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Rachel Carson Center for Environment and Society  
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Jens Kersten

## A Farewell to Residual Risk? A Legal Perspective on the Risks of Nuclear Power after Fukushima.

Following the “slow-motion catastrophe”<sup>1</sup> that unfolded at Fukushima in March 2011, the German political establishment reacted by accelerating its controversial phaseout from domestic nuclear energy production the following June. Proponents of nuclear power regard this to be a premature end of the non-military use of nuclear energy;<sup>2</sup> as far as they are concerned, Germany’s nuclear safety record has not been compromised by the Japanese reactor disaster. On the contrary, they argue that a rash jettisoning of nuclear technologies will weaken energy safety in Germany. For many pro-nuclear advocates, it is ultimately hypocritical for Germany to halt the domestic production of nuclear power while continuing to import it from neighbouring countries. Critics of nuclear power, on the other hand, consider the accelerated exit strategy long overdue.<sup>3</sup> Coming after Three Mile Island and Chernobyl, Fukushima was hardly just another isolated accident; the Japanese reactor debacle—with its catastrophic human, social, ecological, and economic consequences—proved once again the latent dangers of nuclear power plants. For opponents of nuclear power, no measures to minimize the risks, however drastic, can give humans the right to subject successive regions of the earth to atomic meltdown. They reject the pro-nuclear argument that Germany cannot afford to forego nuclear solutions to its energy economy; on the contrary, they maintain that as long as nuclear energy continues to be a viable option, there will be no concerted effort to develop alternative energy sources.

In the spring and early summer of 2011, the two sides fell back on these well-rehearsed arguments: the charge of hysteria was levelled at those in favour of the exit strategy, while those against it were accused of marching blindly towards the apocalypse.<sup>4</sup> But in the elections on 27 March 2011 the citizens of the federal state of Baden-Würt-

1 Frank Rieger, “Wir haben Dämonen geschaffen,” *Frankfurter Allgemeine Zeitung*, 12 April 2011, 29. “Zeitlupen-Katastrophe” in German.

2 Konrad Kleinknecht, “Abkehr vom Klimaschutz?” *Aus Politik und Zeitgeschichte* 61, no. 46–47 (2011): 29.

3 Robert Spaemann, *Nach uns die Kernschmelze: Hybris im atomaren Zeitalter* (Stuttgart: Klett-Cotta, 2011), 7ff.

4 Frank Schirrmacher, “Sie nennen es Hysterie,” *Frankfurter Allgemeine Sonntagszeitung*, 3 April 2011, 23; Martina Heßler, “Unsere Scham vor der Maschine,” *Frankfurter Allgemeine Zeitung*, 2 April 2011, 33. For a historical perspective, see Philipp Gassert, “Popularität der Apokalypse: Zur Nuklearangst seit 1945,” *Aus Politik und Zeitgeschichte* 61, no. 46–47 (2011): 48; and Frank Uekötter, *Am Ende der Gewissheiten: Die ökologische Frage im 21. Jahrhundert* (Frankfurt am Main: Campus, 2011), 155ff.

temberg ousted their government, a strong supporter of nuclear energy. The federal government got the message. Although Chancellor Merkel had announced at the end of 2010 that the phaseout of nuclear energy—negotiated by the Schröder government in 2002—would be delayed, after Fukushima it was re-started. The government did not, however, announce an immediate shutdown of nuclear energy. Instead, it proposed a “delayed acceleration” of nuclear phaseout: the final shutdown of the last nuclear reactor in the Federal Republic is not scheduled until 31 December 2022. Therefore, some questions need answering: Can we really talk about a “reaction” to the Japanese reactor meltdown if the final exit won’t happen for a whole decade? Furthermore, shouldn’t the exit be immediate if people, environment, and economy are all out on a limb? Is this really the farewell to residual nuclear risk?

The answers to these questions must take into account the complex relationship between humans and their energy sources. As environmental historians have shown, this relationship has never been entirely “rational,” at least not since industrialization fed the energy appetites of Western, and now global, modernity. This is particularly true of atomic energy. For John McNeill, the “strange career of nuclear power” has proven to be both unpopular and uneconomical.<sup>5</sup> The promise of the 1950s—that nuclear power would make energy “too cheap to meter”—ignored the costs of both investment and production. Reactor disasters and the political “metaphysics of radioactive waste storage” have already yielded very real social and environmental consequences.<sup>6</sup> As McNeil points out, “Some nuclear wastes and part of Chernobyl’s fallout will be lethal for 24,000 years—easily the most lasting insignia of the twentieth century and the longest lien on the future that any generation of humanity has yet imposed.”<sup>7</sup> In this sense, environmental history offers a valuable “critique of prophetic sense,” which Peter Sloterdijk warned us of with regard to climate change and that applies equally to the non-military use of nuclear energy as well.<sup>8</sup>

5 John R. McNeill, *Something New Under the Sun: An Environmental History of the Twentieth-Century World* (New York: W.W. Norton & Co., 2000), 312.

6 Peter Sloterdijk, *Zorn und Zeit: politisch-psychologischer Versuch* (Frankfurt am Main: Suhrkamp, 2006), 146.

7 McNeill, *Something New*, 313. For a perspective on inter-generational justice, see Cass R. Sunstein, *Worst-case Scenarios* (Cambridge, MA: Harvard University Press, 2007), 266.

8 Peter Sloterdijk, “Wie groß ist ‘groß?’” in *Das Raumschiff Erde hat keinen Notausgang*, eds. Paul J. Crutzen et al. (Berlin: Suhrkamp, 2011), 96; for a historical perspective, see Frank Uekötter, “Fukushima and the Lessons of History: Remarks on the Past and Future of Nuclear Power,” in this issue.

The work of Ulrich Beck has been crucial in re-shaping our ideas of energy and risk. In his book *Risk Society*, Beck analyzes social reactions to risks that have the potential to visit large-scale destruction on our civilizations.<sup>9</sup> He describes the 1986 Chernobyl reactor disaster in terms of the conceptual triad of “residual risk, residual hope, and residual activity” (*Restrisiko, Resthoffnung und Restaktivität*) and shows how nuclear risks are actively ignored by society.<sup>10</sup> Since Chernobyl, the communicative parameters of nuclear accidents have changed. In the reactor catastrophe at Fukushima we have seen how the tense relationship between the triad of residual risk, residual hope, and residual activity has been further intensified by strategic disinformation policies of energy corporations and national governments.<sup>11</sup> In addition, Fukushima quickly became old news in the media circus of our information-powered society. While Fukushima no longer dominates the headlines, the nuclear disaster in Japan is by no means over. These are some of the ambivalent ways that the global risk society and the global information society are inseparably linked.

In Beck’s triad, “residual risk” is the key term for a political understanding of “risk society.” Risk societies constitute themselves when risk-taking becomes socially risky.<sup>12</sup> Historically, people have always taken risks. They must act in the face of potentially negative outcomes, whether in agriculture, trade, or war. People have always been—and still are—presented with the choice of acting (or not) to prevent negative consequences. Yet, over the course of industrialization, public and private law have increasingly regulated the framework for risk acceptance and prevention, constituting a legal safety net for social risk-taking. For Beck, these legal provisions constitute the social “risk contract.”<sup>13</sup> This contract is based on the principle that risks can be controlled and/or compensated. That is to say, risks can be taken provided that technical preventative measures are in place and that, in the case of damages, there is some form of compensation or insurance. In contrast to this social normalization and

9 Ulrich Beck, *Risikogesellschaft* (Frankfurt am Main: Suhrkamp, 1986). Published in English as *Risk Society: Towards a New Modernity*, trans. Mark Ritter (London: Sage Publications, 1992). The discussion of the Chernobyl disaster (which took place shortly before the book was published) is in an introduction to the German edition that was omitted in the English translation. Citations thus refer to the German text.

10 *Ibid.*, 7ff.

11 Albert Ingold, *Desinformationsrecht: Verfassungsrechtliche Vorgaben für staatliche Desinformationstätigkeit* (Berlin: Duncker & Humblot, 2011).

12 Ulrich Beck, *Weltrisikogesellschaft. Auf der Suche nach der verlorenen Sicherheit* (Frankfurt am Main: Suhrkamp, 2007), 19ff., 24ff. Published in English as *World at Risk*, trans. Ciaran Cronin (Cambridge: Polity Press, 2009).

13 *Ibid.*, 25.

legal containment of risks, a “risk society” emerges when risks surpass regulatory measures. A society develops into a risk society when, as with nuclear energy, there is residual risk of an uncontrollable and uncompensatable damage, despite technical measures of prevention.<sup>14</sup>

The legal significance of residual risk for the analysis of risk society becomes clear if we take a constitutional perspective. According to the German Federal Constitutional Court (*Bundesverfassungsgericht*), any event that causes “damages of apocalyptic proportions [must] be *effectively* eliminated according to the current state-of-the-art of science and technology.”<sup>15</sup> Risk society, then, only admits to residual risk in theory. Even if a nuclear residual risk theoretically exists, the chance of it actually occurring must be effectively eliminated in order to be constitutional. Sloterdijk underlines this marginalization of residual risk: “risk ‘society’ is *de facto* one in which true risk-taking is prohibited.”<sup>16</sup> In other words, risk societies tend to ignore or to banish residual risk from political discourse. Thus, the bickering about the existence of nuclear residual risk as a “worst-case scenario,”<sup>17</sup> in fact, cuts to the heart of the political legitimacy of risk societies.

According to Christof Mauch, however, this sociological, political and legal approach to risk society “does not explain how such decisions came about historically and how communities have adapted to ‘risks’ and the ‘challenges of nature’ over time.”<sup>18</sup> Thus, the abstract reflection on risk society has to prove its theoretical validity in historical case studies. Germany’s adoption of the concept of “delayed acceleration,” as set out in June 2011 in the Thirteenth Amendment to the Atomic Energy Act, allows such a case study. It exemplifies the paradoxical managing of nuclear risk, considered at once too risky for German risk society and yet socially acceptable for a further ten years. It is this antinomy of residual risk within German energy policy after Fukushima that will be the subject of the analysis below.

14 *Ibid.*, 26.

15 Bundesverfassungsgericht [German Federal Constitutional Court], “Decision 2 BvR 2502/08, 18 February 2010” (CERN), *Neue Zeitschrift für Verwaltungsrecht* 29 (2010): 703f; italics added.

16 Peter Sloterdijk, *Im Weltinnenraum des Kapitals. Für eine philosophische Theorie der Globalisierung* (Frankfurt am Main: Suhrkamp, 2005), 150; italics in the original.

17 Sunstein, *Worst-case Scenarios*.

18 Christof Mauch, “Introduction,” in *Natural Disasters, Cultural Responses: Case Studies Toward a Global Environmental History*, ed. Christof Mauch and Christian Pfeiffer (Lanham, MD: Lexington Books, 2009), 5.

## I. The “Delayed Acceleration” of Nuclear Phaseout

In reaction to the nuclear disaster unleashed by the earthquake and tsunami in Japan, the German government agreed on 6 June 2011 to accelerate the end of domestic nuclear energy production.<sup>19</sup> The *Bundestag*—Germany’s national parliament—quickly passed the Thirteenth Amendment to the Atomic Energy Act (513 votes for and only 79 against) and it became law on 6 August 2011.<sup>20</sup> The phrase “accelerated exit from nuclear energy” indicates that this amendment should not be seen in isolation, but rather in its legislative context.<sup>21</sup> Originally, the Federal Republic of Germany authorized the construction of nuclear power plants without imposing any constraints on the operational life of the facilities. In 2002 the Schröder Government and energy providers negotiated a nuclear phaseout that capped the total amount of energy able to be produced by nuclear power. In 2010, in the Eleventh Amendment to the Atomic Energy Act, Chancellor Merkel expanded the scope of this “residual current” model so that energy companies were permitted to produce additional amounts of atomic electricity.<sup>22</sup> And now, after Fukushima, the Thirteenth Amendment to the Atomic Energy Act introduces the concept of a “delayed acceleration” of the nuclear phaseout.

The Thirteenth Amendment includes three major provisions: *First*, it sets a shutdown date for every nuclear power plant. For eight nuclear power plants, production ended with the enactment of the amendment on 6 August 2011. The remaining nuclear power plants will be shut down at staggered intervals in 2015, 2017, 2019, 2021, and 2022. On 31 December 2022, the last three German nuclear reactors—*Isar 2*, *Emsland*, and *Neckarwestheim 2*—will be closed down. *Second*, it puts an end to the current contingents of atomic energy production permitted under the Eleventh Amendment to the Atomic Energy Act. *Third*, the amendment contains the caveat that a closed reactor may be designated as a reserve energy provider by the government, and kept on standby until 31 March 2013, to ensure the security of energy supply.<sup>23</sup> These three

19 Bundestagsdrucksache [Printed Matter of the German Bundestag], no. 17/6070; 17/6246.

20 Bundesgesetzblatt I [Federal Law Gazette I] (2011): 1704.

21 Dieter Sellner and Frank Fellenberg, “Atomausstieg und Energiewende 2011—das Gesetzespaket im Überblick,” *Neue Zeitschrift für Verwaltungsrecht* 30 (2011): 1025ff.; Michael Kloepfer and David Bruch, “Die Laufzeitverlängerung im Atomrecht zwischen Gesetz und Vertrag,” *JuristenZeitung* 66 (2011): 377 ff.; Jens Kersten and Albert Ingold, “Die Beschleunigung des Atomausstiegs. Verfassungsrechtliche Anforderungen,” *Zeitschrift für Gesetzgebung* 26 (2011): 350 ff.

22 Bundesgesetzblatt I (2010): 1814; Bundestagsdrucksache, no. 17/3051; Kloepfer and Bruch, “Die Laufzeitverlängerung,” 378f.

23 However, this third measure has already been made obsolete by the decision of the Federal Network Agency (*Bundesnetzagentur*) that such “nuclear reserves” are not necessary for supply security ([http://www.bundesnetzagentur.de/cln\\_1912/DE/Presse/Berichte/berichte\\_node.html](http://www.bundesnetzagentur.de/cln_1912/DE/Presse/Berichte/berichte_node.html)).

provisions of the amendment do not foresee any compensation for the energy companies. Parliament justifies this with the economic amortization of the reactors.<sup>24</sup>

The constitutional evaluation of the Thirteenth Amendment is highly controversial, particularly regarding the question of whether, and to what extent, energy companies should be compensated for the “delayed acceleration” of the nuclear phaseout.<sup>25</sup> The constitutional justification for the three measures that comprise the amendment is dependent on one decisive question: whether the Japanese reactor disaster should result in a re-evaluation of the risks of nuclear energy to protect the life, livelihood, and health of German citizens.<sup>26</sup>

## II. Constitutional Requirements for Risk Assessment

The Federal Constitutional Court developed the framework for the constitutional law on risk in its decision of 8 August 1978 regarding the Kalkar nuclear power plant.<sup>27</sup> It still adheres to these guidelines today, particularly with respect to its judgement of 18 February 2010 concerning a series of scientific tests carried out by the European Organization for Nuclear Research (CERN).<sup>28</sup>

The government has to live up to its constitutional obligation to defend its citizens from any threat to life or health caused by scientific and technological progress.<sup>29</sup> This is particularly relevant for the non-military use of nuclear energy that, in the event of malfunction or accident, can transform whole regions into “No-Go areas” or “dead zones.”<sup>30</sup> In the opinion of the Constitutional Court, nuclear energy therefore constitutes a “hazard to human rights.”<sup>31</sup> That is the reason why nuclear power plants are only

24 Bundestagsdrucksache, no. 17/6070, 6.

25 See Wolfgang Ewer, “Der neuerliche Ausstieg aus der Kernenergie—verfassungskonform und entschädigungsfrei,” *Neue Zeitschrift für Verwaltungsrecht* 30 (2011): 1935ff.; David Bruch and Holger Grewe, “Atomausstieg 2011 als Verletzung der Grundrechte der Kernkraftwerksbetreiber?—Zur Verfassungsmäßigkeit der 13. Atomgesetznovelle,” *Die Öffentliche Verwaltung* 64 (2011): 794ff.; Michael Kloepfer, “13. Atomgesetznovelle und Grundrechte,” *Deutsches Verwaltungsblatt* 126 (2011): 1437ff.; Sellner and Fellenberg, “Atomausstieg und Energiewende,” 1025ff.; Kersten and Ingold, “Die Beschleunigung des Atomausstiegs,” 350ff.

26 Grundgesetz für die Bundesrepublik Deutschland [The Basic Law for the Federal Republic of Germany], art. II, par. 2; art. XXa.

27 Bundesverfassungsgericht, “Decision 2 BvL 8/77, 8 August 1978” (Kalkar), *Entscheidungen des Bundesverfassungsgericht* (Decisions of the Constitutional Court) vol. 49 (Tübingen: Mohr Siebeck, 1978), 124ff.

28 Bundesverfassungsgericht, “CERN,” 702ff.

29 Bundesverfassungsgericht, “Kalkar,” 132, 141f.; “CERN,” 703.

30 Spaemann, *Nach uns die Kernschmelze*, 7.

31 Bundesverfassungsgericht, “Kalkar,” 141.

constitutionally acceptable if they conform to the “basic principle of the best possible defence against hazards and prevention of risks.”<sup>32</sup>

In the context of risk assessment necessary for nuclear hazards, the Constitutional Court further differentiates between two types of risks: unacceptable risks, which must be prevented, and acceptable risks, which must be tolerated as “inescapable residual risks.”<sup>33</sup> This distinction between unacceptable and acceptable risks reflects the intertwining of risk and rights in liberal society: the risky activities that drive scientific and technological development are protected by the freedom of research, of profession, and of property.<sup>34</sup> Hence, the demand for a risk-free society flies in the face of the necessary production of risks that are never completely predictable.

In differentiating between risk prevention and risk acceptance, the Constitutional Court adheres to the concept of a “dynamic protection of human rights” that requires the administrative regulation of nuclear power plants using state-of-the-art science and technology.<sup>35</sup> According to the court, “a disaster of apocalyptic magnitude as the potential consequence of scientific progress must, by the standards of current scientific and technological knowledge, be completely ruled out.”<sup>36</sup>

With this ambivalent standard, the Constitutional Court reflects the “breakdown of the horizon of objective knowledge” in risk assessment.<sup>37</sup> In other words, risk assessment is no longer just a problem of scientific and technological knowledge but a question of political responsibility.<sup>38</sup> The political discretion of parliament in its assessment of risk is, in the words of the Constitutional Court, “largely dependent on the observations of actual events when calculating the relative frequency of the occurrence and the similar consequences of similar events in the future.”<sup>39</sup> Revising risk decisions due to new knowledge and experience is part and parcel of dynamic risk assessment: “Knowledge generated by experience, even if this experience is closely entwined with the laws of

32 Ibid., 139.

33 Bundesverfassungsgericht, “CERN,” 704; Bundesverfassungsgericht, “Kalkar,” 137.

34 Bundesverfassungsgericht, “Kalkar,” 143; Bundesverfassungsgericht, “CERN,” 704.

35 Bundesverfassungsgericht, “Kalkar,” 137; Helmuth Schulze-Fielitz, “Risikosteuerung von Hochrisikolagen als Verfassungsproblem—Notfallschutz bei Kernkraftanlagen,” *Die Öffentliche Verwaltung* 64 (2011): 788ff.

36 Bundesverfassungsgericht, “CERN,” 703f.

37 Liv Jaeckel, “Risiko-Signaturen im Recht. Zur Unterscheidbarkeit von Gefahr und Risiko,” *JuristenZeitung* 66 (2011): 120; on the change to “subjective” risk-perception, see Liv Jaeckel, *Gefahrenabwehrrecht und Risikodogmatik. Moderne Technologien im Spiegel des Verwaltungsrechts* (Tübingen: Mohr Siebeck, 2010): 317ff.

38 Bundesverfassungsgericht, “Kalkar,” 131f.

39 Ibid., 142.

science, is only approximate, at least as long as it includes human experience. This kind of knowledge cannot give certainty, but stands to be corrected by every subsequent new experience, and so is always at the cutting edge of what are potentially only as-yet unproved misunderstandings.”<sup>40</sup>

### III. New Risk Assessment

The German Parliament met these constitutional requirements for redefining risk assessment of nuclear energy after Fukushima in the Thirteenth Amendment to the Atomic Energy Act.<sup>41</sup> It combines a fundamental re-assessment of the risks specific to nuclear technology with an estimate of consequences of the nuclear exit strategy for German energy policy.

In its preamble, the amendment makes it clear that Fukushima represents the end of nuclear energy in Germany.<sup>42</sup> Its production and use should be stopped as early as possible. The preamble justifies this new assessment of nuclear power by summarizing the opinion of the independent Ethics Commission on Safe Energy Provision (*Sichere Energieversorgung*), published in its 30 May 2011 report, *Germany’s New Direction in Energy—A Community Decision for the Future*.<sup>43</sup> The Ethics Commission’s report observed that, while the risks of nuclear energy have not changed as a result of Fukushima, the perceptions of those risks certainly have: more people are now aware of the real, not just hypothetical, risks of large-scale accidents.

In the view of the Ethics Commission, there are three relevant aspects of this new evaluation of nuclear risks. *First*, the fact that the reactor disaster happened in high-tech Japan dispels the conviction that such an accident—as well as the botched responses to it—could never happen in Germany. *Second*, it is now clear that it was impossible, even weeks after the disaster, to foresee an end to the catastrophe, to take stock of the extent of the damage, or to give definitive borders to the geographical area affected. *Third*, the disaster in Japan was initiated by events that the reactor had not been

40 *Ibid.*, 143; cf. Bundesverfassungsgericht, “CERN,” 705.

41 Bundestagsdrucksache, no. 17/6070.

42 *Ibid.*, 1, 5.

43 Ethikkommission für Sichere Energieversorgung [Ethics Commission on Safe Energy Provision], *Deutschlands Energiewende—Ein Gemeinschaftswerk für die Zukunft* (Berlin, 2011), 11f.

designed to withstand. In short, Fukushima revealed the limitations of technical risk assessments that are often drafted on the basis of inaccurate or flawed assumptions—for example, about earthquake safety or the maximum height of a tsunami. The preamble of the Thirteenth Amendment, by adopting the Ethics Commission’s evaluation of nuclear risks, reflected the reluctance of legislators since 2002 to support nuclear energy given the problems associated with nuclear power plants, the disposal and reprocessing of nuclear waste, and the potential for abuse.<sup>44</sup>

This re-evaluation of nuclear risks in the Thirteenth Amendment extends to the nuclear phaseout in German energy policy. The amendment set the year 2022 as the earliest possible deadline for the end of nuclear energy programs. Among its reasons, the preamble cites the “the guarantee of nuclear safety, the adherence to national and international climate protection goals, and the guarantee of fair and socially acceptable energy prices.”<sup>45</sup> These considerations lead to the designation of nuclear energy as a *Brückentechnologie* or “bridging technology.”<sup>46</sup> The concept of *Brückentechnologie* focuses on the efficient expansion of alternative energy technologies and infrastructure to allow a speedy transition to an age of renewable energies. The preamble justifies the conditional acceptance of risky nuclear power through its guarantee of the “absolute priority afforded to nuclear safety.”<sup>47</sup> To support this decision, the preamble draws on the report by the Reactor Safety Commission (*Reaktor-Sicherheitskommission*), which had testified in May 2011 that, in light of the immediate causes of the Japanese disaster (tsunami, earthquake, flooding) and of potential human-triggered causes (airplane crashes, gas leaks, accidents in neighboring reactors, terrorism, technical malfunctions, computer-managed attacks), German nuclear power plants still displayed “a high degree of robustness.”<sup>48</sup>

#### IV. Legal Conformity of the New Risk Assessment

From a legal perspective, both the re-evaluation of nuclear risks and the risk assessment of the phaseout are in line with the federal constitution, with regard to German energy

44 Bundestagsdrucksache, no. 17/6070, 5f.

45 *Ibid.*, 1.

46 *Ibid.*, 5.

47 *Ibid.*, 1.

48 Reaktor-Sicherheitskommission [Reactor Safety Commission], *Bericht zur anlagenspezifischen Sicherheitsüberprüfungen deutscher Kernkraftwerke*, (16 May 2011), 6ff., 23ff., 13ff., 83ff.; Bundestagsdrucksache, no. 17/6070, 5.

policy.<sup>49</sup> Legislators are constitutionally required to adhere to the principles of a dynamic risk assessment to protect citizens' health, lives, and livelihoods. In other words, new practical experience and knowledge have to be integrated quickly into risk assessment when it concerns the functioning—and malfunctioning—of hazardous nuclear reactors.<sup>50</sup> Thus, the constitution does not, in Beck's words, follow "a concept of risk that is immune to experience."<sup>51</sup> It could not allow Three Mile Island, Chernobyl, and Fukushima to be summarized as "unfortunate accidents, from which there is nothing to be learnt."<sup>52</sup> Instead, from a constitutional perspective, every decision about risk has to be re-examined in the light of new experiential knowledge and, if necessary, adjusted. In assessing nuclear risk, parliament has broad political discretion, subject only to legal examination under the terms of accuracy and rationality. Following the Ethics Commission's report *Germany's New Direction in Energy*, it accepted the reality of residual nuclear risk in a high-tech country, underlining the limits of effective provisions for disaster scenarios and the inability to manage the consequences of a nuclear catastrophe.

The reasons for the re-evaluation of nuclear risk are rational and supported by evidence. They cannot be dismissed by the argument that those risks were already influencing the controversial debate about nuclear power prior to Fukushima. Constitutionally speaking, "new" risks from nuclear energy are not needed for a new risk assessment; rather, it lies within legislative discretion to re-examine and re-evaluate known risks in the light of current and, in this case, catastrophic experiences. On these grounds, parliament could come to the conclusion that the non-military use of nuclear energy in the Federal Republic of Germany should be prohibited in the future because of the residual risk to civilization.

After weighing this new evaluation of risks against the security of energy supply, climate protection, and socially acceptable energy prices, parliament concluded that a complete phaseout of nuclear energy could only be realized in 2022.<sup>53</sup> In principle, this decision has its basis in the constitution. Parliament justifiably extended its perspective beyond purely

49 Kersten and Ingold, "Die Beschleunigung des Atomausstiegs," 363ff.

50 Bundesverfassungsgericht "CERN," 703f.

51 Ulrich Beck, "Atomausstieg: Der Irrtum der Raupe," *Frankfurter Allgemeine Zeitung*, 14 June 2011, 31.

52 Spaemann, *Nach uns die Kernschmelze*, 7.

53 On the necessity of balancing nuclear risk and alternative resources of energy, see Anthony Giddens, *The Politics of Climate Change* (Cambridge: John Wiley & Sons, 2009), 131ff.; Manfred Bürger, Michael Buck, Georg Pohlner, and Jörg Starflinger, "Fukushima—Gefahr gebannt? Lernen aus der Katastrophe," *Aus Politik und Zeitgeschichte* 61, no. 46–47 (2011): 40.

nuclear hazards to encompass risks relating to energy supply, energy pricing and climate change—since all three are integral to the political evaluation of the nuclear phaseout.

The ambivalent relationship between nuclear power and climate protection, discussed by Markus Vogt elsewhere in this issue, is particularly noteworthy.<sup>54</sup> On the one hand, the proportion of global energy produced by nuclear means is too low—just 2 percent—to justify nuclear energy as a contribution to climate protection. On the other hand, the consequences of climate change (widespread desertification, flooding, and famines) are no less dramatic for the environment and society than the risks associated with nuclear energy. In light of Fukushima, increasing the proportion of nuclear energy in the grid is out of the question. At the same time, legislators must also consider how the loss of energy provision caused by a nuclear phaseout might be “compensated” by fossil energy harmful to the climate.

As a benchmark for these considerations of nuclear, climatic, and social risks, parliament has proclaimed the “absolute priority of nuclear safety.”<sup>55</sup> Yet, we should not overlook parliament’s fundamental acceptance of the residual risk of nuclear energy: an “absolute priority of nuclear safety” only makes sense as a benchmark if one assumes the continuation of nuclear energy production and, therefore, the persistence of residual nuclear risk. In this phrase, parliament is not promising nuclear safety per se, but rather merely the “absolute priority” of nuclear safety in their considerations of the climatic, social, and political risks of a nuclear phaseout.. Hence, the suggestive force of the “absolute priority of nuclear safety” is very much in line with the risk society: it allows the residual nuclear risk to “disappear,” semantically and, thus, politically.

These political criticisms, however, must not be confused with the legal question of whether the Thirteenth Amendment to the Atomic Energy Act is constitutional or not. Parliament has not over-stepped its authority by establishing the benchmark of the “absolute priority of nuclear safety,” which reflects its fundamentally negative evaluation of nuclear risks. Here, the government’s political strategy of bringing in two bodies of experts to legally evaluate the consequences of the Fukushima accident is revealed. The Ethics Commission, in its report *Germany’s New Direction in Energy*, used the new evaluation of nuclear risks to justify the government’s accelerated nuclear phaseout. At

54 Markus Vogt, “Lessons learned from Chernobyl and Fukushima: An ethical evaluation,” in this issue; Giddens, *The Politics of Climate Change*, 131ff.

55 Bundestagsdrucksache, no 17/6070, 1.

the same time, the Reactor Safety Commission justified the “absolute priority of nuclear safety” in the context of the extension of nuclear energy production through December 2022 by assessing the “robustness” of German nuclear power plants. It legitimized the conditional continuation of nuclear energy production by casting it as a “bridging technology” in a nuclear phaseout.

Despite this strategic use of expert knowledge and expert commissions, the constitutionality of risk assessment is not in question. It is neither irrational nor contradictory. Because risk assessment, however delayed, remains orientated towards an exit, there is no contradiction in the fundamentally negative re-evaluation of nuclear risks. In the context of their discretionary prerogative, parliament can thus come to the conclusion that the continued use of nuclear power for a ten-year transition period up to 2022 is acceptable. In short, the model of the “delayed acceleration” of the nuclear phaseout is constitutional.

## V. Summary

Germany responded to the reactor disaster in Fukushima by reassessing the risks posed by the domestic production and use of nuclear energy. Parliament decided to accelerate the phaseout of nuclear energy production. But this political change does not mark a move away from nuclear residual risk. The reasons for this go beyond the 143 nuclear power plants throughout Europe that ensure a measure of residual risk for all EU countries, including Germany.<sup>56</sup> Even without these shared European risks, the German model of “delayed acceleration” accepts the residual nuclear risk for a further decade. Though this slow-motion reaction to the Japanese slow-motion catastrophe can be criticized politically, it is nonetheless constitutional.

This long farewell to nuclear power is mainly due to the fact that the Federal Republic of Germany has identified itself politically with nuclear energy for almost fifty years. The dangers of such a close alliance between state and technology were first addressed in the 1960s and 1970s by Ernst Forsthoff.<sup>57</sup> Only if the state does not identify itself with

<sup>56</sup> On European “risk integration,” see Severin Fischer, “Das ‘Modell Deutschland’ und die europäische Energiepolitik,” *Aus Politik und Zeitgeschichte* 61, no. 46–47 (2011): 19, 22.

<sup>57</sup> Ernst Forsthoff, *Der Staat der Industriegesellschaft* (Munich: C. H. Beck, 1971), 42ff.; Jens Kersten, “Die Entwicklung des Konzepts der Daseinsvorsorge im Werk von Ernst Forsthoff,” *Der Staat* 44 (2005): 560ff.

technology can government and legislature be successful in regulating the competing interests of technical development. Yet, as the drafting of the Thirteenth Amendment to the Atomic Energy Act attests, the alliance between state and technology remains strong, reflected in the strategic political management of the evaluation of nuclear risk by expert commissions.

Forsthoff's demand for the separation between the state and technological development applies not just to Germany but to the European Union as well.<sup>58</sup> A distanced relationship between politics and technology is the precondition for a new form of energy policy, the contours of which have been sketched by Frank Uekoetter elsewhere in this issue. For Uekoetter, sustainable energy solutions will require a more supple style of policy-making that treats energy paths as works in progress, amenable to unforeseen events and unexpected side effects.<sup>59</sup> However, such a self-reflective energy policy is only possible if political actors keep their distance from energy producers and resist identifying themselves with any particular form of energy provision. The Thirteenth Amendment to the Atomic Energy Act of 2011 only partially succeeds in enforcing this distance; in its principle of the "absolute priority of nuclear safety," German risk society has tried once again—one final time?—to semantically gloss over the residual nuclear risk. Thus, the Japanese worst-case reality will remain a German worst-case scenario for at least another decade.

58 On the development of European energy policy, cf. Fischer "Das 'Modell Deutschland,'" 15ff.; Severin Fischer, *Auf dem Weg zur gemeinsamen Energiepolitik. Strategien, Instrumente und Politikgestaltung in der Europäischen Union* (Baden-Baden: Nomos, 2011).

59 Uekoetter, *Am Ende der Gewissheiten*, ch. 7.

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