Causation and climate change litigation: 'bridge too far?'

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Causation and climate change litigation: 'bridge too far'?

Mark Wilde,* United Kingdom

Abstract: *The phenomenon of 'climate change litigation' has come to the fore in recent years as campaigners and activists have become increasingly frustrated at a perceived lack of action on the part of the international community and individual states in terms of getting to grips with the climate change problem. Existing legal mechanisms available to private parties and other bodies, such as non-governmental organizations (NGOs) have been used as a means of endeavouring to hold governments and polluters to account for the effects of climate change. The physical impact of climate change on life and property has been thrown into sharp relief by floods and wildfires in all parts of the globe. One aspect of climate change litigation focuses on the role that tort might play in attempting to secure compensation for at least part of such losses. No one would pretend that actions of this nature can actually solve the problem, but they may serve to shame polluters and so forth by establishing an actual link between their activities and the tangible consequences of climate change. However, such actions raise formidable causation difficulties which have, until recently, rendered such claims outlandish and highly speculative. Nevertheless, developments in extreme weather event attribution may be about to reduce the conceptual and theoretical barriers to bringing such claims. In this article it is argued that, from a UK perspective, existing causality tests may be capable of accommodating such evidence, although, one must be aware of countervailing policy considerations which may inhibit the courts from adopting such an approach.*

Keywords: *Climate change, climate change litigation, attribution science, tort, causation*

I. Introduction

This article has been prepared at a time of heightened public awareness regarding the tangible effects of climate change and the extreme weather events which it brings about. Barely a day passes without a news story focusing on the terrible destruction caused by floods

* Dr. Mark Wilde is Associate Professor at the University of Reading, School of Law, United Kingdom. This article is based on a paper presented at the 'Research Across Boundaries Conference: Challenges of Interdisciplinary Work in the Context of Law,' REWI, University of Graz: June 18, 2021.

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at one extreme end of the extreme weather event spectrum and raging fires at the other. The summer of 2021 has seen a tragic loss of life in many parts of Western Europe including Germany and Belgium as a result of flooding caused by excessive rainfall.[1] Moving further East Turkey has suffered some of the worst wildfires in its history with holiday makers having to be evacuated from beaches by boat as encroaching inland fires pushed people into the sea.[2]

Most would agree that we are now beginning to see the effects of climate change with our own eyes, yet the pace of change at a national and international level remains agonizingly slow. It is now more than thirty years since the international community first undertook to tackle the problem of climate change.[3] Yet, due to a range of political factors attempts to cut greenhouse gases by enough to slow, let alone reverse, the effects of climate change, seem as ineffectual as ever.

Against this background it is hardly surprising that private parties have sought to take the initiative and use whatever legal mechanisms are at their disposal to hold polluters and regulators to account; this has given rise to the fast-growing phenomenon of 'climate change litigation.' Few would argue that such cases are capable, in themselves, of bringing about major change. But they have the potential to name and shame particular parties for their contribution to the problem and could prove to be a useful campaigning tool in that respect.

Climate change litigation takes a variety of forms; however, this article focuses upon the rarest and arguably most difficult claims, namely, actions in tort seeking compensation against specific polluters. The difficulties largely arise from the causation problems associated with showing that a particular person, such as a major energy company, was directly implicated in a specific loss because of its contribution to climate change and subsequent extreme weather events. Until recently such claims would have been dismissed as outlandish and highly speculative at best, and mere publicity stunts at worst. However, the science of weather event attribution has advanced immeasurably in recent years and continues to do so. In this article it is argued that that the conceptual and doctrinal barriers to bringing such claims are now rapidly diminishing. However, it is necessary to bear in mind that there are significant differences between the scientific and legal concepts of causation. The courts do not require proof of causation according to a scientific standard in that other factors are in play including policy considerations and what justice demands. The article primarily focuses on how existing English law on causation in cases of scientific uncertainty (as influenced by Scottish cases),

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1 See *BBC*, Germany floods: dozens killed after record rain in Germany and Belgium, https://www.bbc.co.uk/news/world-europe-57846200 (last visited August 3, 2021).

2 *BBC*, Turkey: foreign tourists evacuated as wildfires threaten resorts, https://www.bbc.co.uk/news/world-europe-58043912 (last visited August 3, 2021).

3 The starting point for securing international consensus on climate change is commonly regarded as the 1992 UN Framework Convention on Climate Change; see *United Nations 1992*, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, https://unfccc.int/resource/docs/convkp/conveng.pdf (last visited August 3, 2021).

might accommodate a tortious claim brought by an injured party against a major carbon emitter.

II. Climate change litigation

As noted in the introduction, claims in tort come within the very broad umbrella term of climate change litigation. This is an ill-defined concept but, in essence, it relates to cases brought by private parties or non-governmental organizations (NGOs) against alleged polluters, governments or regulators for failing to comply with their climate change commitments. Such parties seek to exploit whatever legal mechanisms are at their disposal in a way which enables them to circumvent what might be regarded as inertia or regulatory inaction on the issue of climate change. Ganguly *et al* refer to such actions as 'strategic climate litigation' in that the aim is:

> 'To exert bottom-up pressure on governments ('strategic public climate litigation') or corporations ('strategic private climate litigation') to mitigate, adapt or compensate for losses resulting from climate change.'[4]

As regards 'strategic public climate litigation', litigants have sought to use *public* law mechanisms to bring governmental decisions and so forth within the purview of the courts. In the UK this typically takes the form of judicial review proceedings whereby, for example, the decision to authorise a particular project is challenged on the grounds that there has been inadequate consideration of the climate impact. Recently we have seen such actions brought against HS2 (the UK's high speed rail project)[5] and the third runway at Heathrow;[6] although both claims were unsuccessful due to the very broad discretion which is afforded to the decision-making authority where matters of policy are concerned. By way of contrast, in the Dutch case of *Urgenda* v. *Government of the Netherlands (Ministry of Infrastructure and the Environment)* the litigants achieved a spectacular result when they successfully used section 6:162 of the Dutch Civil Code[7] to show that the Dutch State had failed in its duty of care to society as a whole on the grounds that it had failed to do enough to tackle climate change.[8] In December 2019, the Dutch Supreme Court upheld the decision of the lower courts and ordered that the Government take steps to reduce emissions by at least 25% compared to 1990 levels by 2020 (a tall order given the timescales).[9] It should be noted that the Dutch legal system allows for tort to be used in pursuit of collective public interest objectives in a manner which is quite alien to English common law where such claims would

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4 *Ganguly/Setzer/Heyaert*, If at First You Don't Succeed: Suing Corporations for Climate Change, Vol. 38, No. 4 Oxford Journal of Legal Studies 2018, 841 (843 f).

5 England and Wales Court of Appeal (Civil Division) July 31, 2021, R (on the application of Packham) v. High Speed 2 Ltd, [2020] EWCA Civ 1004.

6 United Kingdom Supreme Court December 16, 2020, R (on the application of Friends of the Earth Ltd & other) v. Heathrow Airport Ltd, [2020] UKSC 52, [2021] PTSR 190.

7 See *Dutch Civil Law,* Dutch Civil Code Book 6 The law of obligations, http://www.dutchcivillaw.com/civilcodebook066.htm (last visited July 26, 2021).

8 For analysis of the Hague District Court decision see *De Graaf/Jans*, The Urgenda Decision: Netherlands liable for role in causing dangerous global climate change, Vol. 27, No. 3 Journal of Environmental Law 2015, 517.

9 Supreme Court of the Netherlands December 20, 2019, 19/00135, Urgenda, ECLI:NL:HR:2019:2007. For all judgments and declarations at each stage of the litigation see *Sabin Center for Climate Change Law – U.S. Litigation Chart*, Urgenda Foundation v. State of the Netherlands, http://climatecasechart.com/climate-change-litigation/non-us-case/urgenda-foundation-v-kingdom-of-the-netherlands/ (last visited July 26, 2021).

fall squarely within the realms of judicial review. Thus, despite the reliance upon tortious concepts in *Urgenda*, it is clearly an example of strategic *public* climate litigation in that it does not focus on specific losses.

Far more unusual is what might be termed *pure* 'strategic private litigation' in which claims for damages, or even injunctive relief, are brought in tort (or non-contractual liability as it is known in many European jurisdictions) against specific polluters for their historic and current contribution to climate change. This raises additional difficulties in that, rather than focusing on the decision-making process, one actually has to prove, on the basis of existing causality tests, that a company actually did contribute to the harm in a significant way. Such actions encounter major evidential difficulties due to the timescales involved, the number of polluters and potential victims, the complexities of the manner in which pollutants contribute to climate change and the manner in which this in turn might lead to extreme weather events causing property damage and personal injury.

Nevertheless, in the United States in particular there have been attempts to bring home such claims over a number of years. In what is now described as the 'first wave' of litigation[10] these claims were initially dismissed for a number of reasons including the argument that they raised 'non-justiciable political questions…' as the court put it in *Comer v. Murphy Oil USA Inc*.[11] However, it was also held that the causation difficulties were likely to be insurmountable which meant that the claimants did not have standing to pursue the litigation. Lack of causation also came to the fore in the case of *Village of Kivalina v. Exxon Mobil Corp*[12] in which a small community faced being entirely inundated by encroaching waters. As in *Comer*, the causation difficulties meant that the community did not have locus standi to pursue damages under public nuisance.

However, this article does not dwell upon the US cases, partly because they have already been extensively written about,[13] but also because they are not conventional tort cases. Very often they take the form of public nuisance actions brought by a State and in that sense, there is a strong public law element to them.[14] As a result, they have much in common with the Dutch *Urgenda* litigation which, despite the use of tortious terminology, sits very much towards the strategic *public* strategic climate change end of the spectrum. Indeed, this aspect came more to the fore in the Supreme Court decision where human rights argument played

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10 See *Ganguly/Setzer/Heyaert*, Vol. 38, No. 4 Oxford Journal of Legal Studies 2018, 846.

11 United States District Court, S. D. Mississippi, Southern Division March 20, 2012, No. 1:11CV220-LG-RHW, Comer v. Murphy Oil Usa, Inc., 839 F. Supp. 2d 849 (S.D. Miss. 2012) para 29 (Guirola Jr., J.).

12 United States Court of Appeals for the Ninth Circuit September 21, 2012, No. 09-17490, Village of Kivalina v. Exxon Mobil Corp, 96 F.3d 849 (9th Cir. 2012).

13 See e.g. *Ganguly/Setzer/Heyaert*, Vol. 38, No. 4 Oxford Journal of Legal Studies 2018, 846 ff; *Akhtar*, Greenhouse gas emissions, litigation and reliance on scientific data, Vol. 25, No 4. Environmental Liability, Law Practice and Policy 2017, 151.

14 For analysis of the use of public nuisance in some of the earlier US climate change litigation cases see *Stedman*, Climate Change and Public Nuisance Law: AEP v. Connecticut and Its Implications for State Common Law Actions, Vol. 36, No. 3 William & Mary Environmental Law and Policy Review 2012, 865.

a more prominent part.[15] Having said that it is fully acknowledged that the boundary between public and private law is fluid, especially where claims are pursued in respect of public goods.[16]

The focus of this paper is very much upon the extent to which a specific person, whose property has, for example, been damaged by flooding, could seek damages against an energy company on the grounds that their carbon emissions contributed to the climate instability which brought about an extreme weather event. Claims of this nature sit squarely at the strategic *private* climate change litigation end of the spectrum. At this point it is particularly worth noting that many people are now unable to obtain insurance cover due to the frequency of flooding events in their areas with the result that, in the absence of government support, civil litigation might provide the only means of redress.[17]

The type of claim in question is exemplified by litigation which has been pursued by a Peruvian farmer and mountain guide, Luciano LLiuya, against the energy company RWE in the German courts in respect of the alleged contribution of that company to climate change and the consequent impact on his local environment and livelihood.[18] In particular, he alleged that the company had contributed to the melting of glaciers and the rapid expansion of a glacial lake that posed the risk of flooding the valleys below with obvious consequences for farming. He argued that the defendant had contributed to a nuisance and invoked paragraph 1004 of the German Civil Code[19] in this respect and sought damages reflecting the losses that he had incurred as a result of having to take mitigation measures. However, his claim recognized that RWE is one of many polluters who had contributed to the problem over many years. Thus, he claimed damages amounting to 0.47% of his losses (which worked out to €17,000) which he argued represented RWE's percentage contribution to overall carbon emissions. On the face of it, this sounds like a modest claim but, of course, the legal significance of establishing the liability of a particular company for its contribution to specific damage flowing from climate change is immeasurable. 0.47% scaled up to thousands or even hundreds of thousands of claims would quickly amount to very substantial sums of money. Predictably, the claim ran into causation problems and the Essen Regional Court held that there was 'no linear causal chain.'[20] However, the Higher Regional Court of Hamm allowed an appeal and held that there

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15 In the Urgenda case the litigants successfully engaged Article 2 of the European Convention on Human Rights (ECHR) on the right to life and right to respect for private life, family life, home and correspondence respectively. For analysis, see *Pedersen*, The networks of human rights and climate change: The State of the Netherlands v Stichting Urgenda, Supreme Court of the Netherlands, 20 December 2019 (19/00135), Vol. 22, No. 3 Environmental Law Review 2020, 227.

16 There is an extensive theoretical debate regarding the use of tort in pursuit of public interest objectives and its relationship with public law mechanism which is beyond the scope of this paper. For a review of the main arguments in an environmental context see *Wilde*, Civil Liability for Environmental Damage: A Comparative Analysis of Law and Policy in Europe and the US[2] (2013) chap 4.

17 See *Denniss*, Mice, floods and the climate crisis: why your insurance won't cover society-wide catastrophes, https://www.proquest.com/blogs-podcasts-websites/mice-floods-climate-crisis-why-your-insurance-won/docview/2539407836/se-2?accountid=13460 (last visited July 28, 2021).

18 The jurisdictional and conflict of laws issues are beyond the scope of this paper; suffice it to say the German courts accepted jurisdiction on the grounds of the domicile of RWE.

19 See § 1004 BGB: 'If the ownership is interfered in another manner than by removal or retention of possession, the owner may require the disturber to remove the interference. If further interferences are to be feared, the owner may seek a prohibitory injunction.'.

20 Essen Regional Court December 15, 2016, 2 O 285/15, ECLI:DE:LGE:2016:1215.2O285.15.00. For all judgments and declarations at each stage of the litigation see *Sabin Center for Climate Change Law – U.S. Litigation Chart*, Luciano Lliuya v. RWE AG, http://climatecasechart.com/climate-change-litigation/non-us-case/lliuya-v-rwe-ag/ (last visited July 28, 2021).

was an arguable case, and that the claimant should have the opportunity to try and establish causation at trial. Moreover, the mere fact that multiple parties may have contributed to the harm would not preclude a fair assessment of liabilities. The costs of remediation and mitigation work had been clearly set out and existing legal mechanisms facilitated a fair apportionment of liability:

> 'Moreover, as the defendant's argument ultimately seeks to establish, the fact that multiple parties have caused the interference ('disturbers') does not necessarily mean that eliminating that interference would be impossible. On the contrary, the established interpretation is that, in the case of multiple 'disturbers', each participant must eliminate its own contribution, and joint and several liability is only considered if the contributions cannot be separated and there is equal importance. … In addition, it is not necessarily the case, and has not yet been determined, that the protective measures will ultimately be implemented by the public authority. The Senate did not interpret the term 'third party', as it was used in the plaintiff's claim, as referring exclusively to the state.'[21]

There has even been an attempt to use tort-based remedies to prevent harm from occurring in the first place. In a first instance decision of the Federal Court of Australia in *Sharma by her litigation representative Sister Marie Brigid Arthur v. Minister for the Environment*[22] it was held that a government minister owes a duty of care to the children of Australia not to augment carbon emissions by authorizing new coal mining development. Moreover, they are entitled to a *quia timet* injunction so as to prevent a breach of that duty of care.

Thus, we are fast reaching a situation whereby various courts around the globe are beginning to accept that it is possible to conceptualise some of the harms associated with climate change as individual losses which might invite the application of tort-based remedies.[23] However, causation is likely to provide one of the most difficult obstacles for litigants to surmount. Given that a major comparative analysis is impossible given the confines of a short article, the remainder of this paper uses English and Welsh and Scottish law as a case study for examining how the courts in these jurisdictions might approach the issue of causation if presented with a tort claim arising from loss caused by an extreme weather event attributed to climate change. Nevertheless, there are some core issues which are of general application.

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21 Essen Regional Court December 15, 2016, 2 O 285/15, ECLI:DE:LGE:2016:1215.2O285.15.00; see Hamm Higher Regional Court February 7, 2018, I-5 U 15/17.

22 Federal Court of Australia May 27, 2021, VID 607 of 2020, Sharma by her litigation representative Sister Marie Brigid Arthur v. Minister for the Environment, [2021] FCA 560. The case will inevitably be appealed.

23 See *Kumar/Frank*, Holding Private Emitters to Account for the Effects of Climate Change: Could a Case like Lliuya Succeed under English Nuisance Laws?, Vol. 12, No. 2 Carbon & Climate Law Review 2018, 110; see also *Hinteregger*, Civil Liability and the Challenges of Climate Change: A Functional Analysis, Vol. 8, No. 2 Journal of European Tort Law 2017, 238; *Akhtar*, Greenhouse gas emissions, "Event Attribution" and Locus Standi in Foreign Courts, Vol. 50, No. 4-5 Environmental Policy and Law 2021, 309.

III. Causation and scientific uncertainty: a UK perspective

The starting point for this analysis is provided by existing causality tests as these are all that the courts would have to work with if an equivalent of Luciano Lliuya were to seek damages against a UK domiciled energy company (such as BP etc) in respect of its contribution to climate change and subsequent damage to property and so forth.

In the legal systems of the UK the basic causation test is the 'but for' test – 'but for the defendant's acts or omissions would the harm have occurred?'[24] If the answer to that is 'no, the harm would not have occurred', then clearly, whatever the defendant did or did not do was of causative significance.[25] We can instantly see the limitations of this in that it is a binary test which demands a yes or no answer. Many types of harm or injury result from a range of factors, especially where we are dealing with matters such as industrial disease. In such cases applying the 'but for' test will not yield a clear yes or no answer. Alternatively (and this is of crucial importance for present purposes), it might lead one to say 'yes, the harm might have occurred, irrespective of what the defendant did or not do, but there are other factors which suggest that we ought not to let the defendant off the hook.' This might demand some 'massaging' of causality tests as some commentators have put it.[26] Although this only works to a point, and it may be necessary to build a new test or an exception insofar as one can within the confines of a system built upon judicial precedent – that is the essence of English Common Law. As we shall see, this may be the point at which lawyers and scientists part company in terms of how they use evidence. At this point, however, it is instructive to take a step back and look at how causation tests have developed so as to deal with issues of scientific uncertainty in cause and effect.

A. Historical perspectives

Of course, climate change is the ultimate environmental problem, and it is worth noting that there is nothing new about causation problems in an environmental context. Indeed, ever since industrial activity rapidly expanded in the wake of the Industrial Revolution, it has been difficult to pin pollution on a specific polluter where there are many businesses engaged in the same activity. In the early 1980s John McLaren wrote a seminal piece on how English nuisance law developed in the light of the new challenges created by the Industrial Revolution.[27] It became increasingly difficult for those suffering property damage, as a result of smoke and effluvia, to bring nuisance claims against specific polluters due to the proliferation of factories in a dense industrial area. We are all familiar with images of forests of factory chimneys in industrial cities and the 'dark satanic mills' of William Blake fame. With so many chimneys pumping identical pollutants into the atmosphere it was near impossible for a litigant to link their losses to a specific factory chimney. The problem was succinctly

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[24] As exemplified by the standard textbook case of High Court of Justice Queen's Bench Division November 8, 1969, Barnett v. Chelsea and Kensington Hospital Management Committee, [1969] 1 QB 428.

[25] High Court of Justice Queen's Bench Division November 8, 1969, Barnett v. Chelsea and Kensington Hospital Management Committee, [1969] 1 QB 428. By the time the patient presented himself for treatment it was already too late meaning that the doctor's negligence had no effect on the outcome.

[26] See *Steel/Ibbetson*, More Grief on Uncertain Causation in Tort, Vol. 70, No. 2 The Cambridge Law Journal 2011, 451 (452).

[27] *McLaren*, Nuisance Law and the Industrial Revolution – Some Lessons from Social History, Vol. 3, No. 2 Oxford Journal of Legal Studies 1983, 155 (198).

described by a landowner in evidence to a House of Lords Select Committee set up to investigate the problem of toxic emissions from the Alkali Industry:[28]

> 'I might explain that the reason why I have not myself brought actions against the alkali manufacturers at St. Helens has been simply this: I am assured by my solicitor that it is impossible to bring an action with any chance of success unless I can put my finger upon the right man. I cannot put my finger upon the right man, with all the assistance I can get, when there are a dozen or 20 works all emitting vapours at the same time.'[29]

McLaren, who conducted much archival work for his article, describes how solicitors would hire runners to actually follow trails of smoke from factory chimneys to see if they ended up anywhere near their clients' property.[30]

Not surprisingly this technique of chasing smoke trails was very limited in terms of efficacy due to the extent to which it relied upon the imperfections of eyewitness testimony.[31] Moreover, it clearly did not work in respect of emissions into water where, in the absence of a very distinctive plume, there was no way following the pollutants. In fact, this is where the first interesting case law developments occurred and Steel and Ibbetson,[32] cite a small number of nineteenth century Scottish cases where the courts were prepared to hold a factory liable on the basis that its emissions made a 'material contribution' to the harm. In *Duke of Buccleuch v. Cowan*,[33] for example, the pursuer sought an injunction against a paper mill in respect of the pollution of a river in which he enjoyed riparian rights. However, there happened to be a concentration of paper mills in the area each emitting identical pollutants into the water. Lord Cowan held that:

> 'The question is whether each and all of the parties who have materially contributed to the wrong may not be made responsible for the consequences? Or whether they are to evade responsibility for their acts because it is not proved, or cannot be proved, that their individual pollution of the stream, although materially contributing to it, amounts in itself to a nuisance?'[34]

Thus, the defendant was precluded from evading liability simply on the basis that his contribution to the harm could not be disentangled from others engaged in a similar activity. Moreover, for the purposes of establishing whether the defendant's contribution to the harm

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28 An early chemicals industry which used the 'Le Blanc process' to produce caustic soda used in glass manufacture and soap.

29 *McLaren*, Vol. 3, No. 2 Oxford Journal of Legal Studies 1983, 198, citing United Kingdom House of Lords 1862, E17/194/1, Select Committee Report on Inquiry of Noxious Vapours, Minutes of Evidence 17, Q 161.

30 *McLaren*, Vol. 3, No. 2 Oxford Journal of Legal Studies 1983, 198.

31 In an echo of the past there has been a case in recent times which failed due to the unreliability of such evidence; see High Court of England and Wales September 28, 2012, Anslow v. Norton Aluminium, 2012 EWHC 2610 QB regarding emissions from an aluminium foundry. The claims relating to noise, dust and smoke failed on the basis that the eyewitness evidence could not reliably link specific emissions with specific harms due to the amount of industrial activity in the area.

32 See *Steel/Ibbetson*, Vol. 70, No. 2 The Cambridge Law Journal 2011, 453.

33 Scottish Court of Session November 28, 1866, Duke of Buccleuch v. Cowan & Others, 5 M 214.

34 Scottish Court of Session November 28, 1866, Duke of Buccleuch v. Cowan & Others, 5 M 228 (Lord Cowan).

was 'material' it would not be necessary to show that his contribution alone would have been sufficient to cause the loss:

> '...it is not indispensable for each of the pursuers to prove that any one of the mills would of itself, if all the other mills were stopped, be sufficient to pollute the river to the "effect of creating a nuisance to him, but that the opposite of that is laid down—namely, that it is sufficient to entitle a pursuer to a verdict to prove that the water is polluted by the mills, and that each defender materially contributes to that pollution.'[35]

Steel and Ibbetson argue that this approach massages the *conceptual* side of causation in that the court accepts that actionable harm occurs where the defendant contributes to the harm, even if their actions were not the sole or even the main cause of the harm.[36] In any event, one can square this approach with 'but for' if one so desires in that it is possible to say that the defendant's contribution was the 'straw that broke the camel's back.' At the risk of overloading the issue with metaphors Steel's and Ibbetson's weak bridge analogy is very helpful in this respect. Any road user will be familiar with warning signs alerting drivers to weight restrictions for weak bridges. Imagine that two lorries, one very large and heavy (but still just within the weight restriction for the bridge) and one much smaller vehicle approach the bridge from opposite ends and drive straight onto the bridge at the same time causing structural damage as a result. Intuitively, one would say that the largest and heaviest lorry is the main cause, however, it is factually accurate to say that the bridge would not have been damaged 'but for' the contribution made by the smaller lorry.[37]

B. The industrial disease cases

The concept of 'material contribution' does not appear again in the case law until the 1950s when it was resurrected in the context of industrial disease cases. This is one of many examples of where Scottish law has shaped English law by way of the House of Lords which was the apex court for all the home nations of the UK before the establishment of the Supreme Court in 2010.

1. Material contribution

In *Bonnington Castings v. Wardlaw*[38] an employee at a foundry contracted pneumoconiosis as a result of exposure to silica dust. The causation problem arose from the fact that there were multiple sources of exposure in the factory and only one could be pinned on a specific breach of duty on the part of the employer. Thus, he breathed in both 'guilty' and 'non-guilty' particles as they have been somewhat inelegantly described. It was, of course, impossible to separate out the effect of the two groups of particles in that their effect was cumulative. Lord Reid, in the House of Lords, proposed that it would suffice to show that the guilty dust had

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35 Scottish Court of Session November 28, 1866, Duke of Buccleuch v. Cowan & Others, 5 M 234 f (Lord Cowan).

36 See *Steel/Ibbetson*, Vol. 70, No. 2 The Cambridge Law Journal 2011, 453 ff. *Steel* and *Ibbetson* argue that there are two aspects of causation, namely, the 'evidential' and the 'conceptual.' The evidential side concerns whether it can be proved that the defendant's act or omission actually brought about the state of affairs which caused the harm. The conceptual side focuses on whether the state of affairs brought about by the defendant should be regarded as the harm.

37 See *Steel/Ibbetson*, Vol. 70, No. 2 The Cambridge Law Journal 2011, 454.

38 United Kingdom House of Lords March 1, 1956, Bonnington Castings Ltd v. Wardlaw, [1956] AC 613.

made a 'material contribution' to the harm. Moreover, he said that it was not necessary to quantify the extent of this contribution in any precise or scientific way; it would suffice to show that the dust arising from the breach of duty made more than a '*de minimus*' contribution to the harm.[39] This strongly mirrored the approach adopted by the court in the river pollution case of *Duke of Buccleuch*.[40] The approach adopted by Lord Reid left the court with a considerable amount of leeway in terms of determining what constituted a significant contribution.

2. Material increase in risk

Following *Bonnington Castings*, most student textbooks on English tort law then jump straight to the leading case of *McGhee v. NCB* (which is of crucial importance for present purposes); this, however, overlooks a small interim step which is worthy of brief mention in order to provide a complete picture of how the case law developed. Just a year after the *Bonnington Castings* decision another Scottish case with near identical facts came before the House of Lords, namely, *Nicholson v. Atlas Steel Foundry & Engineering Co*.[41] On this occasion claims were brought on the basis of breaches of health and safety legislation as opposed to the common law of negligence. Interestingly, *Bonnington* was applied but the judge, Viscount Simmonds, held that the defendant had *increased the risk* of the disease occurring rather than using the expression *material contribution*. This may be the point at which the concept of *increase in risk* enters the legal lexicon in the context of causation and the significance of this shall be expanded in the following analysis.

At this point it is necessary to turn to the leading case of *McGhee v. NCB*[42] which continues to play a highly significant role in terms of how the courts approach scientific uncertainty on cause and effect. The brief facts concerned a workman who had been employed to unload bricks from a hot, smoky, and dusty brick kiln. Hitherto he had been employed to undertake cleaner duties and as soon as he was put to work in the brick kilns, he developed dermatitis. For the purposes of establishing liability, it was not enough to show that he had contracted dermatitis at the brick works; it was necessary to link this with a specific breach of duty on the part of the employer. The only such breach which could be identified was a failure to provide showering facilities at the end of his shift which meant that he had to cycle home covered in dust thereby prolonging his period of exposure to the harmful element. On the face of it the case was similar to *Bonnington* but there was one crucial difference in that McGhee was not a case of cumulative exposure. None of the dust exposure in the brick kiln itself was attributable to any breach of duty on the part of the employer and in that sense, it was all *innocent dust* at the point of initial exposure in the kiln: the question was, therefore, 'did the failure to provide showering facilities convert all the dust on his skin to *guilty dust* at the point where he cycled out of the brickworks gates?' Once again, the case fell before Lord Reid in

39 United Kingdom House of Lords March 1, 1956, Bonnington Castings Ltd v. Wardlaw, [1956] AC 621.
40 Scottish Court of Session November 28, 1866, Duke of Buccleuch v. Cowan & Others, 5 M 214.
41 United Kingdom House of Lords March 14, 1957, Nicholson v. Atlas Steel Foundry & Engineering Co, [1957] 1 WLR 613.
42 United Kingdom House of Lords November 15, 1972, McGhee v. National Coal Board, [1973] 1 WLR 1.

the House of Lords who had the opportunity to revisit his decision in *Bonnington*. On this occasion it was held that the failure to provide showers materially increased the risk of the dermatitis and that this would suffice to establish liability.[43] The solution adopted by Lord Reid reflected the manner in which the medical evidence had been put. Expert witnesses were not prepared to say that the dust, as a matter of scientific fact, had caused the dermatitis, but they were prepared to say that the provision of showers would have 'materially decreased' the risk of dermatitis.[44]

McGhee has sparked an enduring debate about whether material increase in risk is synonymous with material contribution or whether it constitutes a new test. If one looks at Lord Reid's judgment it is clear that, so far as he was concerned, there was no practical difference between the two approaches.[45] Lord Salmond seemed to think it was little more than a matter of semantics:

'In the circumstances of the present case, the possibility of a distinction existing between (a) having materially increased the risk of contracting the disease, and (b) having materially contributed to causing the disease may no doubt be a fruitful source of interesting academic discussions between students of philosophy. Such a distinction is, however, far too unreal to be recognised by the common law. I would accordingly allow the appeal.' [emphasis added][46]

However, others, including Steel and Ibbetson are of the view that the increase in risk approach went considerably beyond material contribution and represented far more than a mere massaging of existing causality tests. They argue that one cannot reconcile material increase in risk with factual causation on a balance of probabilities and the approach has to be regarded as an exception to the normal rules on causation.[47] Following *McGhee*, the issue was, how far would the courts be prepared to go with this exception - the answer was, 'not very far at all.'

Perhaps worried that they had created an unruly monster the House of Lords reined back its creation in the medical negligence case of *Wilsher v. Essex Area Health Authority*.[48] In this case the negligent actions of medical staff were only one of a range of explanations for the injury caused to a premature infant. Overturning the Court of Appeal, the House of Lords held that material increase in risk could not apply where each potential cause was of a fundamentally different nature. The significance of this distinction is expanded upon below.

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43 United Kingdom House of Lords November 15, 1972, McGhee v. National Coal Board, [1973] 1 WLR 1 4H.

44 United Kingdom House of Lords November 15, 1972, McGhee v. National Coal Board, [1973] 1 WLR 1 4H.

45 United Kingdom House of Lords November 15, 1972, McGhee v. National Coal Board, [1973] 1 WLR 1 5B. He states, 'From a broad and practical viewpoint I can see no substantial difference between saying that what the defender did materially increased the risk of injury to the pursuer and saying that what the defender did made a material contribution to his injury.'

46 United Kingdom House of Lords November 15, 1972, McGhee v. National Coal Board, [1973] 1 WLR 1 12H-13A.

47 *Steel/Ibbetson*, Vol. 70, No. 2 The Cambridge Law Journal 2011, 456: ' ...treating a material increase of risk as equivalent to a material contribution to injury created too broad a base for liability, since anything which had the potential to bring about a result could – obviously – be said to have increased the risk of that result occurring.'; with *McGhee* English law first clearly departed from normal evidential rule in proof of causation.

48 United Kingdom House of Lords March 10, 1987, Wilsher v. Essex Area Health Authority, [1987] QB 730.

3. Material increase in risk and the asbestos cases

In recent years the only significant case law developments in causation in the legal systems of the UK have occurred in the asbestos exposure cases where victims have contracted mesothelioma and asbestosis. In *Fairchild v. Glenhaven Funeral Services Ltd*[49] the claimants had worked for a number of different employers, and it was impossible to say at which place of work the 'guilty asbestos fibre' had been inhaled. The House of Lords was prepared to apply the material increase in risk approach on the grounds that each employer had been guilty of negligence and the damage was commensurate with such a breach. The key aspect of the case was that each employer had enhanced the risk of lung diseases associated with asbestos as a result of their various breaches of duty. This enabled the House of Lords to distinguish *Wilsher* on the grounds that there had been no such common linkage between the alternative explanations for the harm in that case. This line of reasoning was pushed a step further in *Barker v. Corus*[50] in that part of the claimant's exposure stemmed from a period of self-employment which was not a tortious cause in that one cannot commit a tort against oneself. The fact that one of the sources of exposure was non-tortious was significant in that it removed one of the common threads linking together the potential sources of exposure to asbestos. Nevertheless, the House of Lords was still prepared to find that causation had been established on the basis of the material increase in risk approach. However, damages were awarded on a *several* as opposed to a *joint and several* basis meaning that compensation was calculated according to the length and intensity of exposure to asbestos at a particular place of work. From this it can be seen that there is a link with one of the aspects of the *Lliuya* litigation to which we shall return in due course; namely, proportionate liability correlating to a defendant's overall contribution to the quantities of pollutants in the environment. However, the UK Government instantly stepped in by way of legislation and restored joint and several liability in the specific context of asbestos so as to ensure that no one was left undercompensated. This is a peculiarity of the English common law system in that it shows how the government may step in by way of legislation in order to correct what is perceived as a wrong turn in the development of the common law.[51] A clear policy decision was taken to hold industry accountable for the full costs of asbestos notwithstanding the causation difficulties.

In *Sienkiewicz v. Greif*[52] a claim was brought by the estate of an office worker in a steel drum factory where large amounts of asbestos were present. However, in common with *Barker*, one of the potential sources of exposure was non-tortious, namely background levels of asbestos in the atmosphere of the industrial area in which the factory had been situated (Ellesmere Port near Liverpool); this was described as 'environmental exposure' in that it was the cumulative effect of all the industrial activities in the area and could not be linked with

49 United Kingdom House of Lords June 20, 2002, Fairchild v. Glenhaven Funeral Services Ltd, [2002] UKHL 22, [2003] 1 AC 32.
50 United Kingdom House of Lords May 3, 2006, Barker v. Corus, [2006] UKHL 20, [2006] 2 AC 572.
51 See sec 3 Compensation Act 2006.
52 United Kingdom Supreme Court March 9, 2011, Sienkiewicz v. Greif, [2011] UKSC 10, [2011] 2 AC 299.

specific sources. This aspect of the case is highly significant for present purposes in that it steers the issue back towards the environmental sphere. The newly established UK Supreme Court, which had only recently replaced the House of Lords, applied the material increase in risk approach, notwithstanding the fact that not all potential causes were tortious. Moreover, three very important propositions emerged from the litigation. Firstly, it was made clear that material increase in risk could only be used where it was 'impossible' to establish causation via conventional means.[53] Secondly, the double the risk approach (which had been applied in some US cases and some earlier UK cases) was rejected as the test for determining what increase in risk is significant – at least in cases involving asbestos exposure.[54] The third major point to emerge was that epidemiological evidence (or other forms of mathematical modelling or statistical analysis) had to be used with care and would normally need to be buttressed by other evidence rather than entirely on its own.[55]

For present purposes a major limitation of these cases is that they have served to render the concept of 'increase in risk' as synonymous with asbestos litigation; indeed, it is now even sometimes referred to as the 'Fairchild exception.' In fact, some judges have gone so far to say that asbestos should be treated as a unique case and this more flexible approach should never be extended to other areas.[56] Nevertheless, so far as the position under English law is concerned, *Sienkiewicz* would be the starting point for anyone seeking to sue, for example, an energy company whilst overcoming the causation difficulties.

IV. Climate change attribution

At this point it is necessary to return to climate change litigation specifically and the challenges associated with linking damage to identifiable polluters. Before doing so it is instructive to briefly outline some of the developments which have taken place in the field of attribution science and the extent to which tests such as material increase in risk could be assimilated with such evidence and render it usable in a court of law.

A. The science of extreme weather event attribution

The science of extreme weather event attribution has been around for about 17 years and seeks to establish links between climate change and weather events.[57] In essence, various computer modelling techniques bring together as much data as scientists are able to collate

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53 United Kingdom Supreme Court March 9, 2011, Sienkiewicz v. Greif, [2011] UKSC 10, para 18 (Lord Phillips).

54 United Kingdom Supreme Court March 9, 2011, Sienkiewicz v. Greif, [2011] UKSC 10, para 160 (Lord Rodger).

55 United Kingdom Supreme Court March 9, 2011, Sienkiewicz v. Greif, [2011] UKSC 10, para 96 (Lord Phillips). His Lordship referred to the 'taxicab' example whereby there are two taxi firms in a town; one operates yellow cabs, and one operates blue cabs and has twice as many vehicles in its fleet than the firm with yellow cabs. One dark night a pedestrian is knocked down and no one takes a note of the colour of the cab. A purely statistical analysis would suggest that he was knocked over by a blue cab. However, it would clearly be ludicrous to make such an assumption and, 'Much more significant would have been the care taken by the rival taxi firms in employing competent drivers, and the past accident record of the firms in question.' (not to mention, of course, whether there is any damage to a vehicle).

56 See Lord Hoffmann writing extra-judicially about the issue *Hoffman*, Fairchild and After, in *Burrows/Johnston/Zimmermann* (eds), Judge and Jurist: Essays in Memory of Lord Rodger of Earlsferry (2013) 63.

57 For a more detailed overview of some of the methodologies see *Marjanac/Patton*, Extreme weather event attribution science and climate change litigation: an essential step in the causal chain?, Vol. 36, No. 3 Journal of Energy & Natural Resources Law 2018, 265; *Jézéquel et al*, Singular Extreme Events and Their Attribution to Climate Change: A Climate Service – Centered Analysis, Vol. 12, No. 1 Weather, Climate and Society 2020, 89.

(from the historical record, geological surveys and so forth) and build a counterfactual world which strips out human activity. By comparing this with what is happening in the actual world we can start gaining some sense of the impact of human activity on the climate and how this has increased the likelihood of extreme weather events causing flooding, forest fires and so forth. As the techniques improve and become more sophisticated, they are able to start drilling deeper into the data and assess the contribution of particular sectors such as oil and gas. Richard Heede's *Carbon Majors study*[58] is a ground-breaking piece of work in this respect in that the author was able to quantify the proportion of greenhouse gas emissions which are attributable to specific companies. This was achieved by sifting through mountains of published data including annual production reports. Chevron was identified as the leading polluter responsible for 3.5% of total emissions to date, closely followed by ExxonMobil at 3.2% and BP at 2.5%. Of course, this does not link these companies with specific extreme weather events but the data feeds into the quest to determine how a percentage increase in greenhouse gas emissions translates into an increase in the likelihood of extreme weather events.

B. Climate change attribution and existing causality tests

In terms of packaging such data in a form which could be utilized in litigation, it is clearly commensurate with an approach based upon material increase in risk. As Marjanac and Patton make clear: 'Event attribution is … most frequently the study of changing probabilities rather than a deterministic expression of causality.'[59] The foregoing analysis of the case law in the UK demonstrates that this would clearly be compatible with a legal test based upon material increase in risk in that both the scientific test and the legal test concern probabilistic causation and do not rely upon trying to provide a definitive yes or no answer. For example, one would not ask the question, 'but for Chevron's emissions would the heatwave and forest fires have occurred?' Rather, the question should be, 'to what extent did Chevron's emissions increase the risk of the heatwave and forest fires which led to the destruction of property, injury and loss of life?' Moreover, it should be remembered that it may not always be necessary to pin damage on a *specific* extreme weather event. The *LLiuya* case is based on glacier melt brought about by an increase in ambient temperatures which now constitutes the 'new normal' rather than an extreme event as such. RWE is being pursued on the basis that its contribution to the cumulative effect of all emissions from the sector has been to increase global temperatures to the extent that extreme weather events are now more likely.

Thus, from a conceptual point of view one could argue that such evidence would fit with a material increase in risk approach. The courts are already familiar with epidemiological evidence, which is another form of statistical analysis, and shares some of the features of climate change attribution; however, it has not been fully tested as being determinative of

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58 *Heede*, Carbon Majors: Accounting for carbon and methane emissions, LAP 2019, 1854.

59 See *Marjanac/Patton*, Vol. 36, No. 3 Journal of Energy & Natural Resources Law 2018, 273.

causation in a UK case.[60] Marjanac and Patton assert that: 'Courts are … likely to be comfortable and willing to accept event attribution science in climate change litigation, subject to its being robustly interrogated, as is the case with any other expert evidence.'[61]

However, when applied to the legal systems of the UK this is perhaps a rather bald assertion in that, as noted above, the courts have approached statistical evidence with a degree of wariness.

Moreover, a number of significant developments would have to occur in order for the courts to be more receptive to such evidence. Most fundamentally, it would be necessary to uncouple the increase in risk approach from asbestos litigation and reclaim it as a more generally applicable concept. The courts would also need to accept the proposition that it is impossible to establish causation according to a normal balance of probabilities test – this should not prove controversial. They would also need to be persuaded that greenhouse gas emissions from a range of sectors can be regarded as a 'single agent' linking all the potential polluters in the same way that asbestos dust connected the employers in the asbestos cases. It might also be necessary to maintain the rejection of the 'double the risk test' for determining whether an increase in risk is significant. Although, where the normal risk of an event is very low, even a slight increase in greenhouse gas emissions might in fact suffice to double the risk; in which case the double the risk approach may not prove to be an obstacle to establishing liability even if it were to be applied.[62] Damages would also have to be determined on the basis of *several* as opposed to *joint and several* liability. Above it was noted that this is a crucial aspect of the *Lliuya* litigation where RWE is being sued on a pro rata basis in correlation with its historic contribution to greenhouse gas emissions. As noted above in respect of the UK asbestos litigation, a judicial attempt to impose several as opposed to joint and several liability was reversed by the Government by way of legislation in order to ensure that no injured worker was left undercompensated or with no compensation at all. However, it would be entirely unrealistic to hold an individual polluter accountable for the entire contribution of an industrial sector to climate instability and extreme weather events. Finally, the courts would need to be fully confident that the evidence with which they have been presented is sufficiently rigorous and tested. Above it was noted that the Bradford-Hill criteria have received a degree of judicial endorsement in respect of epidemiological studies. As regards the attribution sciences there are certain 'badges of quality.' In the US the National Academy of Sciences has endorsed certain techniques[63] and something called the Daubert

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60 Evidence of this nature was used in the case of High Court of Justice Queen's Bench Division October 8, 1993, Reay and Hope v. British Nuclear Fuels Ltd, [1994] Env LR 320 in order to establish a causal link between clusters of cases of cancer in the offspring of workers at the Sellafield Nuclear Power Plant and the occupation of their fathers, although in this case the court was not persuaded about the reliability of the study due to a number of methodological problems. In High Court of England and Wales Queen's Bench Division July 29, 2009, Corby Group Litigation, [2009] EWHC 1944 (TCC), [2010] Env LR D2 it was held that, at least in principle, there was no reason why epidemiological evidence could not be used to establish a link between toxic dust released by the redevelopment of a former steelworks site and certain birth defects in the children of mothers who had been exposed to the dust. However, the case was settled before matters proceeded to a full trial of the facts meaning that the evidence was never tested.

61 *Marjanac/Patton*, Vol. 36, No. 3 Journal of Energy & Natural Resources Law 2018, 279.

62 In fact, a slight increase in greenhouse gas emissions may in fact have a far more dramatic effect than this where the normal risk of an eventuality is very low. *Marjanac* and *Patton* refer to a 2016 rapid event attribution study which found that 'anthropogenic climate change made temperature anomalies in the Coral Sea 175 times more likely'. See *Marjanac/Patton*, Vol. 36, No. 3 Journal of Energy & Natural Resources Law 2018, 284.

63 See *Marjanac/Patton*, Vol. 36, No. 3 Journal of Energy & Natural Resources Law 2018, 271.

criteria have also been used – although some experts working in the field have proposed that those need modifying in order to take account of the latest modelling techniques.[64]

V. Conclusions

It seems that the courts are close to accepting that it is conceptually and theoretically possible to establish a link between an extreme weather event, and consequent damage, with the contribution of a specific polluter to climate change. This would be a significant step in respect of claims which until recently would have been dismissed as outlandish in the extreme. Courts in different jurisdictions may progress at different rates in terms of their acceptance of such evidence and the *Lliuya* litigation shows that the German courts, for example, may be some way ahead of their UK counterparts. However, it should be noted that energy companies and the like are mostly multinational corporations subject to many jurisdictions. It would only take a single judgment in a single jurisdiction to have major repercussions on a corporation and, indeed, the entire sector in which it operates.

In terms of whether the courts of the home nations of the UK would adopt a similar approach, it is, perhaps, important to note that that we should not become overly fixated on the idea that the courts would be looking for science to be able to put a specific figure on the risk of an extreme weather event occurring (as a result of the specific contribution to greenhouse gas emissions of a particular polluter). Nor should one necessarily expect them to wait for science to provide a perfect algorithm or formula which is universally accepted as a means of accurately calculating the contribution of a company to an extreme weather event. Causation is often more about policy and a judicial instinct as to what justice demands than it is about cold hard logic and scientific fact.[65] Moreover, much progress has been made in terms of establishing coherent and theoretically justifiable strategies for developing alternative approaches to causation where evidential difficulties are created by the indeterminate nature of claimants and defendants.[66]

Having said that, it must be acknowledged that the Court would not ignore the existence of mathematical evidence and so forth if it exists, but it will need to know that it is scientifically sound and peer reviewed. Nevertheless, such evidence may only provide one piece of the puzzle and would be viewed in the light of the other factors including the environmental and safety record of the companies concerned. In *Sienkiewicz*[67] itself the epidemiological evidence was found to be of limited assistance due to the complex aetiology of asbestos; but

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64 See *Pfrommer/Goeschl/Proelss/Carrier/Lenhard/Martin/Niemeier/Schmidt*, Establishing causation in climate litigation: admissibility and reliability, Vol. 152 Climate Change 2019, 67.

65 An oft cited quote from the judgment of Lord Reid in McGhee v NCB is, 'it has often been said that the legal concept of causation is not based on logic or philosophy. It is based on the practical way in which the ordinary man's mind works in the everyday affairs of life.' See United Kingdom House of Lords November 15, 1972, McGhee v. National Coal Board, [1973] 1 WLR 1 4F.

66 See e.g. *Steel*, Justifying Exceptions to Proof of Causation in Tort Law, Vol. 78, No. 3 Modern Law Review 2015, 729.

67 United Kingdom Supreme Court March 9, 2011, Sienkiewicz v. Greif, [2011] UKSC 10, para 101 (Lord Phillips).

this did not preclude the Court from finding that causation had been established in the light of other factors.

Overall, it is possible to conclude that it may be conceptually possible to use material increase in risk in the context of attribution science; although, this is far from saying that the courts in the UK would actually choose to adopt such an approach. Thus, for policy reasons the courts may decide that this is a path which they should not follow and that it is an issue which the Government ought to deal with by way of legislation if it is so minded. This can be a particular issue in the English common law system where, if the court senses it is straying into unduly controversial waters it may show deference to the legislature and 'pass the buck' to the Government. One example is provided by the case of *Cambridge Water v. Eastern Counties Leather*,[68] concerning liability for historic pollution, the House of Lords declined to apply the common law in a way which would have made the polluter liable. It is clear that this was partly motivated by a desire not to cut across a new statutory contaminated land regime which the Parliament was in the process of debating.[69]

Of course, there are other liability models which are less reliant on establishing a causal link between a specific harm and a specific polluter. Obvious examples included the International Oil Pollution Compensation Funds[70] where industry, governments and insurance companies, contribute to a central fund and several authors have proposed a similar model for damage attributable to carbon emissions.[71] Although, this would entail attempting to secure another international agreement and the international community does not have an impressive track record in such matters. Indeed, the phenomenon of climate change litigation is driven by regulatory inactivity and a failure to secure or implement international agreements.

In the long term, however, nothing should be ruled out and the courts have proved themselves to be capable of developing the law in unusual or unexpected ways on a number of occasions throughout history in response to new challenges.

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68 United Kingdom House of Lords December 9, 1993, Cambridge Water v. Eastern Counties Leather, [1994] 2 AC 264.

69 United Kingdom House of Lords December 9, 1993, Cambridge Water v. Eastern Counties Leather, [1994] 2 AC 307C-D (Lord Goff).

70 See main Funds website *International Oil Pollution Compensation Funds (IOPC Funds)*, The International Oil Pollution Compensation Fund, https://www.iopcfunds.org/ (last visited August 03, 2021).

71 *Olszynski/Mascher/Doelle*, From Smokes to Smokestacks: Lessons from Tobacco for the Future of Climate Change Liability, Georgetown Environmental Law Review 2017, 1.