2021/N) – Denmark – Thor Offshore wind farm.

²³² Commission Decision of 20 July 2020 in SA.54683 (2020/N) – Ireland – Renewable Electricity Support Scheme (RESS).

²³³ Commission Decision of 14 June 2019 in SA.53347 (2019/N) – Italy – Support to electricity from renewable sources 2019-2021.

²³⁴ Commission Decision (n. 231), para 88 f.

²³⁵ Ibid., para 91 f.

²³⁶ Commission Decision (n. 232), para 116.

4.2.2.3 Compatibility with the internal market pursuant to Article 107(3)(c) TFEU

The CCfD under examination here is comparable with the implemented CfD support schemes. Moreover, the CEEAG apply to CCfDs, which leads to the conclusion that approval by the Commission is possible in principle²³⁷. Nevertheless, some issues arise here. For instance, the scope of the aid and also the amount of the gross grant equivalent of the aid cannot be calculated due to the volatility of the reference price in the EU ETS.²³⁸ However, this does not prevent compatibility of State aid under Article 107(3)(c) TFEU since the wording of this provision does not expressly require that the Commission has to quantify the precise amount of the grant equivalent arising from an aid measure.²³⁹

Furthermore, the question of whether the measure constitutes ‘investment aid’ or ‘operating aid’ is another important aspect in relation to compatibility.²⁴⁰ According to settled case-law, operating aid intended to maintain the status quo or to release an undertaking from costs that it would normally have had to bear in its day-to-day management or normal activities cannot be considered compatible with the internal market.²⁴¹ However, the support for undertakings through the CCfD does not preserve the status quo but rather is intended to enable investments in the shift to climate-neutral technologies. This runs counter to the view that payments made on the basis of the CCfD are operating aid in this sense.²⁴² Moreover, the ECJ has decided that, irrespective of whether it is ‘investment aid’ or ‘operating aid’, an aid measure can satisfy the requirements of Article 107(3)(c) TFEU.²⁴³

Finally, from a State aid law perspective, it is questionable what effects there are where the payments to the favoured undertaking are expected to be significant. This issue could lead to impermissible overcompensation. However, the ultimate sum of a grant on its own does not mean that it constitutes overcompensation. Instead, it must be demonstrated that the payments exceed what is necessary to attract investments in the new technologies.²⁴⁴ Nevertheless, this is not the case for a CCfD mechanism for renewable hydrogen. The strike price can be evaluated

²³⁷ See *Agora Energiewende* (n. 218), p. 9.

²³⁸ *Ibid.*

²³⁹ T-356/15, *Austria v Commission*, EU:T:2018:439, para 249.

²⁴⁰ *Agora Energiewende* (n. 218), p. 9.

²⁴¹ C-288/96, *Germany v Commission*, EU:C:2000:537, paras 88-91.

²⁴² *Agora Energiewende* (n. 218), p. 9.

²⁴³ C-594/18 P, *Austria v Commission*, EU:C:2020:742, para 113.

²⁴⁴ T-356/15, *Austria v Commission*, EU:T:2018:439, para 606.

regularly and adjusted to the actual CO₂ abatement costs which thus contradicts possible overcompensations.²⁴⁵

The CEEAG lays down criteria for compatibility under Article 107(3)(c) TFEU which are of importance for the assessment of the CCfD under examination. The points 22(a) and 22(b) CEEAG list aspects that are significant when assessing the positive and negative condition. As regards the positive condition – that the aid facilitates the development of an economic activity – the Commission analyses three aspects. First, the identification of the economic activity which is being facilitated by the measure, its positive effects for the society at large and, where applicable, its relevance for specific policies of the Union. It must have an incentive effect, i.e. whether it induces the beneficiary to engage in more environmentally-friendly behaviour. Finally, an absence of breach of any relevant provisions of Union law. The analysis of the negative condition – that the aid does not unduly affect trading conditions to an extent contrary to the common interest – contains six aspects. These include the need for State intervention, the appropriateness of the aid, the proportionality of the aid (aid limited to the minimum necessary to attain its objective) including cumulation, the transparency of the aid, the avoidance of undue negative effects of the aid on competition and trade as well as a balancing exercise to weigh up the positive and negative effects of the aid.

A CCfD for renewable hydrogen satisfies the first two conditions of the positive condition: it promotes the development of renewable energies and low-emission technologies, i.e. renewable hydrogen, thus contributing to climate and energy objectives of the Union. Further, the measure has an incentive effect since the CCfD mechanism induces the beneficiaries to change their behaviour and engage in the transition to climate-neutral technologies, which they would not carry out without the aid or would carry out in a restricted or different manner.²⁴⁶

Moreover, impermissible discrimination could occur if the CCfD is restricted to undertakings in one Member State, thus violating relevant Union law.²⁴⁷ However, the ECJ regards it as permissible in the promotion of electricity from renewable energies where Member States restrict their support exclusively to green electricity in the national territory.²⁴⁸ In case the CCfD would not be extended to foreign undertakings, the same can apply for the measure under

²⁴⁵ See *Agora Energiewende* (n. 218), p. 10.

²⁴⁶ CEEAG (n. 4), point 26.

²⁴⁷ See *Agora Energiewende* (n. 218), p. 11.

²⁴⁸ *C-573/12, Ålands Vindkraft AB v Energimyndigheten*, EU:C:2014:2037, para 104.

examination, in as much as justification on grounds of environmental protection falls for consideration.²⁴⁹

Due to the continuing high costs of these technologies in comparison to conventional technologies,²⁵⁰ the transition to renewable hydrogen technologies by undertakings would not occur without the CCfD. It thus constitutes a necessary measure to remedy a market failure.

When discussing the appropriateness of a CCfD for renewable hydrogen, it must be kept in mind that the EU ETS already provides for an instrument that similarly to the carbon contract addresses some of the identified market failures.²⁵¹ However, the Commission has recognised in the CEEAG that State aid may reinforce other policies and measures that aim at remedying the same market failures.²⁵² Despite the recent rise in emission allowance prices, these might not be high enough to attract necessary investment in climate-neutral technologies. To achieve this, a steady increase in the CO₂ price is needed.²⁵³ Consequently, there must be other measures alongside the EU ETS to incentivise these investments, e.g. CCfDs.

Moreover, the aid would also have to be proportionate, i.e. the aid amount per beneficiary must be limited to the minimum needed for carrying out the aided project or activity.²⁵⁴ Generally, the measure is proportionate if the aid corresponds to the net extra cost ('funding gap') necessary to meet the objective of the aid measure, compared to the counterfactual scenario in the absence of aid. This criterion can be fulfilled if the aid amounts in the CCfD mechanism are determined through a competitive bidding process.²⁵⁵ This criterion requires enough bidders. Alternatively, the funding gap must be determined by comparing the profitability of the factual and counterfactual scenarios.²⁵⁶ In addition, the CEEAG considers that a more limited eligible scheme does not unduly distort competition where a measure targets a specific sectoral or technology-based target established in Union law²⁵⁷, as given in the case under examination for the production of renewable hydrogen.

²⁴⁹ Agora Energiewende (n. 218), p. 11.

²⁵⁰ Richstein (n. 194), p. 2.

²⁵¹ Vogl (n. 193), p. 81. See also CEEAG (n. 4), point 34.

²⁵² CEEAG (n. 4), point 34.

²⁵³ Chiappinelli (n. 198), p. 2.

²⁵⁴ See CEEAG (n. 4), point 46.

²⁵⁵ Ibid., point 49.

²⁵⁶ Ibid., point 51.

²⁵⁷ Ibid., point 96(a).

Finally, the identified negative effects on competition and trade will be balanced with the positive effects of the planned aid on the supported economic activities, including its contribution to environmental protection.²⁵⁸ This criterion is also fulfilled since the CCfD enables the shift to climate-neutral technologies in certain sectors and thus contributes to environmental protection in the EU. The related interference with competition in contrast is not disproportionate to the positive effects because without the CCfD the necessary first-of-a-kind investments in technologies like renewable hydrogen would not be made due to the high cost of these technologies²⁵⁹.

To conclude, on the basis of the foregoing assessment, it can be considered that a national CCfD mechanism for renewable hydrogen pilot projects in industrial processes is in line with the relevant provisions of the CEEAG. They pursue an objective of common interest in a necessary and proportionate way, the distortions of competition are limited, and therefore the aid could be deemed compatible with the internal market pursuant to Article 107(3)(c) TFEU.

4.3 Zero-subsidy bids in offshore wind auctions

4.3.1 The market situation for offshore wind energy

Looking beyond the scope of the CEEAG when analysing measures for the development of certain economic activities such as renewable energies, the question arises when these technologies become fully competitive and State aid in this respect might become redundant. In this context, ‘zero-subsidy bids’ have sparked interest among academia, particularly with regards to cost decreases and the need for revenue stabilisation systems for renewable energies.

The bids without public support mostly occur in the offshore wind industry which experiences enormous growth. In this regard, the EU plans to multiply the offshore wind energy capacity by nearly 30 times, from 12 GW in 2020 to 300 GW by 2050.²⁶⁰ Studies foresee cost reductions of 50 % until 2026 and a rather steep learning curve.²⁶¹ Moreover, if the current trend continues

²⁵⁸ Ibid., section 3.3.

²⁵⁹ Agora Energiewende (n. 218), p. 11.

²⁶⁰ Commission, ‘An EU strategy to harness the potential of offshore renewable energy for a climate neutral future’, (Communication) COM(2020) 741 final, p. 1.

²⁶¹ Gabriela Rubio Domingo & Pedro Linares, ‘The future investment cost of offshore wind: An estimation based on auction results’ (2021), in: Renewable and Sustainable Energy Reviews 148, p. 9.

beyond 2026, offshore wind might achieve cost competitiveness by 2030.²⁶² The costs have already fallen in the past years, resulting in the submission of zero-subsidy bids at offshore wind auctions in Germany in 2017 and 2018.²⁶³ Moreover, the Dutch government introduced a no-subsidy requirement but agreed to pay for the grid connection in an offshore wind tender that opened in March 2019.²⁶⁴

Contracts for a period of 25 to 30 years and the large scale of projects constitute the main drivers for submitting zero-subsidy bids.²⁶⁵ Furthermore, the expectation of higher power prices, increasing experience in production, and the exclusion of grid connections from the tenders – as in the Netherlands – are contributing factors in offshore wind auctions.²⁶⁶ Nevertheless, questions arise which revenue stabilisation systems are most suitable to attract investments in renewable energies. In the absence of State aid, privately concluded long-term power purchase agreements (‘PPAs’) are discussed as instruments for contractual electricity prices between producers and consumers²⁶⁷. The Commission recommends designing support schemes to complement corporate purchase agreements for renewable energy.²⁶⁸ PPAs aim to ensure reliable revenue streams from electricity sale but also involve the risks that the actual price of electricity is lower than the contractual price. Less favourable financial ratios and lower credit ratings also occur due to the definition of long-term purchase agreements as long-term liabilities.²⁶⁹ In this respect, it is argued by some that privately concluded long-term electricity contracts lead to higher costs compared to State-backed contracts such as CfDs.²⁷⁰

4.3.2 Price floors and caps

The CEEAG mention ‘zero-subsidy bids’ with regards to the proportionality of State aid. Generally, the aid amount needs to correspond to the net extra cost (‘funding gap’).²⁷¹ The Commission expresses its desire for competitive bidding processes which determine the

²⁶² Ibid.

²⁶³ Roman Sieler, ‘Offshore Wind – Achieved Cost Reductions in Germany’ (2022), p. 1.

²⁶⁴ Thomas Greve & Marta Rocha, ‘Policy and Theoretical Implications of the Zero-subsidy bids in the German Offshore Wind Tenders’ (2020), in: *The Energy Journal* 41:4, p. 91.

²⁶⁵ Ibid., p. 92.

²⁶⁶ Ibid.

²⁶⁷ Nils May & Karsten Neuhoff, ‘Private langfristige Stromabnahmeverträge (PPA’s für erneuerbare Energien: kein Ersatz für öffentl. Ausschreibungen’, in *DIW Aktuell* 22, p. 1.

²⁶⁸ Commission, ‘Recommendation on speeding up permit-granting procedures for renewable energy projects and facilitating Power Purchase Agreements’, (Recommendation) C/2022 3219 final.

²⁶⁹ Nils May and Others, ‘Renewable energy policy: risk hedging is taking center stage’ (2017), *DIW Economic Bulletin* 39, p. 392.

²⁷⁰ Cf. May & Neuhoff, (n. 267), p. 2.

²⁷¹ CEEAG (n. 4), point 48.

assessment of the net extra cost. This relates to the presumption that competitive bidding processes provide a reliable estimate of the minimum aid required by potential beneficiaries.²⁷²

‘However, in case there is a possibility of ‘zero subsidy bids’ Member States should explain how proportionality will be ensured. (...) Price floors or caps that constrain the competitive process undermining proportionality, even if at zero, should be avoided.’²⁷³

The Commission shies away from setting strict conditions here but identifies problematic aspects. However, it is evident that the Commission wants to ensure a level playing field, which is; one of the guiding principles of State aid control. Auctions have the advantage of reflecting continuous cost reductions and allowing cost-efficient support.²⁷⁴ Setting lower or upper limits for prices might constrain the competitive bidding process and therefore merits scrutiny which the CEEAG rightly acknowledge. Most importantly, the lessons learned from steady cost decreases associated with zero-subsidy bids could be of special importance to Member States planning to expand their offshore wind market.²⁷⁵ In this regard, prices depend on the offshore wind energy capacity installed in the countries.²⁷⁶

4.4 Conclusions on *supportive integration*

The CEEAG provide opportunities for *supportive integration* of environmental protection requirements. This includes the promotion of renewable energies to reduce GHG in various sectors, e.g. industry. In this regard, the Guidelines account for a comprehensive toolbox for cost scenarios to unfold. New aids forms such as CCfDs constitute hedging instruments for the industrial decarbonisation that accompany the EU ETS. The CCfDs stabilise prices for renewable-based technologies and effectively provide investment security as well as reduce finance costs. However, the cumulative criteria for State aid are likely to be fulfilled. In this respect, the case-study shows that CCfDs for renewable hydrogen pilot projects in Member States could be compatible with the internal market. Finally, zero-subsidy bids have occurred due to the drastic cost decreases and the growing experiences with offshore wind energy. These bids highlight situations in which private companies seize favourable market conditions and

²⁷² Ibid., point 49.

²⁷³ CEEAG (n. 4), point 49 and footnote 42.

²⁷⁴ Pablo del Río & Pedro Linares, ‘Back to the future? Rethinking auctions for renewable support’ (2014), in: *Renewable and Sustainable Energy Reviews* 35, p. 43.

²⁷⁵ See Sieler (n. 263), p. 12.

²⁷⁶ Ibid., p. 5.

prefer concluding long-term private purchase agreements with consumers, beyond State aid. Accordingly, the discussions on the most suitable instruments for stable revenues will be conducted in the light of steady cost decreases for renewable energies.

5 Concluding remarks

The EU's State aid regime plays a central role in incentivising the promotion of renewable energies and the phase-out of fossil fuels. This essay applied the classification method of *preventative* and *supportive integration* of environmental protection requirements under Article 11 TFEU to the CEEAG. It finds that the Guidelines include coherent rules for various innovative measures. State aid may be applied in a way as to benefit the environment. However, the CEEAG do not close the door to fossil fuels by allowing State aid for natural gas, and therefore hamper the deployment of renewables. Consequently, the Commission did not choose 'green State aid law' because there is no coherence between the CEEAG and the EU's climate protection commitments, e.g. the ratification of the Paris Agreement.

Initially, the part on *preventative integration* analysed CEEAG provisions where State aid may be applied in a way as to prevent environmental degradation. It points towards problematic provisions that could stand in the way of a fossil fuel phase-out. The new aid category on decarbonisation measures sets technologies with different learning curves on an equal footing. In this context, the exceptions for renewable energies, energy efficiency and renewable hydrogen underline the importance of these technologies for climate protection. However, the discussions on the most suitable auction design to ensure emissions reductions whilst fostering innovation are complex and require a balancing of different policy objectives.

In addition, the CEEAG's new aid category on the compatibility of State aid for the closure of coal activities merits scrutiny. It is reasonable to support coal miners that require early pensions or retraining in view of a 'just transition'. However, calculations for compensations that foresee the lifespans of coal-fired power plants way into the second half of the 21st century – as presented in the German lignite phase-out case – are to be assessed critically for various technical and economic reasons. As has been shown, the Commission must thoroughly calculate the lifetime and market situation for coal power plants and must be wary of overcompensations for fossil fuel activities. Consequently, the application of this new aid category will play a

significant role in the European energy transition. Criteria for clear and transparent calculations must be fulfilled before granting State aid for the closure of coal activities.

The Commission applies an ambiguous approach to fossil fuels. On the one hand, it allows State aid for natural gas. On the other hand, it acknowledges the need for a phase-out and presents issues associated with fossil fuel infrastructure, such as carbon lock-in or stranded assets. Therefore, the Commission tries to rescue its climate ambitions by introducing safeguards to the CEEAG. These safeguards propose that natural gas projects should close on timelines consistent with the climate targets. However, it is unreasonable to grant State aid in climate, energy and environment for projects that are to be closed in the short term. Moreover, as has been shown, relying on promising but immature technologies, such as CCS/CCU, does not present satisfactory safeguards either. In addition, the CEEAG's lack of legal certainty entails the risk of granting State aid for hydrogen produced from natural gas and a 'business as usual' scenario to burn fossil fuels.

Regarding *supportive integration*, the Guidelines account for a comprehensive toolbox for cost scenarios as well as technological developments to unfold. New features such as CCfDs constitute hedging instruments for the industrial decarbonisation that accompany the EU ETS. It has been shown that the CEEAG have acknowledged their implementation because CCfDs facilitate first-of-a-kind investments for renewable-based technologies in certain sectors, e.g. basic materials. The case-study finds that regular evaluations of the strike price as well as adjustments to the actual CO₂ abatement must be carried out to prevent overcompensations and ensure the efficiency of the instrument. Hence, the compatibility of CCfDs constitutes an important factor for bridging finance gaps. Considering the CJEU's case-law on the German EEG surcharge, it will be interesting to follow the practical application of CCfDs to reflect on the role of the State or a public counterpart. However, the interplay with the EU ETS should not obscure the fact that further measures must accompany CCfDs to enable scalable business models. This is due to the fact that carbon prices are an important but not the only crucial factor in creating incentives for investments in low-emission technologies, i.e. renewable hydrogen.

Zero-subsidy bids play an important role in discussions on different revenue stabilisation systems, such as PPAs or CfDs. Moreover, the main drivers for cost decreases, that lead to zero-subsidy bids, can serve as important examples for Member States that want to expand their offshore wind energy market. With decreasing costs for renewables, zero-subsidy bids could

become more frequent under certain conditions, and it will be revealing to follow upcoming assessments of price floors and caps, in line with the CEEAG.

Due to their soft law nature and the Commission's wide discretion with regards to Article 107(3) TFEU, it is evident that the CEEAG's provisions do not serve as the last reference for all future State aid decisions in climate, environmental protection and energy. Nevertheless, they constitute an important source of law in the State aid field, and it is regrettable that the Commission did not choose green State aid law. The Member States must adapt their support schemes for the upcoming years, which may include natural gas. This entails the danger of using taxpayers' money for long-term investments that undermine climate protection commitments. Consequently, it will be interesting to follow the application of the CEEAG's safeguards in practice to reflect on the EU's commitment to phase out all fossil fuels, including natural gas. Moreover, the Commission's decision in the German lignite phase-out case will be significant because it may serve as an example for future phase-out scenarios across the EU. Further research on this matter could analyse the outcome of the case. In this respect, it is of the author's opinion that this new aid category must be applied in a way that does not penalise taxpayers for corporate wrongdoings, but instead ensures an efficient allocation of resources targeted towards emissions reductions. In general, as action on the European energy transition will increase and more decisions on the matter will be taken, this will result in further research on green State aid law.

Finally, there are signs of hope for the European energy transition. The Russian aggression against Ukraine in 2022 made the case for 'freedom energies' even clearer. Renewable energies experience drastic cost reductions and gain momentum. Nevertheless, the *supportive* or *preventative integration* of environmental protection requirements into EU State aid law never exists in a vacuum but is heavily interdependent. The EU was initially built on coal power, and even in the year 2022, fossil fuels are deeply embedded into Europe's economy and society. As long as Member States grant State aid for fossil fuels, this creates major barriers to the deployment of renewable energies. Consequently, referring to the statement of Sir David Attenborough, time is running out to work with nature, not against it.

Table of cases

Judgements of the Court of Justice of the European Union

C-379/98 *PreussonElektra* EU:C:2001:160.

C-81/10 P, *France Télécom*, EU:C:2011:811.

C-172/03, *Heiser*, EU:C:2005:130.

C-71/09 P, *Comitato 'Venezia vuole vivere'*, EU:C:2011:368.

C-310/99, *Italy v Commission*, EU:C:2002:143.

C-124/10 P, *Commission v EDF*, EU:C:2012:318.

C-126/01, *GEMO*, EU:C:2003:622.

C-148/04 *Unicredito Italiano*, EU:C:2005:522.

C-393/04 *Air Liquide Industries Belgium*, EU:C:2006:216.

C-387/92 *Banco Exterior de España*, EU:C:1994:100.

C-480/09 P *AceaElectrabel v Commission*, EU:C:2010:787.

C-405/16 P, *Germany v Commission*, EU:C:2019:268.

C-288/96, *Germany v Commission*, EU:C:2000:537.

C-573/12, *Ålands Vindkraft AB v Energimyndigheten*, EU:C:2014:2037.

C-594/18 P, *Austria v Commission*, EU:C:2020:742.

Judgements of The General Court

T-356/15, *Austria v Commission*, EU:T:2018:439.

T-347/09, *Germany v Commission*, EU:T:2013:418.

Opinions of Advocates General

C-82/77, *Van Tiggele*, EU:C:1977:205, (Opinion of AG Capotorti).

Commission Decisions (State aid)

Commission Decision of 8 October 2014 in SA.34947 (2013/C) – United Kingdom – Hinkley Point C.

Commission Decision of 23 July 2014 in SA.36196 (2014/N) – United Kingdom – Electricity Market Reform – Contract for Difference for Renewables.

Commission Decision of 12 May 2020 in SA.54537 (2020/NN) – Netherlands – Prohibition of coal for the production of electricity in the Netherlands.

Commission Decision of 2 March 2021 in SA.53625 (2020/N) – Germany – Lignite phase-out.

Commission Decision of 3 March 2021 in SA.57858 (2021/N) – Denmark – Thor Offshore wind farm.

Commission Decision of 20 July 2020 in SA.54683 (2020/N) – Ireland – Renewable Electricity Support Scheme (RESS).

Commission Decision of 14 June 2019 in SA.53347 (2019/N) – Italy – Support to electricity from renewable sources 2019-2021.

Table of legislation

Union primary legislation

Consolidated version of the Treaty on the Functioning of the European Union [2012] OJ C 326/01.

Consolidated version of the Treaty on the European Union [2012] OJ C 326/01.

Paris Agreement, Decision 1/CP.21, 29 January 2016, Doc. FCCCC/CP/2015/10.Add.1.

Union secondary legislation

Commission Regulation (EU) No 1407/2013 of 18 December 2013 on the application of Articles 107 and 107 TFEU to de minimis aid [2013] OJ L352/1.

Commission Regulation (EU) 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty [2014] OJ L 187/1.

Council Decision (EU) 2016/1841 of 5 October 2016 on the conclusion, on behalf of the European Union, of the Paris Agreement adopted under the United Nations Framework Convention on Climate Change [2016] OJ L282/1.

Council Regulation (EU) 2015/1589 of 13 July 2015 laying down the detailed rules for the application of Article 108 of the Treaty on the Functioning of the European Union (codification) [2015] OJ L 248/9.

Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law') [2021] OJ L 243.

Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088.

Directive (EU) 2018/2001 of the of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast) [2018] OJ L328/82.

Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law'), OJ L 243/1.

German material

Federal Ministry of Justice (Germany), 'Kohleverstromungsbeendigungsgesetz vom 8. August 2020 (BGBl. I S. 1818), das zuletzt durch Artikel 13 des Gesetzes vom 16. Juli 2021 (BGBl. I S. 3026) geändert worden ist'.

Guidelines, Communications and other Union documents

Notices and Guidelines

Commission, ‘Guidelines on State aid for climate, environmental protection and energy 2022’ [2022] OJ C80/1.

Commission, ‘Guidelines on State aid for environmental protection and energy 2014-2020’ [2014] OJ C200/1 as corrected [2016] OJ C290/11.

Commission, ‘Commission Notice on the notion of State aid as referred to in Article 107(1) TFEU’ [2016] OJ C262/1.

Communications and other Commission materials

Commission, ‘The European green Deal’ (Communication) COM(2019) 640 final.

Commission, ‘REPowerEU: Joint European Action for more affordable, secure and sustainable energy’ (Communication) COM(2022) 108 final.

Commission, ‘REPowerEU Plan’ (Communication) COM(2022) 230 final.

Commission, ‘A hydrogen strategy for a climate-neutral Europe’, (Communication), COM(2020) 301 final.

Commission, ‘An EU strategy to harness the potential of offshore renewable energy for a climate neutral future’, (Communication) COM(2020) 741 final.

Commission, ‘Recommendation on speeding up permit-granting procedures for renewable energy projects and facilitating Power Purchase Agreements’, (Recommendation) C/2022 3219 final.

Commission, ‘Stepping up Europe’s 2030 climate ambition. Investing in a climate-neutral future for the benefit of our people’ (Impact Assessment), SWD(2020) 176 final.

Commission, ‘The EU economy after COVID-19: implications for economic governance’, (Communication) COM(2021) 662 final.

Other Union materials

Commission press release, ‘State aid: Commission approves compensation for early closure of coal plant in the Netherlands’, (12 May 2020), <https://ec.europa.eu/commission/presscorner/detail/en/ip_20_863>accessed 11 April 2022.

Commission press release, 'State aid: Commission endorses the new Guidelines on State aid for Climate, Environmental Protection and Energy' (12 May 2020)
<https://ec.europa.eu/commission/presscorner/detail/en/ip_21_6982> accessed 11 April 2022.

Commission, 'The Just Transition Mechanism: making sure no one is left behind' (website),
<https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/finance-and-green-deal/just-transition-mechanism_en> accessed 11 April 2022.

European Court of Auditors, 'Review01/2022: Energy taxation, carbon pricing and energy subsidies' (2022).

Bibliography

Books

Bacon K, *European Union Law of State Aid* (3rd edn OUP 2017).

Craig P and De Burca G, *EU Law: Text, Cases, and Materials* (7th edn, OUP 2020).

Homann H and Micheau C (eds), *State Aid Law of the European Union* (OUP 2016).

Krämer L, *EU Environmental Law* (8th edn, Sweet & Maxwell 2016).

Langlet D & Mahmoudi S, *EU Environmental Law and Policy*, (OUP 2016).

Nowag J, *Environmental Integration in Competition and Free-movement laws* (OUP 2016).

Skovgaard J, *The Economisation of Climate Change. How the G20, the OECD and the IMF Address Fossil Fuel Subsidies and Climate Finance* (Cambridge University Press 2021).

Werner P and Vincent V (eds), *EU State aid Control: Law and Economic* (Kluwer Law International 2017).

Articles

Chiappinelli O & Neuhoff K, 'Time-consistent carbon pricing: The role of carbon contracts for differences' (2020), in: DIW Discussion Papers N° 1859.

Del P Río & Linares P, 'Back to the future? Rethinking auctions for renewable support' (2014), in: Renewable and Sustainable Energy Reviews 35.

Erickson P, Lazarus M and Tempest K, 'Carbon lock-in from fossil fuel supply infrastructure' (2015), in: SEI Discussion Brief.

Gençsü I and Others, 'Phasing out public financial flows to fossil fuel production in Europe' (2020), in: Climate Policy 20:8, p. 1010-1023, DOI: 10.1080/14693062.2020.1736978.

Gerres T and Linares P, 'Carbon Contracts for Difference: their role in European industrial decarbonization' (2020).

Giljam R, 'Implementing Ecological Governance in EU Energy Law: The role of technology neutral legislative design in fostering innovation' (2018), in: European Energy and Environmental Law Review 27:6, p. 236-250.

Haelg L, 'Promoting technical diversity: How renewable energy auction designs influence policy outcomes' (2020), in: Energy Research & Social Science 69, p. 17.

Jaffe A and Others, 'A tale of two market failures: Technology and environmental policy' (2005), in: Ecological Economics 54:2, p. 164-174.

Kassim H and Lyons B, 'The New Political Economy of EU State Aid Policy' (2013), in: *Journal of Industry, Competition and Trade* 13:1, p. 1-21.

May M & Neuhoff J, 'Private langfristige Stromabnahmeverträge (PPA's für erneuerbare Energien: kein Ersatz für öffentl. Ausschreibungen' (2019), in: DIW Aktuell 22.

Moses L, 'Recurring Dilemmas: The Law's Race to Keep up with Technological Change' (2007), in: *University of Illinois Journal of Law, Technology and Policy* 2, p. 239-289.

Nowag J, Mundaca L and Åhman M, 'Phasing out fossil fuel subsidies in the EU? Exploring the role of state aid rules' (2021), in: *Climate Policy* 21:8, p. 1037-1052, DOI:10.1080/14693062.2021.1965523.

Reed C, 'Taking Sides on Technology Neutrality' (2007) 4(3) SCRIPT-ed, p. 263-284.

Richstein J, 'Project-based Carbon Contracts: A Way to Finance Innovative Low-Carbon Investments' (2017).

Richstein J and Others, 'Carbon Contracts for Difference. An assessment of selected socio-economic impacts for Germany' (2021).

Rosenow J & Lowes R, 'Will blue hydrogen lock us into fossil fuels forever?' (2021) In: *One Earth* 4, p. 1527-1529
<<https://www.sciencedirect.com/science/article/pii/S2590332221006047> >
accessed 25 April 2022.

Vogl V, Åhman M & Nilsson L, 'The making of green steel in the EU: a policy evolution of the early commercialization phase' (2021), in: *Climate Policy* 21:1, 78-92.

Wang N and Others, 'What went wrong? Learning from three decades of carbon capture, utilization and sequestration (CCUS) pilot and demonstration projects' (2021), in *Energy Policy* 158
<<https://www.sciencedirect.com/science/article/abs/pii/S030142152100416X?via%3Dihub>>
accessed 25 April 2022.

Reports and other secondary sources

Agora Energiewende: 'Making renewable hydrogen cost-competitive. Legal evaluation of potential policy support instruments' (2021).

Agora Energiewende, '12 insights on hydrogen' (2021) <https://static.agora-energiewende.de/fileadmin/Projekte/2021/2021_11_H2_Insights/A-EW_245_H2_Insights_WEB.pdf> accessed 19 April 2022.

Argus Media, 'German lignite plant margins halve from 2024' (2021)
<https://www.argusmedia.com/en/news/2195015-modern-german-lignite-plant-margins-halve-from-2024?utm_campaign=Oktopost-free-news-coal&utm_content=Oktopost-twitter&utm_medium=social&utm_source=twitter&utm_term=coal> accessed 12 April 2022.

Buck M and Others, ‘Making State Aid Work for Europe’s Decarbonisation. A critical assessment of the EU Guidelines on aid for renewable energy’ (2019) <<https://www.clientearth.org/media/cfln4kxc/workshop-presentation-making-state-aid-work-for-europes-decarbonisation-20-november-2019-coll-en.pdf>> accessed 17 April 2022.

CAN Europe, ‘Contribution to State aid SA.53625 (2020/N) Germany, Compensation for RWE and LEAG for lignite phase-out’ (2020) <<https://caneurope.org/can-europe-contribution-to-state-aid-sa-53625-2020-n-germany-compensation-of-rwe-and-leag-for-lignite-phase-out/>> accessed 12 April 2022.

CAN Europe, ‘Response to public consultation on the revised CEEAG’ (2021) <https://caneurope.org/content/uploads/2021/08/CAN-Europe-response-to-State-Aid-CEEAG-revision-public-consultation_20210802.pdf> accessed 11 April 2022.

Carbon Tracker Initiative, ‘Four in Five EU Coal plants unprofitable as renewables and gas power ahead’ (2019) <<https://carbontracker.org/four-in-five-eu-coal-plants-unprofitable-as-renewables-and-gas-power-ahead/>> accessed 10 April 2022.

Carbon Tracker Initiative, References & resources: key terms [webpage]. <[ww.carbontracker.org/resources/](http://www.carbontracker.org/resources/)> accessed 10 April 2022.

Chestney N, Abnett K and Twidale S, ‘Europe’s carbon price nears the 100 euro milestone’ (2022), <<https://www.reuters.com/business/energy/europes-carbon-price-nears-100-euro-milestone-2022-02-04/>> accessed 10 April 2022.

Client Earth, ‘A State Aid Framework for a Green Recovery: Mainstreaming climate protection in EU State aid law’ (2020) <<https://www.clientearth.org/media/c45naoms/2020-09-30-a-state-aid-framework-for-a-green-recovery-coll-en.pdf>> accessed 5 May 2022.

Client Earth, ‘Briefing on the CEEAG’ (2021) <<https://www.clientearth.org/media/yubbv4od/clientearth-briefing-on-the-ceeag-24-12-2021.pdf>> accessed 28 April 2022.

Harriet Fox, ‘Top 10 EU emitters all coal power plants in 2021’ (2022), <<https://ember-climate.org/insights/research/top-10-emitters-in-the-eu-ets-2021/>> accessed 10 April 2022.

IEA, ‘Renewable Energy for Industry. From green energy to green materials and fuels’ (2017).

Inman M and Others, ‘Europe Gas Tracker Report’ (2021) <<https://globalenergymonitor.org/wp-content/uploads/2021/03/GEM-Europe-Gas-Tracker-Report-2021.pdf>> accessed 19 April 2022.

IRENA, ‘Majority of New Renewables Undercut Cheapest Fossil Fuel on Cost’, (2021) <<https://www.irena.org/newsroom/pressreleases/2021/Jun/Majority-of-New-Renewables-Undercut-Cheapest-Fossil-Fuel-on-Cost>> accessed 10 April 2022.

IPCC, ‘Global Warming Potentials (IPCC Fourth Assessment Report’
<<https://unfccc.int/process-and-meetings/transparency-and-reporting/greenhouse-gas-data/frequently-asked-questions/global-warming-potentials-ipcc-fourth-assessment-report>>
accessed 19 April 2022.

IPCC, 2022: ‘Summary for Policymakers’, in: Shukla P.R., Skea J and Others (eds), *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment of the Intergovernmental Panel on Climate Change*, (World Meteorological Organization 2022).

Lai O, ‘Key takeaways from Prince William’s The Earthshot Prize: Repairing our Planet’ (2021) <<https://earth.org/key-takeaways-from-prince-williams-the-earthshot-prize-repairing-our-planet/>> accessed 18 May 2022.

Matthes F and Others, ‘Einordnung der geplanten Entschädigungszahlen für die Stilllegungen deutscher Braunkohlekraftwerke im Kontext aktueller Entwicklungen’ (2020)
<http://p376185.mittwaldserver.info/fileadmin/user_upload/Dateien/Bilder/Content/Presse/Öko-Institut_2020_-_Einordnung_der_geplanten_Entschädigungszahlungen_für_deutsche_Braunkohlekraftwerke_final.pdf> accessed 12 April 2022.

Pakalkaite V, ‘Technology-neutral auctions, myth or reality’ (2019),
<<https://www.strommarkttreffen.org/2019-04-12-Pakalkaite-RES-auction-designs-and-results-comparison-across-EU.pdf>> accessed 17 April 2022.

Reuters, ‘Germany to present renewable energy expansion measures’,
<<https://www.reuters.com/article/germany-politics-energy-idAFL5N2W35JP>>
accessed 2 May 2022.

Sieler R, ‘Offshore Wind – Achieved Cost Reductions in Germany’ (2022),
<https://www.adelphi.de/en/system/files/mediathek/bilder/Offshore_wind%282%29.pdf>
accessed 18 May 2022.

Ulrich B, ‘Sag mir, wo noch Blumen sind’ (2022)
< <https://www.zeit.de/2022/20/klimapolitik-krieg-ukraine-Ing-terminals-energiewende> >
accessed 20 May 2022.

Worthington B, ‘Why Europe must back a technology-neutral energy policy’ Europe's World (2015) <<https://www.friendsofeurope.org/insights/why-europe-must-back-a-technology-neutral-energy-policy/>> accessed 10 April 2022.