ARTICLES

LEGAL AND MARKET UNCERTAINTY IN MARKET-BASED INSTRUMENTS: THE CASE OF THE EU ETS

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Parties in litigation may experience legal uncertainty, which can spread into markets. If so, there are relevant and pervasive consequences for unrelated third parties. We argue that certain types of legal remedies cause the transformation from legal uncertainty into "market uncertainty." This problem is particularly important for "artificial markets," such as those created by the legislator for the purposes of market-based regulation, e.g., the European Union Emission Trading System ("EU ETS"). Specifically, market uncertainty is a likely consequence of the use of *restitutio in integrum* (a property-rule remedy) as opposed to the use of damages (a liability-rule remedy). Recent litigation within the EU ETS provides a clear example of both the mechanisms of transmission of legal uncertainty to the market and of its causes. We identify the costs of letting legal uncertainty turn into market uncertainty and examine possible solutions to this problem.

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Introduction 416
I. From Legal to Market Uncertainty: The Role of Remedies.... 420
A. Formalizing Legal Uncertainty 420
B. The Costs of Legal Uncertainty 424
C. Uncertainty in Artificial Markets 425
D. The Role of Remedies 427
E. The Costs of Market Uncertainty 429
II. The EU ETS 431
A. Legislative Framework 432
B. Litigation 434
C. Remedies and Market Uncertainty 437
III. Solutions 440
A. Ex Ante Solution: Restricted Litigation Period 441
B. Ex Post Solution: Liability-Rule Protection 443
Concluding Remarks 446

INTRODUCTION

> *"It is our imperfect knowledge of the future, a consequence of change, not change as such, which is crucial for the understanding of our problem."*[1]

As a regulatory tool, law is uniquely capable of shaping individuals' behavior.[2] In order to be guided by legal rules, however, one must know what they entail[3] and how they will be applied, which is complicated by the non-static nature of legal rules and systems[4] and the interpretative function of the courts.[5]

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[1] FRANK H. KNIGHT, RISK, UNCERTAINTY AND PROFIT 198 (1921).

[2] Jeremy Waldron, *Vagueness and the Guidance of Action*, *in* PHILOSOPHICAL FOUNDATIONS OF LANGUAGE IN THE LAW 6 (A. Marmor & S. Soames eds., forthcoming 2010) ("I accept that guiding action (or guiding conduct or guiding behavior) is the mode of governance distinctive to law. (I do not think it is right to say—as some do—that guiding action is the function of law. Rather it is the distinctive way in which law performs whatever functions are given to it by law-makers.")).

[3] A commonly used brocard states *"nemo legem ignorare censetur"* (no one should ignore the law). See *Lambert v. California*, 355 U.S. 225, 228 (1957) and *Cheek v. United States*, 498 U.S. 192, 198 (1991) for two statements of the principle that ignorance of the law does not excuse a transgression.

[4] Legal changes can have many different causes, including: unanticipated socioeconomic or technological changes, *see* RICHARD A. POSNER, ECONOMIC ANALYSIS OF LAW 554 (6th ed. 2003); the "coral-style creation" of the common

When this "legal uncertainty" negatively affects parties' ability to predict the consequences of their actions, the resulting costs translate legal uncertainty into an economically relevant form of uncertainty.[6] Costs may arise due to uncertainty regarding *current* disputes, where, if the law is uncertain, parties develop diverging expectations regarding the outcome of adjudication and hence find it more difficult to agree to a settlement.[7] The resulting rise in litigation imposes evident and relevant costs on the litigants and the legal system.[8] In addition, legal uncertainty about *future* disputes can generate risks in the present, which parties may attempt to remove through economically costly practices such as the purchase of professional malpractice insurance or the reservation of funds to cover for liability. Aside from the costs to the parties involved and to the legal system, these disputes typically also indirectly impose costs on third parties. One could consider the negative effects on the creditors of a firm driven into

law, *see* KARL N. LLEWELLYN, THE COMMON LAW TRADITION: DECIDING APPEALS 120 (1960); heterogeneity in the composition of the judiciary, *see* Andrew F. Hannsen, *The Effect of Judicial Institutions on Uncertainty and the Rate of Litigation: The Election Versus Appointment of State Judges*, 28 J. LEGAL STUD. 205 (1999) (showing that the decision issued by elected judges are more easily predicted that those by appointed judges due to their clearer political orientation); or ambiguously drafted legislation, *see* Katharina Pistor & Chenggang Xu, *Incomplete Law*, 35 N.Y.U. J. INT'L L. & POL. 931 (2003) (analyzing the problem of incomplete laws and the optimal allocation of residual legislative powers).

[5] BRUNO LEONI, FREEDOM AND THE LAW 85–86 (3d ed. 1991); H. L. A. HART, THE CONCEPT OF LAW 272 (2d ed. 1994); Lawrence B. Solum, *Indeterminacy*, *in* A COMPANION TO PHILOSOPHY OF LAW AND LEGAL THEORY 488 (Dennis M. Patterson ed., 1999); Michael S. Green, *Legal Realism as Theory of Law*, 46 WM. & MARY L. REV. 1915, 1921 (2005). *See also* KARL N. LLEWELLYN, THE BRAMBLE BUSH 14 (2d ed. 1951) (stressing the importance of predictability of judicial outcomes).

[6] In economics a distinction is made between uncertainty and risk. A risky situation is one that can result in different outcomes, each of which can occur with a known probability. In contrast, under uncertainty, the probabilities of the different outcomes are not known. KNIGHT, *supra* note 1, at 233. In our analysis we use a notion of uncertainty that is close to the economic notion of uncertainty, although it is not crucial for our analysis that probabilities are unknown.

[7] William M. Landes, *An Economic Analysis of the Courts*, 14 J.L. & ECON. 61, 99 (1971); Richard A. Posner, *The Behavior of Administrative Agencies*, 1 J. LEGAL STUD. 305, 322 (1972); John P. Gould, *The Economics of Legal Conflicts*, 2 J. LEGAL STUD. 279, 286 (1973).

[8] Giuseppe Dari-Mattiacci et al., *The Dynamics of the Legal System*, J. ECON. BEHAV. & ORG. (forthcoming); Giuseppe Dari-Mattiacci & Bruno Deffains, *Uncertainty of Law and the Legal Process*, 163 J. INSTITUTIONAL & THEORETICAL ECON. 627, 641 (2007).

bankruptcy by an unanticipated liability suit; creditors are not a party to the liability suit but are indirectly affected by it. Alternatively, when liability suits are anticipated through the purchase of malpractice insurance, prices of services are likely to increase which imposing additional costs on consumers.

Recent litigation involving the European Union's Emissions Trading Scheme ("EU ETS")—a market-based regulatory mechanism established by the European Union to reduce greenhouse gas emissions[9]—has shown that under certain circumstances, legal uncertainty can have direct effects on all third parties active in a certain market, creating which we call "market uncertainty." In the aforementioned litigation,[10] the European Court of First Instance[11] annulled two decisions of the European Commission[12] regarding the number of emission rights that Poland and Estonia were allowed to allocate to their national industries under the EU ETS.[13] Following these judgments, the Commission, Poland, and Estonia were forced to negotiate two new National Allocation Plans (NAPs).[14] Given the structure of the EU ETS, a new NAP implies not only a change in the amount of allowances allocated to the countries involved in the litigation, but also of the total of allowances available on the EU ETS market. Through this mechanism, the emissions market is exposed to great uncertainty: the allowances at stake in these cases amount to 4.2% of the total number of allowances available on the EU ETS market.[15] Similar

[9] Council Directive 2003/87, 2003 O.J. (L 275) 32 (EC). The EU ETS has been based on the United States Acid Rain Program and is now a cornerstone of European (international) climate change policy. For a detailed review of the US Acid Rain Program, see DANNY ELLERMAN ET AL., MARKETS FOR CLEAN AIR: THE U.S. ACID RAIN PROGRAM (2000).

[10] Case T-183/07, Poland v. Comm'n, 2009 E.C.R. II-03395; Case T-263/07, Estonia v. Comm'n, 2009 E.C.R. II-03463.

[11] Since the entry into force of the Lisbon Treaty, the Court of First Instance has been known as the General Court. *See* Treaty on the European Union, 2010 *O.J. (C 83) 13*, art. 19(1) [hereinafter TEU]. As these decisions were made before the entry into force of the Lisbon Treaty, we will refer to the General Court by its name at the time of the rulings: the Court of First Instance.

[12] Poland v. Comm'n, ¶155-163; Estonia v. Comm'n, ¶ 34.

[13] For the precise limitations imposed by the Commission in its decisions regarding the amount of allowances, see Commission Decision No. 2007/1295, art. 1(1) and 2(1) (EC); Commission Decision No. 2007/1978, art. 1 (EC) respectively.

[14] *See infra* Section II. A.

[15] For the quantitative analysis, see *infra* Appendix.

pending cases bring the fraction of disputed allowances to 8.4%.[16] Moreover, the appeal of the decision by the Commission, alongside the political negotiations for the new NAPs, prolongs the state of legal and market uncertainty for the parties to the disputes *and* for the actors trading in the European carbon market.[17]

Aside from providing a clear example of the phenomenon that we identify as market uncertainty, these cases also allow us to provide an important contribution to existing theory through the identification and analysis of the relationship between remedies and market uncertainty. We demonstrate that this problem is particularly relevant for "artificial markets" created by the policymaker as part of a market-based regulation.[18] The key feature of these markets is that the nature and the number of goods traded in the market are determined by law rather than by a regular production process. As such, these markets rely heavily on their institutional setting, which is vulnerable to external events,[19]

[16] Case T-499/07, Bulgaria v. Comm'n (pending, application 2008 O.J. (C64) 50); Case T-500/07, Bulgaria v. Comm'n (pending, application 2008 O.J. (C64) 51); Case T-483/07, Romania v. Comm'n (pending, application 2008 O.J. (C51) 56); Case T-484/07, Romania v. Comm'n (pending, application 2008 O.J. (C51) 57); Case T-369/07 Latvia. v. Comm'n (pending, application 2007 O.J. (C269) 66); Case T-263/07, Estonia v. Comm'n (pending, application 2007 O.J. (C223) 12). See *infra* Section II. C. and the Appendix for more detail.

[17] A new NAP for both Poland and Estonia was approved by the Commission on April 19, 2010. *See* Press Release, European Comm'n, Emissions Trading: Commission Accepts Polish National Allocation Plan for 2008-2012, No. IP/10/442 (Apr. 19, 2010), *available at* http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/442&format=HTML&aged=0&language=EN&guiLanguage=en. The appeal to the European Court of Justice regarding this case will not be decided for some time. *See* cases lodged and pending under number C-504/09P, Comm'n v. Poland/Comm'n v. Estonia.

[18] Economic theory suggests that if such markets function properly, the regulatory aim can be attained more efficiently or effectively than in case of command-and-control regulation. Nobel laureate Paul Krugman has recently remarked, "Action on climate, if it happens, will take the form of 'cap and trade:' businesses won't be told what to produce or how, but they will have to buy permits to cover their emissions of carbon dioxide and other greenhouse gases. So they'll be able to increase their profits if they can burn less carbon—and there's every reason to believe that they'll be clever and creative about finding ways to do just that." Paul Krugman, *An Affordable Truth*, N.Y. TIMES, Dec. 7, 2009, at A29.

[19] *See* Robert D. Cooter, *The Cost of Coase*, 11 J. LEGAL STUD. 1, 11 (1982) (contrasting pollution taxes with emission allowances, identifying two types of uncertainty). Under pollution taxes, firms know the price of pollution but the government is uncertain about the total amount of pollution; with emission allowances, the government knows the total amount of allowances but firms are

including litigation. The remedies that are, or can be, awarded in such litigation are capable of transforming the legal uncertainty affecting the parties to broader market uncertainty. In the EU ETS cases, the annulments granted by the European Court of First Instance will be shown to function as a catalyst for legal and market uncertainty.[20]

The structure of this paper will be as follows: Section I will discuss the theory behind the notions of legal and market uncertainty and the mechanisms by which legal uncertainty percolates into markets. We will pay specific attention to the role of remedies awarded by courts in order to demonstrate that market uncertainty is a consequence of property-rule remedies (e.g., annulment) as opposed to liability-rule remedies (e.g., damages). In Section II, we refer back to the EU ETS case law, which provides a practical example of the theoretical problems discussed in Section I. Section III then explores possible solutions to these problems.

I. FROM LEGAL TO MARKET UNCERTAINTY: THE ROLE OF REMEDIES

In this section, we illustrate the theory behind, and the link between, legal and market uncertainty by means of a hypothetical, abstract scenario; in the next section, we move to the application of this framework of analysis to the study of the EU ETS and the related litigation. The framework that we describe in this section rests upon a large body of literature situated at the intersection of different fields of research, principally legal scholarship and economic theory.

A. *Formalizing Legal Uncertainty*

The notion of legal uncertainty predates the emergence of any modern legal system by centuries. Aristotle questioned whether Solon left certain aspects of the Athenian constitution unclear so that they could be further discussed by the people of Athens or because it is simply impossible to write perfect laws.[21] Modern

uncertain about the price of allowances. Under market uncertainty the two types of uncertainty are combined, as both the price and the quantity of allowances (total amount of pollution) are uncertain.

[20] *See infra* Section I.

[21] ARISTOTLE, THE ATHENIAN CONSTITUTION 16 (Frederic G. Kenyon trans., 1891).

scholars have focused on the predictability of judicial decisions. Judicial decisions are particularly relevant because parties will try to anticipate the outcome of adjudication and act accordingly.[22] Some scholars, such as Weber and Carbonnier, equate legal uncertainty with the presence of gaps in the law,[23] while others, such as Perelman and Bobbio, have denied the existence of such gaps, noting that courts will fill any alleged gap by deciding the case.[24] These two positions can be reconciled by categorizing them as ex ante and ex post perspectives on the same problem. Ex post, courts, as adjudicators, are bound to fill any legal gaps. By deciding a specific case, courts will inevitably clarify the law in that case. Thus, ex post, no gaps remain. Ex ante, however, parties may find it difficult to predict how courts will interpret the law and hence will fail to anticipate the court's decision. Thus, ex ante the law may contain gaps.[25]

Seen as a prediction problem,[26] litigation can be easily formalized as a typical decision problem under uncertainty and analyzed using the toolbox of economic theory. If a conflict emerges between two individuals, P (the plaintiff) and D (the defendant), one may ask whether P will bring the case to court or reach a settlement agreement with D. Empirical studies suggest that a very small percentage of all conflicts end up in court: 3% of mediated cases and 2% of non-mediated cases are actually tried in court.[27] While reasons to go to court can range from an attempt to extract a payment from a deep-pocketed defendant to a need for

[22] *See*, *e.g.*, Robert H. Mnookin & Lewis Kornhauser, *Bargaining in the Shadow of the Law: The Case of Divorce*, 88 YALE L.J. 950 (1979).

[23] MAX WEBER ON LAW IN ECONOMY AND SOCIETY 31–33 (Max Rheinstein ed., Edward Shils trans., 1954); JEAN CARBONNIER, FLEXIBLE DROIT: TEXTES POUR UNE SOCIOLOGIE DU DROIT SANS RIGUEUR (6th ed. 1988).

[24] Chaïm Perelman, *Le problème des lacunes en droit, essai de synthèse*, *in* LE PROBLÈME DES LACUNES EN DROIT 537 (Chaïm Perelman ed., 1968); NORBERTO BOBBIO, TEORIA GENERALE DEL DIRITTO (1993).

[25] To the extent that a specific court decision creates a precedent for or exercises some authority on a future decision, it will reduce legal uncertainty for future cases. In this case, courts exercise a broadly-defined lawmaking function which affects the dynamic development of the legal system. *See* Dari-Mattiacci et al., *supra* note 8.

[26] Mnookin & Kornhauser, *supra* note 22, at 951 (arguing that the laws in effect affect ex ante the how, when, and what of divorce negotiations.)

[27] Daniel P. Kessler & Daniel L. Rubinfeld, *Empirical Study of the Civil Justice System*, *in* HANDBOOK OF LAW AND ECONOMICS 388-89 (A. Mitchell Polinsky & Steven Shavell eds., 2007).

satisfaction or revenge,[28] most cases can be explained by legal uncertainty:[29] parties are unsure about their status or the status of their actions under the law and wish the courts to clarify their positions. As put by Knight: "We live only by knowing something about the future; while the problems of life, or of conduct at least, arise from the fact that we know so little."[30]

Since going to trial is more expensive than reaching a settlement agreement, rational parties will try to settle the case rather than go to court. For example, imagine that P intends to bring a tort claim against D for damages equal to 100 tokens. Assume that litigation would cost 5 to each of them in terms of court fees, lawyers' fees, time, and other costs. Now consider two scenarios. In the first scenario, P and D have similar ideas about the merits of the case. That is, imagine that both think that the chance that P will win in court is 75%.[31] Ex ante, the parties expect that P will earn 70 tokens if they go to court—that is, P will receive an expected judgment worth 75% of 100, minus the 5 tokens that P has to pay to litigate—while D will lose 80 tokens—that is, he will lose 75% of 100 and pay 5 in litigation costs. Instead, if they settle, both of them could be better off. Assume that they settle for exactly 77: P receives 77 instead of 70; D pays 77 instead of 80. Put differently, P gains 7 and D gains 3 by settling. The sum of the parties' gains by settling is equal to 10, which is the sum of their litigation costs. In this scenario, P and D will settle for some amount in the range 70-80, where both of them prefer settlement to litigation. When parties agree on the merits of the case, litigation cannot be explained: we should observe a settlement rate of 100%.

Consider now a different scenario where parties have different expectations about the merits of the case. P thinks that his probability of winning in court is 80%, while D thinks that the probability that P will win in court is only 60%; that is, both parties are optimistic about the relative strengths of their cases.[32]

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[28] *See generally* Lucian A. Bebchuk, *Suing Solely to Extract a Settlement Offer*, 17 J. LEGAL STUD. 437, 442-43 (1988) (explaining the economic considerations that affect a decision to settle).

[29] *See supra* note 7.

[30] KNIGHT, *supra* note 1, at 199.

[31] These probabilities can also be seen as the share of damages the court will award to P.

[32] The parties are optimistic because each thinks he has a greater probability

As a result, P is willing to settle for an amount greater than 75—his expected judgment of 80 minus the cost of litigation—while the defendant is willing to pay less than 65—his expected loss in court of 60 plus the litigation costs. In this case, P and D will not settle because P's minimum demand exceeds D's maximum offer. In this scenario, parties will litigate, imposing costs on themselves and on the legal system.

This simple model shows that litigation will occur when parties' expectations diverge.[33] Economic theory explains the divergence in the parties' expectations through legal uncertainty. The intuition is straightforward: if the law were certain, then parties would form the same expectations about the court decision and they would settle. In contrast, uncertain laws are open to different interpretations both by private parties and by the courts, possibly resulting in divergent (optimistic) expectations and consequently in litigation.[34]

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of winning than his counterpart thinks he has. In the example, P thinks he has a probability of winning equal to 80%, while D thinks P has a probability of winning equal to 60%; thus, P is optimistic about his chances of winning relative to D. The other way around, D thinks he will win with a probability equal to 40% (that is, 100% – 60%), while P thinks D will win with a probability equal to 20% (that is, 100% – 80%); hence, D is optimistic about his own chances of winning relative to P. Note that this notion of mutual optimism does not imply that a party thinks that he will win with a greater probability than the other party. In fact, in the example, this is the case for P—who thinks his chances are 80% against 20% for D—but not for D—who thinks his chances are 40% against 60% for P. That is, D is an optimist even though he thinks P's chances are better than his. D is an optimist (relative to P) because he thinks his chances are better than what P thinks, and vice versa.

[33] *See* Andrew F. Daughety & Jennifer F. Reinganum, *Settlement* 11 (Dept of Econ., Vanderbilt Univ., Working Paper No. 08-W08, 20., 2d ed. 2010) (reviewing the literature on more elaborate models of settlement and litigation).

[34] The model of litigation based on mutual optimism derives from the work of Landes, Posner and Gould, *supra* note 7. In their model, parties have divergent priors. The same result can be obtained by allowing parties the same prior but letting them see different information and thus building different posteriors. *See* Keith N. Hylton & Haizhen Lin, *Trial Selection Theory and Evidence: A Review* (Boston Univ. Sch. of L., Working Paper No. 09-27, 2009). Cooter, *supra* note 19, has shown that failure to settle might also derive from strategic behavior, thus providing an additional reason for litigation even absent legal uncertainty. Lucian A. Bebchuck, *Litigation and Settlement Under Imperfect Information*, 15 RAND J. ECON. 404, 406, 408-09 (1984), provides the first model in which litigation emerges as a result of strategic behavior by an uninformed party who is facing an informed party. Other scholars have followed this approach by constructing screening or signaling models of litigation. *See* Daugherty & Reinganum, *supra* note 33, at 48.

B. *The Costs of Legal Uncertainty*

The economic model of litigation translates legal uncertainty into measurable costs, which we review in this section. The first case we consider is uncertainty about *current* disputes. Litigation is costly and failure to settle means that the parties will have to bear litigation costs. The typical example is a tort case, where P (the victim) and D (the tortfeasor) fail to settle because they interpret the duty of care differently and, thus, have different expectations about their chances of success at trial. Here, legal uncertainty generates costs in the context of an ongoing dispute.

Legal uncertainty may also arise concerning *future* disputes. One may consider a contract agreed between P (the promisor) and D (the promisee). When writing the contract, P and D anticipate the possibility of litigation, caused, for instance, by the interpretation of a clause determining the timing of performance. In order to reduce the likelihood of future litigation, P and D invest more time and resources in drafting the contract, including, for example, a liquidated damages clause or an arbitration clause.[35] The costs of legal uncertainty can materialize ex post through litigation, but they can also occur ex ante through costly attempts to avoid litigation. Thus, legal uncertainty may today generate costs related to future disputes that may never materialize.

A second example of the legal uncertainty surrounding future disputes is a property conflict between P and D. In this case, D believes himself to be the owner of a piece of land, but P contends that he is the owner since D's title is invalid. Here, P and D are not in a contractual relationship and may, in fact, be strangers. The cost of legal uncertainty lies in the ambiguity surrounding the property rights. If P brings a claim against D to court and wins, D loses the property that he held. This possibility makes D unsure of his title and reduces his incentives to invest in the property.[36] The reduction of investment by D is not compensated by P's possible incentives to invest since P's claim is also insecure; thus, legal uncertainty as to which party has a title to own the land reduces the overall incentives to invest in improvement and generates relevant

[35] Giuseppe Dari-Mattiacci, *Arbitration versus Settlement*, 58 REVUE ECONOMIQUE 1291, 1304 (2007).

[36] This is because some types of investments have no value for the other party, cannot be easily transferred elsewhere, and hence cannot be recouped once made.

(opportunity) costs.[37]

In addition to the costs that legal uncertainty imposes on the litigants, there are indirect costs for third parties (T). First of all, recourse to the judicial system is costly and, to a large extent, these costs are borne by taxpayers whose tax payments fund the institutional structure needed for a functioning legal system. There may also be costs for third parties who are in a contractual relationship with the litigants. A firm D that goes bankrupt following a damages payment in torts to P, may also bankrupt D's creditor T. Likewise, a party T who bought property from a seller D, whose title is later declared invalid to the benefit of P, may lose his property. Thus, legal uncertainty concerning both current and future disputes imposes costs on more than just the litigants; it creates costs for qualified third parties which have a relationship with the litigants as well as consumers who may see these uncertainty costs translated into higher prices; and finally, legal uncertainty creates costs for society at large as it must pay to maintain and operate the judicial system.

C. *Uncertainty in Artificial Markets*

All markets are supported by a legal infrastructure that sets out provisions regarding the enforcement of contracts and the definition and protection of property rights. This legal structure is vital for the successful functioning of a market, but it does not create the goods traded in the market. Intellectual property rights, for instance, provide the conditions under which an idea can be protected and marketed but do not generate the idea.[38] An example of a market where the goods are created by law is the EU ETS market created by Directive 2003/87/EC.[39] We will refer to

[37] *Cf.* Gordon Tullock, *The Welfare Cost of Tariffs, Monopolies and Theft*, 5 W. ECON. J. 224 (1967) (discussing how theft and monopoly divert investment away from societally beneficial improvements and into costly lobbying and protection); Harold Demsetz, *Towards a Theory of Property Rights*, 57 AM. ECON. REV. 347 (1967) (prohibiting a property right, such as with a military draft, precludes the internalization of externalities and leads to inefficient output).

[38] William M. Landes & Richard A. Posner, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW 12–16 (2003) (illustrating the incentive effects of intellectual property).

[39] Directive 2003/87, *supra* note 9. We will discuss this market further in Section II.

this type of market as an "artificial market."[40]

In an artificial market, the law defines the goods traded and determines their number, so that the quantity of the goods available on the market is completely exogenous. As a result, scarcity, the fundamental driver of economic exchange, is a legal product in artificial markets, whereas it is the result of production costs, technological constraints, or geographical distance in regular markets.[41] Thus, in artificial markets, production is exogenous to the market and does not respond to market forces. Rather, it is in the hands of lawmakers, regulators and, as we will show, courts.

Considering these characteristics, a schematic representation of an artificial market could be as follows: the number of goods available on the market has been fixed at *N*. The initial *N* goods[42] are allocated among market participants and, after trading is opened, these *N* goods can be bought and sold, altering the initial allocation. The price of the goods traded depends on the quantity *N*—an indicator of scarcity—and other factors that affect the value of the goods for the market participants and hence their willingness to pay. Clearly, any event that alters the number *N* of goods affects the market price. Moreover, the mere prospect of such an event occurring may cause market participants to take action—for instance, securing more or less goods than they actually need—in anticipation of the change. The analogue in a regular product market could be the relaxation of a quota on imported goods.

There are two types of events which may bring about such

[40] The term "artificial market" has been used in economic theory to refer to a method of modeling the behavior of market actors in a controlled environment. Rather than observing behavior in "natural" markets, where issues such as reputation may play a role, actors are placed in a controlled environment. *See generally* Alan Kirman, *Artificial Markets: Rationality and Organization*, *in* COMPLEXITY AND ARTIFICIAL MARKETS 195, 198–99 (Klaus Schredelseker & Florian Hauser eds., 2008). In this article, we use the term in a different sense: our artificial markets are real markets, rather than an experimental setting or a simulation.

[41] Market structure in regular markets also affects the quantity of goods traded and might derive from the law. For instance, the law might grant a firm a monopoly in a certain sector, thereby determining a contraction in supply as compared to a competitive market. In this case, however, the effect on quantity is indirect and concurs with the other factors mentioned in the text. In contrast, in artificial markets, the effect is direct and completely due to the law.

[42] Here we assume that the initial good holders are so numerous that none of them has a monopoly power. If that were not the case—imagine a single firm holding all *n* rights—the analysis would be different.

changes in the number of *N* may occur. The first is the enactment of a legal or regulatory act.[43] This type of event can be problematic in terms of legal uncertainty but the consequences for the market are limited since an enactment is often announced at a very early stage. Moreover, it may involve consultation procedures which result in a steady flow of information to market actors affected by the changes.[44] A second, potentially more disruptive, change comes about through litigation. We have seen that legal uncertainty can create direct costs to the litigants and indirect costs to qualified third parties. In artificial markets, legal uncertainty may directly impact third parties if the awarded remedies affect the initial allocation of the goods. The problem of possible changes in *N* (market uncertainty) through litigation (legal uncertainty) is the focus of our analysis in the following section. We will pay particular attention to the role of remedies.

D. *The Role of Remedies*

Consider a conflict between a market participant P_i and the regulator D concerning the number (n_i) of goods initially allocated to P_i: P_i claims that he should have received $n_i + 1$ goods. This conflict generates the legal uncertainty costs examined above and some of these costs will affect qualified third parties. Moreover, if this type of litigation alters the number *N* of goods available on the market, the uncertainty surrounding the case between P_i and D spreads to all market participants. The decisive element in this equation is the remedy available to P_i.

Calabresi and Melamed offer a famous, fundamental dichotomy of legal remedies, in which they distinguish property rules and liability rules.[45] A property-rule remedy implies the

[43] In the context of the EU ETS market, major changes were enacted in anticipation of the third trading phase. *See, e.g.*, Council Directive 2009/29, 2009 O.J. (L 140) 63, 63 (EC). These changes will be discussed in detail in Section II below.

[44] *See, e.g.*, *Commission Report Building a Global Carbon Market*, COM (2006) 676 final (Nov. 13, 2006). The review process for the EU ETS, for instance, was already foreseen in Directive 2003/87, *supra* note 9, art. 30. The eventual review took place in 2006 and resulting Directive 2009/29, *supra* note 43, was not adopted until 2009. The changes suggested in the review will be implemented from 2013 onwards.

[45] Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1106 (1972).

assignment of the contested entitlement to the plaintiff. In a contract case, a property-rule remedy implies specific performance; in a tort case, a property-rule remedy implies *restitutio in integrum*; in a property case, a property-rule remedy implies the transfer of the property back to the original owner.[46] The purpose of property-rule protection of an entitlement is to undo the violation of this entitlement: violations are never allowed to persist. Liability-rule protection, however, may allow violations to occur and/or continue under the penalty of a payment of damages. In a contract, tort, or even property law case, a liability-rule remedy consists exclusively of damages.[47] The non-performing party, the tortfeasor, or the encroacher (taker), does not have to perform or give back the entitlement as it was. Under a damages regime, one is allowed to retain the entitlement. This view of legal remedies has generated an immense amount of literature dealing with different aspects of the problem and, in particular, with the optimal choice of remedy under different circumstances.[48] Thus far, however, the role of remedies in connection with uncertainty and artificial markets has not yet been examined.

In the conflict described above, P_i could either bring an action to receive the contested good—restoration of his entitlement to the $n_i + 1$ goods (under property-rule protection)—or, alternatively, bring an action for damages for failure to receive $n_i + 1$ goods (under liability-rule protection). If the available remedy is damages, a successful P_i will receive a monetary payment from D. This solution generates legal uncertainty for the litigants but does not impact the number N of goods available on the market. Under property-rule protection, a successful P_i will receive an additional good and the number of goods available on the market will increase from N to $N + 1$. Every participant in the market is now directly affected by the court's decision since the value of the

[46] Possibly, an additional criminal or otherwise punitive sanction is added so that the original violation is completely deterred. *Id.* at 1126.

[47] *Id*. at 1092.

[48] *See, e.g.*, Susan Rose-Ackerman, *Inalienability and the Theory of Property Rights*, 85 COLUM. L. REV. 931 (1985); Ian Ayres & Eric Talley, *Distinguishing Between Consensual and Nonconsensual Advantages of Liability Rules*, 105 YALE L.J. 235 (1995); Lewis Kaplow & Steven Shavell, *Property Rules Versus Liability Rules: An Economic Analysis*, 109 HARV. L. REV. 713 (1996); Andrew Bell & Gideon Parchomovsky, *Pliability Rules*, 101 MICH. L. REV. 1 (2002).

goods he holds changes due to the injection of a new good into the market. In other words, legal uncertainty is translated into market uncertainty. This simplified scenario shows the immediate importance of remedies in this context.

When the legal entitlement of P_i to a certain amount of goods n_i in the initial allocation phase is protected by a property rule, legal uncertainty is allowed to metastasize through the market as a result of a change in *N*. All current or future litigation involving a specific market participant P_i and his allocation of goods n_i potentially changes the total number of goods *N* traded on the market and hence affects all other market participants. In other words, the uncertainty surrounding the outcome of litigation between D and P_i is of direct concern to all parties operating on the same market, even though they are not involved in the litigation and may have no relationship with P_i. An increase in *N* reduces the value of the goods held by all market participants while a reduction in *N* increases it. Importantly, it is not only ongoing litigation that generates market uncertainty. The prospect of future litigation generates market uncertainty, irrespective of whether this litigation in fact materializes and its potential outcome. The possibility for unexpected fluctuations in the quantity and price of the goods imposes costs on all market participants. This is especially true when the goods traded are used as a production factor by the market participants.[49]

E. *The Costs of Market Uncertainty*

The costs generated by market uncertainty are pervasive.[50] Parties facing uncertainty will put in place (expensive) strategies to reduce the costs, or reap the benefits, of future changes.[51] Absent instruments to convert risk in a sure monetary payment (such as an insurance premium), parties may alter their purchase or investment

[49] This will be discussed in more detail in Section I. E.

[50] *See* Y. FENG, DEMOCRACY, GOVERNANCE, AND ECONOMIC PERFORMANCE: THEORY AND EVIDENCE 296 (2003) (arguing that instability and uncertainty are important factors determining growth).

[51] *See* Isaac Ehrlich & Gary S. Becker, *Market Insurance, Self-Insurance, and Self-Protection*, 80 J. POL. ECON. 623 (1972) (analyzing the relationship between the purchase of insurance coverage and risk-reducing activities); Tom Baker et al., *The Virtues of Uncertainty in Law: An Experimental Approach*, 89 IOWA L. REV. 443 (2004) (showing that parties alter their behavior in the face of uncertain penalties).

choices in order to put themselves in a less vulnerable position should an adverse situation materialize, or to exploit momentum created by sudden changes. For instance, a sudden reduction in the price of a production factor is damaging to firms which already invested since late buyers may be able to sell their final products at a lower price.[52] Conversely, an increase in the price advantages early buyers. Moreover, since some investment decisions are irreversible, firms faced with uncertainty may decide to wait for better (but, probably, never complete) information before making their choices.[53]

Purchasing insurance and altering investment strategies are costly risk-reduction activities that weigh on the economic performance of firms. Furthermore, these costs, borne by individual economic actors, add up to produce measurable effects in the whole economy at the national (and possibly international) level, such as falling stock prices[54] or slower economic growth.[55] Since both insured and uninsured risks are costly for market actors, events that generate risks inevitably create costs.

Market uncertainty in artificial markets creates risks on a very fundamental level—regarding the number of goods available on the market—and hence generates risk-bearing costs for all market participants. Additionally, if the goods traded in the market are production factors, uncertainty may translate into more volatile revenues and hence may have consequences on stock prices and further spread through the financial market to parties that operate outside the market where uncertainty arises. Likewise, the costs of market uncertainty can drip down to consumers in the form of higher product prices.[56] Although these costs are difficult to

[52] For instance, a sudden drop in the price of emission allowances occurred in the EU ETS market after the judgments of the Court of First Instance in Case T-183/07, Poland v. Comm'n, 2009 E.C.R. II-03395 and Case T-263/07, Estonia v. Comm'n, 2009 E.C.R. II-03463. *See infra* note 101 and accompanying text.

[53] AVINASH K. DIXIT & ROBERT S. PINDYCK, INVESTMENT UNDER UNCERTAINTY (1994) (stressing the value of waiting for better information).

[54] Lubos Pastor & Pietro Veronesi, *Uncertainty About Government Policy and Stock Prices* (Ctr. Econ. Policy Research, Discussion Paper No. DP7897, 2010), *available at* http://ssrn.com/abstract=1640974.

[55] *See* Aymo Brunetti et al., *Credibility of Rules and Economic Growth: Evidence from a Worldwide Survey of the Private Sector* (World Bank Policy Research, Working Paper No. 1760, 1997); Aymo Brunetti & Beatrice Weder, *Investment and Institutional Uncertainty: A Comparative Study of Different Uncertainty Measures* (Int'l Fin. Corp., Dep't of Econs, 1997).

[56] *See* Case T-183/07 R, Poland v. Comm'n, 2007 E.C.R. II-00152, ¶ 44.

measure in absolute terms, they are no different from risk-bearing costs deriving from natural disasters, market shocks, or other more or less common events.

II. THE EU ETS

The incentives underlying the EU ETS are created by the imposition of a cap on the total amount of greenhouse gas emissions, which creates scarcity.[57] The subsequent trade between firms in emission allowances on the ETS market is aimed at achieving the (static) optimal allocation of existing allowances; that is, allowances will be purchased by firms which value them most, based on their individual comparison between their marginal abatement costs and the price of allowances.[58] This flexibility ensures that firms can make a cost-efficient decision regarding the reduction of emissions or the purchase of additional allowances. The fact that the cap will become increasingly stringent over time is also meant to incentivize the (dynamic) investment in greener technologies by industry.[59] These effects depend on the functioning of the EU ETS market and its success in creating a solid price signal on which companies can base their decisions. Thus far, the creation of the EU ETS market has been considered relatively successful despite teething problems concerning over-allocation of allowances and an unstable price-signal in the first two trading phases running from 2005 to 2012.[60] The success and failures of the EU ETS have been the subject of much academic literature, most of which has focused on the extent to which the ETS has been able to achieve the environmental and economic goals set in its founding Directive.[61]

In this section, we apply the theory regarding the transformation from legal uncertainty into market uncertainty to

[57] JOHN DALES, POLLUTION, PROPERTY AND PRICES (1968) (on the economic theory underlying modern market-based regulation such as the EU ETS).

[58] *See* Ronald Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1, 15, 34 (1960) (showing that well-functioning markets allocate resources to highest-value users independently of the initial allocation of said resources).

[59] Directive 2009/29, *supra* note 43, art. 9, at 70, stipulates that, from 2013 onwards, the total amount of allowances to be issued every year will decrease by a linear factor of 1.74%.

[60] *See supra* Section I. A.

[61] Directive 2003/87, *supra* note 9. *See, e.g.*, A. Danny Ellerman & Barbara K. Buchner, *The European Union Emissions Trading Scheme: Origins, Allocation, and Early Results*, 1 REV. ENVTL. ECON. & POL'Y 66 (2007).

recent developments concerning the EU ETS. The EU ETS, according to our definition, is an artificial market where market actors trade goods (the emission allowances) that have been created through EU legislation. The recent case law of the European Court of First Instance[62] and the Court of Justice is of specific interest since it demonstrates the link between remedies awarded by the courts following litigation and market uncertainty. This link will be explored in more detail in order to show that market uncertainty is a likely consequence of the use of *restitutio in integrum* (a property-rule remedy). A liability-rule remedy such as damages, however, may prevent market uncertainty under the same circumstances.

A. *Legislative Framework*

The European Emission Trading Scheme is the European Union's pilot program using a market-based instrument in order to resolve environmental problems. The EU ETS was created in order to reduce greenhouse gas emissions in a "cost-effective and economically efficient manner"[63] and to fulfill the Community's reduction commitments under the Kyoto Protocol.[64] The Trading Scheme was set up by Directive 2003/87/EC (the "Directive")[65] and thus far consists of three trading phases. The first trading period (2005-2007) was the so-called "learning by doing" phase where growing pains of the system could be identified and resolved before the second "Kyoto commitment" phase (2008-2012). Substantially different provisions for the third phase, which will run from 2013-2020, have been set out in Directive

[62] Now the General Court, *see supra* note 11.

[63] Directive 2003/87, *supra* note 9, art. 1, at ¶ 1.

[64] For the legal documents that contain these commitments, see the United Nations Framework Convention on Climate Change, May 9, 1992, U.N. Doc FCCC/INFORMAL/84 (1992), *available at* http://unfccc.int/resource/docs/convkp/conveng.pdf (entered into force Mar. 21, 1994); the Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 11, 1997, U.N. Doc FCCC/CP1997/L.7/Add. 1 (1998), *available at* http://unfccc.int/resource/docs/convkp/kpeng.pdf. *See also* Council Decision No. 2002/358, of April 25 2002 Concerning the Approval, on Behalf of the European Community, of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the Joint Fulfillment of Commitments Thereunder 2002 O.J. (L130) 1. The Burden Sharing agreement can be found in Annex II of Council Decision 2002/358.

[65] Directive 2003/87, *supra* note 9.

2009/29/EC.[66]

The powers of the European Member States and the European Commission during the first two phases of the EU ETS are set out in the relevant Articles of Directive 2003/87/EC, specifically Articles 9, 10 and 11. An important prerogative of the Member States under Article 9(1) of Directive 2003/87/EC is to develop "a national plan stating the total quantity of allowances that [they] intend to allocate for that period and how [they] propose to allocate them" ("National Allocation Plan" or "NAP").[67] The number of allowances available for allocation in each NAP depends on the respective Member State's obligations as set out in the Burden Sharing Agreement[68] but is also influenced by the Member State's decision regarding the division of the reduction burden between those sectors of the economy mentioned in Annex I of Directive 2003/87/EC (the so-called ETS sectors) and the residual, so-called non-ETS sectors.[69] National Allocation Plans only refer to the ETS sectors, meaning that measures pertaining to the other non-ETS sectors are set out in other, separate national documents. Therefore, the amount of allowances available to the ETS sectors depends on the non-ETS sectors' share of the national reduction goal and vice versa.

The appraisal of National Allocation Plans by the Commission must be based on the twelve criteria set out in Annex III of the Directive, which include: proportional allocation between ETS and non-ETS sectors; consistency with actual and projected progress towards fulfilling the commitments of the Member State; consistency with other Community instruments; and non-discrimination between companies and sectors.[70] Under Article

[66] Directive 2009/29, *supra* note 43. *See generally* Josephine A.W. van Zeben, *(De)centralized Law-making in the EU ETS*, 3 CARBON & CLIMATE L. REV. 340 (2009) (discussing foreseen changes to the EU ETS post-2012).

[67] Directive 2003/87, *supra* note 9, art. 9(1).

[68] Commission Decision No. 2006/944, 2006 O.J. (L 358) 87 (EC).

[69] The ETS sectors include, most importantly, the energy and metal industries. See Directive 2003/87, *supra* note 9, Annex I for more detail. The only greenhouse gas covered by the EU ETS during Phase I was CO_2. In Phase II, the scope of the EU ETS was extended to include all six greenhouse gasses included in the Kyoto Protocol. The greenhouse gases covered by the Kyoto Protocol are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride. The aggregate target is based on the carbon dioxide equivalent of each of the greenhouse gases.

[70] Directive 2003/87, *supra* note 9, Annex II (containing a complete overview of the criteria).

9(3), these criteria, together with Article 10 of Directive 2003/87/EC, are the basis upon which the Commission may review the NAPs and choose to reject them if considered incompatible with (one of) these criteria.[71] In order to provide guidance for the Member States as to the relative importance of the Annex III criteria and their interpretation, the Commission published a Communication ("the Commission's Guidelines").[72] Although these Guidelines are not a measure of secondary legislation under Article 288 Treaty on the Functioning of the European Union ("TFEU") with general legal effect, they do restrict the Commission in terms of their review discretion regarding the NAPs.[73]

Aside from clarifying the Commission's decision-making powers, the Court of First Instance has also developed jurisprudence regarding the Member States' autonomy in composing their NAPs. Thus far, the Court has ruled mostly in favor of Member States' autonomy, but it has also confirmed that the Commission's right to review *can* go beyond the criteria in Annex III and Article 9 of Directive 2003/87/EC as long as the alternative criteria are "objective and transparent".[74] Once the Commission has approved the NAP, the Member State can take an Article 11(1) decision and issue the allowances to specific installations.[75] In accordance with Articles 10 and 11 of Directive 2003/87/EC, the Member States had to allocate at least 95% (Phase I) or 90% (Phase II) free of charge (the so-called "grandfathering" of emission allowances).

B. *Litigation*

Despite, or perhaps due to, the relative youth of the system, a significant body of jurisprudence has evolved around the EU

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[71] Directive 2003/87, *supra* note 9, art. 9(3).

[72] *Communication from the Commission on Guidance to Assist Member States in the Implementation of the Criteria Listed in Annex III to Directive 2003/87/EC Establishing a Scheme for Greenhouse Gas Emission Allowance Trading Within the Community and Amending Council Directive 96/61/EC, and on the Circumstances under which Force Majeure is Demonstrated*, COM (2003) 830 final (Jan. 7, 2004).

[73] Case T-374/04, Germany. v. Comm'n, 2007 E.C.R. II-4431, ¶ 110.

[74] *Id.*

[75] Directive 2003/87, *supra* note 9, art. 11.

ETS.[76] The majority of cases concern Commission decisions on Member States' proposed National Allocation Plans. The applications to the Courts typically seek the annulment of Commission decisions regarding National Allocation Plans of the first and/or second phases of the EU ETS.[77] Landmark judgments of the Court thus far include: Case T-143/05 *United Kingdom v. Commission*, clarifying the comparative competences of the Member States and the Commission under Directive 2003/87/EC regarding the amendment of NAPs and the importance of the Member State's "right to amend" in light of the so-called "double public consultation system" of Directive 2003/87/EC;[78] and Case T-374/04 *Germany v. Commission* concerning the relationship between the Commission's right to review and the Member States' autonomy in composing the NAPs and confirming the broad discretion of the Member States in transposing Directive 2003/87/EC.[79] Although these cases do not always affect the number of allowances that are assigned to companies, and as such do not directly impact the market, they have set the stage for the landmark judgments of *Poland v. Commission* and *Estonia v. Commission* that do so.

Cases T-183/07 *Republic of Poland v. Commission*[80] and T-263/07 *Republic of Estonia v. Commission*[81] concern the NAPs submitted by the Polish and Estonian governments for the second trading period which allocated a certain amount of CO_2 equivalent to the national industries. As is stipulated in Article 10 of Directive 2003/87/EC, the Commission adopted two separate Decisions regarding these NAPs ("the Decisions").[82] In these

[76] Since the start of the EU ETS, there have been over thirty decisions regarding Directive 2003/87, *supra* note 9, with over a dozen cases pending. *See* Josephine A.W. van Zeben, *The European Emissions Trading Scheme Case Law*, 18 REV. EUR. COMMUNITY & INT'L ENVTL. L. 119, 120 (2009).

[77] *See supra* note 16.

[78] Case T-143/05, United Kingdom. v. Comm'n, joined with Case T-178/05, United Kingdom v. Comm'n, 2005 E.C.R. II-4807.

[79] Case T-374/04, Germany. v. Comm'n, 2007 E.C.R. II-4431, ¶ 110. For a complete description of these cases, see Van Zeben, *supra* note 76.

[80] Case T-183/07, Poland v. Comm'n, 2009 E.C.R. II-03395.

[81] Case T-263/07, Estonia v. Comm'n, 2009 E.C.R. II-03463.

[82] Commission Decision No. 2007/1295, art. 1(1) and 2(1) (EC) (concerning the national allocation plan for the allocation of greenhouse gas emission allowances notified by the Republic of Poland for the period from 2008 to 2012); Commission Decision No. 2007/1978, art. 1 (EC) (concerning the national allocation plan for the allocation of greenhouse gas emission allowances notified

Decisions, the Commission concluded that both NAPs infringed several criteria of Annex II and on that basis rejected the NAPs. The Commission stated that in order for the NAPs to fulfill the criteria contained in Annex II, a reduction of the total annual quantity of emission allowances by 26.7% in the case of the Polish NAP and 47.8% in the case of the Estonian NAP was required. The Polish and Estonian governments requested that the Court annul these Decisions on the basis that the Commission had exceeded its powers under Article 9(3) of Directive 2003/87/EC. Specifically, Poland submitted that the Commission had overstepped its powers under the Directive by replacing the data and economic model used by Poland with its own and, consequently, using its own data and economic assessment to conclude that the NAP was incompatible with the Directive and imposing a ceiling for the total quantity of allowances that could be allocated in the NAPs.[83] A similar claim was made by Estonia.[84]

The Court agreed with Poland and Estonia's lines of reasoning and added that the fact that the Commission went on to include a maximum total quantity of allowances shows that the Commission clearly misjudged the extent of its powers of review under Article 9(3).[85] It has been made clear in established case law that it is for each Member State and not for the Commission to decide on the total quantity of allowances.[86] As such, the Commission Decisions deprived the provisions of Article 11(2) of their effect and encroached upon the exclusive competences of the Member State by deciding on the total number of allowances. In light of these considerations, the Court found that the Commission had indeed acted *ultra vires* by replacing the data and economic models used by Poland and Estonia with its own. Moreover, the Court found that the Commission had violated the duty to state reasons and subsequently annulled the Decisions.[87]

by the Republic of Estonia for the period from 2008 to 2012).

[83] Poland v. Comm'n, ¶¶ 120-121.

[84] Estonia v. Comm'n, ¶ 41.

[85] Poland v. Comm'n, ¶ 100.

[86] *See* Case C-503/07 P, Saint-Gobain Glass Deutschland v. Comm'n, 2008 E.C.R. I-2217, ¶ 75 (cited in Case T-183/07, Poland v. Comm'n, 2009 E.C.R. II-03395, ¶ 126).

[87] Poland v. Comm'n, ¶ 163; Case T-263/07, Estonia v. Comm'n, 2009 E.C.R. II-03463, ¶ 114.

Following the judgments, the Commission was forced to take new decisions regarding the Polish and Estonian NAPs, which led the Commission to reject both NAPs again on different grounds.[88] Thereafter, the onus was on Poland and Estonia to prepare new NAPs. In response, the Commission released a press-statement stating that "[i]n order to minimize the regulatory uncertainty created by the court ruling, [Commissioner Stavros Dimas] encourage[s] Estonia and Poland to proceed swiftly and prepare new plans on the basis of the most recent data."[89] On April 19, 2010, the Commission approved the new NAP submitted by Poland, finally providing some measure of certainty for Polish companies regarding the current trading phase.[90] Alongside this political negotiation process, the Commission decided to appeal the decision of the Court of First Instance,[91] adding to the period of uncertainty.[92]

C. *Remedies and Market Uncertainty*

The EU ETS market, like all other markets, is embedded in an institutional (legal) setting where the rules defining and protecting (property) rights play a crucial role.[93] The importance of this legal setting is augmented by the fact that the allowances traded on the EU ETS market are the result of legislation. This fact, together with the legally determined level of scarcity through the setting of a cap, is aimed at achieving the policy aim of environmental protection through reduced greenhouse gas emissions. Thus, the

[88] Press Release, European Comm'n, Emissions Trading: Commission Takes New Decisions on Estonian and Polish National Allocation Plans for 2008-2012, No. IP/09/1907 (Dec. 11, 2009), *available at* http://europa.eu/rapid/ pressReleasesAction.do?reference=IP/ 09/1907&format= HTML&aged=0&lan guage=EN&guiLanguage=en.

[89] *Id.* (quoting Commissioner Stavros Dimas). This "most recent data" referred to the data which had been used by the Commission in its first decision regarding the NAPs, data with which the Court had not allowed the Commission to replace the original Polish and Estonian data. *See* Poland v. Comm'n, ¶¶ 64–65.

[90] *See* Press Release, European Comm'n, *supra* note 17.

[91] Cases lodged and pending under number C-504/09P, Comm'n v. Poland/Comm'n v. Estonia.

[92] The Court's judgments in these cases are expected to serve as a blueprint for other similar disputes between the Commission and member states, which could mean that the effects on the market will become even more substantial. *See* pending cases, *supra* note 16.

[93] *See generally supra* Section I.

EU ETS market, as an artificial market, is vulnerable to events that may not be disruptive in a regular market; particularly, events that (can) impact the legally determined level of scarcity may create market uncertainty.[94]

The key role of remedies in the transformation of legal uncertainty into market uncertainty has been made explicit in the aforementioned cases, *Poland v. Commission* and *Estonia v. Commission*. The only remedy available under European law for the type of action brought by Poland and Estonia—a Member State bringing an action under Articles 230 EC and 231 EC (now Articles 263 TFEU and 264 TFEU)—is that of annulment (a property-rule remedy). This means that additional allowances may become available after successful actions.[95] Pending cases, together with the cases of Poland and Estonia, represent a total claim of 174 million tonnes of additional allowances, corresponding to over 8.4% of the total amount already allocated (2,080 million tonnes).[96] Although in practice it is unlikely that the total amount of allowances will shift by such a margin, these numbers provide us with a range of theoretically possible market scenarios, where the lower bound is the current amount approved by the Commission (2,080 million tonnes), while the upper bound is the amount that would be available if all applicants got their way (2,254 million tonnes). It is worth noting that over 71% of the total reductions imposed by the Commission while reviewing NAPs has been subject to appeal.[97] The fact that the European Courts make use of a property-type remedy where the

[94] An analogous situation in a regular product market would be the relaxation of a quota on imported goods.

[95] Since the judgment of the CFI does not signal the end of the legal options available to parties nor give a definite outcome regarding the political renegotiation, it is not clear whether, and how many, allowances will eventually become available at the time of writing.

[96] *See supra* note 16 and *infra* Appendix of this article for full details on allowances assigned and reductions indicated by the Commission.

[97] *See infra* Appendix, Table 1. Without exception these appeals have come from the Central and Eastern European Member States, which may point at a deeper discontent in this region regarding the EU ETS. We will not discuss this aspect of the litigation in detail in this article. For a discussion of Central and Eastern European countries' views on EU ETS, see Jon B. Skjærseth & Jørgen Wettestad, *Is EU Enlargement Bad for Environmental Policy? Confronting Gloomy Expectations with Evidence*, 7 INT'L ENVTL. AGREEMENTS 263-80 (2007) (on the effects of European expansion on European climate change policy, especially the EU ETS).

Commission's decision is annulled and the allowances are added to the Member State's "account" is the main cause for market uncertainty in this context. In order to provide an insight into the mechanisms at work in this type of litigation, it is important to consider the consequences, legal and economic, of *Poland v. Commission* and *Estonia v. Commission.*

In *Poland v. Commission* and *Estonia v. Commission,* the Court annulled the Commission's decisions on the Polish and Estonian NAP and as such "reset" the review procedure of these NAPs under Article 10 of the Directive. Although the media was quick to point at possible increases in the amount of emissions available to Poland and Estonia,[98] it remains unclear whether there will in fact be an increase of allowances. On December 11, 2009, the Commission again rejected both NAPs—reemphasizing that the amount of allowances allocated by both Member States was too high—which means that both Poland and Estonia had to submit revised NAPs, taking into account the requirement to recalculate the number of allowances allocated therein.[99] Combined with the Commission's appeal regarding the Court's annulment of its original decision, this rejection leads to a protracted state of legal uncertainty.[100] The fact that it remains unclear whether new allowances will find their way into the market and, if so, how many, also prolongs market uncertainty on the side of the Polish and Estonian companies covered by the EU ETS and all other actors active on the ETS market. Some claim this uncertainty is illustrated by the 2.9% price drop on the ETS market directly after the judgment.[101] Considering the notorious instability of the price signal in the EU ETS, however, price variations are not the only, or the best, indicators for the market effects of the judgment.[102] True market uncertainty derives from

[98] *See, e.g.*, Stephanie Bodoni & Jonathan Stearns, *Poland, Estonia Win Challenge to CO2-Emission Limits*, BLOOMBERG.COM (Sep. 23, 2009), http://www.bloomberg.com/apps/news?pid=20601085&sid=ahlP2z11ukIY.

[99] Press Release, European Comm'n, *supra* note 88.

[100] Cases lodged and pending under number C-504/09P, Comm'n v. Poland/Comm'n v. Estonia..

[101] A 2.9% price drop occurred immediately after the judgments were made public. For complete price data, see Point Carbon's database, http://www.pointcarbon.com.

[102] A more careful analysis of price fluctuations in response to the Member States' decisions to appeal, the Court rulings, and the Commission's subsequent decisions exceeds the scope of this article.

the hypothetical 4.2% increase in the total amount of allowances on the market in case of successful claims by Poland and Estonia[103] and the possible increase of 8.4% if the remainder of the cases would be decided in a similar fashion.[104] As we have stressed, however, it is not the final increase that determines the costs of uncertainty, but rather the possibility for a range of different outcomes to materialize.

Poland appeared to be aware of these disruptions and petitioned the Court for an interim injunction of the Commission's decision pending the outcome of Case T183/07.[105] The Court rejected this petition on the grounds that the uncertainty to which the Polish industry (and more generally the whole market) had been subjected in light of the litigation did not derive from the Commission's decision but rather from Poland's own decision to petition the Court.[106] As such, the Court identified the litigation itself as the reason for legal uncertainty.[107] In addition, the Court stated that any adverse consequences of the Commission decisions could be remedied by adjusting the amount of allowances ex post, stressing the availability of *restitutio in integrum* (a property type remedy). The Court thereby implicitly supports our view that under the current system, legal uncertainty results in market uncertainty and that this is augmented by the application of property type remedies.[108]

III. SOLUTIONS

Fencing for uncertainty is costly. Thus, removing uncertainty when possible is preferable since doing so lowers overall costs. In this section we outline two types of potential solutions to market uncertainty within the EU ETS. First, we consider an ex ante solution: litigation should be confined to an interim period between the allocation phase and the trading phase. Next, we

[103] The total number of allowances in the EU ETS market is approximately 2,080 million tonnes CO_2 equivalent. The appealed amounts by Poland and Estonia represent approximately 76 million tonnes and 12 million tonnes respectively. Together, they represent an addition of 4.2% to the total. *See infra* Appendix, Table 1.

[104] *Id.*

[105] Case T-183/07 R, Poland v. Comm'n, 2007 E.C.R. II-00152, ¶ 25.

[106] *Id.* ¶¶ 38–56.

[107] *Id.* ¶ 53.

[108] *Id.* ¶ 44.

consider an ex post solution: the award of a liability-rule remedy (damages) to a successful plaintiff rather than a property-rule remedy (an additional allocation), so that the total amount of allowances on the market remains constant irrespective of the outcome of litigation. The advantages and disadvantages of these solutions will be discussed together with their feasibility within the current framework of European law.

A. *Ex Ante Solution: Restricted Litigation Period*

Since timing is such an important aspect of the creation of market uncertainty within the EU ETS, we must consider ways in which to confine the temporal effects of the judgments. Strict time periods for the judicial review of relevant decisions concerning the EU ETS would ensure that all legal uncertainty is resolved before the start of trading periods. In theory, these time periods could be set out in the relevant directives, Directive 2003/87/EC and Directive 2009/29/EC. In terms of reducing market uncertainty, this would be the optimal solution. But since the access of the Member States to the Courts is set out in the European Treaties, specifically in Article 263 TFEU, it is very questionable whether the Member States' right to judicial review could be limited by a provision in a secondary source of law, such as a directive or regulation. Member States would likely perceive such a restriction as unlawful; problems regarding lawfulness could only be resolved if effected through a change in European primary law (i.e. the Treaties). This, however, requires political consensus on the issue and it is extremely unlikely that the Member States would accept such an intrusion of their standing rights. Therefore, a more feasible alternative could be the use of expedited review procedures.

The need for legal certainty is not unique to the EU ETS market, even though its effects on economic certainty may be of a new scale and scope. Other areas of European law have also encountered the need for speedy decisions of the European Courts, such as the areas of justice and home affairs and competition law. As may be read in Article 23a of Protocol (No 3) on the Statute of the Court of Justice of the European Union, the Rules of Procedure of the Court may provide for "an expedited or accelerated procedure and, for reference for a preliminary ruling relating to the

area of freedom, security and justice, an urgent procedure."[109] The Court indeed incorporates this possibility within its Rules of Procedure in Chapter 3a, Article 62a.[110] Despite this provision, the application of the possibility of expedited review has traditionally been limited. Thus far, it has primarily been applied in, and aimed at, justice and home affairs cases[111] and has been granted only very reluctantly[112] in cases governing, for instance, competition law.[113]

[109] Protocol (No 3) on the Statute of the Court of Justice of the European Union, art. 23a, 2008 O.J. (C 115) 210.

[110] Rules of Procedure, European Court of Justice, art. 62a, 2008 O.J. (L 24) 39 ("1. On application by the applicant or the defendant, the President may exceptionally decide, on the basis of a recommendation by the Judge-Rapporteur and after hearing the other party and the Advocate General, that a case is to be determined pursuant to an expedited procedure derogating from the provisions of these Rules, where the particular urgency of the case requires the Court to give its ruling with the minimum of delay. An application for a case to be decided under an expedited procedure shall be made by a separate document lodged at the same time as the application initiating the proceedings or the defence, as the case may be. 2. Under the expedited procedure, the originating application and the defence may be supplemented by a reply and a rejoinder only if the President considers this to be necessary. An intervener may lodge a statement in intervention only if the President considers this to be necessary. 3. Once the defence has been lodged or, if the decision to adjudicate under an expedited procedure is not made until after that pleading has been lodged, once that decision has been taken, the President shall fix a date for the hearing, which shall be communicated forthwith to the parties. He may postpone the date of the hearing where the organization of measures of inquiry or of other preparatory measures so requires. Without prejudice to Article 42, the parties may supplement their arguments and offer further evidence in the course of the oral procedure. They must, however, give reasons for the delay in offering such further evidence. 4. The Court shall give its ruling after hearing the Advocate General.").

[111] *See* Court of Justice of the European Union, Information Note on References from National Courts for a Preliminary Ruling, Supplement Following the Implementation of the Urgent Preliminary Ruling Procedure Applicable to References Concerning the Area of Freedom, Security and Justice, 2008 O.J. (C 64) 1. *See also* Press Release, Court of Justice of the European Union, A New Procedure in the Area of Freedom, Security and Justice: The Urgent Preliminary Ruling Procedure, No. 12/08 (Mar. 3, 2008), *available at* http://curia.europa.eu/en/actu/communiques/cp08/info/cp080012en.pdf.

[112] The authors submit that the reason for this reluctance is the great strain which this expedited procedure places on the Court in terms of resources. Such a concentration of scarce resources (i.e., time and personnel) may be justified only in the most urgent cases. In the Court of Justice Supplement, *supra* note 111, ¶ 7, the Court states that the detention of a person would be grounds for such expedited review; but, such an imposition of fundamental rights of individuals are seldom at stake in cases raised in the area of competition law.

[113] The key ruling in this respect was Case T-464/04, Indep. Music Publishers & Labels Ass'n v. Comm'n, 2006 E.C.R. II-345. In this case, the expedited

The division of time and resources among different cases is a key consideration for the Court. Due to the already overloaded docket of the Court, granting any expedited procedures necessarily involves pushing back other cases even further. Significantly, in Case C-503/07P, *Saint-Gobain Glass Deutschland GmbH, Fels-Werke GmbH, Spenner-Zement GmbH & Co. KG v. Commission*, the Court of First Instance initially allowed the case to proceed under the expedited procedure, but was overruled by the Court of Justice on appeal.[114]

Applying expedited procedures in cases such as *Poland v. Commission* and *Estonia v. Commission* could, in theory, prevent such cases from continuing into the trading phases.[115] A possible problem could be the accumulation of several such cases filed by different Member States, such as the nine cases concerning the Commission decisions regarding phase-two NAPs.[116] Nonetheless, we believe this problem to be manageable considering that there is an upper bound to the number of cases, namely the number of Member States, twenty-seven. Moreover, as witnessed in the cases of *Poland v. Commission* and *Estonia v. Commission*, there is a high degree of homogeneity among the pleas of the Member States, facilitating the Court's assessment. A particular strength of this solution is that it allows the use of property-rule remedies: since the trading phase has not yet started, the allocation of additional allowances to a certain market participant is irrelevant to third parties on the market, and thus there is no market uncertainty.

B. *Ex Post Solution: Liability-Rule Protection*

Under current European law, the only remedy available to the

procedure was granted but the Court later criticized Impala's behavior and forced it to bear one quarter of its costs due to its efforts to delay the case despite its earlier insistence on an expedited procedure. In Cases T-195/01 & T-207/01, *Gib. v. Comm'n*, 2002 E.C.R. II-2309, the Court applied the expedited procedure for the first time in a State Aid case.

[114] Case C-503/07 P, Saint-Gobain Glass Deutschland v. Comm'n, 2008 E.C.R. I-2217, ¶¶ 28, 45.

[115] As an illustration: the application of Case T-183/07 R, Poland v. Comm'n, 2007 E.C.R. II-00152, was submitted on May 28, 2007 and that in Estonia v. Comm'n, 2009 E.C.R. II-03463, was submitted on July 17, 2007. Both were decided on September 29, 2009, over two years after the application and almost two years into the second trading phase of the EU ETS.

[116] *See supra* note 16.

Court in case of "lack of competence, infringement of an essential procedural requirement, infringement of the Treaties or of any rule of law relating to their application, or misuse of powers"[117] is to declare the act concerned void.[118] In terms of market uncertainty, this remedy may be considered highly detrimental to the EU ETS.[119] A liability-rule protection alternative allows the award of damages to replace the current annulment remedy. In *Poland v. Commission* and *Estonia v. Commission*, the Commission would have to make a lump-sum payment to the Member States, representing the amount of allowances that should have been assigned to the Member States' industries. Although we are aware of the difficulties that may be involved when the Court sets damages, the focus of this article lies on the effect of this remedy on the market as compared to the current remedy of annulment. Importantly, the knowledge that, regardless of the outcome of the case, the amount of allowances would remain constant means that the possibility for legal uncertainty to transform into market uncertainty is taken away.

Currently, the TFEU's only reference to the possibility of making a claim for non-contractual damages is in Article 340 TFEU: "In the case of non-contractual liability, the Union shall, in accordance with the general principles common to the laws of the Member States, make good any damages caused by its institutions or by its servants in the performance of their duties."[120] It is unclear whether this non-contractual liability only extends to third parties or also includes Member States. The Court's competence regarding the review of the legality of acts of the European institutions intended to produce legal effects *vis-à-vis* third parties is explicitly stated in the Treaty,[121] and there is a rich body of case law regarding the possibility for third parties to claim redress for actions of, for instance, the European Commission.[122] Said third

[117] Consolidated Version of the Treaty on the Functioning of the European Union art. 263, 2008 O.J. C 115/47 [hereinafter TFEU].

[118] *Id.*, art. 264. *See also id.*, art. 266 ("The institution whose act has been declared void or whose failure to act has been declared contrary to the Treaties shall be required to take the necessary measures to comply with the judgment of the Court of Justice of the European Union.").

[119] *See supra* Sections II. B. and II. C.

[120] TFEU, *supra* note 117, art. 340.

[121] *Id.*, art. 263.

[122] *See, e.g.*, Case C-26/81, Oleifici Mediterranei v. EEC, 1982 E.C.R. 3057, ¶ 16 (confirming that "the involvement of non-contractual liability of the

parties, however, do not have any standing before the European Courts regarding the EU ETS as the Court of First Instances has confirmed on several occasions.[123] Specifically, the Court has made it clear that in the context of the EU ETS, the Commission's decision on the National Allocation Plans are not those which affect the legal rights of operators covered by the System.[124] Rather, the Member State's final decision regarding the allocation of rights is the one which operators can appeal, but only before national courts.[125]

Commission and the assertion of the right to compensation for damage suffered depend on the satisfaction of a number of requirements relating to the unlawfulness of the conduct of which the institutions are accused, the reality of the damage and the existence of a causal connection between that conduct and the damage in question"). Moreover, settled case law shows that when the alleged illegality concerns a legislative act, liability on the part of the Community is dependent upon a finding that there has been a breach of a superior rule of law for the protection of individuals. *See* Case C-352/98, Bergaderm and Goupil v. Comm'n, 2000 E.C.R. I-5291, ¶ 42; Case C-237/98 P, Dorsch Consult Ingenieursellschaft mBH v. Council and Comm'n, 2000 E.C.R. I-2938, ¶ 17.

[123] *See, e.g.*, Case T-387/04, EnBW Energie Baden-Württemberg v. Comm'n, 2007 E.C.R. II-1195; Case C-503/07 P, Saint-Gobain Glass Deutschland v. Comm'n, 2008 E.C.R. I-2217.

[124] *See* Case T-27/07, U.S. Steel Košice v. Comm'n, 2007 E.C.R. II-128. Here, the applicant requested annulment of the Commission decision regarding the Slovak NAP for phase II of the EU ETS. The Commission had decided that the Slovak authorities had to reduce the allocated allowances by roughly 10 million tonnes of CO_2 equivalent and that the allocation proposed for the years 2008 and 2009 provided an undue advantage to one operator, U.S. Steel, and as such amounted to State aid. *Id.*, ¶¶ 20, 22. The reference to State aid was especially important in light of the production limitations as proposed under the Act of Accession signed by the Slovak Republic. The Court held that the action was inadmissible, in line with the case-law discussed above, and confirmed that the Commission decision only included a preliminary review of the State aid situation; thus, it did not constitute a decision for the purposes of Article 87 and, as such, did not provide a basis for *locus standi*. *Id.*, ¶ 72. *See also* Case T-13/07, Cemex U.K. Cement v. Comm'n, 2007 E.C.R. II-146 (regarding the British NAP); Case T-28/07, Fels-Werke v. Comm'n, 2007 E.C.R. II-98 (regarding the German NAP); Case T-193/07, Gorazdze Cement v. Comm'n, 2008 O.J. (C 301) 36; Case T-195/07, Lafarge Cement v. Comm'n, 2008 O.J. (C 301) 36; Case T-196/07, Dyckerhoff Polska v. Comm'n, 2008 O.J. (C 301) 37; Case T-197/07, Grupa Ozarow v. Comm'n, 2008 O.J. (C 301) 37; Case T-198/07, Cementownia 'Warta' v. Comm'n, 2008 O.J. (C301) 38; Case T-199/07, Cementownia 'Odra' v. Comm'n, 2008 O.J. (C 301) 38; Case T-203/07, Cemex Polska v. Comm'n, 2008 O.J. (C 301) 38 (regarding the Polish NAP); and Case T-241/07, Buzzi Unicem v. Comm'n, 2009 O.J. (C 6) 30 (regarding the Italian NAP).

[125] *See* Case C-6/08 P, U.S. Steel Košice v. Comm'n, 2008 E.C.R. I-96.

Clearly, the standing rights of the Member States are not problematic in the same way that those of companies or other private third parties are, since the legal standing of Member States before the European Courts is secured in the Treaties.[126] Nevertheless, the (lack of) case law suggests that Article 340 TFEU does not envisage a right to claim for non-contractual damages against the European institutions by the Member States. That is not to say that the Courts could not interpret Article 340 TFEU as having such application. Therefore, the incorporation of the possibility of awarding damages into the existing European legal framework is a question of political feasibility. In addition, a liability-rule remedy raises important problems related to the financing of damages awards. First, any damages paid to successful Member State are ultimately paid by all Member States through their financing of the European institutions. As such, damages constitute an unintended redistribution of wealth among Member States, which is not necessarily desirable. Secondly, it is unclear whether damages paid to a Member State will find their way to the affected industries.

CONCLUDING REMARKS

"The power of the lawyer is in the uncertainty of the law."[127]

"Investors don't like uncertainty."[128]

Uncertainty is a permanent feature of society, both in its legal systems and its economies. The problem with uncertainty lies in the costs that come with it. These costs may be caused by litigation or failed business strategies. In this paper, we looked at one specific type of interaction between legal uncertainty expressed by litigation and market uncertainty reflected in market functioning. The increasing use of market-based regulation provides us with a growing number of examples where the natural, and necessary, gaps in legislation can have a knock-on effect on

[126] TFEU art. 263, *supra* note 117.

[127] Letter from Jeremy Bentham to Sir James Mackintosh (1808), in 10 The Works of Jeremy Bentham, at 429 (John Bowring ed., Elibron Classics 2006) (1843).

[128] Interview by Anderson Forest with Kenneth Lay, CEO, Enron Corp. (Aug. 20, 2001), in *Enron's Ken Lay: "There Is No Other Shoe to Fall*," BUSINESSWEEK (Aug. 23, 2001), http://www.businessweek.com/stories/2001-08-23/enrons-ken-lay-theres-no-other-shoe-to-fall.

certain markets. Through the use of certain types of remedies, these effects can be reduced, which lowers the costs of uncertainty for the litigants and also for parties who are not directly involved in the relevant litigation. In the context of the European Union Emission Trading System, we have shown that the award of damages, instead of an annulment, or the use of time restrictions regarding litigation weakens the causal link between legal uncertainty and market uncertainty. Theoretically, more fundamental solutions may be achieved by altering the legislation that created the market.

There has been some experimentation within the Member States with solving the problem of intra-trading-phase litigation. An interesting example is the litigation reserve created within the Dutch NAP, where a certain amount of allowances was set aside for allocation depending on possible successful claims by individual installations.[129] If any allowances remain in the litigation reserve, they are added to the new entrants reserve. In case of a shortage, the number of allowances to existing installations is recalculated by determining the new total amount and using a factor to bring it within the then available amount.[130] To the extent that it is certain that allowances in the reserve will enter the market, be it through litigation or redistribution of residual allowances, this model would solve some of the problems witnessed at the European level. Thus, the "final" total number of allowances on the market remains constant; but the distribution of these allowances among the market participants and the timing of their release remain unknown ex ante. This means that some market uncertainty remains.

In terms of altering the legislative framework supporting the EU ETS, the Commission pushed for several important changes to the EU ETS Directive for the third trading phase.[131] This resulted

[129] Netherlands National Allocation Plan for Greenhouse Gas Allowances 2008-2012: Plan of the Minister for Economic Affairs and the State Secretary for Housing, Spatial Planning and the Environment, (Sep. 26, 2006), *available at* http://ec.europa.eu/clima/policies/ets/allocation/2008/docs/nap_netherlands en.pdf.

[130] *Id.*, Section 2.3.2 (stating that this will equal the original amount plus 0.5 megatons/year).

[131] Problems of over-allocation played an important role in this respect; but the divergence between NAPs and the limited changes the Commission could achieve due to the nature of the review process was another important consideration. *See, e.g.*, A. Denny Ellerman & Barbara Buchner, *supra* note 61

in the abolition of the National Allocation Plans,[132] which solves some of the specific problems we have addressed in this article, but does not answer the more general question regarding the relationship between legal and market uncertainty. Notably, instances regarding the allocation of rights to carbon leakage sensitive areas,[133] transitional free allocations for modernization of electricity generation,[134] and national implementation measures[135] generally may cause litigation comparable to that in *Poland v. Commission* and *Estonia v. Commission*. In reference to a decision regarding the allocation of rights (to carbon leakage sensitive areas or modernization, for instance), a ruling in favor of a Member State would also result in additional allowances possibly entering the market.

Finally, we believe that our findings on market uncertainty are also relevant for the ongoing discussion regarding the need for and

(using the level of 2005 Business as Usual (BAU) emissions as a benchmark); Stefano Clò, *Assessing the European Emissions Trading Scheme Effectiveness in Reaching the Kyoto Target: An Analysis of the Cap Stringency* (Rotterdam Inst. of L. and Econ., Working Paper No. 14, 2008) (using economic efficiency, proportionality and the polluter-pays principle as benchmarks in order to test cap stringency). *See also* Van Zeben, *supra* note 76 (on the Commission's often-failed attempts to influence the Member States' NAPs through its review process).

[132] *See extensively* Van Zeben, *supra* note 66 (on the revision of the EU ETS for the third phase and the accompanying changes). *See also Commission Proposal for a Directive Amending Directive 2003/87/EC so as to Improve and Extend the Greenhouse Gas Emission Allowance Trading System of the Community*, at 11, COM (2008) 16 final (Jan. 23, 2008). This Proposal was published as part of the review process as set out in Directive 2003/87, *supra* note 9, art. 30. Directive 2003/87, art. 30(2) stipulates that review of the ETS should culminate in a report drafted by the Commission and be submitted to the European Council and Parliament by June 30, 2006. Together with the Commission Proposal, an impact assessment was published. *See Commission Impact Assessment Accompanying the Proposal for a Directive so as to Improve and Extend the EU Greenhouse Gas Emission Allowance Trading System*, COM (2008) 16 final (Jan. 23, 2008). The Commission successfully proposed a Community-wide cap model in Directive 2009/29, *supra* note 43.

[133] *See generally* Directive 2009/29, *supra* note 43, art. 10b(1), at 75-76 (requiring assessment of carbon leakage); *Id.* art. 10b(2), at 75-76 (allowing review by Commission of assessments).

[134] *See generally* Directive 2009/29, *supra* note 43, art. 10c, at 75-76 (establishing transnational fee allocations; Commission can review them under art. 10c(6)).

[135] Directive 2009/29, *supra* note 43, art. 11, at 77 (requiring national implementation measures; submissions rejected by Commission cannot be used for allowances).

importance of scarcity within the EU ETS market. This literature has focused on the relationship between the so-called effectiveness of the EU ETS—through achievement of the environmental goal of emissions reduction at the lowest cost—and the level of scarcity in the market.[136] The present discussion unveils an important analogy between the mechanisms that preside over the transmission of legal uncertainty to market uncertainty and the effect of court decisions on the level of scarcity. In both cases, the use of annulment (a property-rule remedy) is highly disruptive. The impact of litigation on scarcity has not yet been explored; our analysis shows that the use of alternative, liability-rule remedies prevents additional allowances from coming into the market through litigation and thus would safeguard the predetermined level of scarcity. However, the problems of scarcity and market uncertainty remain distinct insofar that scarcity is affected only by the final outcome of litigation, whereas market uncertainty is generated by the mere possibility of an increase in allowances. If the court decides against a market participant petitioning for more allowances, the (ex post) level of scarcity is not affected but, as we have shown, the costs caused by market uncertainty have already occurred since they are related to the (ex ante) uncertain outcome of litigation rather than the actual outcome. Further work must be done to consider this link between litigation and scarcity in artificial markets. This paper has started by introducing methods of limiting market uncertainty as caused by legal uncertainty through the use of specific legal remedies. The incorporation of these observations will hopefully contribute to the economic efficiency of market-based regulatory regimes such as the EU ETS.

[136] *See, e.g.*, Cló, *supra* note 131.

Appendix

Table 1: Allocation of allowances per country for the period 2008-2012.[i]

Country	**Total Number (million tonnes per year)[ii]**	**Reduction by the Commission**	**Appeal**
Austria[iii]	30.729906	2.070094	
Belgium[iv]	58.507703	4.820532	
Bulgaria[v]	42.269658	***9.710330***	*
Cyprus[vi]	5.479780	1.641718	
Czech Republic[vii]	86.835264	***15.064736***	*
Denmark[viii]	24.500000	-	
Estonia[ix]	12.717058	***11.657987***	*
Finland[x]	37.557891	2.042109	
France[xi]	132.800000	-	
Germany[xii]	453.070175	28.929825	
Greece[xiii]	69.087549	6.414060	
Hungary[xiv]	26.908852	***3.824461***	*
Ireland[xv]	21.151244	1.486756	
Italy[xvi]	195.746486	13.253514	
Latvia[xvii]	3.283303	***4.480580***	*
Lithuania[xviii]	8.851304	***7.738696***	*
Luxembourg[xix]	2.690906	1.259094	
Malta[xx]	2.143061	0.812539	
Poland[xxi]	208.515395	***76.132937***	*
Portugal[xxii]	34.810329	1.089671	
Romania[xxiii]	75.944352	***19.754248***	*
Slovakia[xxiv]	30.912261	***10.387739***	*
Slovenia[xxv]	8.298937	-	
Spain[xxvi]	152.250729	0.422271	
Sweden[xxvii]	22.802439	2.138302	
The Netherlands[xxviii]	85.813458	4.586542	
United Kingdom[xxix]	246.200000	-	

Total	2080.042215	All 240.631013 Appealed 174.250528		
Reductions imposed by the Commission represent 11.8% of the allowances.				
Appeals (bolded italics) concern 8.4% of the total allowances and 71% of the reductions imposed by the Commission.				
Poland and Estonia alone account for 4.2% of the total allowances.				

[i] This information is based on the Commission Decisions regarding the National allocation plans, *available at* http://ec.europa.eu/clima/documentation/ets/allocation_2008_en.htm.

[ii] This is the amount which has been approved by the Commission in its decision on the respective NAPs. This is also the amount of allowances currently on the market. The amount originally proposed by the Member States is given by the amount approved by the Commission plus the reduction applied (see the next column).

[iii] Commission of the European Communities, Commission Decision of April 2, 2007 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Austria in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[iv] Commission of the European Communities, Commission Decision of January 16, 2007 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Belgium in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[v] Commission of the European Communities, Corrigendum to the Commission Decision C(2007)5255 of October 26, 2007: Commission Decision of October 26, 2007 Concerning the National Allocation Plan for the Years 2008 to 2012 for the Allocation of Greenhouse Gas Emission Allowances Notified by Bulgaria in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[vi] Commission of the European Communities, Commission Decision of July 18, 2007 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Cyprus in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[vii] Commission of the European Communities, Commission Decision of March 26, 2007 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by the Czech Republic in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[viii] Commission of the European Communities, Commission Decision of August 31, 2007 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Denmark in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[ix] Commission of the European Communities, Commission Decision of May 4, 2007 Concerning the National Allocation Plan for the Allocation of Greenhouse

Gas Emission Allowances Notified by Estonia in Accordance with Directive 2003/87/EC of the European Parliament and of the Council, Article 2(1) and 3(1). The Plan was rejected again later in Commission Decision of December 11, 2009 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Estonia in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[x] Commission of the European Communities, Commission Decision of June 4, 2007 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Finland in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[xi] Commission of the European Communities, Commission Decision of March 26, 2007 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by France in Accordance with Directive 2003/87/EC of the European Parliament and of the Council, *supra* note 7.

[xii] Commission of the European Communities, Commission Decision of November 29, 2006 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Germany in Accordance with Directive 2003/87/EC of the European Parliament and of the Council. Later amended (not in terms of the amount of allowances) by Commission Decision of October 26, 2007 Concerning the Amendment to the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Germany in Accordance with Article 3(3) of Commission Decision C/2006/5609 Final of November 29, 2006 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Germany in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[xiii] Commission of the European Communities, Commission Decision of November 29, 2006 Concerning the National Allocation plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Greece in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[xiv] Commission of the European Communities, Commission Decision of April 16, 2007 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Hungary in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[xv] Commission of the European Communities, Commission Decision of November 29, 2006 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Ireland in Accordance with Directive 2003/87/EC of the European Parliament and of the Council, *supra* note 13.

[xvi] Commission of the European Communities, Commission Decision of May 15, 2007 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Italy in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[xvii] Commission of the European Communities, Commission Decision of November 29, 2006 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Latvia in Accordance with Directive 2003/87/EC of the European Parliament and of the Council, *supra* note 13.

[xviii] *Id.*

[xix] *Id.*

[xx] *Id.*

[xxi] Commission of the European Communities, Commission Decision of March 26, 2007 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Poland in Accordance with Directive 2003/87/EC of the European Parliament and of the Council, Article, *supra* note 7. Later rejected again by Commission Decision of December 11, 2009 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Poland in Accordance with Directive 2003/87/EC of the European Parliament and of the Council, *supra* note 9.

[xxii] Commission of the European Communities, Commission Decision of October 18, 2007 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Portugal in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[xxiii] Commission of the European Communities, Commission Decision of October 26, 2007 Concerning the National Allocation Plan for the Period 2008 to 2012 for the Allocation of Greenhouse Gas Emission Allowances Notified by Romania in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[xxiv] Commission of the European Communities, Commission Decision of November 29, 2006 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Slovakia in Accordance with Directive 2003/87/EC of the European Parliament and of the Council, *supra* note 13.

[xxv] Commission of the European Communities, Commission Decision of February 5, 2007 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Slovenia in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[xxvi] Commission of the European Communities, Commission Decision of February 26, 2007 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Spain in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[xxvii] Commission of the European Communities, Commission Decision of July 13, 2007 Concerning the Amendment to the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Sweden in Accordance with Article 3(3) of Commission Decision C/2006/5617Final of November 29, 2006 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by Sweden in Accordance with Directive 2003/87/EC of the European Parliament and of the Council.

[xxviii] Commission of the European Communities, Commission Decision of January 16, 2007 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by the Netherlands in accordance with Directive 2003/87/EC of the European Parliament and of the Council, *supra* note 4.

[xxix] Commission of the European Communities, Commission Decision of November 29, 2006 Concerning the National Allocation Plan for the Allocation of Greenhouse Gas Emission Allowances Notified by the United Kingdom in accordance with Directive 2003/87/EC of the European Parliament and of the Council, *supra* note 13.