

Climate Change Liability, Negative Emissions and Biodiversity Restoration

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Abstract

This article is about climate liability and the stimulation of negative emissions through nature restoration. Such a measure can contribute to the reduction of greenhouse gas emissions, but can also lead to a restoration of biodiversity and of ecosystem services. In order to finance measures aimed at achieving natural negative emissions, the European Commission is considering introducing a system of carbon credits as part of the 'Fit for 55' program. This contribution investigates the advantages and disadvantages thereof and wonders about the nature and extent of the liability risks if, for example, nature is destroyed that is financed with carbon credits and which results in the release of stored CO₂. In that respect, attention is given to the Environmental Liability Directive. If the stimulation of natural negative emissions is also aimed at restoring biodiversity, in the event of a loss of nature, merely recouping the market price of a 'carbon credit' is insufficient to compensate the public for the damage done.

Keywords

climate change liability – negative emissions – ecosystem services – carbon credits
– biodiversity – environmental liability

'[...] emissions released anywhere contribute to [climate change] everywhere'.¹

'Climate change involves a global pollutant and the effects of emission reductions are a public good.'²

1 Introduction: Climate Change and the Challenge of Negative Emissions³

We are facing an enormous challenge. By now everyone is familiar with the reports of the International Panel on Climate Change (IPCC) on climate change and its consequences. One of the important conclusions of the latest IPCC reports – dated August 2021 and February 2022 – is that the global temperature increase in the 21st century will exceed 2°C if there is no drastic reduction in emissions of CO₂ and other greenhouse gases in the coming decades.⁴ The most recent UNEP Emission Gap Report shows that the objectives formulated by the signatory states and the European Union (EU) – on behalf of the EU member states – following the 2015 Paris Agreement,⁵ are far from sufficient to limit the global temperature increase to 2°C.⁶ If reduction targets are not tightened up, it is likely that the global temperature increase – assuming that the reduction targets reported by parties to the Paris Agreement (NDCs⁷) are met – will be 2.7°C (margin: 2.2–3.2°C and with a 66% probability).⁸ Meanwhile, a number of parties to the Agreement, including the European Union, have tightened

1 Statement Ban Ki-moon, Secretary-General of the United Nations, prior to the Paris Climate Summit, 'What I expect from the UN Climate Change Conference in Paris', COP21, Goal 13: Climate Action, News dated 25 November 2025 (www.un.org/sustainabledevelopment/blog/2015/11/what-i-expect-from-the-un-climate-change-conference-in-paris/).

2 T. Tietenberg & L. Lewis, *Environmental and Natural Resource Economics*, New York: 2018, p. 403.

3 This publication is an updated version of my inaugural lecture held at Utrecht University on 23 March 2022, published by BoomJuridisch in March 2022 (ISBN-978-94-6212-686-2).

4 IPCC, Climate Change 2021: *The Physical Science basis. Contribution of Working Group I to the Sixth Assessment Report of the International Panel on Climate Change* (hereinafter: IPCC AR6 WGI 2021 report), p. SPM-17 (www.ipcc.ch/report/ar6/wg1/) and IPCC, Climate Change 2022: *Mitigation of Climate Change. Working Group III contribution to the Sixth Assessment Report of the International Panel on Climate Change* (hereafter: IPCC AR6 WGIII 2022 report), p. SPM-15-SPM18.

5 *Trb.* 2016, 162.

6 See UNEP Emission Gap Report 2021 (www.unep.org/resources/emissions-gap-report-2021).

7 NDCs stands for Nationally Determined Contributions and can be accessed at: www4.unfccc.int/sites/ndcstaging/Pages/LatestSubmissions.aspx.

8 *UNEP Emission Gap Report 2021*, a.w. p. XII–XIV.

their own reduction targets. On this basis, it is likely that the global temperature increase will be 2.2°C (margin 2.0–2.5°C and with a 66% probability).⁹

The basic objective of the Paris Agreement is to limit global warming to well below 2°C. However, since insights into climate science – emerging before the Paris Agreement was established in late 2015 – show that a safe temperature rise should not exceed 1.5°C, the Agreement states that Parties to the Agreement strive to limit global warming to 1.5 °C, ‘recognizing that this would significantly reduce the risks and impacts of climate change’ (Art. 2.1(a) of the Agreement).¹⁰ At the request of the Parties to the Agreement,¹¹ the IPCC released a report in 2018 that addresses the difference in negative impacts between a global temperature increase of 1.5°C and of 2°C.¹² This report indicates that these impacts are significant. This has also been reflected in Dutch case law. For instance, in the Urgenda judgment, the wording of which is repeated by the District Court of The Hague in the case of Milieudefensie et al. v Shell,¹³ the Supreme Court considered that in “the last couple of years, further insight has shown that a safe temperature increase should not exceed 1.5 °C [...]”.¹⁴ Also courts outside of the Netherlands refer to this development in climate science. Interesting examples are judgments in France,¹⁵ Ireland¹⁶ and Germany,¹⁷. The judgment of the Bundesverfassungsgericht is particularly interesting because

9 UNEP *Emission Gap Report 2021*, a.w. p. XVI. See also UNFCCC Synthesis Report, *Nationally Determined Contributions under the Paris Agreement*, September 17, 2021, which assesses the temperature level that is likely to be reached from the NDCs registered on July 30, 2021, based on the realization of those NDCs. See FCCC/PA/CMA/2021/8, September 17, 2021 (https://unfccc.int/sites/default/files/resource/cma2021_08_adv.pdf).

10 Moreover, these are non-binding targets. See in this sense also District Court of The Hague 26 May 2021, ECLI:NL:RBDHA:2021:5337 (Milieudefensie c.s. / Shell), par. 4.4.27.

11 See UNFCCC, Decision 1/CP.21, para 21 (26 January 2016): ‘Invites the Intergovernmental Panel on Climate Change to provide a special report in 2018 on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways’. Available at: <https://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf>.

12 See IPCC, *Special Report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways*, 2018 (www.ipcc.ch/sr15/) (hereinafter IPCC Special Report 2018).

13 District Court of The Hague, 26 May 2021, ECLI:NL:RBDHA:2021:5337 (Milieudefensie c.s. / Shell), paragraph 2.3.3. See also paragraph 4.4.27 of the judgement. See also about this judgment: E.H.P. Brans & M. Scheltema, ‘Aansprakelijkheid Shell voor klimaatverandering. Een “carbon major” geconfronteerd met een reductiebevel’, *M&R* 2021/80.

14 Supreme Court Netherlands 20 December 2019, ECLI:NL:HR:2019:2006, r.o. 2.1.

15 See also Tribunal Administratif de Paris February 3, 2021, AB 2021/146, paragraph 16, n.t. Nijenhuijs.

16 Supreme Court Ireland 31 July 2020, [2020] IESC 49, para 3.4.

17 Bundesverfassungsgericht, Order of the First Senate of 24 March 2021, ECLI:DE:BVerfG:2021:RS20210324.1bvr265618, r. o. 211–212.

it makes a connection between this development in climate science, the role of the legislator in setting climate targets and the rights of future generations.¹⁸ Incidentally, the negotiating parties in Glasgow, in November 2021, were also aware of this development in climate science. It led to the following phrase in the Glasgow Climate Pact: “reaffirms [...] to pursue efforts to limit the temperature increase to 1.5°C [...], recognising that this would significantly reduce the risks and impacts of climate change.”¹⁹

Due to these and other – not necessarily climate related – developments, many countries in the world are now taking measures to reduce emissions and are tightening up their reduction targets.²⁰ The European Union (and hence its Member States) has also done so. In June 2021, for example, the European Union decided to tighten the emissions target for 2030. Previously this was at least 40% compared to 1990. Now there is a net greenhouse gas reduction target for 2030 of at least 55% and no net emissions in 2050 (both compared to 1990).

The emphasis in this article is on one of the measures proposed by the European Commission to achieve this; negative emissions.²¹ Not meant here are the technical measures that can be taken to achieve this, such as Carbon Capture Storage (CCS). That is the capture and storage of CO₂ in, for example, empty gas fields under the sea bed. What is meant here are measures that can be taken to increase the capacity of forests, croplands, wetlands, oceans and water bodies to store and/or sequester CO₂; biological CCS.²² Interestingly, if this is done properly, it might lead to the restoration of nature and biodiversity

18 Interestingly this development in climate science is linked to the policy freedom of the legislator: ‘However, in view of the considerable lack of certainty reflected in the ranges and uncertainties stated by the IPCC, Art. 20a [Grundgesetz (GG)] leaves the legislator with leeway to determine the climate goal in terms of how it evaluates the dangers and risks from the standpoint of political responsibility [...]. It is not apparent that the limits of this legislative leeway have been violated by the choice of the Paris target, at least not at present. However, new and sufficiently reliable findings on the development of anthropogenic global warming, its consequences and controllability, might make it necessary to set different targets within the framework of Art. 20a GG, even when taking the legislator’s decision-making leeway into account.’

19 Glasgow Climate Pact, 13 November 2021, Decision -/CP.26, para. 15 (https://unfccc.int/sites/default/files/resource/cop26_auv_2f_cover_decision.pdf).

20 See UNFCCC, *Nationally determined contributions under the Paris Agreement. Revised synthesis report by the secretariat*, 25 October 2021, FCCC/PA/CMA/2021/8/Rev.1.

21 Negative emissions are defined by the IPCC as: ‘Removal of greenhouse gases (GHGs) from the atmosphere by deliberate human activities, i.e., in addition to the removal that would occur via natural carbon cycle processes.’ See IPCC, 2018: Annex I: Glossary, in IPCC Special Report 2018.

22 This term is used in the Dutch Climate Accord (Nederlands Klimaatakkoord), p. 136.

and of ecosystem services, by which is meant the capacity of ecosystems to provide goods and services to (protected) species and habitats and to humans.²³ According to climate scientists negative emissions are of importance for achieving climate targets.²⁴ However, these alone are far from sufficient to achieve the reduction objectives of the Paris Agreement.²⁵

The article is structured as follows. Chapter 2 deals with climate targets and nature restoration as a climate measure, including the 2021 proposal to revise the EU Regulation on land use, land use change and forestry (LULUCF) and the EU Biodiversity Strategy 2030. Chapters 3 and 4 addresses loss of biodiversity and of ecosystem services and measures taken to halt this loss, thereby referring to the 2022 proposal for and EU Nature Restoration Law. Chapter 5 and 6 deal with carbon credits and liability issues, whereby the Environmental Liability Directive is being addressed. Chapter 8 addresses administrative requirements in order to have a reliable system of carbon removals and trade in carbon credits. Chapter 9 is the concluding chapter.

2 Climate Targets

One of the goals of the European Union, set out in the European Climate Change Act which came into force on 29 July 2021, is to have zero net greenhouse gas emissions by 2050.²⁶ This means that the CO₂ emissions that still occur due to human activities are to be compensated by the removal of CO₂ from the atmosphere. For the period after 2050, the European Union aims for negative emissions.²⁷ An important intermediate target is a *net* emission reduction of at least 55% by 2030 compared to 1990.²⁸ It will be addressed in more detail later, but net greenhouse gas emissions refer to the total of greenhouse gases emitted minus for instance the CO₂ captured and used in for example horticulture (*carbon capture and use (CCU)*) or by storing CO₂ in newly

²³ See further chapter 3.

²⁴ See footnote 33–37.

²⁵ Cf. IPBES-IPCC co-sponsored workshop report on biodiversity and climate change. Synopsis, 2021 p. 16, <https://ipbes.net/events/ipbes-ipcc-co-sponsored-workshop-report-biodiversity-and-climate-change>.

²⁶ Art. 2(1) of the Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing a framework for achieving climate neutrality, and amending Regulation (EC) No 401/2009 and Regulation (EU) 2018/1999 ('2021 European Climate Act'), *oJ* 2021, L 243/1.

²⁷ *Idem*.

²⁸ Art. 4 para 1 of the European Climate Change Act. Net greenhouse gas emissions are emissions after deduction of removals.

planted forests.²⁹ On this basis, it should be possible to achieve a reduction for the European Union as a whole, including negative emissions, of more than 55% compared with 1990, i.e. 57%, by 2030.³⁰

55 or 57% might not seem much and accordingly it might not seem to be relevant. Yet, for several reasons, that is not the case. First of all, for the European Union as a whole it concerns a quantity of negative emissions in the period up to 2030 that is considerably larger than what for instance Member States such as Denmark, Belgium, Austria or the Netherlands currently emit per year.³¹ More importantly, the IPCC in its analyses of the reduction paths that can be followed to limit the global temperature increase to 1.5 or 2°C, explicitly takes into account the necessity of negative emissions.³² It notes: “[t]he deployment of carbon dioxide removal (CDR) [...] is unavoidable if net zero CO₂ or GHG emissions are to be achieved.”³³ There are various reasons for it. First of all, it might be that it appears that in the coming years the global response to climate change is not enough to limit the increase in global average temperature to 1.5°C or 2°C above pre-industrial levels. In addition, it might well be that not enough emission reduction measures are taken to implement the Nationally Determined Contributions (NDCs) formulated in the context of Paris, Glasgow and future climate change conferences.³⁴ Apart from that, negative emissions

29 There are several methods that can be used to remove CO₂. For an overview, see *IPCC, 2018 Special Report, providing a comprehensive assessment of 1.5 °C pathways*, Chapter 4-3.7.1 et seq. (<https://www.ipcc.ch/sr15/chapter/chapter-4/>). See also V.J. Schweizer, et al, *Integrated Climate-Change Assessment. Scenarios and Carbon Dioxide Removal*, 2020 One Earth, 3(2) p. 169, table 1.

30 European Parliament, EU Climate Law: MEPs confirm deal on climate neutrality by 2050, 24 June 2021 (www.europarl.europa.eu/news/en/press-room/20210621IPR06627/eu-climate-law-meps-confirm-deal-on-climate-neutrality-by-2050).

31 The European Commission's proposal assumes a target of 310 Mton CO₂ equivalent net removals across the Union in 2030. See art. 4 paragraph 2 of the Proposal for a Regulation amending Regulation (EU) 2018/841, COM(2021) 554 final. In 2019 Denmark, Belgium, Austria emitted respectively 44.06, 108.22 and 69.80 Mton CO₂-equivalent (see www.climatewatchdate.org). In 2020, greenhouse gas emissions in the Netherlands amounted to 165 Mton CO₂ equivalent. See CLO, *Emissions of greenhouse gases, 1990–2020*, 31 August 2021 (www.clo.nl/indicatoren/nl0165-broeikasgasemissies-in-nederland).

32 See IPCC AR6 WGI 2021 report, p. SPM 17 and TS 64. See also a.o. V.J. Schweizer et al, *Integrated Climate-Change Assessment. Scenarios and Carbon Dioxide Removal*, 2020 One Earth, 3(2) p. 166. See similarly: J.C. Minx et al, ‘Negative emissions – Part 1: Research landscape and synthesis’, 2018 *Environ. Res. Lett* 13 063001 and S. Fuss et al, ‘Negative emissions – Part 2: Costs, potentials and side effects’, 2018 *Environ. Res. Lett* 13 063001.

33 IPCC, *Climate Change 2022: Mitigation of Climate Change. Summary for Policymakers* (hereafter: IPCC AR6 WGIII 2022 report) p. 40 (https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_SPM.pdf).

34 IPCC Special Report 2018, pp. 114 and 116.

are necessary because there will always be sources of greenhouse gases. Examples are emissions from agriculture, aviation, shipping and industrial sectors that have difficulty producing in a CO₂-neutral manner, such as the steel and cement industries.³⁵ These will continue to emit greenhouse gases, and negative emissions are therefore essential if a target is to be met of zero greenhouse gas emissions by 2050.³⁶ Interestingly, the European Union is not alone in setting a net zero reduction target. More and more countries are doing so. An interesting example is the United Kingdom which has included a net reduction target in its Climate Change Act 2008.³⁷ There are other countries, but for some of them it is far from clear how this will be achieved.³⁸

On 14 July 2021, the European Commission put forward a large number of proposals to achieve these reduction targets.³⁹ These are additional or new regulations. They have been introduced because the EU's current energy and environmental policies do not go far enough to meet the targets for 2030 and 2050 set out in the European Climate Change Act. Illustrative is the graph below,⁴⁰ which shows that many additional policies will be necessary to achieve these targets.

35 IPCC AR6 WGIII 2022 report, p. 40.

36 The Netherlands Environmental Assessment Agency (PBL) also takes the view that, in order to comply with the Paris Agreement, on a national, European and global scale, substantial quantities of negative emissions are virtually inevitable, i.e. measures that remove CO₂ from the atmosphere. PBL, *Negatieve emissies. Technisch potentieel, realistisch potentieel and kosten voor Nederland*, The Hague 7 February 2018, p. 5 (PBL Report 2018). See also p. 20–21 and figure 1.1 of this report.

37 See sections 1 and 27 of that Act. See further HM Government, *Net Zero Strategy: Build Back Greener*, October 2021. It is to be noted that January 2022 Friend of the Earth UK started proceedings against the UK government because, in its opinion, the plans to realise this 'Net Zero Strategy' are insufficiently robust. The High Court of Justice decided the case on 18 July 2022. See [2022] EWHC 1841 (Admin).

38 See UNEP, *Emission Gap Report*, November 2021, p. 18 ff.

39 For an overview of them see https://ec.europa.eu/commission/presscorner/detail/en/IP_21_3541.

40 EEA, *Trends and projections in Europe*, 2021, p. 8 (www.eea.europa.eu/publications/trends-and-projections-in-europe-2021).

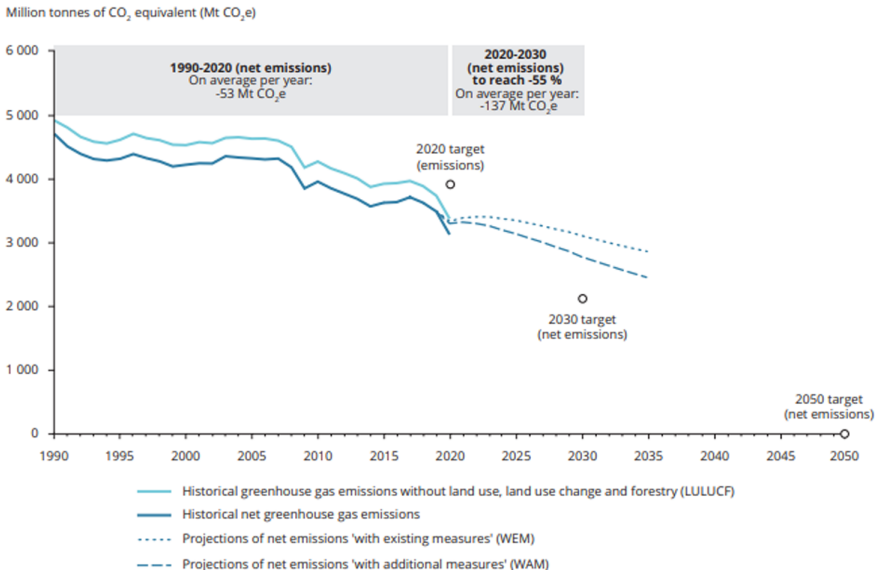


FIGURE 1 Gap between GHG emission targets and GHG reduction levels predictable under existing and additional policies

This also applies to most (if not all) of the EU Member States. An example is the Netherlands. To implement the 2021 European Climate Act, the Dutch government decided to amend the Dutch Climate Law and to set new targets in this law; 55% in 2030 with a preference for 60%.⁴¹ According to the Netherlands Environmental Assessment Agency, extra measures are necessary to achieve these targets.⁴²

The package of measures that the EU is preparing, also referred to as 'Fit for 55', consists of a dozen legislative proposals.⁴³ A number of these are certainly interesting, including the proposal to phase out the issuing of free emission

41 See Proposal for Amending the Climate Law (Implementation of the European Climate Law, TK 2021–2022, 36 169, nr. 2 including its Explanatory Memorandum (TK 2021–2022, 36 169, nr. 3). The targets were set in the Coalition Agreement 2021–2025, *Looking out for each other, looking forward to the future*, 15 December 2021, p. 10 (hereafter: Coalition Agreement).

42 PBL, *Reflection on the environmental themes in the coalition agreement 2021–2025*, 23 December 2021, which notes: 'The new target for 2030 implies an additional policy challenge compared to the previous government's target, which, according to the Climate and Energy Outlook (KEV), was not yet within reach by 2021 [...]'. And: 'Based on existing potential and policy studies, the coalition agreement's target of at least 55 per cent reduction, with policy aimed at 60 per cent reduction, is nevertheless at the limit of what can be practically achieved in the timeframe up to 2030, if targeted volume policy is disregarded and carbon leakage must be prevented [...]' (p. 10–11).

43 Fit for 55: meeting the EU 2030 climate target for climate neutrality, Brussels, 14 July 2021, COM/2021/550 final. See further i.a. S. Schalke et al, 'Implementing the EU Climate Law via the 'Fit for 55' package, *Oxford Open Energy*, 2022/1, p. 1–13.

rights to aviation, ending in 2027,⁴⁴ and to bring (international) shipping under the European Emissions Trading Scheme – EU ETS – as a result of which greenhouse gas emissions from shipping will also be priced. There are also other proposals worthy of discussion, but the focus here is on an EU proposal that will involve greater efforts to restore nature and biodiversity. That is the 2021 proposal to revise the EU Regulation on land use, land use change and forestry (LULUCF) and which aims at the collective achievement of climate neutrality by 2035 in the land use, forestry and agriculture sector.⁴⁵

Net Greenhouse Gas Emissions

This proposal to revise the LULUCF Regulation, in conjunction with the strategy developed by the European Commission for, inter alia, restoring biodiversity by 2030,⁴⁶ must, on the one hand, ensure that the net removal of greenhouse gases by 2030 is 15% higher than it is today and, on the other, contribute to protecting and restoring ecosystems and biodiversity.

What is going to happen? First of all, three billion trees are to be planted within the European Union by 2030, and all the remaining old-growth forests in Europe are to be protected more strictly than is currently the case.⁴⁷ An EU ‘forest strategy’ must ensure that there is diversity in planting and that this planting does not cause damage to biodiversity.⁴⁸ Monitoring will also be used to determine whether the objective is being achieved.⁴⁹ Other measures include restoring degraded forests and improving the management of existing forests so as to limit the felling of young trees that can still absorb CO₂.⁵⁰

44 See further on this: N. Dobson, ‘A tale of two systems: The EU’s approach to aviation emissions in the Fit for 55 Package’, *TVR* 2022/1.

45 Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulations (EU) 2018/841 as regards the scope, simplifying the compliance rules, setting out the targets of the Member States for 2030 and committing to the collective achievement of climate neutrality by 2035 in the land use, forestry and agriculture sector, and (EU) 2018/1999 as regards improvement in monitoring, reporting, tracking of progress and review. See further on this regulation: K. Böhling, M.F.M. Todeschini, *The Forest Sector in the 2030 EU Climate Policy Framework: Looking back to Assess Its Future*, 2021 *Journal for European Environmental & Planning Law*, 18(1), 124–142.

46 European Commission, *EU Biodiversity Strategy 2030. Bringing nature back into our lives*, Brussels 20 May 2020, (hereafter: *EU Biodiversity Strategy 2030*), and COM(2020)380 final and European Commission, *New EU Forestry Strategy for 2030*, Brussels 16 July 2021, COM(2021) 572 final (hereafter: *New EU Forest Strategy for 2030*).

47 *New EU Forest Strategy for 2030*, p. 14 and *EU Biodiversity Strategy 2030*, p. 4.

48 *New EU Forest Strategy for 2030*, p. 13.

49 Idem. Monitoring updates will be published on the webpage of the European Forest Information System: <https://forest.eea.europa.eu/>.

50 See also in this sense: PBL 2018, p. 52.

In addition, measures are being taken to better protect carbon-rich sources, such as grasslands and peatlands, so that CO₂ already stored is retained and not emitted. These include reducing the amount of cultivated land, including grassland, by reducing ploughing and preventing the drainage of peatlands and bogs.⁵¹ To avoid misunderstandings, this last category of measures is primarily aimed at countering the emission of greenhouse gases. However, given the emission reduction targets, it is no less relevant.^{52,53}

Marine ecosystems also play an important role. Studies have shown that seagrass absorbs and stores CO₂ from the atmosphere, and can therefore play a role in achieving the negative emission targets.⁵⁴ Efforts to restore degraded seagrass beds in the Wadden Sea, for example, by planting seagrass – as is currently being done⁵⁵ – can therefore also be seen as a climate measure. Finally, the network of protected areas in the EU – Natura 2000 areas – will be expanded and efforts will be made to ensure strict protection of areas of very high biodiversity and climate value.

Is the European Commission's proposal very surprising? No. For example, Article 5(1) of the Paris Agreement, citing the 1993 UN Climate Convention,⁵⁶

51 The EC's proposals also relate to the method of production in agriculture. This is not discussed here. For more information on this, see among other things European Commission, *A farm to fork strategy. For a fair, healthy and environmentally friendly food system*, Brussels 2 May 2020, COM(2020) 381 final and COWI e.a., *Technical Guidance Handbook. Setting up and implementing result-based carbon farming mechanisms in the EU*, Report to EC, DG Climate Action, 2021. See also the following article on the switch to a plant-based diet and the negative emissions this can produce: Z. Sun et al, 'Dietary change in high-income nations alone can lead to substantial double climate dividend', 3 *Nature Food* 2022, p. 29 ff.

52 PBL report 2018, p. 50 and 51. See also *EC Communication, EU soil strategy for 2030*, Brussels 17 November 2021, COM(2021) 699 final, p. 5.

53 Interestingly, the reduction of CO₂ emissions from peatlands has already been the subject of debate in the Administrative Jurisdiction Division of the Council of State (ABRvS). The legal question was whether the executive board of a water board had taken sufficient account of CO₂ emissions from peatlands when adopting a decision on water levels. See ABRvS 15 September 2021, ECLI:NL:RVS:2021:2077, *AB* 2021/319, with commentary by Gils & Groothuijse.

54 See M.P.J. Oreska et al, 'The greenhouse gas offset potential from seagrass restoration', *Scientific Report* (2020) 10:7325 and D.M. Alongi & Blue Carbon, *Coastal Sequestration for Climate Change Mitigation*, Springer 2018, p. 37. See also *Verified Carbon Standard, VM0033 Methodology for Tidal Wetland and Seagrass Restoration*, v1.0, 2015 (<https://verra.org/methodology/vm0033-methodology-for-tidal-wetland-and-seagrass-restoration-v1-0/>) and R.J.M. Temmink et al, 'Recovering wetland biogeomorphic feedbacks to restore the world's biotic carbon hotspots', *Science* Vol. 376, Issue 6593 (6 May 2022).

55 See <https://zeegrasherstelwaddenzee.com/> and <https://nos.nl/artikel/2345872-proef-met-zeegras-in-de-waddenzee-verloopt-onverwacht-succesvol>.

56 Cf. art. 4, para. 1 sub D UN Climate Convention, *Treaty Series* 1992, 189.

states that Parties to the Convention should take measures to ‘conserve and enhance [...] sinks and reservoirs of greenhouse gases [...] including forests [and oceans, as well as other terrestrial, coastal and marine ecosystems] [...]’.⁵⁷ This was reiterated in the Glasgow Climate Pact.⁵⁸

Older EU regulations also have such a target, but the recent change in the EU’s emissions target means that this element of climate policy is receiving more attention.⁵⁹ The same goes for some Member States. Illustrative is the Dutch Climate Agreement of June 2019, which aim is to implement measures to act in line with national emission reduction targets. This agreement notes that ‘marsh, peat and coastal (*blue carbon*) ecosystems in particular possess both a large carbon stock, which must be protected, and a high CO₂ sequestration capacity’, and that this must be taken into account when implementing water and environment policy in the Netherlands.⁶⁰ The Climate Agreement even includes a concrete objective on this point. For example, it has been agreed that in the case of peatlands in the Netherlands – about 9% of the Dutch territory – their CO₂ emissions must be reduced by 1 Megaton CO₂ equivalents (Mton CO₂-eq) by 2030, which means that more CO₂ is being retained.⁶¹

3 Loss of Biodiversity: Restoring, Protecting and Preserving Nature as a Climate Measure

It follows from the EU Climate Change Act that to achieve the reduction targets it is necessary to “maintain, manage and enhance natural sinks in the long term and protect and restore biodiversity”.⁶² Various reports indicate that there has

57 The quote concerns a combination of the provisions of Article 5, paragraph 1 of the Paris Agreement and Article 4, paragraph 1 under d of the UN Climate Convention (*Treaty Series* 1992, 189). In the judgment of the AbRvS of 21 July 2021, ECLI:NL:RVS:2021:1597, para. 4.2, the question of whether an NGO can successfully invoke Article 5(1) of the Paris Agreement is being addressed.

58 See Glasgow Climate Pact, para. 21.

59 See Art. 15(3)(c) of Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on governance of the energy union and climate action and amending various directives and regulations, *OJ* 2018 L 328/1.

60 Climate Agreement, The Hague 28 June 2019, p. 141.

61 *Idem*, p. 137. See further on this point: M.W.W. van Gils & F.A.G. Groothuijse, ‘Juridisch instrumentarium voor de reductie van CO₂-emissie uit veengebieden: gefundeerd op slappe bodem?’, *TBR* 2021/115. Greenhouse gas emissions in the Netherlands in 2020 amounted to 165 Mton CO₂-eq. See the CBS website (www.cbs.nl/nl-nl/dossier/dossier-broeikasgassen/hoofdcategorieen/hoe-groot-is-onze-broeikasgasuitstoot-wat-is-het-doel-).

62 Art. 5 para 5 sub j European Climate Change Act.

been a major loss of biodiversity worldwide.^{63,64} Climate change is seen as one of the main causes of this.⁶⁵ Other direct causes are overexploitation of natural resources, pollution and invasive alien species.⁶⁶ EU data also confirms this picture. Despite all the nature protection and restoration measures taken by EU Member States – the Netherlands alone spent over €830 million on nature and land management in 2018⁶⁷ – only 15% of habitats protected under EU law and 27% of animal and plant species protected under EU law are in a good conservation status (excluding protected bird species).⁶⁸ The EU has thus not yet succeeded in halting the loss of biodiversity.⁶⁹ Wetlands, dunes and peatlands appear to be among the most threatened ecosystems in Europe.⁷⁰ This is due to several causes, including human-induced changes in hydrology, such as dewatering or drainage, and groundwater abstraction.⁷¹ Other threatened ecosystems include forests and grasslands. Only 14% of the total forest area in the European Union is in a good conservation status.⁷² This is due to forest fires and poor or insufficient forest management. The figures for some if not most of the individual Member States are not much better.⁷³

It is interesting to note that climate measures can be envisaged which, in addition to causing negative emissions or preventing emissions from occurring, contribute to the conservation, restoration and sustainable use of biodiversity. This also follows from the recently published EU Biodiversity Strategy

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- 63 Biodiversity or biological diversity is defined in the 1992 Biodiversity Convention (*Trb.* 1993, 54) as “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems.” (art. 2).
- 64 See also OECD, *Biodiversity, Natural Capital and the Economy: A Policy Guide for Finance, Economic and Environment Ministers*. Report prepared by the OECD for the G7 Presidency of the United Kingdom 2021, 2021, pp. 14–16.
- 65 Idem, p. 16. See also IPBES, *Global Assessment of Biodiversity and Ecosystem Services*, 2019, p. XVI and XLIV (<https://ipbes.net/global-assessment>).
- 66 Idem.
- 67 CBS, *Kosten en financiering; natuur- en landschapsbeheer*, 27 January 2021.
- 68 EEA, *State of nature in the EU Results from reporting under the nature directives 2013–2018*, 2020, pp. 41–49 and 127–135 (hereafter EEA 2020). See also J. Maes et al, *Mapping and Assessment of Ecosystems and their Services: An EU ecosystem assessment*, Luxembourg: 2020, p. 416 ff.
- 69 EEA 2020, p. 7. EEA, *The European Environment State and Outlook 2020*, Luxembourg 2019, p. 322.
- 70 EEA 2020, p. 41.
- 71 On this subject see among others K. Bastmeijer, M. van Rijswijk & J. Verschuuren, ‘Verdroging in Brabant. Een Europeesrechtelijk perspectief’, *TU/UU* June 2021.
- 72 EEA 2020, p. 132.
- 73 See for instance for the Netherlands see WUR, *Vogel en Habitatrichtlijnrapportage 2019*, p. 7 and 8 (www.natura2000.nl/sites/default/files/Nieuws/WOt-brochure%20Vogel-%20en%20Habitatrichtlijnrapportage%202019.PDF).

to 2030.⁷⁴ It follows from this document that the European Commission is committed to restoring degraded ecosystems in the European Union with the aim of both restoring biodiversity and helping to combat climate change and its consequences. In doing so, the Commission is placing the emphasis – and this is relevant here – on those ecosystems in the EU “with the most potential to capture and store carbon and to prevent and reduce the impact of natural disasters”.⁷⁵ So the strategy also focuses on greenhouse gas emission reductions and on climate adaptation. In that context, it is to be noted that coastal ecosystems such as mudflats, salt marshes, sea-grass beds, oyster beds and dunes not only provide natural protection against floods and storms but also provide other ecosystem services. For example, seagrass beds provide a foraging area, shelter and nursery for commercially and non-commercially interesting fish and shellfish, which in turn serve as food for (protected) birds. Seagrass beds prevent erosion and – importantly in the context of climate change – seagrass beds act as a carbon store.⁷⁶

Thus more emphasis is placed on the importance of ‘ecosystem services’; the capacity of ecosystems to provide goods and services to (protected) species and habitats and to humans. Examples include food, drinking water and clean air, but also protection of biodiversity, pollination of crops and preservation of valuable genetic material. Other examples are: protection against flooding, water storage, cooling in cities, recreation, rest and relaxation and valuing the existence of various animal and plant species.^{77,78}

⁷⁴ *EU Biodiversity Strategy 2030*.

⁷⁵ *Idem*, p. 6. See similarly *New EU Forest Strategy for 2030*, p. 14.

⁷⁶ See e.g. M.E. Röhr et al, *Blue Carbon Storage Capacity of Temperate Eelgrass (Zostera marina) Meadows*, 2018 *Global Biogeochemical Cycles* 32, p. 1457 et seq. On the ecosystem functions of seagrass, see Deltares et al, *Grevelingen systeem reportage*, July 2020, chap. 11.9.

⁷⁷ The System of Environmental-Economic Accounting (SEEA), which was commissioned by the UN, the EU, the FAO and the IMF, defines ecosystem services as “the contributions of ecosystems to the benefits that are used in economic and other human activities” and classifies them as follows:

- *Provisioning services* are those ecosystem services representing the contributions to benefits that are extracted or harvested from ecosystems;
- *Regulating and maintenance services* are those ecosystem services resulting from the ability of ecosystems to regulate biological processes and to influence climate, hydrological and biochemical cycles, and thereby maintain environmental conditions beneficial to individuals and society;
- *Cultural services* are the experiential and intangible services related to the perceived or actual qualities of ecosystems whose existence and functioning contributes to a range of cultural benefits.
- (see <https://seea.un.org/content/frequently-asked-questions#What%20are%20ecosystem%20services>).

⁷⁸ For an overview of ecosystem services provided by ecosystems to Dutch society, see: Compendium voor de Leefomgeving, *Ecosysteemdiensten in Nederland*, 2020, 15

An example close to home are trees in cities. Trees in urban areas reduce the temperature by providing shade, evaporation and reflection.⁷⁹ Trees are therefore used to combat or reduce heat stress in cities.⁸⁰ But trees also contribute to a better air quality, store CO₂ and capture water during rainfall. Trees also contribute to a pleasant living environment.

Taking the ecosystem services provided by such trees, the question arises how to calculate damages if serious damage is done to trees that are visually striking or important such as a monumental tree in a park or standing in a city square. In the Netherlands there is a number of court decisions concerning damage done to (monumental) trees where it was proved to be impossible to replace the damaged or cut down tree by a comparable one, for example because a comparable tree it is not available on the market.⁸¹ It appears that in such cases civil judges were prepared to determine the damage on the difference in 'tree value' between the damaged or cut down tree and the tree which is available on the market. At the time, to determine the value of the damaged tree, courts applied the 'Methode Raad', which is based on tree nursery prices and tree maintenance costs, corrected by the condition, planting method and location of the tree.⁸² An interesting aspect of that method is that even if there is no comparable specimen available on the market, there is a method available which can be used – if natural recovery, whether or not stimulated by repair measures, is not an option – to determine the loss of tree value.⁸³ Courts were also willing to use this method to determine the extent of the replanting obligations contained in municipal regulations.⁸⁴

February 2021 (www.clo.nl/indicatoren/nl1572-goederen-en-diensten-van-ecosystemen-in-nederland-). See also *Atlas Natuurlijk Kapitaal*, where ecosystem services are listed according to an international classification (www.atlasnatuurlijkkapitaal.nl/natuurlijkkapitaal). See also B. de Knegt et al., 'Graadmeter Diensten van Natuur, update 2020', *WUR*, December 2020.

79 J. Schwaab et al, 'The role of urban trees in reducing land surface temperatures in European cities', *Nat. Communications* 12, 6763 (2021).

80 See also the municipality of Amsterdam, *Strategie Klimaatadaptatie Amsterdam*, Amsterdam 2020, p. 14.

81 For an overview, see also E.H.P. Brans & B. Visser, 'Aansprakelijkheid voor schade aan bomen. Schade en Schadeberekening', 23 *Milieu en Recht*, 1996, p. 132–140.

82 See Brans & B. Visser, *idem*.

83 See about the calculation of damages in case of a damage to a tree that is not such that it has to be replaced, HR 15 December 2017, ECLI:NL:HR:2017:3145, *M&R* 2018/41, n.n.. E.H.P. Brans & H.J.S.M. Langbroek. See also the interesting conclusion to this judgment, in which it is argued, inter alia, that a concrete method of calculating damage to trees is the starting point and not a model-based or abstract method, PHR 15 September 2017, ECLI:NL:HR:2017:940.

84 See Brans & Visser, note 83.

In the meantime, there have been some interesting and relevant developments. For example, taken to the increased focus on ecosystem services, a method has now been developed which places greater emphasis on the ecosystem services provided by the tree in question.⁸⁵ Examples include CO₂ capture, air pollution capture, water regulation and cooling. And this development is not an isolated one. As part of the EU's climate policy and biodiversity strategy for 2030, the European Commission has commissioned studies into the ecosystem services provided by nine key ecosystems, including forests, croplands, wetlands, grasslands, rivers and lakes, and their economic value.⁸⁶ For here is relevant that one of these services is the capture and retention of CO₂. Other examples are flood risk reduction, water purification, pollination of crops and recreation in nature.⁸⁷

4 Net Emissions and Large-scale Restoration of European Forests, Peatlands, Grasslands and Wetlands

Given the EU's ambitious climate targets for 2030 and 2050, it is not surprising that the European Commission is taking measures to achieve these goals. One is the publication in June 2022 of a proposal for a regulation on nature restoration – referred to as the EU Nature Restoration Law – with nature restoration targets that are binding on Member States.⁸⁸ The proposal includes targets for the restoration of inter alia freshwater, marine, urban, forest and agricultural ecosystems and of pollinator populations.⁸⁹ The objective of this new EU Nature Restoration Law is “to contribute to the continuous, long-term and sustained recovery of biodiverse and resilient nature across the EU's land and sea areas by restoring ecosystems and to contribute to achieving Union

85 These include the i-Tree Eco-method. See more about this method Platform i-Tree Nederland, *De Baten van Bomen. Resultaten van i-Tree Eco in Netherland* (www.itreetools.org/documents/511/The_Benefits_of_Trees_Results_of_i-Tree_Eco_in_the_Netherlands.pdf).

86 V. Vysna et al, *Accounting for ecosystems and their services in the European Union (INCA)*. Final report from phase II of the INCA project aiming to develop a pilot for an integrated system of ecosystem accounts for the EU. Statistical report. Publications office of the European Union, Luxembourg, 2021.

87 Idem, p. 8–9.

88 See articles 4–10 of the Proposal for a Regulation of the European Parliament and of the Council on Nature Restoration, Brussels, 22.6.2022, COM(2022) 304 final (hereafter: *Proposal for EU Nature Restoration Law*).

89 Idem.

climate mitigation and climate adaptation objectives [...].⁹⁰ It is thus a step to help Member States to improve and restore damaged and carbon-rich ecosystems to good ecological status, thereby contributing to the climate mitigation and adaptation policies of the EU.⁹¹

One of the components of the proposed EU Nature Restoration is the preparation by Member States of national restoration plans whereby Member States are required to identify synergies with climate change mitigation and adaptation and disaster prevention and have to prioritise restoration measures accordingly.⁹² Other elements of the proposed regulation include extensive monitoring requirements, including concerning the stock of organic carbon in cropland mineral soils, and the development of a methodology to map and assess ecosystems and their condition. Existing nature conservation directives such as the Birds and Habitats Directives⁹³, the Water Framework Directive⁹⁴ and that relating to the Marine Strategy⁹⁵ are – as the European Commission rightly points out – inadequate in these respects.⁹⁶ The ambitions are considerable. By 2030, large areas of degraded and carbon-rich ecosystems in the EU have to be restored.⁹⁷

5 Carbon Credits⁹⁸

It follows from what is just discussed that there is a clear relationship between nature restoration and the attainment of the climate targets that the EU has set

90 Idem, p. 3. See also article 1 of the *Proposal for EU Nature Restoration Law*.

91 See i.a. para. 7, 15 en 16 of the preamble of the *Proposal for EU Nature Restoration Law*. See also EU *Biodiversity Strategy 2030*, p. 17, and EC, EU Nature Restoration Targets, (https://ec.europa.eu/environment/strategy/biodiversity-strategy-2030/eu-nature-restoration-targets_nl).

92 See i.a. article 11(5) of the *Proposal for EU Nature Restoration Law*.

93 Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds, *OJ* 1979 L 103/0001 and Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, *OJ* 1992 L 206/0007.

94 Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, *OJ* L 327/1.

95 Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy, *OJEU* 2008 L 164/19.

96 See in this sense also the European Commission, Inception Impact Assessment. EU nature restoration targets, Ref. Ares(2020)6342791 – 04/11/2020, p. 2. See similarly *EEA* 2020, p. 114.

97 EU Biodiversity Strategy to 2030, p. 7.

98 In the following, the Clean Development Mechanism (CDM) and Joint Implementation Mechanism (JI), which formed part of the Kyoto Protocol (*Treaty Series* 1998, 170),

itself for 2030 and 2050.⁹⁹ The knife cuts both ways and probably more, since these measures can also have a positive impact on water quality, not without importance given the objectives of the Water Framework Directive and where most of the Member States currently stands.¹⁰⁰ It could also lead to nitrogen reduction. Relevant, taken the scale of nitrogen emissions in the Netherlands, Belgium and a few other EU Member States and their consequences for Natura 2000 sites.¹⁰¹ In that context, the following is to be noted.

In order to stimulate natural negative emissions, the European Commission is currently working on a regulatory framework aimed at the certification of projects that result in sustainable carbon removal and storage.¹⁰² One of the aims is to create a new earnings model so that managers of agricultural land, forests, peat bogs and the like are rewarded for the measures they take to ensure that negative emissions occur.¹⁰³ Not much is known yet about the scope of this system. Will it only cover projects that lead to negative emissions – the absorption of CO₂ – such as the management and planting of forests? Or will it also cover projects aimed at reducing greenhouse gas emissions, such as projects designed to prevent the drainage or drying out of peat bogs and marshes or the change of management of agricultural land in order to improve the stock of organic carbon?

The instrument referring to is the trade in ‘carbon removal certificates’ also known as ‘voluntary carbon credits’ or ‘carbon credits’.¹⁰⁴ There is a lot of discussion about carbon rights trading. Positive: ‘carbon farmers’ fix carbon in soil by choosing a different method of tillage, financed by a company that wants to

are ignored. The same applies to the EU ETS, which created a regulated market for emissions trading.

99 It is also for this reason that it was decided to use a significant part of the 25% of the EU budget allocated to climate action for investments in biodiversity and nature-based solutions. See *EU Biodiversity Strategy 2030*, p. 20.

100 See figure 2 ‘Percentage of waterbodies, not in good ecological status or potential, per river basic district, as published on the EEA webpage ‘Ecological status of surface waters in Europe’, 18 November 2021 (<https://www.eea.europa.eu/ims/ecological-status-of-surface-waters>). See for the Netherlands: PBL, *Nationale Analyse Waterkwaliteit*, onderdeel van de Delta-aanpak Waterkwaliteit, The Hague 30 April 2020.

101 See i.a. EEA, *Agricultural Land: Nitrogen Balance*, figure 2 26 November 2019 (<https://www.eea.europa.eu/airs/2018/natural-capital/agricultural-land-nitrogen-balance>) and W.K. Hicks et al (ed.), ‘Nitrogen Deposition and Natura 2000: Science and Practice in Determining Environmental Impacts’, COST 2011.

102 European Commission, *Commission work programme 2022*, Strasbourg 19 October 2021, COM(2021) 645 final, p. 3.

103 European Commission, ‘Sustainable Carbon Cycles’, Brussels, 15.12.2021, COM(2021) 800 final, p. 5. See also TK 2021-2021, 22 112, nr. 3318, p. 3 (Fiche: Mededeling Duurzame koolstofcycli).

104 Hereinafter, primarily the term ‘carbon credits’ is used.

compensate for its greenhouse gas emissions.¹⁰⁵ Negative: it is a form of ‘greenwashing’. With this, companies or individuals buy off an act that is negative for the environment and contributes to climate change.¹⁰⁶ What is relevant here is that the use of ‘carbon credits’ creates an opportunity for a company or a person to reduce the CO₂ emissions for which that company or person is responsible by paying money to a company that invests in sustainable agriculture, nature management, etc. to reduce the total amount of greenhouse gas emissions in the world.¹⁰⁷ An example is the airline that provides the opportunity to offset the greenhouse gas emissions associated with the trip by purchasing an emission allowance or making a financial contribution to a project aimed at reducing emissions.¹⁰⁸

The European Commission is not alone in viewing carbon credits as an interesting model for financing nature and landscape management. For example, also the coalition agreement of the Dutch government explicitly takes this instrument into account.¹⁰⁹ There is also at least one bank in the Netherlands which is active in this field and finances projects which remove and capture CO₂ from the atmosphere, which should lead on the one hand to farmers generating additional income and on the other hand to companies making it possible to offset greenhouse gas emissions.¹¹⁰ With regard to the latter, it may be voluntary compensation,¹¹¹ but it may also be mandatory. Interesting in that respect is the decision of the District Court of The Hague in the climate case

105 See also *the Volkskrant* of 30 December 2021, p. 11, ‘Keukenfabriek finds carbon farmer’. The other method of tillage involves no more ploughing, no more tearing up grassland and sowing field margins with deep-rooting plant species.

106 The term ‘Greenwashing’ has many different meanings. See S.V. de Freitas Netto et al, ‘Concepts and forms of greenwashing: a systematic review’, *Environ Sci Eur* (2020) 32:19.

107 Description taken from Oxford English Dictionary.

108 One example is KLM, which offers passengers the opportunity to make a financial contribution to clean energy projects being developed in developing countries through its CO₂ZERO programme. The projects in question are verified and certified by the Gold Standard, which was set up in 2003 by the WWF and other international NGOs (www.goldstandard.org/). The NGO Stichting Fossielvrij started in July 2022 legal proceeding against KLM arguing that KLM is misleading customers who make such a financial contribution. See: <https://verbiedfossielereclame.nl/rechtszaak-tegen-klm-vanwegemisleidende-reclame-enige-mogelijkheid-zolang-er-geen-wet-is-die-fossiele-reclame-verbiedt/>.

109 Coalition Agreement, p. 15. See also the TK 2021–2022, 32 813 and 31 239, Nr. 1053, 10 June 2022, para. 3.1.5.

110 An example is Rabo Carbon Bank (www.rabobank.nl/en/about-us/carbon-bank-for-corporates).

111 See District Court The Hague 6 June 2012, ECLI:NL:RBSGR:2012:BX1737 (Face the Future), from which follows that the N.V. Samenwerkende Electriciteitsproductiebedrijven (SEP) wants to compensate its carbon dioxide emissions by, inter alia, planting forests in the Netherlands.

Milieudefensie/Shell, from which it *seems to* follow that Shell, with regard to the ‘Scope 3’ emissions – the emissions that occur through the use of Shell products by its customers, including consumers¹¹² – can comply with the dictum by opting for the purchase of ‘carbon credits’.¹¹³

Although limited in the Netherlands,¹¹⁴ there is already some experience with ‘carbon credits’. The United Kingdom for instance has the *UK Woodland Carbon Code*.¹¹⁵ The aim of the *Woodland Carbon Code* is to accelerate the establishment of forests and to develop a market for the permanent sequestration of carbon in forests. Because the market price of carbon credits is still low and does not yet provide enough financial security for conservationists and others, the UK Government has decided to create a guarantee system that will allow carbon credits to be sold to the government at a pre-guaranteed price until 2055.¹¹⁶ This is an attempt to provide financial security for landowners and tenants who are willing to invest in negative emissions through the planting of forest. Interestingly, to ensure that this system functions properly, a validation and verification system has been introduced to prevent the double sale of carbon credits and to assess the quality of what has been planted and whether the quantity of negative emissions is being achieved as planned. In this context, it is also relevant that a method has been developed to calculate the extent of these emissions. Finally, it is important to note that long-term contracts must also be entered into, lasting until 2055. That is five years after the UK should have achieved its emission target of net zero emissions.¹¹⁷

The issuing of ‘carbon credits’ is therefore a method to finance nature restoration, maintenance and conservation and to contribute to meeting emission reduction targets.

112 Scope 3 emissions are defined in the Greenhouse Gas Protocol as follows: ‘Scope 3 emissions are all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions’. See https://ghgprotocol.org/sites/default/files/standards_supporting/FAQ.pdf.

113 Section 4.4.55 of the judgment of the District Court of The Hague of 26 May 2021, ECLI:NL:RBDHA:2021:5337, whereby it must be noted that where it concerns ‘Scope 3’ emissions – some 85% of Shell’s total emissions – the question arises as to what exactly Shell is liable for. See in this sense also Brans & Scheltema, nt. 14, p. 565 et seq. See also section 4.4.30 of the District Court decision.

114 There is some experience with this kind of projects. See Stichting Nationale Koolstofmarkt. The website indicates that 25 projects have been registered, of which five have been validated. These projects will result in a reduction of 1675 tCO₂ /year (<https://nationaleco2markt.nl/>).

115 www.woodlandcarboncode.org.uk/.

116 For further information on the Woodland Carbon Code and associated warranty system, please visit www.gov.uk/guidance/woodland-carbon-guarantee.

117 See UK Climate Change Act 2008, as amended by the Climate Change Act 2008 (2050 Target Amendment) Order 2019 (S.I. 2019/1056).

6 Loss of Ability to Achieve Emission Targets

As noted earlier, the European Commission is committed to achieving negative emissions through nature restoration, maintenance or construction of nature areas – with the secondary aim of restoring biodiversity and ecosystems – and to finance this by marketing ‘carbon credits’. However, what if damage is done to nature that has been created, maintained and protected on the basis of a ‘carbon credit’? For example by a forest fire or by the long-term and deliberate extraction of groundwater from a peatland or marshland. Given the importance of negative emissions for meeting reduction targets, the obvious course of action is to seek cost recovery, for example through civil law. But against whom is the causer of the damage liable. Is it the landowner, the buyer of the ‘carbon credit’ or the central government that is keen to include the negative emissions in the national (non-ETS) emission reduction target – and what is the extent of the damage suffered?¹¹⁸

Is the damage the value of the carbon credit at the moment of destruction of the (protected) flora and fauna or nature area? Should the company that has invested in carbon credits, with the objective to compensate (partly) for the carbon emissions it has caused or that of its customers¹¹⁹ – and that advertises with this – be satisfied with that? Or should the damage be assessed at the cost of acquiring new carbon credits, plus an allowance for the loss of negative emissions resulting from the event giving rise to the damage, as a result of which, with hindsight, the undertaking has not succeeded in compensating for its emissions? Or should the damage be assessed at the cost of the measures which must actually be taken in order to achieve the same level of negative emissions, including the interim loss of emissions? This would then be compensation in kind.¹²⁰

What about the Member State that wants to include the quantity of CO₂ captured by, for example, forest planting in the implementation of the national

¹¹⁸ The starting point in this respect is that a comparison must be made between the situation in which the injured party has found himself as a result of the event causing the damage and the situation in which the injured party would have found himself in the absence of this event, whereby circumstances must also be taken into account that would have occurred in the absence of the event causing the damage, such as seasonal influences. See further on this point inter alia C.J.M. Klaassen, ‘Begroting van (toekomstige) schade: over (on)mogelijkheden en (on)zekerheden, ‘Groningen’ en ‘Vianen’ en hun betekenis in breder verband’, *NTBR* 2021/34 (with references to literature and case law).

¹¹⁹ Think of scope 3 emissions.

¹²⁰ See further on this point: D.J.B. Op Heij, ‘Schadevergoeding in natura: Een verkennend rechtspraakonderzoek en een toekomstgericht perspectief’, *WPNR* 2022/7353, p. 4 et seq.

emission reduction targets?¹²¹ This has already been the subject of legal proceedings.¹²² It might be that it concerns limited quantities of greenhouse gases. However, note that the Netherlands has managed to comply with the Urgenda ruling by tenths of a percent.¹²³ So should the damage be assessed on cost of the extra measures that the government has to take to compensate for the loss of negative emissions?

In short, how should this type of liability risk be dealt with and how should the extent of the damage that may arise be determined? Legally very interesting, but also relevant questions. Certainly if one bears in mind that the purpose of many nature projects for which 'carbon credits' are issued is to absorb and retain CO₂ for a very long time and that, according to expectations, by 2030 there will be a worldwide demand for 'carbon credits' and perhaps even scarcity.¹²⁴

In this respect, it is striking that the *Fit-for-55 programme* does not indicate that the European Commission is proposing measures in this respect. There is, at the moment, no draft directive or regulation such as the one on the geological storage of carbon dioxide, the CCS Directive.¹²⁵ That Directive includes a scheme for liability for climate damage resulting from leakage of CO₂ from an underground storage site. This includes surrendering allowances for any emissions resulting from a leakage and requiring the government to monitor and take corrective action under circumstances.¹²⁶ I am not aware of any plans in

121 Cf. TK 2021-2021, 22 112, nr. 3318, p. 7. This letter to the parliament calls attention to the way carbon credits play role in the national reduction target and in the EU ETS.

122 See District Court The Hague 6 June 2012, ECLI:RBSGR:2012:BX1737 (Face the Future), dealing with the question whether there is unjustified enrichment because the State includes negative emissions that arise due to forest planting by Face the Future, in the Dutch emission reduction target.

123 CBS, Urgenda target greenhouse gas emissions in 2020, 9 February 2022. Based on final figures from the emissions inventory, it has been established that in 2020 greenhouse gas emissions in the Netherlands were 25,5 percent lower than in 1990. For further details on the extent of Dutch emissions, the distribution between ETS and non-ETS, etc., see: www.cbs.nl/nl-nl/nieuws/2022/06/urgenda-doel-uitstoot-broeikasgassen-in-2020-gehaald.

124 C. Blaufelder et al, *A blueprint for scaling voluntary carbon markets to meet the climate challenge*, January 2021, pp. 2–4. The publication indicates that the global demand for voluntary carbon credits in 2030 will be between 1,5–2,0 gigatonnes of CO₂ and will be worth between \$5 and \$30 billion. (www.mckinsey.com/business-functions/sustainability/our-insights/a-blueprint-for-scaling-voluntary-carbon-markets-to-meet-the-climate-challenge). This does arise interesting questions, such as who has a right to negative emissions. The worldwide capacity for negative emissions is not unlimited. See further: IM Möller, 'Shell sees its future in negative emissions', August 22, 2022 (www.wur.nl).

125 Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide, *OJEU* 2009, L 140/114.

126 For more information on the CCS Directive, see W.Th. Braams & E.H.P. Brans, 'Aansprakelijkheid voor schade door opslag van CO₂', *Gemeentestem* 2009, no. 7328, pp. 577–587.

this regard, but given the importance of negative emissions for the EU, given the emission targets the Union has set itself for 2030 and 2050, this should be addressed. The European Commission had taken the initiative to propose rules on certifying carbon removals and in that respect to develop rules to monitor, report and verify the authenticity of these removals, but although highly relevant, it is a different issue.¹²⁷

7 Damage to Biodiversity, Ecosystems and Ecosystem Services: The Environmental Liability Directive

As noted before, the European Commission is committed to remediating degraded ecosystems with the aim of both restoring biodiversity and helping to combat climate change and its consequences. This is not without significance. For instance, it might be that greening cities, improving the quality of nature areas and the expansion thereof will help people to accept the necessity of emission reduction measures, including those taken in the context of energy transition. However, in that respect also the following is of relevance.

If there is a loss of carbon credits due to a forest fire or another event and the aim is to restore biodiversity and ecosystems, it is not enough to claim compensation only for the loss of carbon credits and/or the destruction of sources of negative emissions, which has actually led to an emission of greenhouse gases. In that case, based on the ‘polluter pays’ principle, efforts should also be made to recover this type of damage.

For a long time, it was impossible under civil law of most Member States to successfully hold liable those who have caused for damage to protected species and habitats, ecosystems, ecosystem services and biodiversity.¹²⁸ Often such parts of nature do not belong to anyone. And even if it were possible to hold someone liable for such damage, the problem at the time was that there was no damage suffered in an economic sense, since protected species and habitats, ecosystems and the like often have no clear economic value.

Interestingly, this has now changed. Following the example of a number of laws in the United States,¹²⁹ the EU Environmental Liability Directive has been

¹²⁷ See EC, Certification of carbon removals – EU rules (https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13172-Certification-of-carbon-removals-EU-rules_en).

¹²⁸ See i.a. E.H.P. Brans, *Liability for Damage to Public Natural Resources. Standing, Damage and Damage Assessment*, Kluwer Law International, November 2001 and J. Foulon, ‘Recent developments in French environmental law: Recognition and implementation of ecological damage in French tort law’ *Environmental Law Review*. 2019;21(4):309–317.

¹²⁹ These include the 1990 Oil Pollution Act (33 U.S.C. §2701 et seq. (1990)), which followed the 1989 Exxon Valdez incident in Alaska, and the Comprehensive Environmental

in place since 2007.¹³⁰ The system is not perfect – see below – but it is now possible to hold liable those who have caused damage to protected species and habitats, ecosystems and ecosystem services. It is no longer relevant that there may be no one who owns such resources and/or that there is no clear economic value of what has been affected. It is also irrelevant whether the owner of a protected area that has been damaged does not want nature to be restored. The government acts as a sort of trustee and can, on behalf of all of us, hold the party that caused the damage liable and take or enforce restoration measures. There also have been developed valuation methods, which make it less important that there is no market and that such natural resources or ecosystem services do not have a clear market value.¹³¹

On the basis of the Environmental Liability Directive, it is possible, under certain circumstances, to force the party causing damage to nature – for example, a sea grass bed – to take remedial measures. Interestingly, the party causing this damage is also obliged to compensate the interim loss of natural resources and ecosystem services.¹³² This would then have to be done by taking additional restoration measures. However, the Environmental Liability Directive is only applicable if, in brief, it can be demonstrated that damage has been caused to *protected* species and habitats and that this damage is significant. Not all forests, peat bogs, natural grasslands and wetlands fall within the scope of the Directive. Only those located in Natura 2000 areas are.

This immediately raises a point of concern. If carbon credits are used to invest in areas outside the Natura 2000 areas, it is highly questionable whether, given the current private and administrative law in the Member States, there are sufficient legal means available to hold a party responsible for damage to a

Response, Compensation, and Liability Act (CERCLA or Superfund), 42 U.S.C. §9601 et seq. (1980). For an interesting article on these laws and specifically the liability section for damage to (protected) flora and fauna and ecosystem services: C.A. Jones & L. DiPinto, 'The role of ecosystem services in USA natural resource liability litigation', *EcosystemServices* 29 (2018) 333ff.

130 Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage (as amended), *OJ L* 143/56–75. This Directive has been implemented in the Netherlands by way of amending the Environmental Management Act. See: E.H.P. Brans, 'Het wetsvoorstel tot implementatie van de EU-richtlijn Milieuaansprakelijkheid (2004/35/EG)', *M&R* 2007, p. 536–545 and M.G. Faure & M. Peeters e.a., *Milieuaansprakelijkheid goed geregeld?* The Hague 2010.

131 See Annex II of Directive 2004/35/EC. See further on this: J. Lipton, E. Özdemiroğlu, et al (ed.), *Equivalency Methods for Environmental Liability. Assessing Damage and Compensation under the European Environmental Liability Directive*, Springer 2018.

132 Brans, idem, p. 14 and D. Chapman & J. Ipton, in: Lipton & Özdemiroğlu e.a., a.w., p. 113 et seq. See also figure 4.2 from this publication by Lipton & Özdemiroğlu. The figure shows the interim loss of natural resources and ecosystem services.

nature area that has been realised or restored through the use of carbon credits successfully liable for this type of damage.¹³³

However, also the following is relevant. Based on experience with the Environmental Liability Directive in and outside of the Netherlands, it is clear that it is not easy to demonstrate that damage that has been caused to protected habitats and species and that the damage is such that it is possible to apply the Directive. Take the incident involving the container ship *MSC Zoe*, which lost more than 430 containers north of the Wadden Islands, causing i.a. microplastics to end up in the North Sea and the Wadden Sea area. Research has been carried out into the consequences of the incident for the ecosystem of the North Sea and the Wadden Sea.¹³⁴ It follows from this and other research that it is extremely complex to demonstrate for such areas that damage has been caused and that it is clear that the damage is of such a significance that the Directive can be applied.¹³⁵ In short, on the basis of the current text of the Directive, it is by no means certain that if damage is caused to Natura 2000 areas that because of their potential to store and retain large quantities of CO₂ have been maintained and upgraded, it is possible to enforce remediation measures and thus compensate the public for the loss of natural resources and ecosystem services (i.a. recreation). To avoid misunderstandings, I am not referring financially compensating the public. That is not the issue. The Directive is designed to ensure that compensation should take the form of remedial measures.

8 Administrative Requirements for Trading Carbon Credits

If carbon credits are going to play a role in achieving global temperature goals and EU and/or Member States emission reduction targets, there are other issues to be addressed. For instance, in order to have a successful and reliable system of carbon removals and trade in carbon credits,¹³⁶ various administrative requirements need to be fulfilled. Such as regarding how to verify that

133 Furthermore, the Environmental Liability Directive does not preclude the extension of its scope to natural sites other than Natura 2000 sites. Some Member States have done so.

134 E. Foekema et al, 'Ecologische effecten van het incident met de *MSC Zoe* op het Nederlandse Waddengebied, met focus op microplastics', *NIOZ Rapport 2021-03*.

135 See also J.S. Buerkert, *The ELD: A solution to Pollution?* Utrecht 2021 (UU thesis).

136 See in this sense among others M. Peeters, *Improving Citizen Responsibility in the North and its Consequences for the South: Voluntary Carbon Offsets and Government Involvement*, in B.J. Richardson et al. (ed.), *Climate Law and Developing Countries*, Edward Elgar 2009, p. 337 ff.

negative emissions are taking place, what the extent is of these negative emissions, how this is recorded, how it is ensured that carbon sources are retained for a long period of time, how trading in carbon credits can take place and how it is prevented that the benefits of a project that reduces emissions is sold twice of more. The European Commission also considers this relevant issues and is preparing legislation to address these issues, including the amendment of a number of directives and regulations.¹³⁷ No details are available yet, but it is safe to assume that in order to create a robust, reliable and long term voluntary carbon market, a strong legal foundation is necessary.¹³⁸

9 Concluding Remarks: The Relevance of Negative Emissions, Necessary but Not Sufficient

To avoid misunderstandings, negative emissions are not the solution. As noted earlier, negative emissions are of importance for achieving climate targets, but these alone are far from sufficient to achieve the reduction objectives of the Paris Agreement.¹³⁹ Therefore, additional measures are definitely needed. However, what is being discussed here is a promising measure that allows for multiple objectives to be achieved and that are relevant to an enjoyable life, such as emission reduction, nature conservation, nature recovery, biodiversity restoration, greening urban spaces, etc. But if such measures are taken, (partly) funded by voluntary carbon credits, the following legal issues arise. If damage occurs, administrative enforcement or civil liability must be brought in and remedial action must be taken or enforced to restore the (temporary) loss of natural resources and ecosystem services and to compensate for the greenhouse gas emissions caused by the incident. Compensating for loss of economic value of a lost carbon credit will not be enough to make the public whole.

137 See i.a. European Commission, 'Sustainable Carbon Cycles, Brussels, 15.12.2021, COM(2021) 800 final, p. 6, 8 and 19–21. The European Commission has already commissioned research into the requirements and risks of setting up a trade in ecosystem services. See, among others, I. Vizslai et al, *Payments for Forest Ecosystem Services – SWOT Analysis and Possibilities for Implementation*, EU 2016 and the EC-funded project InnoForEst (<https://innoforest.eu/project/objectives-of-innoforest/>).

138 See in this respect also: ISDA, *Legal Implications of Voluntary Carbon Credits*, December 2021

139 Cf. IPBES-IPCC co-sponsored workshop report on biodiversity and climate change. Synopsis, 2021 p. 16, <https://ipbes.net/events/ipbes-ipcc-co-sponsored-workshop-report-biodiversity-and-climate-change>.

Experience with the MSC Zoe and other environmental incidents in and outside the EU show that it is not easy to conduct ecological and economic research in such a way that a party that caused environmental damage can be successfully held liable under administrative law or civil law for the damage caused. Given the importance of nature to people,¹⁴⁰ including where it concerns emission reduction, it is necessary to invest in training people and forming multidisciplinary teams capable of assessing the extent of damage to nature, to ecosystem services, and to the loss or limitation of the possibility of achieving negative emissions. And, at least as relevant, who have the knowledge to assess how to restore what has been damaged. Given the importance of negative emissions, this too will have to be included.

¹⁴⁰ The issue of granting rights to nature and the benefits thereof is not being addressed. On this issue, see inter alia: Michele Carducci et al, Towards an EU Charter of the Fundamental Rights of Nature, December 2019 (www.eesc.europa.eu/sites/default/files/files/qe-03-20-586-en-n.pdf) and L. Burgers, J. de Outer, Rights of Nature. Case studies from six continents, 2021.