Submission ID: 36434

Following my submission via interested party number 35794 in January, and my verbal submissions on behalf of F.A.C.T.S on 29th April 2025, I now add to those submissions with more detail.
Firstly I invite the Examination Authority (Ex A) to accompany me on a walk through the location of the pipeline with Robert Eckton , a retired Headmaster, who was the person who 'discovered' the existence of the Liquid Ethylene pipeline for the purposes of Fylde Borough Council Planning Application number :18/0036.
On that occasion the Health and Safety Executive (HSE) became involved and advised against the small development applied for on the basis that it would constitute a risk incompatible with the Precautionary Principle.
However, as the HSE do not involve themselves in infrastructure applications as a matter of policy projects for entirely practical and understandable reasons, the responsibility for investigating this matter independently therefore falls to the Ex A , the professional association for onshore pipeline operators (UKOPA) & the Planning Advice for Hazardous Installations (PADHI).
Please find attached an article explaining the remit and range of the legally binding Precautionary Principle on this application (although the UK is no longer part of the EU it has not repealed the legislation which binds the UK to the Precautionary Principle).
The more serious threat to safety comes from the liquid ethylene pipeline (whose pathway map is attached to this submission), although the LPG pipeline also offers a significant risk of disturbance and danger to housing and other facilities nearby.
The liquid ethylene pipeline, is pumped at high pressure at a temperature of minus 104*c. It is carried in a steel pipe approximately 3-4 feet below the surface although it can be seen at certain parts of the route at its shallowest depth.
Liquid ethylene unlike LPG which requires a spark to ignite, explodes spontaneously on contact with air. When a crack appears on the pipeline and the ethylene begins to escape it causes the ethylene in the pipeline to expand, occasioning further fissures in the pipe back down the line
This means there are dangers to public safety, residential buildings, and businesses are all at risk from a leak originally caused much further away. The magnitude of the risk is therefore the much greater than the hazard calculation for the OZ, MZ and IZ zones outlined in the Pipeline Hazards paper I originally forwarded to the Ex A in January.
The Ex A will see from the map which accompanies this submission that the liquid ethylene pipeline crosses both the A583 and the A584. It is close to two farms and to Dobbies Garden Centre, two large motorhome businesses and a caravan business which holds large quantities of Calor Gas for resale on its premises.. Dobbies were unaware of the existence of the liquid ethylene pipeline when contacted. F.A.C.T.S and LCC councillors intend to refer this matter to Dobbies owners (Tesco) as a matter of good health and safety practice.
It is clear the Applicant undertook no background checks prior to submitting their proposal. Had they done so they would surely as a responsible company who say they are committed to public safety, have published details as to what strategy they proposed to deal with these significant threats to the safety of the community.
This is not altogether surprising they were unaware of the ethylene pipeline in light of the fact that ethylene pipelines do not appear on any local or ordinance survey maps for fear of them being a terrorist target. However in the case of LPG pipes why the Applicant did not undertake an appraisal of the risks that a development of this size would render to the pipeline suggests once more an Application compiled in haste, without due diligence or any meaningful consultation that might have led to an early identification of a more suitable and cost effective route..
Instead the Applicants ask the Ex A to pass their proposal on trust that a satisfactory solution may be found through negotiation with pipeline operators. This in fact would be in direct contravention of the Precautionary Principal.
There are three factors associated with risk when undertaking development near gas and ethylene pipelines:
1. An acute safety risk (in the applicants case one associated with a major incident arising from the large area and of volume of disruption which would occur as a result of the proposed development itself.
2. Population and facilities within the affected zones identified in the Hazards paper I previously submitted to the Ex A.
3. Excavation risk.
Of these 3 the least quantifiable risk is the risk caused by excavation. The proposed site is so large in length and width that factors such as variable ground drainage (flooding causing ground to shift); the amount of vibration occasioned by filling in 30 tons of of concrete every 500 yards along the route for way stations; drilling and the combination of activity at any one time means that the risk from this activity cannot be accurately or safely calculated.
The Precautionary Principle is informed by 3 specific principles:
1. Full scientific evaluation & the degree of uncertainty arising from that;
2. a risk evaluation, an evaluation of the potential consequences of inaction and;
3. the participation of ALL interested parties in the study of precautionary measures (ie not just the companies that operate the pipelines).
The attached article concludes: that jurisdictions governed by the Precautionary Principle agree that society must be protected even if science cannot provide.
It is submitted that the level of uncertainty of outcome of the potential for (in this case catastrophic) damage, via disturbance to the pipelines is sufficient to refuse the Application as presently submitted.
Further, should such an incident occur, the congestion occasioned by the acknowledged increase in HGV traffic on the route would exacerbate the effects of any incident, trapping commuters and delaying the intervention of the emergency services.
The proportionality of adverse effects are therefore even greater for the community when these risks are assessed as a whole rather than individually. It is submitted that this is an occasion when the sum of risk is greater than the individual risk factors.
None of these factors have been considered or addressed by the Applicant. It is simply not acceptable for the Applicant to say (as they did at the conclusion of OFH 1) 'give us permission and we will agree a path forward with the pipeline operators'. That is not an approach which conforms to the Precautionary Principle and not one which holds the safety and wellbeing of the community as a priority.
It is the sheer lack of understanding of the Applicant of such matters which is rightly causing extreme shock and anxiety across the community of Fylde residents , commuters and indeed across the political spectrum, where MP's of all parties,

councillors of all parties are all urging the Applicant to turn its attention to the alternative route at Stanah.
The Stanah route harbours none of the many disruptions, dangers, and problems that are present with the cable corridor. It is a route favoured by residents of the Fylde and those in Blackpool North and Thornton Cleveleys where Stanah is located.

Legally binding precautionary and prevention principles: Aspects of epistemic uncertain causation

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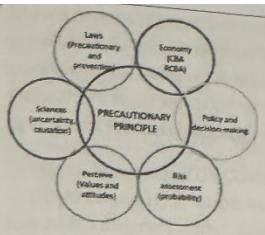
Highlights

- Three legal systems (the People's Republic of China, the European Union, and the US) are studied to articulate how uncertainty affects causal analyses that must satisfy legal requisites.
- We study prevention and precaution principles, and discuss how probabilistic methods are necessary to understand the wide range of outcomes—from reducing the incidence of cancer to avoiding or coping with natural or technological catastrophic events.
- We find that the scientific basis of the analysis of precautionary and preventive choices is invariant as to the jurisdictions that use it because analysis is predicated on scientific evidence of causation and analysis.
- We conclude complex causation can be assessed through epidemiological reasoning, and develop a template for this, while

Abstract

Legally binding precautionary principles direct societal actions through regulatory laws to prevent future catastrophic or irreversible consequences that can result from human and natural hazards. Those principles connect uncertain cause and effect to public actions and hence must be transparent, scientifically sound and, on the average, demonstrably add to societal wellbeing. Focusing on legally binding forms of precaution and prevention concerning public choices, seen as prospects, we articulate how uncertainty affects causal analyses that must satisfy their legal requirements. The common measure of uncertainty is probability, explicitly used (and framed in various guises) by the three legal systems we study: the People's Republic of China, the European Union, and the United States. Probabilities can represent different forms of uncertainty, their technical differences, but use the same calculus. They occur at the intersection of legal and scientific causation and allow abstracting, from a prospective reality via models and simulations, future catastrophic or irreversible consequences. Probabilistic causal models—e.g., frailty models, power laws, self-organizing criticalities, and scale-free regularities – link environmental and other regulatory choices to reduce exposures likely to cause adverse responses. Thus, this type of causation is the scientific basis of the EU's Precautionary Principle, its Directives and Regulations; US federal regulatory and case law, and Chinese laws regarding the prevention of hazards. We use examples that clarify and guide public policy analysts to better formalize prospective public choices to avoid ambiguities or possibly incorrect results. We find that the scientific basis necessary to the analysis of precautionary and preventive choices is invariant to the jurisdictions that use it. We conclude that precautionary choices characterized by complex causation can be qualitatively assessed through adapting nine classic epidemiological criteria.

Graphical abstract



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Introduction

Environmental or health and safety instruments such as treaties, regulations, directives and case law both within and between the Member States in the EU; statutes and regulations in the PRC; and statutes, regulations, and case law in the US contain binding precautionary and preventive principles to justify public decisions designed to protect the public when causation is uncertain. Table 1 contains a simplified overview of the three jurisdictions we deal with in this paper. We focus on decision support through the coupling of legal reasoning with probabilistic cause and effect to either predict or forecast future catastrophic or irreversible consequences.

The paradigm version of precautionary principle is the European Union's Consolidated Treaties – the Treaty on the Functioning of the European Union (TFEU, Lisbon Treaty, Article 191, paragraph 2) – regarding the protection of the *environment* and *public health*, as well as *the prudent and rational utilization of natural resources*. It states that:
Union policy on the environment shall aim at a high level of protection taking into account the diversity of situations in the various regions of the Union. It shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay.

The US, which does not have a constitutional precautionary principle, mentions it in federal case law concerning EPA's regulations under the Clean Air Act, as Amended. The court stated that the CAAA has a *precautionary and preventive orientation* (*Lead Industries Ass'n, Inc. v. EPA, 647 F.2d 1130, (D.C.Cir. 1980)*).

The PRC laws also explicitly mention prevention and precaution. The prevention principle is one of the most fundamental guiding principles in China's environmental and public health-related laws. Concepts inherent to the precautionary principle, risk

analysis, burden of proof, and scientific evidence are also mentioned in these laws, such as the Environmental Protection Law (adopted in 1989), the Environmental Impact Assessment Law (Adopted in 2002), the law on the Prevention and Control of Atmospheric Pollution (2000, as amended) and the law on Quality And Safety Of Agricultural Products (adopted in 2006).

The EU's Commission (EU's COMM 2000 (12-04-2011, EUR-Lex)) states that:
... the precautionary principle may be invoked when a phenomenon, product or process may have a dangerous effect, identified by a scientific and objective evaluation, if this evaluation does not allow the risk to be determined with sufficient certainty. Recourse to the principle belongs in the general framework of risk analysis ... and more particularly in the context of risk management.... The Commission stresses that the precautionary principle may only be invoked in the event of a potential risk and that it can never justify arbitrary decisions. The precautionary principle may only be invoked when the three preliminary conditions are met:

- identification of potentially adverse effects;
- evaluation of the scientific data available;
- the extent of scientific uncertainty.

These precepts both guide and need clarification. Our logic is inductive and consists of the event generating multiple consequences depending on its context: the premises (the law) and outcomes (probable casualties) are known, but the *rule* that links them – causation – is often not well understood. We provide a basis for assessing when *evaluation does not allow the risk to be determined with sufficient certainty*: risk *analysis* deals with all shades of uncertainty, not just with a specific situation of risk or uncertainty. Rather than looking at decision-theoretic models, we study the divergence between administrative decisions (taken by agencies') and their judicial review: this is essential to understanding causation and the success of an eventual public decision.

The EU (COMM 2000), the PRC and the US IOM (2013) characterize *risk* probabilistically—but with different understandings of what uncertainty means. The latter states that a risk is "[t]he likelihood or probability that exposure arising from a given source, or in some case multiple sources, will cause harm to human health." Yet, the tenor is (IOM, 2013) surprising:
Because of some uncertainty analysis has delayed the rulemaking ... (there must be some) caution against excessively complex uncertainty analysis ... the amount of uncertainty analysis should match the need of the decision-maker.

This puts the cart before the ox. Why should "excessively complex uncertainty analysis be avoided and why match the need of the decision-maker?" Analysis is much less expensive that implementing the incorrect decision, particularly when that decision may be irrevocable: the stakes determine the amount of analysis. This silent pessimism should be at least contrasted with neutrality, as a baseline for calibrating it. Here, this step is bypassed in favor of arbitrary risk aversion. The IOM (2013) goes further: it states that "[e]ven great uncertainty does not imply that action to promote or protect should be delayed."

The IOM (2013) suggests that:
Understanding the types of the uncertainty ... will help ... decision makers determine when to invest resources to reduce the uncertainty and how to take that uncertainty into account in their decisions. ... [T]he ... committee classifies uncertainty in two categories: (1) statistical variability and heterogeneity (... aleatory or exogenous uncertainty), and (2) model and parameter uncertainty (also called epistemic uncertainty). ... a third category of uncertainty, ... deep uncertainty (uncertainty about the fundamental processes or assumptions underlying a risk assessment),.... Uncertainty stemming either from statistical variability and heterogeneity or from model and parameter uncertainty can be deep uncertainty.

Deep uncertainty (IOM, 2013):
... exists when analysts do not know, or the parties to a decision cannot agree on, (1) the appropriate models to describe the interactions among a system's variables, (2) the probability distributions to represent uncertainty about key variables and parameters in these models and/or (3) how to value the desirability of alternative outcomes. (citations omitted).

COMM 2000 (12-04-2011, EUR-Lex) states that the Precautionary Principle *shall be informed by three specific principles*:

- the fullest possible scientific evaluation, the determination, as far as possible, of the degree of scientific uncertainty;
- a risk evaluation and an evaluation of the potential consequences of inaction;
- the participation of all interested parties in the study of precautionary measures, once the results of the scientific evaluation and/or the risk evaluation are available.

It adds (COMM 2000 (12-04-2011)) that: "... public agencies responsible for risk management may decide to act or not to act, depending on the level of risk." However,

unlike US federal law, the EU's *level* of risk is not explicit. While we do not comment on whether the US 10^{-4} to 10^{-6} (i.e., probability of cancer, lifetime, individual) risks used by the US EPA are correct, a scientifically sound risk threshold, based on the gravity and magnitude of the hazard, is critical to decision-making. This depends on causal models, discussed in Section 2.

Section snippets

Forms of uncertainty

Both the EU and the US laws deal with uncertain causal knowledge. We summarize terms found in the remainder of this paper. Gilboa (1988) shows that, when knowledge about a context is incomplete or not available, there may not be a unique distribution function over many (but perhaps not all) of the states that characterize the context studied. Ellsberg (2001) found situations where there would be simply no way to infer meaningful probabilities for events ... and theories which purport to describe ...

Legal causation and evidence: US, EU, the PRC

Catastrophic events, such as mass exposures to toxicants or carcinogens, exemplify differences between regulatory law – such as those forming the EU's Precautionary Principle – and their review by courts that assess the scientific evidence of causation under administrative, environmental or tort law doctrines. We discuss: (i) US law, to explain a variety of legal principles and rules, (ii) EU law, to extend the understanding of regulatory choices under administrative law and how they parallel ...

Catastrophes: Key causal aspects

This Section extends probabilistic causal analysis to another domain of the Precautionary Principle: natural or technological disasters, as initiators of physical or other damage leading to hazardous exposures (such as large scale releases of chemicals) or resulting in damage on their own. The salient aspects (although the *Act of God* and other legal theories limit legal individual recourse) are

(1) Technological catastrophes cause mass casualties: the legal aspects we discussed broadly apply under ...

...

Conclusions

To aid the dialog about determining what degree of precaution may be necessary under uncertain but probabilistic events, where the decision-maker faces prospects and not certain outcomes, we have taken a two-pronged approach. We have selected the EU, the PRC and the US as key jurisdictions and reviewed how these formulate precautionary choices. We have found a fundamental agreement – variously stated by those jurisdictions – that society must be protected even if science cannot provide ...

Acknowledgments

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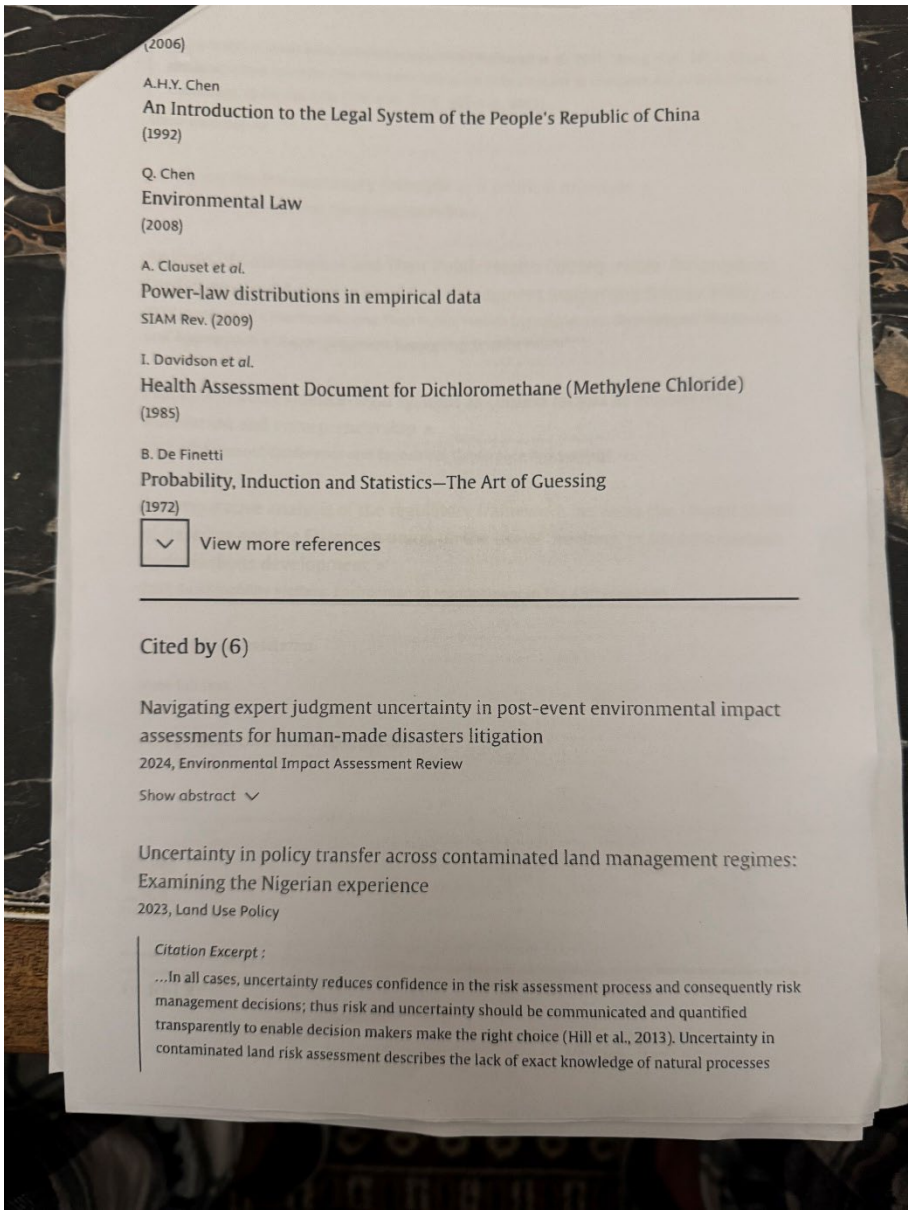

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Navigating expert judgment uncertainty in post-event environmental impact assessments for human-made disasters litigation
2024, Environmental Impact Assessment Review

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Uncertainty in policy transfer across contaminated land management regimes: Examining the Nigerian experience
2023, Land Use Policy

Citation Excerpt :

...In all cases, uncertainty reduces confidence in the risk assessment process and consequently risk management decisions; thus risk and uncertainty should be communicated and quantified transparently to enable decision makers make the right choice (Hill et al., 2013). Uncertainty in contaminated land risk assessment describes the lack of exact knowledge of natural processes

which result in inadequate site characterisation (Nathanail et al., 2011; Sheng et al., 2015). Major risk assessment for some contaminants take more than a decade to complete due to limitations in knowledge, space and time (Abt et al., 2010; Hill et al., 2013)....

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2023, Ethics in Science and Environmental Politics

Analysis of Catastrophes and Their Public Health Consequences: Descriptions, Predictions, and Aggregation of Expert Judgment Supporting Science Policy ↗
2020, Analysis of Catastrophes and Their Public Health Consequences: Descriptions, Predictions, and Aggregation of Expert Judgment Supporting Science Policy

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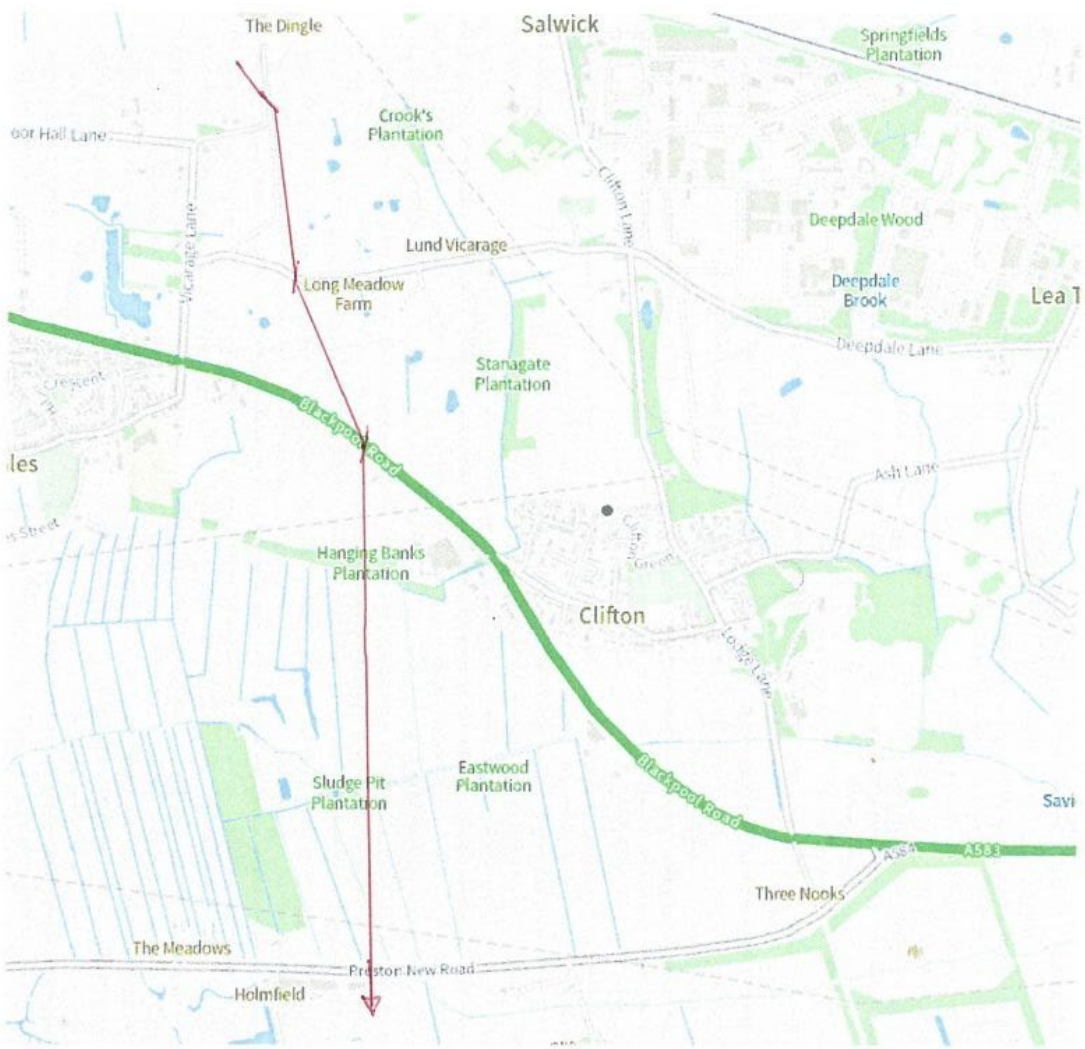

Approximate route of Ethylene Pipeline

It is pumped as a liquid at −104°C