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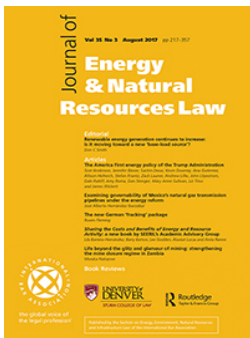
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The new German ‘fracking’ package

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Germany is a relative late-comer among its European peers when it comes to hydraulic fracturing and shale gas regulations. It was not until February 2017 that Germany’s new regulations in this field took effect. This article analyses the main features of the new German ‘fracking’ regulations, situates them in the context of European Union law on unconventional gas and provides background information on the evolution of European and German ‘fracking’ regulation. It critically assesses the six core features of the German ‘fracking’ package and concludes that considerable issues and incoherencies in the formulations might lead to successful legal challenges of the package by the industry.

Keywords: shale gas; fracking; unconventional; Europe; Germany

1. Introduction

In the summer of 2016, the German parliament (Bundestag) installed a specific regulatory framework for hydraulic fracturing in Germany, consisting of two laws and one ordinance, which became effective on 11 February 2017.¹ This so-called fracking package outlaws the usage of hydraulic fracturing for the extraction of hydrocarbons

¹ Bundestag, ‘Drucksache 18/4713 Bill of the German Federal Government on the alteration of water- and environmental protection norms with the aim of prohibiting and minimising risks associated with the procedures of the fracking technology’ (*Gesetzesentwurf der Bundesregierung Entwurf eines Gesetzes zur Änderung wasser- und naturschutzrechtlicher Vorschriften zur Untersagung und zur Risikominimierung bei den Verfahren der Fracking-Technologie*) <http://dipbt.bundestag.de/doc/btd/18/047/1804713.pdf> accessed 7 April 2015 (Drucksache 18/4713); Bundestag, ‘Drucksache 18/4714 German Government Draft Bill to expand the Mining Damage Presumption to borehole mining and caverns’ (*Bundesregierung Entwurf eines Gesetzes zur Ausdehnung der Bergschadenshaftung auf den Bohrlochbergbau und Kavernen*) <http://dipbt.bundestag.de/doc/btd/18/047/1804714.pdf> accessed 7 April 2015 (Drucksache 18/4714); Bundesrat, ‘Drucksache 144/15 German Ministry of the Economy and Energy Ordinance on the introduction of Environmental Impact Assessments and on mining requirements in deployment of the fracking technology and deep drills’ (*Verordnung zur Einführung von Umweltverträglichkeitsprüfungen und über bergbauliche Anforderungen beim Einsatz der Fracking-Technologie und Tiefbohrungen*) www.bundesrat.de/SharedDocs/beratungsvorgaenge/2015/0101-0200/0144-15.html?jsessionid=86AAD3036B5C2CDA8A8A2B4B565717AF.2_cid349?cms_templateQueryString=Suchbegriff&cms_fromSearch=true accessed 7 April 2016 (Bundesrat Drucksache 144/15).

from certain types of rock, whereas extraction from other rock types by means of hydraulic fracturing remains licit.²

The new regulatory framework of the fracking package centres on six themes:

- a particular German definition of so-called ‘unconventional’ and ‘conventional’ fracking;
- the relationship between the package and the German constitution;
- the legal nature of the package;
- the prohibition of fracking in water protection areas and the use of best available techniques;
- liability and the reversal of the burden of proof; and
- the obligatory conduct of Environmental Impact Assessments (EIAs) for all fracking activities.

This article assesses these features individually and traces the law and policy processes that led to the emergence of the fracking package. The article proceeds as follows: it begins with a brief description of the main technological features of ‘fracking’.³ This is followed by a short outline of the history of shale gas regulation in the European Union and the (previously failed) attempts to install a comprehensive, nationwide regulatory framework for fracking in Germany. Subsequently, the contribution focuses on each of the individual features of the new fracking package and scrutinises these features against the backdrop of guidance documents, studies, etc. At the end, some preliminary conclusions are drawn.

2. Shale gas extraction – the techniques

Hydraulic fracturing, or fracking, is a technique that is commonly associated with shale gas (natural gas that is present in very small pores of organic rich shales).⁴ However, hydraulic fracturing cannot only be deployed for shale gas extraction: it may be used for all sorts of oil and gas extraction and even for geothermal purposes.⁵

² Bundestag, ‘Fracking vote by name’ (*Fracking Namentliche Abstimmung*) www.bundestag.de/bundestag/plenum/abstimmung/grafik accessed 29 June 2016. The upper chamber (Bundesrat) followed suit on 8 July 2016, see Bundesrat, ‘Drucksache 358/16 (Beschluss des Bundesrates)’ [www.bundesrat.de/SharedDocs/drucksachen/2016/0301-0400/358-16\(B\).pdf?__blob=publicationFile&v=1](http://www.bundesrat.de/SharedDocs/drucksachen/2016/0301-0400/358-16(B).pdf?__blob=publicationFile&v=1) accessed 13 July 2016 (Bundesrat Drucksache 358/16) and Bundesrat, ‘Drucksache 353/16 (Beschluss des Bundesrates)’ [www.bundesrat.de/SharedDocs/drucksachen/2016/0301-0400/353-16\(B\).pdf?__blob=publicationFile&v=1](http://www.bundesrat.de/SharedDocs/drucksachen/2016/0301-0400/353-16(B).pdf?__blob=publicationFile&v=1) accessed 13 July 2016 (Bundesrat Drucksache 353/16).

³ The technology will be explained below. The term ‘fracking’ is inaccurate when it is used to describe hydraulic fracturing generically, since ‘fracking’ could also mean pneumatic fracturing or other fracturing techniques, which are not in the spotlight of the public debate. However, the German legislator uses the terminology ‘fracking’. In order to facilitate the reading-flow and coherence, this author will adopt the German lax terminology and refer to fracking when discussing hydraulic fracturing.

⁴ Knut Bjorlykke, *Petroleum Geoscience: From Sedimentary Environments to Rock Physics* (Springer Verlag 2010) 464 (Bjorlykke).

⁵ Sachverständigenrat für Umweltfragen (SRU) Martin Faulstich and others, ‘Fracking zur Schiefergasgewinnung Ein Beitrag zur energie- und umweltpolitischen Bewertung Stellungnahme’ ⁶ www.umweltrat.de/SharedDocs/Downloads/DE/04_Stellungnahmen/2012_2016/2013_05_AS_18_Fracking.pdf?__blob=publicationFile accessed 2 July 2013 (SRU Faulstich); Energy and Climate Change Committee of the House of Commons, *Shale Gas* (Fifth Report of Session 2010–12, HC 795, Vol I) 54 (UK Report I).

Deployment for these other purposes is not a new development. Hydraulic fracturing was initially developed to enhance the recovery of conventional hydrocarbons.⁶

The industry differentiates between conventional and unconventional hydrocarbons, depending on the ability of the gas to migrate *in situ*: conventional hydrocarbons make their way up from the source rock ('primary migration') into layers of more permeable reservoir rock, like sandstone or limestone ('secondary migration') and gather in minute holes, gaps or pores in these rocks.⁷ These constitute 'traps',⁸ for hydrocarbons, as they are overlaid by caps of impermeable rock. From these reservoirs 'conventional' hydrocarbons may be produced.⁹

Unconventional hydrocarbons, by contrast, are 'trapped'¹⁰ in the source rock and do not migrate in a commercially viable manner without stimulation (no 'primary migration');¹¹ the 'unconventional bit' is, hence, the impermeability of the source rock and the fact that no 'primary migration' is taking place.¹²

Hydraulic fracturing has been singled out in the public debate as a particularly important, but controversial, technique for the production of unconventional hydrocarbons.¹³ However, two different technologies are actually required for industry-scale extraction of unconventional hydrocarbons: first, innovative/horizontal drilling and second, hydraulic fracturing.¹⁴ After the well has been successfully established by innovative drilling technologies, a second step is required to actually extract gas: hydraulic

6 Ralph W Veatch Jr, 'Overview of Current Hydraulic Fracturing Design and Treatment Technology – Part 1' (1983) 35 *Journal of Petroleum Technology* 677 (Veatch Part 1).

7 Robert Stoneley, *An Introduction to Petroleum Exploration for Non-Geologists* (Oxford University Press 1995) 27 (Stoneley).

8 *Ibid* 35.

9 Engineers accordingly tap into these reservoirs to extract conventional gas, which flows with comparative ease from the reservoir rock as a result of its permeability; see Stoneley (n 7) 35 and SRU Faulstich (n 5) 7.

10 Note that this terminology might be deceptive as it is also used in the context of 'conventional' gas extraction, but with a slightly different meaning, see explanations in the text before.

11 An apt explanation of the terminology has been provided by Mark Miller, CEO Cuadrilla Resources – Statement to the UK Commission, see: UK Report I (n 5) Ev 24:

Unconventionals are only a term that we as an industry coined years ago to describe a type of reservoir. It is not the process. There is no such thing as an unconventional well or a conventional well; there is only an unconventional reservoir, and that only means that the gas is stored in the same place that it is generated.

12 Stoneley (n 7) 11 and 101; SRU Faulstich (n 5) 7–8.

13 See for instance the European Commission in Commission Recommendation 2014/70/EU of 22 January 2014 on minimum principles for the exploration and production of hydrocarbons (such as shale gas) using high-volume hydraulic fracturing [2014] OJ L39/72 preamble 3 and 5; Milieu Ltd, 'Regulatory Provisions Governing Key Aspects of Unconventional Gas Extraction in Selected Member States' (2013) http://ec.europa.eu/environment/integration/energy/uff_studies_en.htm accessed 4 September 2014; Energy and Climate Change Committee of the House of Commons, *Shale Gas* (Fifth Report of Session 2010–12, HC 795, Vol I and Vol II) Ev 24 (UK Report I and UK Report II).

14 Ivan LG Pearson and others, *Unconventional Gas: Potential Energy Market Impacts in the European Union* (Joint Research Centre of the European Commission 2012) 59 <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/unconventional-gas-europe-potential-energy-market-impacts> accessed 20 May 2014 (Pearson and others); Harald Andruleit and others Bundesanstalt für Geowissenschaften und Rohstoffe (BGR), 'Abschätzung des Erdgaspotenzials aus dichten Tongesteinen (Schiefergas) in Deutschland' (Bundesanstalt für Geowissenschaften und Rohstoffe 2012) 35 (Andruleit and others BGR Abschätzung).

fracturing.¹⁵ Hydraulic fracturing is not a drilling method, but a stimulation treatment that is being applied to an existing well.¹⁶ The technology aims to enlarge the naturally occurring fissures in the rock layer and to create additional ones to allow the gas to flow more readily.¹⁷

To fully understand the regulations that are entailed in the German fracking package, it is important to note that gas may be produced by hydraulic fracturing from several rock types, not only from shale. Unconventional gas may also be present in layers of coal and sandstone. However, the production methods for the extraction of all types of unconventional hydrocarbons are quite similar. All of the described ‘trapping’ rocks are low permeability structures.¹⁸

3. The evolution of shale gas regulation in Europe and Germany

3.1. The European Union and ‘fracking’ regulation¹⁹

Owing to the division of powers between the EU and its Member States²⁰ it is necessary for the EU to have competence, whenever it wishes to act on a certain issue.²¹ A competence that shall provide the EU with regulatory powers in a particular area²² must have been conferred upon it²³ by the European Treaties.²⁴

Moreover, the principle of subsidiarity, entailed in article 5(3) of the Treaty on the Functioning of the European Union (TFEU), prescribes that the EU shall act only if and insofar as objectives of regulatory action cannot be sufficiently achieved by Member States.²⁵ This principle of subsidiarity has been explicitly designed to curb and confine the activities of the EU.²⁶ Matters should be dealt with at the level closest to those affected by them and EU action should be the exception, reserved for cases where the Union is better placed to act than the Member States.²⁷

Shale gas extraction touches upon the competences of energy (TFEU, article 194) as well as environmental regulation (TFEU, article 192).²⁸ These are shared competences, which means that the Member States and the EU both have a competence to regulate. In the past, these articles have been used to adopt measures that entail a particular level of harmonisation. Harmonisation means that the EU establishes standards for, inter alia,

15 Details on hydraulic fracturing may be found at: Veatch Part 1 (n 6) 677.

16 Andruleit and others BGR Abschätzung (n 14) 35.

17 Bjorlykke (n 4) 464.

18 Lars Dietrich and Till Elgeti, ‘Rechtliche Implikationen der Aufsuchung und Förderung von unkonventionellem Erdgas’ (2011) 127(7–8) *Erdöl Erdgas Kohle* 311; Pearson and others (n 14) 56–57.

19 A detailed analysis of the new EU regulatory framework on shale gas can be found at Ruven Fleming, ‘The European Commission’s Approach Towards Safe Shale Gas Extraction’ in Martha Roggenkamp and Catherine Banet (eds), *European Energy Law Report XI* (Intersentia 2017) (Fleming).

20 Paul Craig and Grainne de Burca, *EU Law: Text, Cases, and Materials* (5th edn, Oxford University Press 2011) 75–78 (Craig and De Burca).

21 Craig and De Burca (n 20) 74; Jan H Jans and Hans HB Vedder, *European Environmental Law* (3rd edn, Europa Law Publishing 2008) 10.

22 Craig and De Burca (n 20) 75.

23 Treaty on European Union (TEU), art 5(2); Jans and Vedder (n 21) 10.

24 Craig and De Burca (n 20) 75–76.

25 TFEU, art 5(3); Craig and De Burca (n 20) 94–95.

26 Craig and De Burca (n 20) 94.

27 This may be deduced from the systematic of art 5(3) TFEU; see also: Craig and De Burca (n 20) 94.

28 See Leonie Reins, ‘In Search of the Legal Basis for Environmental and Energy Regulation at the EU Level: The Case of Unconventional Gas Extraction’ (2014) 23(1) *RECIEL* 125, 129 et seq; Fleming (n 19).

techniques, products and processes in a certain field.²⁹ There are two kinds of harmonisation, minimum on the one hand and total/maximum harmonisation on the other.³⁰ Both articles 192 and 194 of the TFEU often provided the bases of measures that resulted in a minimum level of harmonisation.³¹

Since 2012, several EU bodies, including the European Parliament and the Committee of the Regions, an advisory body representing local and regional authorities in the EU,³² have pressed the European Commission to introduce stringent shale gas regulations in the EU.³³ Their demands were underpinned by a couple of scientific reports on shale gas, which arrived at the conclusion that legislative action by the EU was required.³⁴ By 2014, the Commission responded to that request and put into place a new framework that is specifically designed to regulate unconventional hydrocarbon extraction.³⁵

The new EU framework on shale gas extraction consists of two components, a Communication and a Recommendation, which should be read together. The main regulatory instrument is the Recommendation on exploration and production of shale gas (2014 Shale Gas Recommendation).³⁶ This Recommendation is supplemented by

²⁹ Craig and De Burca (n 20) 148–49 and 620–21.

³⁰ Paul Craig and Grainne de Burca, *EU Law: Text, Cases, and Materials* (6th edn, Oxford University Press 2015) 626 talk about maximum harmonisation, meanwhile Jan H Jans and Hans HB Vedder, *European Environmental Law: After Lisbon* (4th edn, Europa Law Publishing 2012) 97 and 104 et seq and Lorenzo Squintani, ‘Gold-Plating of European Environmental Law’ (PhD thesis, University of Groningen 2013) (hereinafter: Squintani) 9 et seq refer to total harmonisation. A discussion of possible differences between these two concepts lies beyond the scope of this work.

³¹ Matthias Wagner, *Das Konzept der Mindestharmonisierung* (Duncker & Humblot 2000) 102–03; Gerd Winter, ‘Die Steuerung grenzüberschreitender Abfallströme’ (2000) 115 DVBl 657, 666; although this has also been admitted by Jans and Vedder (4th edn, 2012) (n 30) 119, they do not exclude the possibility of adopting total harmonisation measures on the legal basis of TFEU, art 192. For that discussion and a possible solution, see Squintani (n 30) 24 et seq.

³² European Union, ‘Committee of the Regions’ <http://cor.europa.eu/Pages/welcome.html> accessed 5 September 2014.

³³ European Parliament, Resolution of 21 November 2012 on the environmental impacts of shale gas and shale oil extraction activities (2011/2308(INI)) para 4 <https://publications.europa.eu/en/publication-detail/-/publication/b55f3367-a3c8-11e5-b528-01aa75ed71a1/language-en/format-PDF/A1A> accessed 23 April 2014; European Parliament, Resolution of 21 November 2012 on industrial, energy and other aspects of shale gas and oil (2011/2309(INI)) para 2 www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P7-TA-2012-0444&language=EN accessed 4 September 2014; EU’s Assembly of Regional and Local Representatives, Draft Opinion of the Committee of the Regions local and regional authorities perspective on shale/tight gas and oil (unconventional hydrocarbons) paras 8–11 www.cor.europa.eu/en/activities/opinions/Pages/opinion-factsheet.aspx?OpinionNumber=CDR%201616/2013 accessed 4 September 2014.

³⁴ AMEC Ltd, ‘Technical Support for Assessing the Need for a Risk Management Framework for Unconventional Gas Extraction’ (2014) viii, xiii, xiv, 100–01, 104–05 and 107 http://ec.europa.eu/environment/integration/energy/uff_studies_en.htm accessed 4 September 2014; ICF International Ltd, *Mitigation of Climate Impacts of Possible Future Shale Gas Extraction in the EU: Available Technologies, Best Practices and Options for Policy Makers* (2014) 2–3 and 88–89 http://ec.europa.eu/environment/integration/energy/uff_studies_en.htm accessed 4 September 2014; Stefan Lechtenbömer and others, ‘Impacts of Shale Gas and Shale Oil Extraction on the Environment and on Human Health’ (European Parliament 2011) 9–10 and 78–79; Stefania Gottardo and others, ‘Assessment of the Use of Substances in Hydraulic Fracturing of Shale Gas Reservoirs under REACH’ (Publications Office of the European Union 2013) 8 and 42.

³⁵ However, its main aim is shale gas extraction, which is already made clear by the title of the relevant documents. In the titles of both the Recommendation and the Communication, shale gas is the only form of energy that has been explicitly mentioned, which highlights its importance.

³⁶ Commission Recommendation 2014/70/EU of 22 January 2014 on minimum principles for the exploration and production of hydrocarbons (such as shale gas) using high-volume hydraulic fracturing [2014] OJ L39/72.

a Communication on the exploration and production of hydrocarbons (such as shale gas) using high-volume hydraulic fracturing in the EU (2014 Shale Gas Communication).³⁷ The Recommendation is not specific to shale gas extraction but targets unconventional gas extraction for which ‘high-volume hydraulic fracturing’ is being used.³⁸ The term means the injection of 1,000m³ or more of water per fracturing stage or 10,000m³ or more of water during the entire fracturing process into a well.³⁹

At the heart of the Recommendation are a number of provisions that aim to address existing gaps in EU secondary legislation. These, in particular, pertain to the Directives on Strategic Environmental Assessment (SEA)⁴⁰ and Environmental Impact Assessments (EIAs),⁴¹ the IPPC Directive⁴² and the IED Directive,⁴³ the Mining Waste Directive,⁴⁴ the Seveso Directives⁴⁵ as well as the Water Framework Directive,⁴⁶ the Groundwater Directive,⁴⁷ the REACH Regulation,⁴⁸ the Environmental Liability Directive⁴⁹ and the Hydrocarbons Licensing

37 Commission, ‘Communication on the exploration and production of hydrocarbons (such as shale gas) using high volume hydraulic fracturing in the EU’ (Communication) COM (2014) 23 final/2.

38 See title of both documents.

39 Commission, 2014 Shale Gas Recommendation, art 2(a). For reasons of coherence and readability, the author will use the generic term ‘shale gas extraction’ when referring to ‘high-volume hydraulic fracturing’.

40 Council Directive (EC) 2001/42 of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment [2001] OJ L197/30.

41 Council Directive (EU) 2011/92 of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment [2012] OJ L26/1, as amended by Council Directive (EU) 2014/52 of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment [2014] OJ L124/1 (hereinafter: EIA Directive). According to art 14 of Directive 2011/92/EU, this Directive repealed the pre-existing, older version of an EIA Directive, namely Council Directive (EC) 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment [1985] OJ L175/40, which had already been amended several times by Council Directive (EC) 97/11 of 3 March 1997 amending Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment [1997] OJ L73/5 and Council Directive (EC) 2003/35 of 26 May 2003 providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC [2003] OJ L156/17.

42 Council Directive (EC) 2008/1 of 15 January 2008 concerning integrated pollution prevention and control [2008] OJ L24/8.

43 Council Directive (EC) 2010/75 of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast) [2010] OJ L334/17.

44 Council Directive (EC) 2006/21/EC of 15 March 2006 on the management of waste from extractive industries [2006] OJ L102/15.

45 Council Directive (EC) 82/501 of 24 June 1982 on the major-accident hazards of certain industrial activities [1982] OJ L230/1 (Seveso I); Council Directive (EC) 96/82/EC of 9 December 1996 on the control of major-accident hazards involving dangerous substances [1997] OJ L13 (Seveso II); Council Directive (EU) 2012/18 of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC OJ L197/1 (Seveso III).

46 Council Directive (EC) 2000/60 of 23 October 2000 establishing a framework for Community action in the field of water policy [2000] OJ L327.

47 Council Directive (EC) 2006/118 of 12 December 2006 on the protection of groundwater against pollution and deterioration [2006] OJ L372/19.

48 Regulation (EC) 1907/2006 of 18 December 2006 concerning the registration, evaluation, authorization and restriction of chemicals (REACH) [2006] OJ L396/1.

49 Council Directive (EC) 2004/35 of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage [2004] OJ L143/56. The Directive has been amended three times since by Council Directive (EC) 2006/21 of 15 March 2006 on the management of waste from extractive industries and amending Directive 2004/35/EC [2006] OJ L102/15, Council

Directive.⁵⁰ While the measures go some way towards closing a number of pre-existing gaps, the European Commission failed to close others. However, a detailed analysis lies beyond the scope of this contribution.⁵¹

The most important feature of this new EU framework on unconventional gas is its legal guise. While Regulations, Directives and Decisions are legally binding to varying degrees, article 288 of the TFEU explicitly states that Recommendations and Opinions shall have no binding force. A Recommendation, thus, has no immediate binding effect upon Member States.⁵² It constitutes a form of soft law⁵³ and the EU cannot enforce Recommendations.⁵⁴

The approach of the EU to rely on non-binding measures may seem surprising at first glance, given the considerable societal debate about fracking and shale gas extraction in Europe. However, this approach sits well with the distribution of regulatory powers between the EU and its Member States, as outlined above. There is no indication that prudent and effective shale gas regulation cannot be achieved by Member States.

It could even be argued that effective shale gas regulation might be more feasible at Member State than at EU level. Shale gas extraction is not a process that lends itself to complete standardisation. Crucial geological features, such as the proximity of shale plays to aquifers, the depths at which the shale plays are buried and how brittle the shale rock is will differ, sometimes substantially, from region to region.⁵⁵ That is why the fracturing fluid is prepared for each well individually and the treatment methods for the 'flow back' differ widely.⁵⁶ Thus, it seems reasonable for the EU to confine itself to the recommendation of processes and to offer help to Member States, but to leave the core decision of whether or not to allow shale gas extraction to the Member States.

Directive (EC) 2009/31 of 23 April 2009 on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006 [2009] OJ L140/63 and Council Directive (EU) 2013/30 of 12 June 2013 on safety of offshore oil and gas operations and amending Directive 2004/35/EC [2013] OJ L178/66.

50 Council Directive (EC) 94/22 of 30 May 1994 on the conditions for granting and using authorizations for the prospecting, exploration and production of hydrocarbons OJ L164/3.

51 For a detailed analysis, see Fleming (n 19).

52 Craig and De Burca (n 20) 107.

53 *Ibid.*

54 Christian Calliess and Matthias Ruffert, *EUV/AEUV Kommentar* (4th edn, Beck 2011) art 288 AEUV para 95.

55 Ruven Fleming and Leonie Reins, 'Shale Gas Extraction, Precaution and Prevention: A Conversation on Regulatory Responses' (2016) 20 Energy Research and Social Science 131, 132.

56 Maximilian Kuhn and Frank Umbach, 'Strategic Perspectives of Unconventional Gas: A Game Changer with Implications for the EU' (2011) European Centre for Energy and Resource Security (EUCERS) Strategy Paper No 1 at 22 www.eucers.eu/2011/05/06/eucers-strategy-paper-no1 accessed 24 February 2017; Spencer Ferguson and Matthew T Gilbert, *Hydraulic Fracturing and Shale Gas Production: Issues, Proposals and Recommendations* (Nova Science Publishers 2013) 94–96; C Ewen and others, 'Hydrofracking Risk Assessment: Executive Summary' at 47 www.researchgate.net/profile/Dietrich_Borchardt/publication/268221248_Hydrofracking_Risk_Assessment_Study_concerning_the_safety_and_environmental_compatibility_of_hydrofracking_for_natural_gas_production_from_unconventional_reservoirs/links/5466063d0cf2052b50a14bfe.pdf accessed 15 February 2017. For a detailed analysis see Ruven Fleming, *Shale Gas, the Environment and Energy Security: A New Framework for Energy Regulation* (Edward Elgar forthcoming 2017).

3.2. The evolution of the German 'fracking' package

Proposals by companies to extract shale gas were frequently met with public resistance in many European countries, among them Germany.⁵⁷ Societal concerns about the environmental sustainability of shale gas extraction were fuelled by earth tremors in the United Kingdom and the media coverage of water contamination in America.⁵⁸

Proponents of shale gas extraction, however, point to the fact that Germany's gas demand is likely to proliferate, even beyond recent projections, due to a current government policy, the *Energiewende* (quite literally: energy turnaround). At the heart of *Energiewende* lies the abandonment of German nuclear power production by 2022.⁵⁹ Nuclear power supplies shall be substituted with renewable energy and the switch shall, inter alia, be powered by gas as a 'bridging fuel'.⁶⁰

Shale gas could make a potential contribution as an alternative to nuclear-based electricity generation. Considering the different options of coal or gas combustion, German Members of Parliament announced that gas shall become the primary fuel of choice in the future because of its ability to replace coal and ease climate change.⁶¹ The German government also stresses that, in order to avoid an ever-increasing import-dependency, the additional gas demand for the *Energiewende* should be covered by domestic gas production.⁶² That domestic gas production could come from shale gas extraction.⁶³

The first German initiatives to develop particular rules for the regulation of fracking and shale gas extraction were launched in the upper chamber of parliament (Bundesrat) and the Bundestag in 2011.⁶⁴ In 2013, the then German government pushed for the

57 See for instance Philippe & Partners Law Firm, 'Final Report on Unconventional Gas in Europe' (2011) 11–14 http://ec.europa.eu/energy/studies/doc/2012_unconventional_gas_in_europe.pdf accessed 12 March 2017 (Philippe & Partners).

58 Anne-Sophie Corbeau, 'The Introduction of Unconventional Gas in Europe: Opportunities and Challenges' in Martha Roggenkamp and Olivia Woolley (eds), *European Energy Law Report IX* (Intersentia 2012) 202–03.

59 Bundesregierung, *Der Weg zur Energie der Zukunft – sicher, bezahlbar und umweltfreundlich Eckpunktepapier der Bundesregierung zur Energiewende* at para 4 [www.dstgb.de/dstgb/Homepage/Schwerpunkte/Klimaschutz/Weitere%20Informationen/Eckpunktepapier%20der%20Bundesregierung%20zur%20Energiewende%20\(PDF,%2033%20KB\)/Energiepaket%20Kabinett%206.6.%20\(Chapeau\).pdf](http://www.dstgb.de/dstgb/Homepage/Schwerpunkte/Klimaschutz/Weitere%20Informationen/Eckpunktepapier%20der%20Bundesregierung%20zur%20Energiewende%20(PDF,%2033%20KB)/Energiepaket%20Kabinett%206.6.%20(Chapeau).pdf) accessed 31 May 2016 (Eckpunkte Energiewende).

60 Eckpunkte Energiewende (n 59) paras 6, 11.

61 Bundestag, 'Stenografischer Bericht 178. Sitzung' of 10 May 2012 Plenarprotokoll 17/178, 21169 <http://dipbt.bundestag.de/dip21/btp/17/17178.pdf> accessed 17 April 2014 (Bundestag Stenografischer Bericht 178. Sitzung). Currently the diminishing nuclear energy supplies are heavily substituted by coal combustion.

62 Bundesregierung, *Energiekonzept 2050*, 16 www.bundesregierung.de/Content/DE/HTML/Breg/Anlagen/infografik-energie-textversion.pdf?__blob=publicationFile accessed 31 May 2016 (Energiekonzept); Eckpunkte Energiewende (n 59) para 14; Bundestag, 'Motion guidance notes on transparency and environmental soundness during unconventional gas production of 8 November 2011' (Antrag Leitlinien für Transparenz und Umweltverträglichkeit bei der Förderung von unkonventionellem Erdgas) Bundestagsdrucksache 17/7612 <http://dipbt.bundestag.de/dip21/btd/17/076/1707612.pdf> accessed 16 April 2014.

63 Further arguments pertain to the anticipated benefits of economic development, a lowering of gas prices, creation of jobs and others. For details, see Ruven Fleming, *Shale Gas, the Environment and Energy Security: A New Framework for Energy Regulation* (Edward Elgar forthcoming 2017).

64 Bundestag, 'Motion guidance notes on transparency and environmental soundness during unconventional gas production of 8 November 2011' (Antrag Leitlinien für Transparenz und Umweltverträglichkeit bei der Förderung von unkonventionellem Erdgas) Bundestagsdrucksache 17/7612 <http://dipbt.bundestag.de/dip21/btd/17/076/1707612.pdf> accessed 16 April 2014; Bundesrat, 'Resolution of the Bundesrat on the handling of the application of fracking-technologies with environmentally toxic chemicals during the exploration and production of unconventional deposits of 3 December 2012'

passage of a shale gas law, but in the end failed to get one adopted and the project was withdrawn from the government's agenda.⁶⁵

Germany is a federal republic and the federal states (Länder) are entitled to enact individual regulations in the field of mining, as long as the nation state has not put in place regulation for particular mining issues.⁶⁶ Up until 2016, some of the German Länder, namely those boasting the biggest shale gas reserves⁶⁷ (North Rhine-Westphalia,⁶⁸ Lower Saxony⁶⁹ and Hesse⁷⁰) imposed moratoria on shale gas extraction on their respective territories. But a nationwide German moratorium had not been put in place. As a result of the system of 'shared' or 'competing' legislative competence under the German constitution, the Länder regulations will now be replaced automatically with the regulations of the 2016 fracking package.⁷¹

On 1 April 2015, the national government, the so-called cabinet (Bundeskabinnett), decided it was time to take the initiative and put forward a package of legal

(*Entscheidung des Bundesrates zum Umgang mit dem Einsatz von Fracking-Technologien mit umwelt-toxischen Chemikalien bei der Aufsuchung und Gewinnung von Erdgas aus unkonventionellen Lagerstätten*) Bundesratsdrucksache 754/12 www.bundesrat.de/SharedDocs/beratungsvorgaenge/2012/0701-0800/0754-12.html accessed 15 April 2014.

65 Die Zeit, 'Fracking-Gesetz scheitert am schwarz-gelben Streit' (4 June 2013) www.zeit.de/wirtschaft/2013-06/fracking-gesetz-union-fdp accessed 16 April 2015; Achim Lang and Jale Tosun 'The Politics of Hydraulic Fracturing in Germany: Party Competition at Different Levels of Government' 177 et seq. in Christopher M. Weible, Tanya Heikkila, Karin Ingold, Manuel Fischer (eds.) *Policy Debates on Hydraulic Fracturing* (Palgrave Macmillan, Denver 2016).

66 In the German legal system, environmental regulation as well as regulation pertaining to mining and energy extraction are competencies that are shared (*konkurrierende Gesetzgebung*) between the nation state (*Bund*) and the German states (*Länder*). With regard to environmental regulation, this shared competence is prescribed by art 74 No 24, 29 and 32 in conjunction with art 72(3) No 2 and 5 of the German constitution for air protection, water protection and general environmental protection; see: Hans Dieter Jarass and Bernd Pieroth, *Grundgesetz Kommentar* (11th edn, C.H. Beck 2011) art 74 paras 69 and 79. With regard to mining activities and the energy industry in general, this shared competence is prescribed by art 74(1) No 11 in conjunction with art 72(1) of the German constitution. Article 74(1) No 11 not only provides the legislator with the power to introduce general regulations on mining and energy extraction, but also reserves to him the right of bringing in additional legislation to regulate new energy technologies, such as shale gas extraction, see: Josef Isensee and Paul Kirchhof, *Handbuch des Staatsrechts Band IV* (CF Müller 1990) section 100 para 173.

67 According to Niedersachsen Landesamt für Bergbau, Energie und Geologie, *Erdöl und Erdgas in der Bundesrepublik Deutschland 2012* (Hanover 2013) 42–43 www.lbegg.niedersachsen.de/portal/live.php?navigation_id=655&article_id=936&psmand=4 accessed 15 April 2014.

68 Ministerium für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz des Landes Nordrhein-Westfalen, 'Pressemitteilung Umweltministerium und Wirtschaftsministerium legen Risikogutachten zu Fracking vor' (7 September 2012) www.umwelt.nrw.de/pressearchiv/presse2012/presse120907_a.php accessed 15 April 2016.

69 Niedersächsisches Ministerium für Umwelt, Energie und Klimaschutz, 'Zulassung von Vorhaben zur Aufsuchung und Gewinnung von Erdgas aus konventionellen Lagerstätten mittels hydraulischer Bohrlochbehandlung zur Risserzeugung in einem Verfahren mit Umweltverträglichkeitsprüfung' www.umwelt.niedersachsen.de/aktuelles/pressemitteilungen/strenge-auflagen-bei-der-ergasfoerderung-122495.html accessed 14 April 2014; Hannoversche Allgemeine, 'Die Fracking-Pause dauert bis 2016' www.haz.de/Nachrichten/Politik/Niedersachsen/Die-Fracking-Pause-dauert-bis-2016-in-Niedersachsen accessed 9 January 2015.

70 Hessisches Ministerium für Umwelt, Klimaschutz, Landwirtschaft und Verbraucherschutz, 'Fracking-Klage gegen das Land Hessen zurückgenommen' (20 August 2014) www.hessen.de/presse/pressemitteilung/fracking-klage-gegen-das-land-hessen-zurueckgenommen-0 retrieved 9 January 2015.

71 Conditional only on the signature of the German president, a rather formal act.

measures.⁷² This fracking package consists of three different proposals, two bills and one draft ordinance.⁷³ The most important one⁷⁴ is the bill on water protection provisions and the prohibition and risk-minimisation of the procedures of the fracking technology (Bill on water protection), which proposes certain alterations to the Water Protection Act (*Wasserhaushaltsgesetz* – WHG).⁷⁵ This bill included detailed provisions on the prohibition of certain usages of hydraulic fracturing. The second bill was concerned with liability and mining damages.⁷⁶ The third legislative proposal was a state ordinance, aiming to ensure that EIAs are conducted for every shale gas extraction project.⁷⁷ The package, thus, did not propose the establishment of a distinct and standalone legal regime. Instead, it operated within the confines of the existing regulatory framework on hydrocarbon extraction and is fine-tuning the regime for the purpose of fracking and shale gas extraction.⁷⁸

Only one month after this package was introduced to the German parliamentary procedure, the upper chamber Bundesrat announced its view on the bills and the German government produced a rebuttal by 20 May 2015.⁷⁹ The overall stance of the Bundesrat was critical towards the proposal, highlighting that it did not go far enough in some respects.⁸⁰ After this ‘clash’ between the German government and the German Bundesrat, discussions on the proposal were stalled.⁸¹

The slowing down of the legislative process, however, was not due to the different views that prevailed in the Bundesrat and the Bundestag, but rather the result of a fierce conflict within the parties Christlich Demokratische Union/Christlich Soziale Union (CDU/CSU) and Sozialdemokratische Partei Deutschlands (SPD), the parliamentary

72 German Government (Bundesregierung), ‘Kabinettsbeschluss Fracking: Mehr Schutz durch strengere Regeln’ www.bmub.bund.de/pressemitteilung/kabinetts-beschliesst-weitgehende-einschraenkungen-fuer-fracking/ accessed 7 April 2015.

73 Drucksache 18/4713 (n 1); Drucksache 18/4714 (n 1); Bundesrat Drucksache 144/15 (n 1).

74 Insofar as it entails the fundamental decisions on fracking in Germany, see Bundestag Drucksache 18/8916, ‘Recommendation and Report of the Committee for Environment, Nature Protection, Building and Reactor-safety concerning Drucksache 18/4713’ (*Beschlussempfehlung und Bericht des Ausschusses für Umwelt, Naturschutz, Bau und Reaktorsicherheit zu Drucksache 18/4713*) at 17 <http://dipbt.bundestag.de/doc/btd/18/089/1808916.pdf> accessed 5 July 2016 (Drucksache 18/8916) and Bundestag, ‘Stenografischer Bericht 180. Sitzung Plenarprotokoll 18/180’ at 17790 <http://dipbt.bundestag.de/dip21/btp/18/18180.pdf#P.17790> accessed 30 June 2016 (Stenografischer Bericht 18/180).

75 Drucksachen 18/4713 (n 1) and 18/8916 (n 74).

76 Drucksache 18/4714 (n 1).

77 Bundesrat Drucksache 144/15 (n 1).

78 The package as such is applicable to all forms of ‘unconventional’ gas extraction, but targets shale gas extraction specifically.

79 Bundestag, ‘Drucksache 18/4949 Report by the government concerning Drucksache 18/4713’ <http://dipbt.bundestag.de/doc/btd/18/049/1804949.pdf> accessed 5 July 2016 (Drucksache 18/4949); Bundestag, ‘Drucksache 18/4952 Report by the government concerning Drucksache 18/4714’ <http://dipbt.bundestag.de/doc/btd/18/049/1804952.pdf> accessed 5 July 2016 (Drucksache 18/4952).

80 Drucksache 18/4949 (n 79) at 1–10; Drucksache 18/4952 (n 79) at 1–4.

81 This is most perceivable when looking at the long journey of the bills through the respective parliamentary committees. On 7 May 2015, the two bills were put before the environmental committee and the Committee for Economic Affairs and Energy of the Bundestag, respectively, see Drucksache 18/8916 (n 74) at 7 and Bundestag Drucksache 18/8907, ‘Recommendation and Report of the Committee for Economic Affairs and Energy concerning Drucksache 18/4714’ (*Beschlussempfehlung und Bericht des Ausschusses für Wirtschaft und Energie zu Drucksache 18/4714*) at 7 <http://dipbt.bundestag.de/doc/btd/18/089/1808907.pdf> accessed 5 July 2016 (Drucksache 18/8907). However, they were not approved by the committees until 22 June 2016; see below and Drucksache 18/8916 (n 74) at 1, 7 and 22.

basis of the government in both chambers. A considerable number of MPs from these three governing parties opposed the proposals of their own government, arguing behind closed doors that the government proposal was too lenient.⁸² The conflict simmered for a year, with individual MPs demanding that the local interests of their particular constituency needed to be represented in the future national regulation of fracking.⁸³

In June 2016, the conflict escalated when rebellious MPs were getting the upper hand. They modified the government bills substantially, turning what might be considered as a well-balanced approach into a strict prohibition on the use of fracking. Final victory for the rebels was in sight when they launched their considerable amendments to the government bill in the respective committees of the Bundestag on 22 June 2016,⁸⁴ equally taking opposition and government by surprise.⁸⁵ Only two days later, the parties approved the substantially amended bills during the final reading in Bundestag on 24 June 2016 and the Bundesrat followed suit on Friday 8 July 2016. The successful attempt to amend the governmental bill was heralded by MPs of these governing parties as a ‘gigantic success’ and a ‘*Sternstunde des Parlaments*’ (moment of glory for parliament; *Sternstunde* literally meaning sidereal hour).⁸⁶ So, what is the precise content of the newly approved legislative package on fracking?

4. The main features of the German fracking package

4.1. ‘Unconventional’ and ‘conventional’ fracking

The first important feature is a differentiation by the German legislator between so-called conventional and unconventional fracking. This differentiation is particularly present in the Bill on water protection.⁸⁷ It departs from the view that fracking activities could conflict with the sustainable management of German water resources, particularly with the objective to maintain and safeguard present and future uses of public water supplies.⁸⁸ The use of fracking, according to the German government, could lead to the risk of groundwater and drinking water contamination.⁸⁹

The three German legislative actions target ‘fracking’, an inaccurate term that is meant to describe hydraulic fracturing.⁹⁰ The European Commission commonly uses the more accurate term ‘high-volume hydraulic fracturing’ (HVHF) (the differentiation between small hydraulic fracturing and HVHF originates from industry use in the

⁸² Der Spiegel, ‘Kritik im Bundestag: Dutzende Abgeordnete torpedieren umstrittenes Fracking-Gesetz’ www.spiegel.de/politik/deutschland/fracking-teile-von-cdu-spd-und-gruenen-gegen-gesetz-a-1026585.html accessed 7 April 2015.

⁸³ A good example is provided by the speech of Andreas Jung, MP in the Bundestag on 24 June 2016, who reflects on his efforts to push the particular hydrological interest of the Bodensee region into the limelight, see: Stenografischer Bericht 18/180 (n 74) at 17802–03.

⁸⁴ Drucksache 18/8916 (n 74); Drucksache 18/8907 (n 81).

⁸⁵ The opposition criticised the short notice with which the proposals had been put before the committees and called the procedure undemocratic; see Drucksache 18/8916 (n 74) at 17 and speeches of Hubertus Zdebel and Julia Verlinde, Stenografischer Bericht 18/180 (n 74) at 17795 and 17798.

⁸⁶ Speeches of Matthias Miersch, Frank Schwabe and Claudia Roth, MPs, Stenografischer Bericht 18/180 (n 74) at 17790, 17801 and 17807.

⁸⁷ Drucksachen 18/4713 (n 1) and 18/8916 (n 74).

⁸⁸ This is the terminology used in WHG, section 6(1) No 4.

⁸⁹ Drucksache 18/4713 (n 1) at 1.

⁹⁰ See n 3 above for explanations on the terminology.

‘motherland’ of shale gas extraction, the United States).⁹¹ The German government and the parties supporting it, however, did not adopt that definition, but instead introduced their own definition.

The now approved Bill on water protection differentiates between conventional and unconventional fracking.⁹² According to the German Ministry of Economic Affairs and Energy, conventional fracking has been practised for many years in Germany, whereas unconventional fracking refers to new applications of hydraulic fracturing.⁹³ The crucial criterion for the differentiation is the type of rock:

conventional fracking takes place in sandstone (mainly at greater depths) [than those where unconventional fracking is applied]. Unconventional fracking takes place in layers of shale-, argillite and marlstone rock strata, as well as in coal seams.⁹⁴ As opposed to the hitherto exploited German sandstone reservoirs, there is no experience or knowledge concerning extraction of natural gas from these 4 types of rock.⁹⁵

Accordingly, the extraction from these four rock types has been labelled ‘unconventional fracking’, whereas fracking sandstones, according to the German government, amounts to ‘conventional’ fracking.⁹⁶

This differentiation has been heavily criticised by the opposition in the German parliament. It was called ‘scientifically untenable’⁹⁷ and ‘arbitrary’⁹⁸ as well as ‘scandalous’.⁹⁹ Indeed, there is no evidence that such a differentiation is made in other countries, within the industry or in geoscience.

Strikingly, this definition is not even used by the government’s own agency in charge of geoscience, the Federal Agency of Geoscience and Natural Resources (Bundesanstalt für Geowissenschaften und Rohstoffe – BGR). That agency consistently differentiates between conventional and unconventional reservoirs but not between conventional and unconventional fracking.¹⁰⁰

The practical repercussion of the government’s odd differentiation is that only ‘unconventional fracking’ in the four rock formations is addressed by the law, whereas the use of hydraulic fracturing in other rock formations remains perfectly legal.¹⁰¹ The government justifies that fundamental differentiation with the following reasons:

91 Department of Environmental Quality Michigan, ‘Hydraulic Fracturing in Michigan’ www.michigan.gov/deq/0,4561,7-135-3311_4231-262172-,00.html accessed 30 June 2016.

92 See for instance Drucksache 18/4949 (n 79) at 11 and Law prohibiting and minimising fracking water risks Article 1.

93 German Ministry of Economic Affairs and Energy, ‘Fracking’ www.bmwi.de/Redaktion/DE/Artikel/Industrie/fracking.html accessed 30 June 2016 (BMW Fracking).

94 *Ibid.*

95 *Ibid.*

96 *Ibid.*

97 Drucksache 18/8916 (n 74) at 17.

98 Drucksache 18/8916 (n 74) at 15.

99 Drucksache 18/8907 (n 81) at 10; speech of Hubertus Zdebel, Stenografischer Bericht 18/180 (n 74) at 17794, 17796.

100 Bundesanstalt für Geowissenschaften und Rohstoffe (BGR), ‘Wissenswertes über Schieferöl und Schiefergas’ www.bgr.bund.de/DE/Themen/Energie/Projekte/laufend/NIKO/FAQ/faq_inhalt.html accessed 30 June 2016; BGR, ‘Schieferöl und Schiefergas in Deutschland Potenziale und Umweltaspekte’ (Bundesanstalt für Geowissenschaften und Rohstoffe 2016) 13–14 (NIKO).

101 As pointed out by MPs Hubertus Zdebel, Julia Verlinden and Annalena Baerbock; see Stenografischer Bericht 18/180 (n 74) at 17795–96, 17799 and 17801.

Fracking in shale and argillite rock, marlstone and coalbed seams has almost never been practised in Germany – as opposed to fracking in sandstone (tight gas); that is why necessary knowledge is missing. In [the former cases] a higher number of drills and drilling pads and a larger volume of frack-fluid per well is required. Moreover, the procedure [fracking] might [in the former cases] also be applied at smaller depths (starting at c 1000 metres) and accordingly a smaller gap to groundwater resources and less mighty barriers between the frack-horizon and utilisable groundwater exist. Hydrological barriers are, for instance, saltstones or Permian sedimentary rock which may prevent upwards migration of fracking fluids from deeper layers [...]. In order to prevent geological, hydrological and environment-specific dangers, particularly for drinking water, the approval of fracking permits [in the four named types of rock] for commercial purposes shall be prohibited until further sufficient research into possible risks has been conducted.¹⁰²

Tight gas, which has been mentioned at the beginning of this statement, is gas produced from tight sand- or limestone formations.¹⁰³ In the US, the use of hydraulic fracturing for oil and gas production from sandstones is well-known and standard practice, commonly referred to as so-called tight oil and tight gas.¹⁰⁴ Fracking has been used for the production of tight gas in Germany since the 1960s.¹⁰⁵ Almost one-third of Germany's domestic gas production comes from tight gas reservoirs that are being exploited with the help of hydraulic fracturing.¹⁰⁶ Similarly, the production of geothermal energy often entails the use of hydraulic fracturing.¹⁰⁷ In all of these cases, the technological process is similar to that of shale gas extraction. The only difference is the depth at which the respective rocks may be found.

Shale gas may be extracted in Germany from depths spanning 1,000–2,500 metres below surface, whereas tight gas and geothermal energy are often found at depths greater than 3,500 metres below the surface.¹⁰⁸ Tight gas is, hence, 'mainly' encountered at greater depths than the other source rocks of unconventional gas.¹⁰⁹ Geological and hydrological barriers are assumed to prevent migration of dangerous substances from these deeper sandstone layers, but not from shale, argillite, marlstone or coalbed seam layers, which are often buried closer to the surface.¹¹⁰

¹⁰² Drucksache 18/4713 (n 1) at 22.

¹⁰³ NIKO (n 100) 196.

¹⁰⁴ US Energy Information Administration, 'Energy in Brief Tight Oil' www.eia.gov/tools/faqs/faq.php?id=847&t=6 accessed 13 July 2016; Lin Sen-Hu and others, 'Status Quo of Tight Oil Exploitation in the United States and Its Implications' (2011) 23(4) *Lithologic Reservoirs* 25.

¹⁰⁵ Bundesrat Drucksache 144/15 (n 1) at 1.

¹⁰⁶ Bundesrat Drucksache 144/15 (n 1) at 6.

¹⁰⁷ Ronan L Hébert and Béatrice Ledéser, 'Calciometry at Soultz-Sous-Forêts Enhanced Geothermal System: Relationships with Fracture Zones, Flow Pathways and Reservoir Chemical Stimulation Results' in Jianwen Yang (ed), *Geothermal Energy, Technology and Geology* (Nova Science Publishers 2012) 94.

¹⁰⁸ Exxon Mobil Europeunconventionalgas.org, 'Tight Gas' www.europeunconventionalgas.org/unconventional-gas/types-of-unconventional-gas/tight-gas accessed 30 June 2016 (Exxon Mobil Tight Gas). Retrieved.

¹⁰⁹ This reservation has even been made by the German Ministry of Economic Affairs and Energy; see the quote above from BMWI Fracking (n 93).

¹¹⁰ Drucksache 18/4713 (n 1) at 22.

However, in particular spots of Germany, shale- and tight oil and gas may be encountered at identical depths.¹¹¹ As the opposition party, the Left, aptly pointed out during the decisive session of the environmental committee of the Bundestag, fracking in sandstone for oil and gas remains legal.¹¹² Production of oil and gas from these sandstone layers is one of the most common ways of ‘conventional’ hydrocarbon extraction.¹¹³ Sandstones differ in terms of brittleness and permeability. A study on oil and gas extraction in Germany found that certain sandstone hydrocarbon reservoirs had not been used for production because the sandstones were not brittle and rather impermeable.¹¹⁴ Particularly in these sandstones that do not easily give away hydrocarbons, the flow might be stimulated by hydraulic fracturing.

Crucially, oil-bearing sandstone reservoirs are often located close to the surface in Germany, up to a couple of hundred metres in depth.¹¹⁵ Thus, they are located at the same depth, or occasionally even closer to the German surface, than hydrocarbon-carrying shale, argillite, marlstone or coalbed seam layers.¹¹⁶ As a result, fracking for oil is now legal in some rock strata (tight oil from sandstones) whereas it is illegal in other (tight oil from shale), although both types of rock might be found at exactly the same depths.

Accordingly, the Bundesrat and MPs of the opposition in the Bundestag argued that potential threats of fracking in tight gas and oil reservoirs might not be different to the potential threats of fracking in the other four types of rock strata.¹¹⁷ Hence, the equation ‘greater depth = more geological and hydrological barriers between the point of fracking and groundwater = more safety’ does not apply in these circumstances.

To sum up, the geological and hydrological circumstances for tight gas extraction/geothermal activities/tight oil extraction on the one hand, and shale gas extraction/unconventional gas extraction on the other hand, are not always different. There are certain areas where, according to the stipulations of the new fracking package, outlawed and licit activities may take place at similar depths and the very same techniques may be applied in a similar way (directional drilling in combination with hydraulic fracturing).

Fracking is a cost-intensive technology¹¹⁸ and the fact that oil prices are not particularly high at the moment might be the reason that this issue has not yet received much attention in Germany. But as the markets pick up and the cost-benefit analyses are looking better, it might be an option to use fracking, for instance for the production of oil from sandstones, in Germany on a larger scale in the future.

111 See a graphic of the German Federal Agency of Geoscience and Natural Resources at www.bmwi.de/Redaktion/DE/Infografiken/Energie/gasfoerderung.html accessed 30 June 2016. For tight oil, see: Landesamt für Bergbau, Energie und Geologie Niedersachsen (LBEG), *Erdöl und Erdgas in der Bundesrepublik Deutschland 2014* (Landesamt für Bergbau, Energie und Geologie 2015) 14–18 and 35–36 www.lbeg.niedersachsen.de/erdoel-erdgas-jahresbericht/jahresbericht-erdoel-und-erdgas-in-der-bundesrepublik-deutschland-936.html accessed 8 July 2016 (LBEG 2014).

112 Drucksache 18/8916 (n 74) at 17.

113 Stoneley (n 7) 27.

114 LBEG 2014 (n 111) at 14.

115 LBEG 2014 (n 111) at 14–18 and 35–36.

116 LBEG 2014 (n 111) at 14–18 and 35–36 and Drucksache 18/8916 (n 74) at 17.

117 Drucksache 18/4949 (n 79) at 9; Stenografischer Bericht 18/180 (n 74) at 17794; Annalena Baerbock, ‘Fracking: Keine Entwarnung’ www.annalena-baerbock.de/pmfracking-keine-entwarnung accessed 12 July 2016.

118 Consider the different technologies required, as discussed above.

The Bundesrat shared these concerns. The Bundesrat argued that, according to expert evidence, the differentiation with regard to depth was not justifiable.¹¹⁹ The Bundesrat stated clearly in that regard: ‘the dangers of fracking for ground and drinking water exist, irrespective of the depths at which the technology is deployed’.¹²⁰

The true reason for the exclusion of certain types of hydrocarbon and geothermal energy production from the fracking prohibition is likely the fact that Germany hosts Europe’s greatest tight gas industry and tight gas production is most advanced here.¹²¹ While protecting the industry might be a legitimate interest of itself, it is highly doubtful whether this differentiation complies with the legal requirements concerning equal treatment.

4.2. *A differentiation in conflict with the German constitution?*

The fundamentally different legal treatment for tight gas, tight oil and geothermal energy production via fracking on the one hand (allowed) and fracking for shale gas, etc (prohibited) is problematic. This artificial differentiation might conflict with the principle of equal treatment, enshrined in article 3 of the German constitution. Article 3 of the German constitution demands that issues that are essentially the same have to be treated in the same way and issues that are essentially different might be treated differently.¹²² Although the legislator has leeway for discretion, the ultimate constraints for him are the fundamental rights of a person or an entity, as enshrined in the German constitution.¹²³

The legality of the German fracking package might be challenged by a company wanting to drill for shale gas in Germany but not allowed to do so. It could litigate against the fracking package by arguing that another company aiming to drill for tight oil or gas at similar depths with the same techniques (hydraulic fracturing) may apply for a licence.

If the former company specialises in shale gas activities, the new law might, in extreme cases, conflict with the fundamental right of the owner of an existing oil and gas company to have and conduct its own business. This fundamental right (*Recht am eingerichteten und ausgeübten Gewerbebetrieb*) is guaranteed under article 14 of the German constitution and may only be taken away from the individual by a law that provides adequate, effective and timely compensation.¹²⁴ The German fracking package does not provide for any compensation.

Moreover, the fracking package might similarly conflict with the right of all Germans to freely choose their occupation under article 12 of the German constitution,

¹¹⁹ Drucksache 18/4949 (n 79) at 2.

¹²⁰ *Ibid.*

¹²¹ According to Exxon Mobil Tight Gas (n 108); the link to the fracking law has been made in Drucksache 18/8916 (n 74) at 17.

¹²² Bruno Schmidt-Bleibtreu and Franz Klein, *Kommentar zum Grundgesetz* (10th edn, Wolters Kluwer Deutschland GmbH 2004) art 3 para 2 (Schmidt-Bleibtreu and Klein).

¹²³ Schmidt-Bleibtreu and Klein (n 122) art 3 paras 3–4.

¹²⁴ BVerfGE 1, 264 (276 ff); 45, 142 (173); BGHZ 23, 157 (162 f); 30, 338; 57, 359 et seq; 67, 190 (192); 81, 21 (33); 92, 34 (37); BVerwGE 62, 224 (226); for more see: Schmidt-Bleibtreu and Klein (n 122) art 14 para 3; Theodor Maunz and Günter Dürig (eds), *Grundgesetz Kommentar* 76. Ergänzungslieferung (C.H. Beck since 1958) art 12 paras 95–113 (Maunz and Dürig).

for the very same reasons.¹²⁵ The legislator would have to justify the unequal treatment. If he is not able to deliver on that, the German fracking package might not be reconcilable with article 3 and possibly article 12 of the German constitution. This author concludes that, as the law stands, it might be struck down by the Federal Constitutional Court, if challenged.

This, however, is unlikely to happen in the foreseeable future. The reasons are of a practical rather than legal nature: oil and gas companies might not have an interest in launching a legal challenge. Shale gas has been highly controversial in Germany¹²⁶ and the debate centred on the clash of strongly held individual beliefs and nationwide campaigns by non-governmental organisations.¹²⁷ Polls show that two-thirds of Germans are in favour of a ban on fracking.¹²⁸ However, the industry is still allowed to use fracking for tight gas, sandstone oil and geothermal purposes. Companies are likely to avoid sparking public anger by a legal challenge to the fracking package until prices increase significantly and European shale gas extraction and tight oil extraction via fracking become economically viable.¹²⁹

In its reply to the governmental bill, the Bundesrat made an interesting proposal, which could be used to improve the law and overcome its currently shaky stature. The Bundesrat demanded to do away with differentiations between rock types altogether and instead proposed the usage of only one central criterion for the water-permitting procedure of fracking activities: the principle of apprehension in the Water Protection Act (*Wasserrechtlicher Besorgnisgrundsatz*).¹³⁰

The principle of apprehension, enshrined in article 48(1)(2) of the WHG, is considered to be 'the fundamental norm' of the entire Water Protection Act.¹³¹ A permit for the introduction of substances into groundwater may not be issued if a detrimental change of water quality is feared (or *apprehended*, the verbatim translation of the German *Besorgnis*).¹³² The principle must be adhered to by all water users under article 9(1) and (2) of the WHG and also applies to the depositing and storing of substances.¹³³

Applying this principle to the issue of fracking would mean that a permit may only be issued if there is no reason to believe the use of fracking could bring about detrimental changes to water quality.¹³⁴ The German government opposed that proposal of the

¹²⁵ Maunz and Dürig (n 124) art 12 para 1 et seq; Schmidt-Bleibtreu and Klein (n 122) art 12 para 1 et seq.

¹²⁶ Dominik Greinacher and Sebastian Helmes, 'Revising the Environmental Impact Assessment Thresholds: The Case of Germany' in Cecile Musialski and others (eds), *Shale Gas in Europe* (Claeys & Casteels 2013) 508.

¹²⁷ Lang and Tosun (n 65).

¹²⁸ According to figures from April 2015, see Drucksache 18/8916 (n 74) at 15.

¹²⁹ This has also been pointed out by several German MPs, namely in their speeches in the Bundestag; see Stenografischer Bericht 18/180 (n 74) at 17795–96 and 17799.

¹³⁰ Drucksache 18/4949 (n 79) at 5–6.

¹³¹ Frank Sieder, Herbert Zeitler and others, *Wasserhaushaltsgesetz Abwasserabgabengesetz Band 1* (C.H. Beck 2016) section 48 para 1 (Sieder and Zeitler).

¹³² WHG, section 48(1)(1).

¹³³ Sieder and Zeitler (n 131) section 48 para 1. An exception applies, according to the most common interpretation of WHG, section 48(1)(2) to 'insignificant' amounts of substances, a term that is highly controversial in Germany, see Sieder and Zeitler (n 131) section 48 paras 3–8. Fracking and the disposal of frack fluid, flow back and waste water is now clearly defined as a water use by art 9 (2) No 3 and 4 of the WHG (these have been newly introduced by the fracking package).

¹³⁴ Drucksache 18/4949 (n 79) at 5–6.

Bundesrat, merely stating that the government does not share the view of the Bundesrat that the use of the principle of apprehension of the Water Protection Act could resolve all issues related to fracking and water contamination.¹³⁵ However, it gave no further reasoning as to why it arrived at this conclusion.

Despite these misgivings of the government, the proposal of the Bundesrat would, indeed, not differentiate between any types of rock. The risk of the law being struck down as not complying with the principle of equal treatment by a constitutional court would, thus, fall away. By altering the law in that respect, the legislator could, hence, comply with the demands of the German constitution, establish a legally ‘water-tight’ regulation and provide potential investors in unconventional gas extraction with a clear framework that is easy to apply.

4.3. *Ban or moratorium?*

The third important feature of the fracking package is its legal nature. The initial fracking package stated explicitly that its measures are not designed to bring about a general prohibition of fracking.¹³⁶ However, the text that did eventually become law maintains that extraction of natural gas (and now also oil) from shale, argillite, marlstone and coalbed seams by hydraulic fracturing is strictly prohibited, irrespective of the depth of the deposit.¹³⁷

It is somewhat difficult to determine whether this regulation actually constitutes a ban or a moratorium. First, the terms ‘moratorium’ and ‘ban’ require some clarification, as they are quite distinct from each other. A ‘moratorium’ refers to the temporary suspension of a specific activity, often to enable scientific research into risks,¹³⁸ whereas ‘a ban’ applies to a general prohibition by legal means.¹³⁹ A moratorium is, thus, a temporary measure with the aim to *suspend* an activity, whereas a ban is of indefinite duration and wants to *suppress and prohibit* an activity in general.

While the German government and the parties supporting it insist that the fracking package entails an indeterminate ban on fracking,¹⁴⁰ MPs of the opposition were even doubting that the law constitutes a moratorium, given that it permits the extraction of tight gas, tight oil and geothermal energy.¹⁴¹ According to them, the only thing that is going to be outlawed by this law is the use of fracking in the four described types of rock and even there no strict ban is put in place.¹⁴²

The name of the most important¹⁴³ of the three legislative acts (Bill on water protection provisions and the *prohibition and risk-minimisation* of the procedures of the fracking technology (Drucksachen 18/4713 and 18/8916)) highlights the ambivalent

¹³⁵ Drucksache 18/4949 (n 79) at 12.

¹³⁶ Drucksache 18/4713 (n 1) at 2.

¹³⁷ Drucksache 18/8916 (n 74) at 2.

¹³⁸ Bryan A Garner (ed), *Black's Law Dictionary* (8th edn, Thomson/West 2004) 1031 (*Black's Law Dictionary*).

¹³⁹ *Black's Law Dictionary* (n 138) 154.

¹⁴⁰ Drucksache 18/8916 (n 74) at 16–17; speeches of Matthias Miersch, Karsten Möring, Andreas Lenz and Maik Beermann, *Stenografischer Bericht* 18/180 (n 74) at 17790–91, 17805–06, 17808, 17872.

¹⁴¹ Drucksache 18/8916 (n 74) at 17 and *Stenografischer Bericht* 18/180 (n 74) at 17790.

¹⁴² *Ibid.*

¹⁴³ Insofar as it entails the fundamental decisions on fracking in Germany, see Drucksache 18/8916 (n 74) at 17 and *Stenografischer Bericht* 18/180 (n 74) at 17790.

nature of what has now become law. There is an element of prohibition on the one hand and, at the same time, risk-minimisation on the other. The conjunction ‘and’ suggests a dual approach. This is, indeed, the objective of the law: prohibiting some activities (fracking in shale, argillite marlstone and coalbed streams), while allowing fracking in sandstone, limestone or for geothermal purposes, as discussed above.¹⁴⁴ But the main question is whether the former part, the prohibition, is a time-sensitive measure that suspends the activity or an indeterminate ban intended to suppress the activity concerned in general and forever.¹⁴⁵

The new section 13a(7) of the WHG establishes that a review of the prohibition of fracking in the four types of rock has to take place by 2021. This, in particular, is central to the characterisation of the law. Many of the rebellious MPs argued that this section merely opens up the possibility for the Bundestag to review the prohibition by 2021.¹⁴⁶ In the event that the Bundestag declines to amend the law, it would stay in place beyond 2021, they argued.¹⁴⁷ One MP called section 13a(7) of the WHG, thus, a ‘redundant formality’, since every law may be revised by the Bundestag at any time.¹⁴⁸ He went on to say ‘even if it is written in that law that by 2021 a report shall be issued [...] it is up to it [the Bundestag] to take a decision by 2020 or 2025. This is all open.’¹⁴⁹ According to this view, the prohibition might only be lifted by a renewed resolution of the Bundestag, which makes it an indeterminate ban, according to several MPs.¹⁵⁰

In contrast to this interpretation of the law, the actual law text reflects more of the characteristics of a moratorium than of a ban. The exact wording of the newly imposed section 13a(7) of the WHG is as follows:

In the year 2021 the German parliament reviews the suitability of the prohibition of section 1 sentence 1 number 1 on the basis of the then existing state of knowledge and technology [...].¹⁵¹

The first eight words ‘In the year 2021 the German parliament reviews’ place an obligation on the Bundestag to review the laws by 2021. There is no leeway for discretion. If the legislator had wanted to leave the decision to review the law to MPs’ discretion, he could have picked a different formulation.

German administrative law envisages three ways in which discretion might be apportioned by a law: *expressis verbis*, by reference to an unequivocal context or by legal description.¹⁵² As the law neither entails an *expressis verbis* section on discretion

¹⁴⁴ Drucksache 18/4713 (n 1) at 1 and 2.

¹⁴⁵ As discussed above, these definitions are taken from *Black’s Law Dictionary* (n 138) 154 and 1031.

¹⁴⁶ Drucksache 18/8916 (n 74) at 16–17; speeches of Matthias Miersch, Karsten Möring, Andreas Lenz and Maik Beermann, Stenografischer Bericht 18/180 (n 74) at 17790–91, 17805–06, 17808, 17872.

¹⁴⁷ *Ibid.*

¹⁴⁸ Stenografischer Bericht 18/180 (n 74) speech of Karsten Möring at 17805–06.

¹⁴⁹ Stenografischer Bericht 18/180 (n 74) speech of Karsten Möring at 17805–06.

¹⁵⁰ Drucksache 18/8916 (n 74) at 16–17; speeches of Matthias Miersch, Karsten Möring, Andreas Lenz and Maik Beermann, Stenografischer Bericht 18/180 (n 74) at 17790–91, 17805–06, 17808, 17872.

¹⁵¹ WHG, section 13a(7) reads in the original: ‘Im Jahr 2021 überprüft der Deutsche Bundestag auf der Grundlage des bis dahin vorliegenden Standes von Wissenschaft und Technik die Angemessenheit des Verbotes nach Absatz 1 Satz 1 Nummer 1’; translation by author.

¹⁵² Steffen Deterbeck, *Allgemeines Verwaltungsrecht mit Verwaltungsprozessrecht* (3rd edn, CH Beck 2005) paras 316 et seq (Deterbeck).

nor is it based in a context that, unequivocally, provides discretion, only the third category, discretion by legal description, remains as a possibility.

This alludes to the so-called ‘*kann, muss, soll*’-provisions of German law.¹⁵³ These are particular formulations in a law text, indicating different levels of discretion.¹⁵⁴ A typical formulation would read: ‘In the year 2021, the German parliament may/should/shall review ...’. Such a formulation, however, is not included in the WHG.

The Bundestag is, indeed, free to come to the conclusion that the prohibition needs to be prolonged, but it may only come to that conclusion after conducting a review in 2021. The text entails no ambiguity as to the fact that a review is obligatory. Thus, a definite element of time is entailed in the law text. The prohibition is, hence, more akin to a moratorium than to a ban.

Moreover, the fracking package entails an exception from the general prohibition on fracking in the four types of rock. According to the new section 13a(2) of the Water Protection Act, four exploratory trials for scientific purposes may be conducted, which are defined rather narrowly.¹⁵⁵ These trials need to be approved at national level, but also by the federal states where they are supposed to take place.¹⁵⁶ They will be supervised by an expert commission which assesses the trials, compiles annual reports on the progress and submits these reports to parliament and the public.¹⁵⁷ The very fact that an explicit provision to enable scientific research features in the fracking package is further evidence that the technology shall not be outlawed indefinitely, but until scientific knowledge increases.

Furthermore, a strict ban on hydraulic fracturing has actually been proposed in Germany, but was dismissed during the legislative procedure. The Bundesrat proposed an amendment to the Federal Mining Act that would have imposed a strict ban on the use of hydraulic fracturing in shale, argillite and marlstone rock as well as in coalbed seams.¹⁵⁸ In its rebuttal to that proposal of the Bundesrat, the German government argued:

It is, however, not the aim of the government to ban a technology forever that is not yet sufficiently researched. Moreover, it is the task to exclude that human health and the environment are endangered by application of the technology, as well as to sustain research possibilities and potential economic perspectives under these prerequisites.¹⁵⁹

Note, however, that this statement was made by the government with a view to the original government bill that has been substantially altered since. Nevertheless, the approved law does not distance itself from this line of reasoning, but rather builds upon it. The rebellious MPs wanted to alter the government bill, but abstained from launching their own proposal in the Bundestag.

The Minister of the Environment of Schleswig-Holstein, Robert Habeck, pointed out that a ban, if it had been desired by parliament, could have been easily achieved

¹⁵³ Detterbeck (n 152) paras 320–21.

¹⁵⁴ *Ibid.*

¹⁵⁵ Drucksache 18/8916 (n 74) at 3 and 19.

¹⁵⁶ *Ibid.*, 17.

¹⁵⁷ New section 13a(6) of the Water Protection Act (WHG), according to Drucksache 18/8916 (n 74) at 4.

¹⁵⁸ Drucksache 18/4949 (n 79) at 10.

¹⁵⁹ *Ibid.*, 14.

by introducing a sentence to the Federal Mining Act.¹⁶⁰ Such a sentence could be quite simple and prescribe that the breaking of rock by hydraulic pressure for the purpose of exploring for or extracting of hydrocarbons is prohibited.¹⁶¹

The fact that MPs adopted neither of these actions suggests that they wanted to stick to the fundamental idea of the government to have a moratorium on certain applications of the fracking technology, but that the terms and conditions of that moratorium should be tightened up.

When the new, amended bill was put before the Bundesrat for its final approval, the committees of the Bundesrat assessed the amended bill, which now became law, concluding that

it is with regret that the Bundesrat has to establish that the exploration for and exploitation of hydrocarbons [...] by hydraulic fracturing still is not entirely banned. It [the technology] is merely going to be prohibited for commercial use in some areas and rock formations. In all of the areas where [fracking] is not explicitly outlawed by the law, could the technology be used for exploration and production of hydrocarbons for scientific purposes, also in unconventional reservoirs.¹⁶²

Thus, the committees of the Bundesrat are not of the opinion that this law constitutes a ban. This is also apparent from the committees' recommendations in which they urged the Bundestag 'to put into place a law that entails a non-time-restricted and factually unrestricted ban of the fracking technology [...]'.¹⁶³

During the debate on the fracking package in the Bundesrat on 8 July 2016, several prime ministers and ministers of different German states made it very clear that they do not consider these laws and the ordinance as establishing a ban.¹⁶⁴ Rather, some of them pushed for a stricter regulation and considered the moratorium to be a compromise.¹⁶⁵

This view is finally supported by a statement of the CDU/CSU faction made during discussions on the alterations of the government bill. In view of the new version of that bill (which has now become law) the faction stated 'A general ban on fracking was never the intention. It is also not necessary. The pivotal point is that this extraction method is made more secure compared to the hitherto existing legal framework and that has been achieved.'¹⁶⁶

4.4. *Strict prohibition of fracking in certain water protection areas and consistent use of best available techniques*

The fourth important feature of the fracking package is its emphasis on water protection and best available techniques (Stand der Technik – BAT). Protection of sensitive sites, like water protection areas or their drainage basins, mineral water resources, sources of water used for the production of beverages, national parks, environmental protection

¹⁶⁰ Bundesrat, 'Plenarprotokoll 947. Sitzung 8.7.2016' at 282 www.bundesrat.de/DE/dokumente/plenarprotokolle/plenarprotokolle-node.html accessed 15 July 2016 (Bundesrat Plenarprotokoll 947. Sitzung).

¹⁶¹ See his proposal *ibid.*

¹⁶² Bundesrat Drucksache 353/16 (n 2) at 2 No 3.

¹⁶³ *Ibid.*, 4 No 9.

¹⁶⁴ Bundesrat Plenarprotokoll 947. Sitzung (n 160) at 281, 282, 283.

¹⁶⁵ *Ibid.*, 281.

¹⁶⁶ Drucksache 18/8916 (n 74) at 17.

areas and Natura 2000 habitats, are particularly protected.¹⁶⁷ The fracking package puts in place an extensive prohibition of fracking in these areas, that, according to the environmental committee of the Bundestag, is required to avoid the occurrence of diverging regulations in individual German federal states.¹⁶⁸

Fracking is also prohibited beneath water protection areas. This rule has been explicitly incorporated into the law to prevent drilling from outside a protected site into the protected area.¹⁶⁹ When compared to the initial governmental bill, the final law also entails better protection of drainage basins of water sources.¹⁷⁰

Interestingly, the use of fracking remains legal for the opening up of healing/thermal water springs (*Heilquellen*). This type of fracking application has been used for quite some time in Germany without causing any issue and it may not be performed by using water-endangering substances.¹⁷¹ The exception has apparently been introduced to cater particularly for Bavarian needs, where thermal water springs are often used.¹⁷²

The quality of all of these water resources in the vicinity of fracking sites has to be controlled via monitoring and benchmarked against baseline studies.¹⁷³ The absence of such baseline studies has been identified as a major issue in the US, which hampered adequate investigation into the repercussions of fracking on water, because the quality of the water prior to fracking activities was unknown.¹⁷⁴ How may one determine whether something has been polluted, if the original status, against which pollution must be benchmarked, is unknown?

Furthermore, all substances that shall be used for fracking purposes, as well as their envisaged amounts, must be disclosed and published, according to section 13b(1)(2) of the WHG.¹⁷⁵ This regulation is stricter than the REACH regulations at EU level, where certain types of information might be spared from public disclosure if publication would undermine legitimate commercial interests.

The two new laws and the new EIA Ordinance coherently require operators of facilities where fracking is taking place to use BAT for extraction.¹⁷⁶ Under German technology regulation, the use of BAT is well established.¹⁷⁷ Instructive

167 On the one hand by a respective supplement to section 13a(1) of the WHG and on the other hand by alterations to sections 1, 23, 24 and 33 of the Nature Protection Act (*Bundesnaturschutzgesetz*).

168 Drucksache 18/8916 (n 74) at 18.

169 Drucksache 18/4713 (n 1) at 24.

170 Stenografischer Bericht 18/180 (n 74) at 17803.

171 Drucksache 18/4713 (n 1) at 24.

172 Stenografischer Bericht 18/180 (n 74) at 17808.

173 WHG, section 13b(1)–(5) according to Drucksache 18/4713 (n 1) at 3 and 11; Drucksache 18/8916 (n 74) at 20.

174 US Environmental Protection Agency (EPA), ‘Draft Investigation of Ground Water Contamination Near Pavillion, Wyoming’ (2011) 39 www.epa.gov/region8/draft-investigation-ground-water-contamination-near-pavillion-wyoming accessed 4 March 2017; US Environmental Protection Agency, *Draft Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources* at 111 www.epa.gov/hfstudy/draft-plan-study-potential-impacts-hydraulic-fracturing-drinking-water-resources-february-7 accessed 25 April 2016.

175 Drucksache 18/4713 (n 1) at 3.

176 See section 13a(4) No 2, (5), (6) of the WHG and Drucksache 18/8916 (n 74) at 19–20.

177 Water Protection Act, section 3 No 11; see also BVerwGE 55, 250; BVerfGE 49, 89 (143) and 53, 30 (58); Georg Meiners, Michael Denneborg and Frank Müller, ‘Gutachten für das Umweltbundesamt Umweltauswirkungen von Fracking bei der Aufsuchung und Gewinnung von Erdgas aus unkonventionellen Lagerstätten – Risikobewertung, Handlungsempfehlungen und Evaluierung bestehender rechtlicher Regelungen und Verwaltungsstrukturen’ (Ministry for the Environment 2012) B 113 (Meiners and others Bund).

examples of BAT for fracking include ‘green completion’ and the three casing system for well insulation.¹⁷⁸

4.5. *The Mining Damage Presumption – liability and the reversal of the burden of proof*

The fracking package also contains a second law concerned with the extension of the Mining Damage Presumption (*Bergschadensvermutung*) to borehole mining and caverns.¹⁷⁹ The so-called Mining Damage Presumption is a pillar of the German legal framework on mining.¹⁸⁰ Its function is to reverse the burden of proof for mining activities.¹⁸¹ If damage occurs in a mining area as a result of subsidence, compression or stretching of the surface, it shall be presumed that the damage is caused by the mining company active in that particular area.¹⁸²

Whether this Mining Damage Presumption also applies to borehole mining and to caverns has been discussed in the literature, due to the unfortunate wording of section 120 of the Federal Mining Act.¹⁸³ The explicit aim of the current law is to extend the Mining Damage Presumption to these activities generally and to fracking activities in particular.¹⁸⁴

The bill functions in two ways. First, it enlarges the scope of the Mining Damage Presumption to earth liftings, fissures and tremors,¹⁸⁵ which also encompasses the issue of induced seismicity.¹⁸⁶ Second, it amends the applicable Impact Area Mining Ordinance (*Einwirkungsbereichs-Bergverordnung*), which regulates what might be considered to be the geographical extent of an area that has been damaged by mining activities.¹⁸⁷

4.6. *The fracking EIA ordinance – obligatory EIAs for fracking activities*

Besides the two laws, the legislative package also consists of a third measure, the issuance of an ordinance on EIAs for fracking activities.¹⁸⁸ The situation in

¹⁷⁸ Energy and Climate Change Committee of the House of Commons, *Shale Gas* (Fifth Report of Session 2010–12, HC 795, Vol 1) 46; SRU Faulstich (n 5) 35.

¹⁷⁹ *Gesetz zur Ausdehnung der Bergschadensvermutung auf den Bohlochbergbau und Kavernen*; see Drucksache 18/4714 (n 1) and Drucksache 18/8907 (n 81) as well as Drucksache 18/4952 (n 79).

¹⁸⁰ Entailed in section 120 of the German Mining Act; for details see: Gerhard Boldt and Herbert Weller, *Bundesberggesetz* (de Gruyter 1994) section 120 Rn 2 et seq (Boldt and Weller); Reinhart Piens, Hans-Wolfgang Schulte and Stephan Graf Vitzthum, *Bundesberggesetz* (2nd edn, Kohlhammer 2013) section 120 Rn 3 et seq (Piens and others).

¹⁸¹ *Ibid.*

¹⁸² Section 120(1)(2) No 2; see Drucksache 18/4714 (n 1) at 7 and Drucksache 18/8907 (n 81) at 3; for more see: Boldt and Weller (n 180) section 120 Rn 2 et seq; Piens and others (n 180) section 120 Rn 3 et seq.

¹⁸³ For the discussion see Boldt and Weller (n 180) section 120 Rn 8; Piens and others (n 180) section 120 Rn 14; Drucksache 18/4714 (n 1) at 11.

¹⁸⁴ *Ibid.*

¹⁸⁵ By amending section 120(1)(2) No 2. See Drucksache 18/4714 (n 1) at 7 and Drucksache 18/8907 (n 81) at 3.

¹⁸⁶ Drucksache 18/4952 (n 79) at 2 and 5–6.

¹⁸⁷ The issue here was how to establish in advance the area that could potentially be affected by tremors caused by mining (and particularly fracking) and where affected citizens could claim compensation. The government argued that it would be impossible to know the area affected in advance and, thus, the area in which the Mining Damage Presumption applies would be impossible to determine, see: Drucksache 18/4952 (n 79) at 7. The interesting solution to this issue is that the impact area for tremors shall be determined after the seismic activity took place, see Drucksache 18/4952 (n 79).

¹⁸⁸ Bundesrat Drucksache 144/15 (n 1).

Germany with regard to EIAs had not been much different to the situation in Europe: the threshold for obligatory EIAs stood at 500,000 cubic metres daily gas production.¹⁸⁹ Thus, fracking operations were subject only to a scoping procedure under the German EIA law (*Gesetz über die Umweltverträglichkeitsprüfung*).¹⁹⁰ This scoping procedure assessed the need to carry out a full-fledged EIA on a case-by-case basis.¹⁹¹

The new EIA ordinance makes EIAs obligatory for fracking activities.¹⁹² This pertains particularly to the exploration for and production of oil and gas via hydraulic fracturing, including scientific trials,¹⁹³ exploration for oil and gas via hydraulic fracturing and disposal of waste water via deep drillings (*Verpressen*).¹⁹⁴ Moreover, hydraulic fracturing for geothermal purposes is also subjected to an EIA, in cases where the geothermal drillings entail water-endangering substances, according to the new section 1 No 8 and 8a of the Ordinance on EIAs for Mining Activities (*Verordnung über die Umweltverträglichkeitsprüfung bergbaulicher Vorhaben (UVP-V Bergbau)*).¹⁹⁵

On a final note, the new EIA fracking ordinance also amends part of the Mining Ordinance for all Mining Plants (ABBergV) to ensure adequate monitoring and that disposal of fracking waste water via deep ground injection may not take place in areas that are located close to the surface.¹⁹⁶ This is mainly achieved by the introduction of a new section 22b (monitoring) and section 22c (treatment and disposal of flow back and *Lagerstättenwasser* [production/reservoir water]) to the ABBergV.¹⁹⁷

The effects of the ordinance shall be evaluated after four years.¹⁹⁸ Although the ordinance is thought as supplementing the two laws on fracking, it currently entails some inadequacies, which make it seem not to perfectly fall into line with the two laws.¹⁹⁹ These inadequacies are mainly due to the fact that the ordinance was modelled upon the original government bills, which now have been substantially altered. It remains to be seen to what extent the Bundesrat is going to alter the ordinance to make it more fitting to the two resolved laws.

5. Conclusion

The most striking point of the German prohibition of shale gas extraction is that scientists deem it unnecessary. Although several studies on the specific German situation

¹⁸⁹ Annex I to the German EIA law in conjunction with section 1 No 2(a) of the German Ordinance concerning Environmental Impact Assessment in Mining Projects (*Verordnung über die Umweltverträglichkeitsprüfung bergbaulicher Vorhaben (UVP-V Bergbau)*).

¹⁹⁰ Meiners and others Bund (n 177) B 138; Philippe & Partners (n 57) para 145.

¹⁹¹ *Ibid.*

¹⁹² Bundesrat Drucksache 144/15 (n 1) at 1.

¹⁹³ The latter has been introduced by the Bundesrat, see Bundesrat Drucksache 358/16 (n 2) at 2 No 2.

¹⁹⁴ Bundesrat Drucksache 144/15 (n 1) at 1–2 and 6–7 with amendments in Bundesrat Drucksache 358/16 (n 2) at 2–3 No 3.

¹⁹⁵ *Ibid.*

¹⁹⁶ *Ibid.*

¹⁹⁷ Bundesrat Drucksache 144/15 (n 1) at 3–5.

¹⁹⁸ *Ibid.*, 13.

¹⁹⁹ The most striking example is the fact that the ordinance is tying in with a depth criterion (3,000 metres), which was entailed in the initial draft package, but has been removed in the actual laws.

regarding shale gas extraction have been released,²⁰⁰ not one asked for a strict prohibition. This fact has been acknowledged during the parliamentary debate in the Bundestag, where Andreas Jung, MP said: ‘We are doing much more than just implementing the suggestions of the experts of the German Federal Environmental Agency. We are a quantum leap ahead.’²⁰¹

The latter part might be subject to controversy. In fact, it is rather alarming to see how little expert opinion of scientists seems to have mattered to the German legislator. A result of that approach is the core regulation of the package, a fundamentally different legal treatment of so-called ‘unconventional’ and ‘conventional’ fracking, which does not sit well with the German constitution.

Very small amendments could improve and fortify the fracking package and take it out of constitutional criticism. But this requires trust and a willingness to listen among the three major institutions of the legislative and the executive power. The fierce debates over the package between the Bundesrat, the government and the Bundestag, however, provide very little hope that this could happen.

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²⁰⁰ Meiners and others Bund (n 177); Ewen and others (n 56); SRU Faulstich (n 5); Andruleit and others BGR Abschätzung (n 14); NIKO (n 100) and many more.

²⁰¹ Stenografischer Bericht 18/180 (n 74) at 17803.