The regulation of risk: the case of fracking in the UK and the Netherlands

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Abstract

The precautionary principle was developed in environmental politics as a guiding mechanism for governments where new technologies, products, and processes produced potential health or environmental problems but where scientific evidence could not explain why. Anecdotal evidence of fracking suggests that it might cause water pollution or subsidence, but the scientific evidence to support this proposition is not yet in place. This paper examines the actions of the UK and Dutch governments toward fracking. Although both governments have adopted the precautionary principle into national law, neither has directly invoked it in the field of fracking, relying instead on more conventional scientific understandings of risk. In line with other papers in *Science and Public Policy*, this article provides a comparative analytical analysis of scientific policy regulation. It does so by arguing that while notionally subscribed to the precautionary principle, the UK and Dutch authorities have been reluctant to use it.

Key words: precautionary principle; fracking; environmental politics; regulation.

1. Introduction

In a world where there are fears of an energy collapse, the means of producing gas and petroleum from shale by using hydraulic fracturing is seen by some governments as a potential game changer in the production of energy. Where extraction of conventional energy resources appears to be near exhaustion the resort to less traditional methods of energy extraction is seen as the way forward. One such method is hydraulic fracturing, but this is not new, despite its prominence in news reports at the present time. Fracking began as an experiment in 1947, but its first commercially successful application was in 1950 (King 2012: 2). The techniques such as directional drilling, fracturing, and micro-seismic monitoring have made gas production from shale technically and economically feasible.

However, the techniques used for unconventional gas extraction today (high volume, or slick water fracking) are different from the earlier drilling techniques. In today’s gas extraction, fracturing, or to give it its technical name, hydraulic fracturing, is a practice in which rock is fractured by a pressurized liquid. This involves the high-pressure injection of fluid, usually water, which contains sand suspended with the aid of some type of thickening agent into a well to create cracks in the deep-rock formations through which natural gas and oil flow more freely. When the hydraulic pressure is removed from the well, small grains of sand hold the fractures open (Gandossi and Von Estoff 2015: 8).

As for most industrial activity, ‘hydraulic fracturing could potentially entail some risks to the environment. Among the concerns raised are the high usage of water, methane infiltration in aquifers, aquifer contamination, extended surface footprint, induced local seismicity, etc.’ (Gandossi and Von Estoff 2015: 3). In the USA where fracking is at an advanced stage, there have been concerns about its impact on local communities, causing the growth of anti-fracking movements. These movements have also grown in the UK and in the Netherlands. Environmentalists claim that the potentially carcinogenic chemicals used may escape and contaminate groundwater around the fracking site. There are also worries that the fracking process can cause small earth tremors (BBC News 2015).

Using the precautionary principle as a policy device for environmental concerns, this paper examines the actions of the UK and Dutch governments with respect to fracking. They have been selected for analysis because they share many similarities. For example, both are, at the time of writing, European Union (EU) member states and both subscribe to the EU position on the precautionary principle. Moreover, both countries base their policies on the quantification of risk. A further reason for choosing these two countries is that both have embarked on shale gas fracturing with evidence of environmental problems from Groningen, Netherlands, while fracking operations are about to begin in East Yorkshire. There are some differences between the two countries, however. Their legislative systems are unalike, with the UK having a common
law system while in the Netherlands the system is based on Roman or Napoleonic law. This means that ‘...many cases that are cases between private parties in the common law system are cases between the state and a citizen or institution under Napoleon law’ (Ale 2005: 232), but both are liberal democracies based on individual freedom, liberty, the rule of law, and a free market economic system. In terms of comparative analysis, therefore, the UK and the Netherlands have more in common with each other than differences, and it is for that reason that this paper conducts a 'most similar' research design in which we try to explain the differences in which the precautionary principle has been applied to the issue of fracking.

Our intention is to examine the way in which the UK and Netherlands' governments have handled the assessment of the risks involved in hydraulic fracturing technology, and does so by using the precautionary principle as the guiding theoretical framework. The paper is laid out on the following ways. It begins by plotting how the UK and Dutch governments over the years have perceived and responded to risk in times of uncertainty. The paper then analyses the use of the precautionary principle as a policy-guiding device in the selected countries, and then determines whether the principle has been operationalized fully in both, or whether the principle has been paid to it. Thereafter, the paper explores the issue of fracking within the UK and the Netherlands in order to determine whether the precautionary principle has been enacted, given that both countries to a greater or lesser degree have committed themselves to its use. The paper ends by drawing together our findings. It is argued that both countries nominally adhere to the precautionary principle but in practice tend not to apply it. This is more the case in the UK, but in the Netherlands the situation regarding fracking is slightly more complex. While not explicitly invoking the precautionary principle, the Dutch authorities have actually applied elements of it due to local pressures. This has not been mirrored in the UK, however, where the authorities have favored a more 'sound science' approach to fracking despite encountering similar local pressures that have been found in the Netherlands.

2. Wider government policy on risk: the UK and the Netherlands

2.1 The UK

Environmental issues, since Victorian times, were dealt with in an ad hoc fashion, resulting in a confusion of agencies, legislation, and procedures. Many early influences on environmental issues came from popular nineteenth century reform movements and charitable bodies concerned with wildlife and the preservation of nature. Yet, looked at historically, Britain has an impressive record of responding to environmental problems. The world’s first environmental inspectorate, the Alkali Inspectorate, was created as far back as 1863; the world’s first planning act was the 1947 Town and Country Planning Act, and the world’s first air pollution control legislation was created in the Clean Air Act of 1956. However, the British approach to environmental problems has generally been a reactive one, and as environmental issues are cross-sectoral in nature, environmental policy has emerged in a fragmented and piecemeal way (Patterson 2008: 58).

The environment became an important issue worldwide in the 1970s and in Britain there was a growth of the environmental lobby and the realization that the undesirable effects of industrial development were beginning to be seen to affect health, lifestyles, and the environment. Matters came to a head in 1974 as a result of a chemical accident in Flixborough. The ensuing public enquiry created the Health and Safety at Work Act. This established the Health and Safety Commission and the Health and Safety Executive. After deliberation on a number of accidents, it suggested, among other ideas, the introduction of a licensing system for activities that may result in hazardous activity.

However, according to one author, politicians in the UK in the past regarded the environment ‘as an unimportant and largely self-contained area of political activity’ (Jordan 2000: 264). This apparent indifferent approach may be explained by two key ideological commitments of the governments during the 1980s and 1990s. First, Conservative governments believed that the state should exist only to ‘provide the framework within which economic agents can pursue their goals; it is not to impose some collective view about where and how economic development is to take place’ (Wale 1992: 87). Similar arguments have also made by Lowe and Flynn 1989 and McCormick (1991). Second, under Conservative governments, there was an implicit desire to keep strict control over government expenditure. This meant that it was difficult to develop regulations to control pollution, because many areas where regulation was needed, such as energy and water, were then in public ownership, and investment in pollution prevention measures would add to public expenditure. In time there were some changes: the New Labour government that came to power in 1997 showed a trend toward ‘a more collective or inclusionary way of approaching environmental risk assessment and this has modified in a small way Britain’s sound science based tradition’ (Patterson 2008: 64). It has to be noted, though, that despite movements toward a more precautionary environmental policy, UK government policy nonetheless remains rooted in the ‘sound science’ tradition.

2.2 The Netherlands

The Netherlands has had some sort of licensing system for a long time. After many major disasters in the Netherlands over several centuries, the king of the Netherlands at that time, Louis Napoleon, in 1807, issued a decree ‘stating ... that a license was needed to operate a facility’ (ale 2005: 235). From that simple decree, years later, this was converted into a number of laws such as the Factory Act (Fabriekwet) 1875, and a Safety Law in 1896. This was the origin of the modern licensing system in the Netherlands. Licenses are now granted under the Environmental Management Act. In terms of the environment generally, the Netherlands has created a National Environmental Policy Act 1969 (NEPA), and a series of National Environmental Policy Plans (NEPP). In the NEPP 2003 document, there is a particular recommendation that there should be an emphasis on the involvement of interested parties outside government (Netherlands Third Environmental Policy Plan (NEPP) 2003: 8). These acts and policies maintain a framework for environmental policy giving a long-term strategy for addressing environmental problems. More specifically, 80% of Dutch legislation on the environment is derived from EU legislation (Government of the Netherlands: n.d.).

3. The precautionary principle as a policy tool

As stated above, this paper will examine the issue of fracking in our two countries by using the precautionary principle as the theoretical framework. The precautionary principle is an important device in environmental policy as witnessed on many occasions. For example, whenever issues of the safety of an industrial process occur
governments are faced with insistent demands from some scientists, the media, and sections of the public for precautionary action to be taken. This can be noted in the UK, for example, in the cases of bovine spongiform encephalopathy (BSE) in cattle, in the development of genetically modified (GM) organisms and in the use of organophosphates (OPs) in sheep farming. The UK government’s instinctive response at the time was to invoke the ‘sound science’ principle. In other words, action had to be based on concrete evidence that a causal relationship had been established between the alleged threat and human health before remedial measures were taken, and furthermore, in the above cases it was claimed that there was no evidence to support such remedial action (Patterson 2008).

The precautionary principle, on the other hand, requires research that goes beyond this reductionist approach to a full understanding of the whole as well as the parts. This has not always been witnessed in UK environmental decision-making.

The aim of the precautionary principle is the prevention of environmental degradation. To that end the principle has found its way into international treaties and protocols, although ‘...the precautionary principle only forms a legally binding norm of international law in those cases where it is laid down in the substantive part of a treaty’ (Douma 2003: 439). EU environmental policy is based on the principles of precaution and of preventive action: the preventive principle was laid down in the EEC Treaty, via the Single European Act of 1986, while the precautionary principle is set out in the Treaty of EU in 1992. Within the EU there was much discussion of the precautionary principle and how it should be applied with some lobbying against the idea (Douma 2003: 230).

In 2000 the EU Commission produced a paper aimed at dealing with the problems that had been highlighted. The resulting communication (Commission of the EC 2000) established Commission guidelines for applying the principle to enable a common understanding of how to appraise, manage, and communicate risk that science was unable to definitively conclude. Its final purpose was to ensure that recourse to the principle was not used as a form of protectionism. The essence of the Commission’s paper is that in specific circumstances where scientific evidence is insufficient, inconclusive, or uncertain, and there are indications through preliminary objective scientific evaluation of reasonable grounds for concern, then the precautionary principle is the correct risk strategy to use (Commission of the EC 2000: 8–9).

Over the decades a vast literature on the precautionary principle has accumulated, although it must be stated that much of it is criticism or refutation of the principle (see, e.g. Wildavski 1990; Holm and Harris 1999; Morris 2000; Sunstein 2005; Brown 2013). While, as one professor of science and technology policy puts it: ‘Precaution is arguably one of the most misunderstood and misrepresented issues in the global politics of science and technology’ (Stirling 2013). It is not a very complicated philosophical idea that is difficult to grasp: it is a very simple concept that should be invoked ‘when there is good reason to believe that harmful effects may occur to human, animal or plant health or to the environment’ (Interdepartmental Liaison Group on Risk Assessment (ILGRA) 2002: 2).

Critics of the precautionary principle believe it stifles innovation, and that humanity will be prevented from using new inventions or innovative technology were the precautionary principle to be enacted (Brown 2013). Some risk researchers, however, believe that the precautionary principle is, in principle, no more vague or ill-defined than other decision principles and like them it can be made precise through elaboration and practice (Sandin et al. 2002: 287). They also believe that although the precautionary principle is value-based, it is not unscientific because it is not exclusively based on science. As another risk researcher notes: ‘...a precautionary appraisal process need in no way imply a rejection of conventional risk assessment. Instead, it reflects an appreciation of a greater diversity of alternatives, together with their respective conditions of applicability’ (Stirling 2008: 103). Moreover, as an EU research project on early warnings of risk found, ‘lay and local knowledge, as well as relevant specialist expertise’ should be included in the appraisal (Harremoes et al. 2002: 186). In other words, this would involve using the democratic process, as can be seen in the Netherlands case study below.

There are a host of differing definitions of the precautionary principle; indeed, to some, it cannot be defined. However, there is one definition that has found favor with many governments and environmental scientists. In 1992, the United Nations Conference on the Environment and Development (UNCED) in Rio de Janeiro ended with a (non-binding) declaration with Principle 15 stating that:

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation (United Nations Conference on Environment and Development (UNCED) 1992).

Note the phrase cost-effective measures: this formulation is said to be a weaker version of the precautionary principle as it imposes a lesser evidential requirement on developers that there activities do not harm humans or the environment. This brings us to note that various writers have distinguished between two versions of the concept—a stronger and a weaker version. The strong formulation of the precautionary principle states that one should ‘take no action unless you are certain that it will do no harm’ (Morris 2000: 1) and a similar take by Sunstein (2005). The weaker version can be seen in the Rio declaration above, and also in an article on the UK government approach to the precautionary principle which noted that ‘this is a balanced precautionary approach, applying judicious and responsible management practices’ (Patterson and Gray 2012: 437). This is in contrast to the sound science approach which is based on a premise that no action should be taken unless there is concrete proof that it will be detrimental.

Perhaps because of the many formulations of the precautionary principle, it is much misunderstood. Rather than taking precautionary action at every turn, as most individuals do as a matter of course in their daily lives, the precautionary principle is only prescribed in the presence of uncertainty. The routine actions of people, such as crossing busy roads, or being careful on icy pavements are natural instincts and are done in the presence of certainty: people know the results of carelessly crossing roads or not treading carefully on icy pavements.

The EU’s take on the precautionary principle is relevant to this article, and is the conceptual framework for this paper, as both the UK and the Netherlands accept the EU commission position on the principle. The EU Commission guidelines (Commission of the EC 2000) state that, among other things, measures based on the precautionary principle should be proportional to the chosen level of protection and that a total ban may not be a proportional response to a potential risk. While the guidelines also recommend examining costs and benefits of action, this examination should not be restricted to an economic cost-benefit-analysis but account should be taken of...
the protection of public health. Moreover, the precautionary principle should not be used as a disguised form of protectionism.

Using the precautionary principle in the presence of uncertainty can be explained by reference to public policy decisions. Policy fields may show characteristics that are either routine, or complex, or technically difficult. In these categories, strategies for coping can be made as outcomes are certain. There are some fields, however, where there are scientific unknowns with no determined solutions, or indeed there are rival claims from experts. Although addressing the issues of foreign policy and terrorism—and not the precautionary principle per se—such scenarios were neatly encapsulated by the then US Secretary for Defense, Donald Rumsfeld’s take on uncertainty: ‘...there are known knowns; there are things we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns—the ones we don’t know we don’t know’ (US Department of Defense 2002). Otwin Renn (2008: 91) states this position more clearly:

- Decisions under certainty: the outcomes of different choices are known.
- Decisions under risk: probabilities can be assigned to the outcomes of different choices.
- Decisions under ignorance: it is not possible to assign probabilities to the outcomes of different choices.

If we accept Renn’s position then this means that risk is not always as quantifiable as some sources would argue. We can see, therefore, that there are occasions where there is scientific uncertainty that goes beyond the range of known, observable uncertainties that are recognized within the parameters of the system being researched. According to the EU position on the precautionary principle, ‘Decision-makers need to be aware of the degree of uncertainty attached to the results of the evaluation of the available scientific information’ (Commission of the EC 2000: 3). The EU version of the precautionary principle is, then, a more open-ended dialogue and a more inclusive peer-review process. With this in mind we can now review the position on the precautionary principle in the UK and the Netherlands.

4. The precautionary principle: the UK and the Netherlands

4.1 The UK

As long ago as 1990, in the White Paper, This Common Inheritance, the British government listed the precautionary principle as one of the five principles with which to guide future environmental policy-making (DoE 1990). Many official documents and political pronouncements since then have referred to the precautionary principle or to precautionary approaches. One such document published by the UK Health and Safety Executive (ILGRA 2002) clearly outlines policy guidance on the precautionary principle. Moreover, as noted earlier, successive UK governments have accepted EU guidelines on the precautionary principle (Commission of the EC 2000). Nevertheless, as one study notes, the British government applies the precautionary principle in a piecemeal fashion: ‘The UK . . . is similar to most other countries, in that their commitments to the precautionary principle are also circumstantial—they apply the precautionary principle selectively’ (Patterson and Gray 2012: 447). It could be argued that this is particularly so of the present UK Conservative government which is more likely to be concerned with the interests of business and industry than environmental protection, with some arguing that the current UK government sees ‘the environment as an impediment to profit’ (Monbiot 2016).

An example of the precautionary principle at work in the UK took place during the 1990s when the government had to deal with the licensing of the new technology of GM seeds. The initial approach to these untried technologies was to accept the conventional risk assessment procedures familiar in the sound science approach. The government found itself caught between pressure from, on the one hand, the multinational biotech corporations urging a sound science approach, and on the other hand, the vociferous campaigns of the green lobby and elements of the media, urging a GM-free Britain, or at least a more precautionary policy in the regulation of GM crops. These events caused the government to change its approach. It used a ‘...weak precautionary approach to the issue, in that the government has attempted to balance the risks to the environment by, on the one hand, delaying commercialization pending clarification of potential harm, and product safety, against, on the other hand, the risk to the environment of taking no action’ (Patterson 2008: 156).

An example of where the precautionary principle perhaps should have been applied—but was not—was the BSE crisis in 1996. When incidents of BSE was found in British cattle herds the government of the day began by claiming to be guided by science but doing very little to solve the problem. As one study concluded: ‘...the UK government claimed to be prudentely protecting public health, while in practice it covertly subordinated the protection of public health, to the support of agricultural sales, with a view also to minimizing state intervention and public expenditure’ (Harremoes et al. 2002: 181). Such examples suggest that while nominally committed to the precautionary principle, UK governments tend to take a more ‘sound science’ approach to regulating environmental risk.

4.2 The Netherlands

The position of the precautionary principle in the Netherlands is, perhaps, just as ambivalent as in the UK. As noted above, environmental risk is law-based. While the precautionary principle is accepted and used in some specific cases, there are no literal references to be found in legislation. Nevertheless, much Dutch environmental legislation does contain elements of a precautionary principle (Douma 2003: 397). There are, however, many policy documents that make it clear how the Dutch government views the precautionary principle. For example, in May 1996 the Dutch Ministry for the Environment convened a conference in the Hague on Principles of Environmental Law. The final declaration (The Hague Declaration), ‘stressed that the Rio Declaration should be given the fullest possible legal effect’. One of the principles to be included was Principle 15, [the] precautionary principle, as quoted above (Douma 2003: 94).

Under the United Nations Agenda 21, the Dutch government laid out its Third National Environmental Policy Plan (NEPP3). In the section on legal instruments to be employed in Environmental policy it said: ‘Consideration is therefore being given to incorporating principles such as the precautionary principle, the preventive principle and the As Low As Reasonably Achievable (ALARA) principle into Dutch Law (Netherlands Third Environmental Policy Plan (NEPP) 2003: 22). In short, the precautionary principle in the Netherlands only exists to the extent of how it is formulated and interpreted in various international treaties.
5. Fracking research and the public debate in the UK and the Netherlands

The past several years have seen the publication of many reports on the fracking activities in the USA and in the UK and as one study observed: ‘...there are now over 450 peer-reviewed studies, reviews and commentaries’ (McCoy and Saunders 2015: 6). Some of these reports were published by public bodies such as the US Environmental Protection Agency, Public Health England, and the Campaign to Protect Rural England (CPRE). In addition, many individual scientists have written reports on fracking in academic science journals. Common to most of these studies is the belief, in the words of one report, that: ‘(A)lthough a growing body of literature indicates that fracking cannot be made entirely safe through any regulatory framework (especially in densely-populated areas), it is possible for risks to be minimised and managed’ (McCoy and Saunders 2015: 31). These studies all catalogue the risks from chemicals in the fracking process, the possibility of high emissions of greenhouse gases and the fact that fracking consumes large volumes of water, not all of which is recoverable (Melville 2013: 26). One scientist in particular makes the point that: ‘...the fact that there is no clear scientific consensus on the issue makes a strong case for increased regulations—after all, it only takes one major spill to make fracking a serious environmental concern’ (Melville 2013: 27).

An analysis of fracking based on Otwin Renn’s typology of risk noted above is instructive. It clearly corresponds with his third position: the decision to undertake fracking is a decision taken under ignorance. It is not possible to assign probabilities to the outcomes of fracking, as some of the literature we have examined has suggested. In other words, the potential dangers of fracking are uncertain given that drilling in the Netherlands and the USA has produced some surprising consequences (such as subsidence) but this evidence has not been conclusively corroborated by the scientific community as yet and might be accounted for by existing weaknesses in the ground structure. This clearly falls within the terrain of the precautionary principle: there is clearly a lack of scientific certainty as far as the safety of fracking is concerned, notwithstanding the UK government’s position that it believes it is encouraging safe environmental exploration.

There are also a number of academic papers that focus on risk assessment of groundwater contamination (e.g. Fletcher 2012) and air emissions from fracking operations (McKenzie et al. 2012). Moreover, the hydraulic fracking industry has developed a number of operating practices (Canadian Association of Petroleum Producers (CAPP) 2012). The methods used are, in groundwater pollution, to conduct a technical assessment of the operations site and a scientific analysis of groundwater contaminant transport as well as a qualitative analysis of the perceptions of local stakeholders (Fletcher 2012: 29), and for air pollution, estimating exposure risks to populations residing near wells and samples from within perimeters of well pads (McKenzie et al. 2012: 2). In terms of industry practice, companies focus on identifying chemical ingredients and characteristic of additives to assess the potential health and environmental risks (Canadian Association of Petroleum Producers (CAPP) 2012: 1). With this in mind, it now seems imperative to ask: what has been the reaction to fracking in the UK and the Netherlands.

5.1 The UK

Anti-fracking organizations have emerged both in the UK and The Netherlands. For example, in Balcombe in West Sussex there were some quite vigorous anti-fracking protests during mid-2013 (Goody 2013). Furthermore, a UK protest group, Frack-off, has made a number of claims about the alleged dangers of fracking. These claims cover such issues as process water contamination, air pollution, earthquakes, and chemical emissions that cause neurological and reproductive problems in humans and animals (Frack-off n.d.). More recently, in East Yorkshire, UK, large crowds gathered outside the local authority offices while local politicians deliberated on whether or not to license fracking in their area.

In terms of policy responses, the government showed a keenness to adopt the new technology as a means of providing a new source of energy and securing many new jobs in the process. On 17 December 2015, the UK government issued new licences for onshore gas and oil exploration. Several well-known companies won the right to explore the possibility of operating in a series of blocks around UK. The companies who won the licences are: Cuadrilla, GDF Suez, Hutton Energy, UK Oil and Gas, Anglo-Swiss Chemicals Group, and Aurora Energy Resources (Hellier 2015). These exploration activities are, however, subject to local planning, safety, and environmental authorization.

In 2015 Cuadrilla gained permission from the local authority to explore sites in Lancashire but this was subsequently rejected by the local authority after local protest. In October 2016, the government allowed Cuadrilla to appeal against the county council’s decision to refuse permission for fracking (Lancashire County Council 2016). While on 23 May 2016, local authorities in the Yorkshire Dales gave permission to Third Energy to commence operations despite opposition from the local community. The UK energy minister said: ‘We’re very clear that fracking is a fantastic opportunity. It’s good for jobs, the economy and strengthening our energy security’ (Gosden 2016).

On the issue of fracking the UK government has not ever mentioned the precautionary principle, believing that ‘shale gas has the potential to provide the UK with greater energy security, growth, and jobs. We are encouraging safe and environmentally sound exploration to determine this potential’ (Department of Energy and Climate Change 2016: 1). There is no mention of the precautionary principle in this newsletter but on the matter of safety it does refer the reader to a Royal Society report reviewing hydraulic fracturing. This report does not mention the precautionary principle in its review of the health, safety, and environmental risks (Royal Society 2012). The UK’s environmental Audit Committee, in its report on Environmental risks of fracking, saw the need for more independent studies into the impacts of fracking and stated that: ‘It is vital that the precautionary principle is applied’ (House of Commons Environmental Audit Committee 2015: 16). A letter published in the British Medical Journal (BMJ 2014) by eighteen medical specialists shows the concern of the medical profession. In the letter they declared their concern for the potential effects of fracking on public health and said ‘there are clear grounds for adopting the precautionary principle and prohibiting fracking’. Despite this opposition, the development of fracking continues within the UK.

5.2 The Netherlands

The Dutch are quite far advanced in terms of gas extraction by hydraulic fracking. The province of Groningen, for example, has been one of Europe’s richest gas fields for three decades, but fracking exploration is comparatively recent. This current huge gas field is, however, only expected to last for a further 15–20 years so the government is quite eager to explore the new fracking technology. However, in affected areas such as the province of Groningen
protest movements, have emerged, and one environmental body, Milieudefensie, has drawn attention to the risk of earthquakes and the leak of methane gas from the boreholes (Milieudefensie 2016). Nevertheless, it has been argued that these earthquakes are not just down to recent fracking activities but are said to be the result of 30 years of oil extraction by conventional methods after which the earth seems to have settled causing the earthquakes (Varlin 2015). There appears to be little support for shale gas in the Netherlands. According to one Dutch News portal, a number of local councils, water boards, and brewing groups have come out against the production of shale gas in the Netherlands because of the risk of pollution (Dutch News 2015).

Because of this lack of public support, and the fact that in recent years there has been much damage to homes, farmhouses, and ancient churches, the Dutch government has been forced to declare a moratorium on shale exploration until 2020. This decision means that the existing shale gas exploration licenses will not be renewed (Shale Gas International 2015). Many of the issues raised in Dutch debates concerning fracking are similar to those in the UK, such as water contamination and what has been particularly manifest are the many earthquakes (aardbevingen) in the province of Groningen (RTV Noord 2015). This has been a profound environmental crisis for the province, and in September 2015 a landmark court ruling has led the way for a huge compensation bill for the companies involved. The court ruling also gave victims some hope that their voices could be ignored no longer (Amin 2015).

Currently in the Netherlands, under the Dutch Mining Act (Mijnbouw wet), landowners own title to the top layer of their land down to a depth of 100 m. The state owns all minerals (delfstoffen) that are under the subsurface at more than 100 m (Norton Rose Fullbright 2015). Mining activities around oil and gas must be licensed by the Minister of Economic Affairs. In terms of how The Netherlands handles public concerns over environmental matters, an event that happened over a decade ago is instructive. The Dutch National Oil Company (Nederlandse Aardolie Maatschappij) (NAM) applied for licenses for an extraction technique where waste water from oil drilling operations (a technique similar to fracking) was being used, in the town of Twente. There local community groups attempted to challenge the issue of these licenses. Citizens gathered information and developed knowledge of fracking and in the process exposed a number of problems such as subsidence in houses and discovered a leak at a pumping station, such events NAM claimed could not happen. These citizens then assembled a dossier of evidence that questioned many of the claims made in the license applications. Their appeal went to the Dutch Council of State but the appeal was ‘deemed inadmissible on the grounds that they were not directly party to the process nor were they sufficiently expert’ (Bennsworth and Velderman 2016: 25). Local politicians began to panic when a series of reports on the risks of subsidence and sinkholes began to appear in the media. Local citizen experts were then given a platform to explain their position and why they challenged the license applications and this was the first time the reporting presented both sides of the story (Bennsworth and Velderman 2016: 26).

The anti-injection campaign grew so big that the local provincial government decided to re-evaluate its policy on whether waste water injection was the optimal solution with the consequence that the Dutch Lower House voted in favor of a moratorium on fracking until 2020. These events show clearly that it was the knowledge developed by local citizens that led to a re-evaluation of the policy on fracking. This was not the norm as Bennsworth and Velderman note:

In gathering knowledge, policy-makers took soundings from consultants, professional companies widely acknowledged for their general expertise in assembling information in accordance with a proposal. Citizens were allowed to participate and express emotion, feelings, and beliefs, but were not listened to when they presented objective evidence (Bennsworth and Velderman 2016: 27).

The message from this case study is that ‘citizens must not be restricted to the role of passive participants but allowed to become consultants using their knowledge in the process’ (Bennsworth and Velderman 2016: 27). In any event, this episode demonstrated that the Dutch authorities have been more willing to acknowledge evidence from a wider range of stakeholders than has been the case in the UK. In other words, by involving this wider range of stakeholders, and by applying a moratorium on the use of fracking until the evidence of its environmental consequences become clearer, the Dutch authorities have invoked elements of a weaker version of the precautionary principle.

6. Comparative summary: the UK and the Netherlands

The first point of note is that both countries are very keen on exploiting the technique of fracking: the UK government, which depends on purchasing gas from overseas, views the technology as a way of ensuring domestic gas supplies and at the same time creating jobs, while The Netherlands, which has been harvesting gas from its north-eastern gas field by conventional means for 30 years, now hopes to extend its life further by using fracking technology. For the Netherlands government fracking is economically very important.

In terms of assessing risk there are differences and similarities between the two countries. In the UK the HSE is the advisory body that determines the methods for risk assessment, while in the Netherlands ‘no single controlling body existed, so the methodologies were developed in committees consisting of representatives and experts from across government and industry’ (Ale 2005: 236). Both the UK and the Netherlands have similar systems in terms of the quantification of risk, and attitudes to the precautionary principle, although their legal systems are different. In the UK there are government policy documents that explicitly state commitment to the precautionary principle. The ILGRA has specifically declared that ‘the precautionary principle should be evoked when there is good reason to believe that harmful effects may occur to human, animal or plant health or to the environment’ (ILGRA 2002: 2). The UK also subscribes to the EU position on the precautionary principle, even if governments of some persuasions are sometimes reluctant to use it. In the Netherlands, however, the intention to include the precautionary principle into Dutch environmental law is often discussed but has not yet happened. However, because of its commitment to EU policy on the environment (80% of environmental legislation is derived from EU legislation, as mentioned above), the Netherlands is committed to the EU policy on the precautionary principle and it is, therefore, used in assessing risk. There is not precise comparative figure for the amount of UK legislation derived from EU legislation but a paper produced by the UK government does admit that: ‘There are few aspects of the environment within the Member States which are not the subject of EU controls’ (UK Government 2014: 22).
In terms of public dissent there have been similar responses to proposed fracking activities, although with more success in the Netherlands: governments in the UK have not given in to any protest movement, as we can see from the recent decision to allow Cuadrilla to appeal against the local council's ban in Lancashire, and the decision to allow exploration in East Yorkshire. As noted above in reference to the UK, the application of the precautionary principle in both countries is circumstantial; it is applied selectively and certainly not to every perceived environmental threat. The principle does not seem to have even been mentioned by the UK government in its pronouncements on shale gas drilling. The application of the precautionary principle is therefore similar in both countries as they both rely on the EU position.

In conclusion, it is clear that decisions on risk are political in nature and depend, as we have noted, on the legal and cultural histories of the two countries under study. Moreover, as one analyst has noted: 'political decisions are not only based on hard quantifiable facts, but also on many judgmental factors' (Ale 2005: 240). It would seem that in terms of the use of the precautionary principle that the Netherlands tends to rely on international treaties while the UK, despite having specific policy documents regarding the use of the precautionary principle, conveniently ignores it when it suits the government's position, as with its seeming disregard for the approval of fracking exploration. The above analysis suggests that whereas both governments notionally adhere to the precautionary principle, both have paid lip-service to it over the use of fracking. The UK government has taken a more 'sound science' approach to fracking. This is perhaps not unsurprising given the reluctance of previous UK governments to invoke the precautionary principle in areas such as BSE and the use of OPs. By contrast, the Dutch authorities have been more readily influenced by stakeholders such as local pressure groups as opposed to basing their decisions on the advice of scientists alone. The authorities have therefore adopted elements of the weaker version of the precautionary principle in terms of fracking, but it appears that this has been more due to circumstance than any rigid following the precautionary principle.

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**References**


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