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A Struggle to Remake the Market: Feed-in Rates and Alternative Energy in 1980s West Germany

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Drawing on government documents as well as the papers of renewable energy advocates, this article looks at debates over alternative energy in West Germany during the 1980s. It shows that because West Germany's monopolistic electricity market was dominated by utilities companies reticent to invest in alternatives, struggles over access to the electric grid and the rates independent producers received for their electricity were essential to efforts to add renewables into the German energy mix after the 1986 Chernobyl disaster. The legislated 'feed-in tariff' for electricity generated by individuals from renewable sources, which emerged from these debates in 1990, cemented the idea that individual Germans, not utilities or the state, were responsible for the fate of renewable energy in Germany and paved the way towards an 'economically viable' renewables sector.

In December 1990, while it was preoccupied with reunification, the German Bundestag hurriedly passed an 'underrated' two-page-long piece of legislation: the Energy Feed-in Law.¹ The law required utilities companies to pay a set rate, known as a feed-in tariff, for renewably generated electricity produced at independent facilities. It was a boon for individuals with the resources to erect wind turbines of their own. On account of the Feed-in Law and the '100 MW Wind' investment incentive program enacted that same year by the Ministry of Research, they were all but certain to recoup the money they spent on their turbines – and even earn a profit. Beginning in 2000, a new law, the Renewable Energy Sources Act, expanded the Feed-in Law's provisions, eventually making photovoltaic panels sound investments as well.² Since the implementation of feed-in tariff legislation, Germany's renewable energy generation capacity has increased dramatically. Between 1990 and 2020, Germany's total installed capacity for onshore wind energy generation jumped from a mere 72 Megawatts (MW) to 53,193 MW; since 2004, when a cost-covering feed-in tariff was implemented for solar power, the country's installed capacity of photovoltaics has skyrocketed from 568 MW to 49,047 MW.³ By the mid-2010s, the feed-in tariff model elicited widespread praise from a chorus of journalists and scholars and came to underpin Germany's newfound 'green' reputation.⁴ Anthony Giddens, to name but one

¹ Andreas Berchem, 'Das Unterschätzte Gesetz', *Die Zeit*, 22 Sept. 2006. 'Gesetz über die Einspeisung von Strom aus erneuerbaren Energien in das öffentliche Netz (Stromeinspeisungsgesetz)', *Bundesgesetzblatt*, 1990, Teil I, Nr. 67: 2633–4.

² 'Gesetz für den Vorrang Erneuerbarer Energien (Erneuerbare-Energien-Gesetz – EEG)', *Bundesgesetzblatt*, 2000, pt. I, no. 13: 305–9. It was only with the EEG's 2004 reform that the feed-in tariff for solar panels was made fully 'cost-covering'.

³ Altogether, including other sources like organic fuels, landfill gas, and hydropower, Germany went from an installed capacity of 12,038 MW of renewable energy generation to a capacity of 132,053 MW during this time. Umweltbundesamt, 'Zeitreihen zur Entwicklung der erneuerbaren Energien in Deutschland' (Feb. 2021), 7.

⁴ Frank Uekötter, *The Greenest Nation? A New History of German Environmentalism* (Cambridge, MA: MIT Press, 2014); Germany's green reputation is widely apparent in foreign press coverage, especially in the mid-2010s. See, for example:

prominent advocate, described the feed-in tariff as ‘a model which can and should be copied elsewhere’.⁵ Dozens of countries have made good on this advice by legislating feed-in tariffs of their own, turning the policy into ‘an “export success story” in itself’.⁶

Although the feed-in tariff has come to be perceived as an effective tool in the global effort to reduce carbon emissions, it took shape in 1980s West Germany, a time and place where concerns about the climate crisis were far less widespread than they are today. Rather than carbon emissions, antinuclear sentiment and the utilities companies’ control of the electric grid were the feed-in tariff’s key contexts. While public opposition to nuclear energy provided an impetus to seek alternatives, government officials were unconvinced that renewables would ever account for more than a tiny fraction of Germany’s energy mix.⁷ Moreover, conservative Chancellor Helmut Kohl’s push ‘away from more state, and towards more market’, precluded proposals to legislate renewables’ share of the energy mix, or subsidise renewable electricity generation.⁸ Instead, officials proposed that renewables ought to be integrated into the energy mix only in so far as they could compete with coal and nuclear power plants. Surprisingly enough, renewables advocates adopted the very same rhetoric of economic viability and competition. Not only did they describe their efforts to feed independently produced electricity into the grid in terms of opening up the energy market, but they also claimed that a cost-covering feed-in tariff would drive up demand for wind turbines and photovoltaic panels and thus initiate mass production and bring about lower prices. In the long run, they predicted, renewably generated electricity would be cheaper than electricity produced at coal and nuclear power plants.

Thus, even if the feed-in tariff’s premise – a legislated price for renewably generated energy – appears antithetical to the idea of a free market, its advocates understood it as a means of opening up the energy marketplace. What is more, the logics underpinning it have surprising commonalities with classic market-based climate change mitigation policies. Like emissions trading, for example, feed-in tariffs depend on the idea that ‘environmental benefits can more efficiently be achieved by manipulating the price system . . . than, for instance, by insisting on particular technological standards’.⁹ That is to say, if emissions trading works by creating a price framework that will cause the cost of carbon emissions to rise and thus incentivises firms to find alternatives, the feed-in tariff works by manipulating prices so that it is in individuals’ interest to invest in wind turbines or photovoltaic panels. Both schemes, then, can be seen as the sorts of climate ‘solutions’ that writers like Naomi Klein declaim as tantamount to ‘bribing and cajoling’, or simply ‘gambling’ rather than ‘ordering companies to stop putting our futures at risk’.¹⁰ Particularly when juxtaposed with sweeping proposals to ‘remunicipalise and democratise’ the energy system that were debated alongside it in parliament during the 1980s, Germany’s feed-in tariff could hardly have seemed to be part of a

Thomas Friedman, ‘Germany, the Green Superpower’, *The New York Times* (6 May 2015); it is also a common theme in American university courses in German studies. See, for example: Charlotte Melin, ‘Climate Change: A “Green” Approach to Teaching Contemporary Germany’, *Die Unterrichtspraxis/Teaching German* 46, 2 (Fall 2013), 185–99.

⁵ Anthony Giddens, *The Politics of Climate Change*, 2nd Edition (Cambridge: Polity Press, 2011), 91.

⁶ Anna Pegels and Wilfried Lütkenhorst, ‘Is Germany’s Energy Transition a Case of Successful Green Industrial Policy? Contrasting Wind and Solar PV’, *Energy Policy* 74 (2014), 524.

⁷ Bundesministerium für Forschung und Technologie, ‘Erneuerbare Energien’ (1986): 1. Bundesarchiv (hereafter BAArch) B 136/24408.

⁸ Kohl quoted in Konrad Jarusch, ‘Zwischen “Reformstau” und “Sozialabbau”. Anmerkungen zur Globalisierungsdebatte in Deutschland, 1973–2003’, in Konrad Jarusch, ed., *Das Ende der Zuversicht. Die siebziger Jahre als Geschichte* (Göttingen: Vandenhoeck & Ruprecht, 2008), 335. Even if Kohl’s program was far milder and less ideologically-driven than the neoliberal transformations initiated by Ronald Reagan in the United States or Margaret Thatcher in the United Kingdom, his policies did follow the same general course of ‘curtail[ing] government expenditure . . . while increasing economic competitiveness through deregulation, a more flexible labor market, tax incentives, and privatization’. Ian Kershaw, *The Global Age: Europe 1950–2017* (New York: Viking, 2018), 289–90. For comparisons of Kohl’s policies with those of Thatcher or Reagan, see also: Philipp Ther, *Die neue Ordnung auf dem alten Kontinent. Eine Geschichte des neoliberalen Europa*, updated edition (Berlin: Suhrkamp, 2016), 47–9; Andreas Rödder, *21.0. Eine kurze Geschichte der Gegenwart* (Munich: Beck, 2015), 48–9.

⁹ Donald MacKenzie, *Material Markets: How Markets are Constructed* (Oxford: Oxford University Press, 2009), 140.

¹⁰ Naomi Klein, *This Changes Everything: Capitalism vs. the Climate* (New York: Simon & Schuster, 2014), 225.

plan to – as Klein puts it – ‘[rise] to the climate challenge’ by ‘rebuilding and reinventing the very idea of the collective, the communal, the commons, the civil, and the civic’.¹¹

Analysing the struggles over renewably generated electricity’s place in the West German energy system, this article explains how and why a system buttressed by arguments about market competition and dependent on convincing individuals to act shaped Germany’s approach to renewable energy. It begins by describing how the monopolistic electricity market that had developed in West Germany during the postwar decades – and the longstanding battles over independent producers’ access to that market – became the seminal context for the exploitation of renewable energy. It turns next to a set of interlinked debates about the place of hydro, wind and solar power in the German energy mix that took place in and around government ministries and the halls of parliament, reaching a head in the years after the 1986 Chernobyl meltdown. These discussions, which developed among a diverse cast comprising not only government bureaucrats, utilities executives and pioneering advocates of wind and solar energy, but also activist MPs and tenacious owner-operators of small hydropower plants, featured both broad areas of agreement and surprising cleavages. The article shows that the idea of a legislated feed-in tariff emerged from the debates of the 1980s as a sort of compromise, a policy that was – on account of conflicting economic calculations – limited enough to mollify its detractors and full enough of potential to excite its proponents. Once the concept was enshrined in the Energy Feed-in Law of 1990, cajoling individuals to act in their own interest – rather than forcing utilities executives to change how their firms produced electricity – became the locus of Germany’s successful and widely lauded effort to increase its capacity for renewable energy generation.

‘Closed Supply Territories’ and ‘Barriers to Entry’

‘The history of the energy sector’, argued the Green MP Willi Tatge in a 1986 Bundestag debate, ‘is a history of private dirigisme practiced by the big utilities, which have been successful up until the present in their efforts to use the state in support of their strivings for expansion and profits’.¹² Tatge’s phrasing was tailored to the polemical style of parliamentary debate, but his comments were nonetheless true to the facts. West Germany’s large utilities did play the leading role in determining how electricity was produced, bought and sold, and in so doing, they benefitted greatly from their relationship to the state. Most utilities were at least partially owned by state or municipal governments, but they were typically managed as publicly traded companies, and only ‘loosely coupled to responsible government agencies’ through the individual government officials who sat on the utilities boards and exercised ‘oversight functions’.¹³ As such, the utilities enjoyed the government’s imprimatur, but were able to ‘function largely independently and on the basis of entrepreneurial criteria’.¹⁴ In accordance with legislation that privileged economies of scale and exempted the energy sector from anti-trust regulations, the utilities had spent the postwar decades dividing the country into exclusive territories within each of which a single company operated the electric grid and made all sales to retail customers. One consequence of this situation was the exclusion of ‘independent or foreign producers or distributors’, who ‘could not enter’ the West German electricity market.¹⁵ Even if independent producers’ struggles to access the electric grid were hardly headline news, they constituted a ‘smouldering’

¹¹ Ibid., 460.

¹² Deutscher Bundestag, Plenarprotokoll 10/222 (19 June 1986), 17225.

¹³ Rainer Eising, *Liberalisierung und Europäisierung. Die regulative Reform der Elektrizitätsversorgung in Großbritannien, der Europäischen Gemeinschaft und der Bundesrepublik Deutschland* (Opladen: Leske + Budrich, 2000), 101.

¹⁴ Gerold Ambrosius, *Der Staat als Unternehmer. Öffentliche Wirtschaft und Kapitalismus seit dem 19. Jahrhundert* (Göttingen, 1984), 136; Monopolkommission, *Mehr Wettbewerb ist möglich* (Baden-Baden, 1976), 399. Both quoted in Eising, *Liberalisierung*, 102.

¹⁵ Jens-Peter Schneider, *Liberalisierung der Stromwirtschaft durch regulative Marktorganisation. Eine vergleichende Untersuchung zur Reform des britischen, US-amerikanischen, europäischen und deutschen Energierechts* (Baden-Baden: Nomos, 1999), 80. On the idea that the electricity sector did not constitute a market in the first place, see, for example, Hans-Josef Fell, *Globale Abkühlung. Strategien gegen die Klimaschutzblockade – ökologisch, wirtschaftlich, erfolgreich* (Berlin: Beuth, 2103), 118.

problem throughout the postwar decades – one that eventually forced open more fundamental questions about how electricity was produced, bought and sold in West Germany.¹⁶

The key to the utilities' dominance of the electricity market – and small producers' inability to access it – was the legal framework. In the name of 'reliable and reasonably priced energy', the Energy Economy Law (*Energiewirtschaftsgesetz*), which had been enacted by the National Socialist regime in 1935 and integrated fully intact into the West German legal code after the Second World War, allowed utilities companies to control the electric grid, and thus also to regulate grid access.¹⁷ Because it was considered impractical to develop parallel transmission lines, the grid was seen as a 'natural monopoly', and the utilities – which operated it themselves on the basis of exclusive licences from municipal governments – were granted exemptions from the FRG's extensive 1957 anti-trust law.¹⁸ On this basis, they signed non-competition agreements with one another and rendered West Germany into a patchwork of 'closed supply territories'.¹⁹

Even otherwise powerful interests stumbled in their efforts to access the electric grid. In the 1950s, coalmining companies demanded the right to produce electricity themselves and sell it to the utilities. Rebuffed by Germany's largest utility, the Rheinisch-Westfälisches Elektrizitätswerk (RWE), which did not want to buy their electricity, Ruhr coal producers declaimed the 1935 Energy Economy Law as 'an instrument . . . for the promotion of existing utilities companies' rather than 'the promotion of energy economy'.²⁰ Despite their complaints, the coal producers had little hope of feeding electricity into the grid. Advocates of grid access were opposed by 'municipalities, the utilities, and the civil service', all of whom sought to maintain a status quo that served their interests.²¹ Grid access did receive lukewarm support from the federal government, but this was premised on the idea that the utilities and independent producers should reach agreements about rates and conditions privately – an unrealistic outlook that did not take the utilities' dominance of the electricity sector into account.²²

In the 1970s, however, the extent to which the travails of independent producers reflected issues inherent to West Germany's monopolistic electricity market became increasingly apparent. The newly formed Monopoly Commission published an extensive report on 'Concentration in the Energy Economy' in 1975.²³ It proposed a handful of piecemeal reforms intended to promote competition among the utilities 'in spite of the [sector's] technical and economic particularities'.²⁴ The

¹⁶ Alexander Faridi, 'Der regulierende Eingriff des Energiewirtschaftsgesetzes in den Wettbewerb zwischen öffentlicher und industrieller Stromerzeugung in den 30er Jahren', *Zeitschrift für Unternehmensgeschichte* 49, 2 (2004), 191.

¹⁷ Eising, *Liberalisierung*, 73.

¹⁸ As Canay Özden-Schilling puts it, 'that the electricity industry was an archetypal natural monopoly was received wisdom in economics' by the early 1980s. Özden-Schilling, *The Current Economy: Electricity Markets and Techno-Economics* (Stanford: Stanford University Press, 2021), 2.

¹⁹ Christian Theobald, 'Grundlagen des deutschen Rechts der Energiewirtschaft', in Jens-Peter Schneider and Christian Theobald, eds., *Handbuch zum Recht der Energiewirtschaft. Die Grundsätze der neuen Rechtslage* (Munich: C.H. Beck, 2003), 18; Peter Becker, *Aufstieg und Krise der deutschen Stromkonzerne* (Bochum: Ponte Press, 2010), 45. Nonetheless, the government did use the Anti-Trust Law in order to set out rules about consumer electricity prices, a device intended to protect consumers by preventing electricity distributors from being overcharged by the operators of power plants. Ursula Berkner, Hans Peter Herrmann and Erich Schmitz, 'Die neue Bundestarifordnung Elektrizität (BTO Elt)' (Verlags- und Wirtschaftsgesellschaft der Elektrizitätswerke m.b.H.: 1990), 13.

²⁰ Faridi, 'Der regulierende Eingriff', 192.

²¹ Eising, *Liberalisierung*, 119.

²² Federal Ministry of Economics, 'Stromversorgung der Deutschen Wirtschaft'. Bundestag Drucksache V/3668 (14 Mar. 1969), 11. See also: Eising, *Liberalisierung*, 119.

²³ Bundeskanzler Willy Brandt, 'Erklärung der Bundesregierung vom 28. Oktober 1969', in Deutscher Bundestag, Plenarprotokoll 6/5 (28 Oct. 1969), 23.

²⁴ The proposed reforms included changes to the system of concession agreements and non-competition agreements, new authority for anti-trust regulators to review such agreements, and the implementation of a right for third-party producers to transmit electricity through the grid. Still, the commission saw these as piecemeal reforms, and determined it could offer no 'generalizable principles' that would bring more competition to the electricity market. Monopolkommission, *Mehr Wettbewerb ist möglich!* (Baden-Baden: Nomos, 1976), 415–16. Three years later, the state of Lower Saxony presented its own case for more competition between the utilities with the support of a position paper by legal scholar Volker Emmerich, which offered similar conclusions. Volker Emmerich, *Ist der kartellrechtliche Ausnahmehereich für die*

Cartel Office also became more active in regulating grid access in the late 1970s. Its investigations of RWE revealed exorbitant grid connection fees, higher retail rates for industrialists who possessed cogeneration facilities, and extremely low payments for electricity produced by cogeneration. The Cartel Office reprimanded the utility, which it said was ‘entrusted with duties of public supply and equipped with a contractually secured territory’, and thus had ‘higher responsibilities for diligence’.²⁵

After airing its grievances, the Cartel Office dropped its formal complaint against RWE in exchange for assurances that the utility would change its practices. To this end, the Cartel Office brokered negotiations between utilities and industrialists over cogeneration and grid access starting in 1977.²⁶ Nearly two years later, the Association of German Utilities Companies (VDEW) reached a deal on industrial cogeneration with the Federation of German Industry (BDI), as well as the Association for the Industrial Energy Economy (VIK), which jointly represented industrialists. Known as the ‘Associations Agreement’, the 1979 deal compelled the utilities to buy electricity produced by cogeneration at set prices, which were based on the utilities’ saved fuel costs.²⁷ The 1980 reform of the Anti-Trust Law codified some aspects of the Associations Agreement, making it illegal for utilities to ‘unreasonably prevent the utilization of electricity produced in independent facilities’.²⁸ Not only did the law limit the utilities’ longstanding prerogative to determine who could access the electric grid, but it also stopped short of singling out cogeneration for special treatment, effectively cracking open the door to the FRG’s monopolistic electricity market for independent producers of all sorts. Owners of small hydropower plants, Germany’s largest remaining group of independent producers, sought to exploit this new opening.

Meltdown, Feed-In

Despite hydropower plant operators’ proud self-conception of their waterworks as ‘legitimate small businesses’ (*mittelständische Unternehmen*) and the hundred-year history of their trade, the low prices the utilities paid them for their electricity had pushed independent hydropower producers into dire straits by the 1980s.²⁹ Federal law left them, like all other independent electricity producers, at the mercy of the utilities, who could decide whether or not to allow a grid connection in the first place, and then dictate the rates they would pay for their electricity. Thus, in Baden-Württemberg, a state that was endowed with a hilly and riverine geography and had once been home to several thousand waterworks, only 643 privately operated plants fed electricity into the grid in 1985. In recent years, one operator complained, more and more of his colleagues ‘had switched their turbines off on account of unmet expenses’.³⁰ Even in neighbouring Bavaria, the only West German state that required utilities to pay a set price for electricity produced at

Leitungsgebundene Versorgungswirtschaft wettbewerbspolitisch gerechtfertigt? (Hannover: Niedersächsischen Minister für Wirtschaft und Verkehr, 1978). See also: Hans Stumpf, ‘Mehr staatliche Lenkung der Energieversorgungsunternehmen?’, *Zeitschrift für öffentliche und gemeinwirtschaftliche Unternehmen* 2, 3 (1979): 277–99.

²⁵ ‘Bericht des Bundeskartellamtes über seine Tätigkeit im Jahre 1977 sowie über Lage und Entwicklung auf seinem Aufgabengebiet (§ 50 GWB)’, Bundestag Drucksache 8/1925, 86–7; ‘Bericht des Bundeskartellamtes über seine Tätigkeit im Jahre 1978 sowie über Lage und Entwicklung auf seinem Aufgabengebiet (§ 50 GWB)’, Bundestag Drucksache 8/2980, 97–8. State oversight of the price utilities paid for electricity was only applicable in cases where an independent producer supplied more than 500 MW of electricity. Becker, *Aufstieg und Krise*, 136.

²⁶ Peter Salje, *EEG 2014. Gesetz für den Aufbau erneuerbarer Energien* 7. Auflage (Cologne: Carl Heymanns Verlag, 2015), 144.

²⁷ ‘Grundsätze über die Intensivierung der Stromwirtschaftlichen Zusammenarbeit zwischen öffentlicher Elektrizitätsversorgung und industrieller Kraftwirtschaft’, *VIK-Mitteilungen*, 4 (1979), 71–3. Because the fixed costs of electricity production comprised such a significant share of the price charged to consumers, the prices offered by the Associations Agreement for electricity fed into the grid by cogeneration plants were well below retail rates charged by the utilities to their customers.

²⁸ Salje, *EEG 2014*, 145.

²⁹ Manfred Lüttke to Bundesminister Martin Bangemann, 14 May 1986. BArch B 102/364813. Already in the late nineteenth century rural waterworks had electrified small villages while nearby urban centres lacked reliable access to electricity. Anton Zeller, ‘Streiflichter aus 100 Jahre Entwicklung der Wasserkraftnutzung in Bayern’, reprinted in Stephan Heimerl, *Wasserkraftprojekte. Beiträge aus der Fachzeitschrift WasserWirtschaft* (Wiesbaden: Springer, 2013), 1–10.

³⁰ Dieter Frauenheim, ‘Wachsendes Interesse an kleinen Wasserkraftwerken’, *Badische Neueste Nachrichten* 10 Feb. 1985. BArch B 102/364813.

independent hydropower plants, thousands of small plants were squeezed out of existence by low profit margins and an inability to afford necessary maintenance and repairs, let alone modernisation of aging facilities.³¹ By 1988, then, the approximately 3,500 independently-owned hydropower plants that still fed electricity into the West German grid accounted for a mere 0.2 per cent of the country's annual electricity production.³² Rather than a legitimate business interest or a meaningful contribution to the German electricity supply, the utilities tended to perceive independent hydropower plant operators as a nuisance. And yet, in the late 1980s, their advocacy shaped the framework in which renewable energy was understood and discussed in West Germany.

Regardless of their plants' small share of Germany's energy mix and the utilities' low opinion of them, hydropower plant operators proved their mettle as well-organised businessmen. In the postwar era, independent hydropower operators organised themselves as the Federal Association of German Waterworks (*Bundesverband Deutsche Wasserkraftwerke*; BDW). The group's leadership included MPs and politically engaged businessmen. After the 1979 Associations Agreement and the 1980 Anti-Trust Law reform provided new frameworks for the treatment of independent producers, the BDW began demanding better conditions from the utilities and calling on government officials to support their efforts. In January 1986 Manfred Lüttke, the chairman of the Baden-Württemberg's Waterworks Association, began a lengthy correspondence with Minister of Economics Martin Bangemann, in which Lüttke informed Bangemann of the waterworks' owners struggles and urged him to intervene.³³ The Chernobyl disaster and its political consequences strengthened Lüttke's hand. In a letter sent to Bangemann just after the meltdown, Lüttke noted the 'fresh demands for expansion of renewable energy production' that had been raised by 'the radioactive fallout catastrophe at Chernobyl' and informed his correspondent that such demands 'could only be met when legitimate small businesses are paid fair rates for their contributions'.³⁴

By referencing fallout from Chernobyl, Lüttke linked hydropower with a disaster that had infringed on Germans' daily lives by prompting officials to close playgrounds and ban the consumption of certain agricultural products.³⁵ While antinuclear sentiment had been strong in West Germany since the mid-1970s, Chernobyl 'rekindled a sense of urgency'.³⁶ In the Bundestag, Chancellor Helmut Kohl's government had to contend with the opposition's efforts to capitalise on widespread antipathy to nuclear energy. The Social Democratic Party of Germany (SPD) finally hardened its antinuclear stance, advocating a phase-out within ten years.³⁷ The fiercely antinuclear Green Party went further,

³¹ Markus Engelsberger, 'Die Entwicklung der rechtlichen Rahmenbedingungen Erneuerbarer Energien in Europa', speech given in Sillian, Austria (21 Sept. 2007). According to the Association of Hydropower Plants in Bavaria, some 7,500 of the 11,114 hydropower plants that had been operating in the state in 1926 were no longer in operation by 1980 (these figures include small plants that had never been connected to the public grid). Anton Zeller, 'Der Kampf um gerechte Strompreise. Wasserkraftnutzung und Strompreise sind eng miteinander verbunden', in Vereinigung Wasserkraftwerke in Bayern, *Wasserkraft in Bayern* (2004), 9. Prices in Bavaria were set by a 1952 law. Jackel, 'Einspeisevergütung und Auslaufen der Konzessionsverträge – eine kritische Studie zu neueren Rechtsentwicklungen', in Jürgen F. Baur, ed., *Deregulierung und Regulierung durch nationales und europäisches Kartellrecht* (Baden-Baden: Nomos, 1994), 34.

³² Riemer (III B 2), 'Vermerk: Betr. Nutzung und Ausbaumöglichkeiten der Wasserkraft', 19 Apr. 1988. BAArch B 102/364818; and Joachim Grawe, 'VDEW-Umfrage 1989: Regenerative Energien kommen voran' (speech, given 28 Aug. 1989). BAArch B 102/364820.

³³ Lüttke's correspondence was so prolific that the ministry eventually created an overview of it. 'Einspeisung von Strom aus kleinen Wasserkraftwerken' (undated, likely 30 June 1987). BAArch B 102/364816.

³⁴ Manfred Lüttke to Bundesminister Martin Bangemann, 14 May 1986. BAArch B 102/364813.

³⁵ Melanie Arndt, *Tschernobyl. Auswirkungen des Reaktorunfalls auf die Bundesrepublik Deutschland und die DDR* (Erfurt: Landeszentrale für politische Bildung Thüringen, 2011), 66–8.

³⁶ Dolores Augustine, *Taking on Technocracy: Nuclear Power in Germany, 1945 to the Present* (New York: Berghahn, 2018), 162. A growing literature describes West German opposition to nuclear power in the 1970s. In addition to Augustine see, for example: Andrew Tompkins, *Better Active than Radioactive: Anti-Nuclear Protest in 1970s France and West Germany* (Oxford: Oxford University Press, 2016); and Stephen Milder, *Greening Democracy: The Anti-Nuclear Movement and Political Environmentalism in West Germany and Beyond, 1968–1983* (Cambridge: Cambridge University Press, 2017).

³⁷ The SPD adopted this position at its August 1986 Party Congress in Nuremberg. Joachim Radkau and Lothar Hahn, *Aufstieg und Fall der deutschen Atomwirtschaft* (Munich: Oekom, 2013), 349.

calling yet again for the immediate decommissioning of all German reactors.³⁸ Despite the public outcry and the opposition's bold demands, the government remained steadfast in its support for nuclear energy, presenting its post-Chernobyl energy policy as a series of measured steps that were consistent with pre-existing commitments.³⁹ Still, even government officials had come to the realisation that voicing support for additional safe, clean energy sources was now prudent.

Hence, in the wake of the Chernobyl meltdown, the Ministry of Economics, which oversaw the energy sector, gladly adopted Lüttke's position, pushing the utilities to improve the conditions under which independent hydropower plants fed their electricity into the grid. 'Precisely in the last few weeks', Dr. Hans Schill, an Assistant Secretary at the ministry, noted in a May 1986 letter to the Association of German Utilities Companies (VDEW), 'the question about the use of alternative energy sources – including, in particular, the potential for hydropower use – which we have always known about, has moved into the foreground of discussions of energy politics'. Thus, Schill argued, a 'good solution' to the challenge of better integrating hydropower into the energy mix would not only be 'sensible energy politics', it would also be a means to 'show that the utilities and the federal government recognize these problems and will not fail to exploit potential alternative sources of energy to an economically reasonable degree'. Since there was – politically speaking – so much to gain by supporting independent hydropower operators, Schill concluded, 'we should take these steps together, even though we know that we are only talking about a limited potential'.⁴⁰

By the end of the summer, the VDEW had agreed to move forward along the lines Schill proposed. At an August meeting between government officials and utilities executives, the VDEW pledged to draft a new framework for independent electricity production that would amount to an average 30 per cent increase in the rates independent electricity producers received from the utilities.⁴¹ The ministry seized on the utilities' offer in order to paint an optimistic picture of the FRG's growing commitment to renewable energies and efficient electricity production. A press release issued immediately after the meeting described the utilities' pledge to 'improve the feed-in tariff by an average of 30 per cent', and to offer better technical solutions for the connection of wind turbines to the grid as 'the result of intensive discussions with the Federal Ministry of Economics and among the utilities'.⁴² Media reports followed the press release's self-celebratory thrust. One newspaper article bore the sub-heading, 'utilities companies accede to Bangemann's demands'.⁴³ The following month, in its 1986 Energy Report, the ministry once again lavished itself with praise for having prompted the utilities' steps towards 'favorable frameworks and, in particular, fair compensation for independent electricity generators'.⁴⁴

Though the ministry wasted no opportunity to note its contributions to the utilities' proposed rate increase, it downplayed the potential for outright intervention, maintaining that there was 'no need for legislative measures at present'. Instead, 'private agreements' remained preferable on account of their 'flexibility'.⁴⁵ The ministry's assessment was not just the product of optimism that the rate increase would satisfy independent energy producers, nor was it solely a function of the government's program of 'less state, more market'. It was also a product of officials' deep-seated belief that industrial cogeneration and renewable energies only really had the potential to supplement the existing energy mix –

³⁸ Arndt, *Tschernobyl*, 69.

³⁹ Katrin Jordan, *Ausgestrahlt. Die mediale Debatte um 'Tschernobyl' in der Bundesrepublik Deutschland und Frankreich, 1986/87* (Göttingen: Wallstein Verlag, 2018), 72; Radkau and Hahn, *Aufstieg und Fall*, 349.

⁴⁰ Hans Schill to Heinz Lichtenberg, 26 May 1986. BAArch B 102/364813.

⁴¹ 'Ergebnisvermerk. Gespräch der Minister Dr. Bangemann und Dr. Wallmann mit Vertretern der Elektrizitätswirtschaft am 20.8.1986 im BMWi', 2 Sept. 1986. BAArch, B 102/364813.

⁴² 'Presseerklärung', 20 Aug. 1986. BAArch B 102/364813.

⁴³ 'Mehr Überschussstrom aus den erneuerbaren Quellen'. *Die Welt*, 21 Aug. 1986. BAArch B 102/364813.

⁴⁴ 'Energiebericht der Bundesregierung', Bundestag Drucksache 10/6073, 26–7. See also: Martin Cronenberg, 'Energierechtsreform – Stand der Überlegungen aus der Sicht der Bundesregierung', in Jürgen F. Baur, ed., *Reform des Energiewirtschaftsgesetzes. Eine Analyse der Änderungsvorschläge* (Baden-Baden: Nomos, 1991), 61.

⁴⁵ 'Energiebericht der Bundesregierung', 26.

not to replace the nuclear and coal-fired power plants on which West Germany depended for the lion's share of its electricity.

Government officials' hesitant support for alternative energies was most evident in their reaction to other proposals to reform the energy sector – ones intended to go far beyond the 'limited potential' they ascribed to rate increases for independent producers. The Green Party, which had entered the Bundestag in 1983, supplied a steady stream of radical proposals to reshape the energy economy in the mid-1980s. Even before the Chernobyl meltdown, the Greens had submitted a 'Bill on Support for Wind Energy' as well as a sweeping bill on the 'Remunicipalisation and Democratisation of Electricity Provision' that they positioned as a replacement of the 1935 Energy Economy Law.⁴⁶ In a November 1985 parliamentary debate, Minister Bangemann denounced the former proposal, which would have eased permitting while requiring utilities companies to connect wind turbines to the grid and pay 70 per cent of the retail rate for the electricity they produced, as an example of 'state dirigisme' operating 'outside the market economy'. Except for the fact that it used legislative authority to set the feed-in rate (and mandated a higher rate), the proposal hardly went beyond Bangemann's ministry's efforts to promote independent electricity production via a negotiated agreement.⁴⁷ Bangemann's exaggerated reaction revealed the extent to which he hoped to detach the promotion of renewable energy from any sort of government-mandated shift in the energy sector. It also highlighted his consistent, if circular, argument that the key to promoting renewables without disrupting the electricity market was forcing renewable energies to prove themselves by becoming 'economically viable' before they gained access to the market.

The Green Party's Remunicipalisation and Democratisation bill, which was far more radical than its Wind Power bill, represented precisely the sort of legislative approach that the Ministry of Economics conceived as antithetical to a free market economy. This bill, which the Greens had commissioned researchers at the Freiburg Eco-Institute (*Öko-Institut*) to write, called for a fundamental reorganisation of the energy economy.⁴⁸ It was intended to bring about a switch from the 'principle of salesmanship' to the 'principle of need' by giving municipalities more control over energy provision, promoting electricity cooperatives, taking control of the electric grid away from the utilities, and integrating citizens into energy planning at the local level. Market principles were nowhere to be found in the painstakingly researched proposal.⁴⁹ Even in the wake of Chernobyl, the Bundestag's Committee on Economics, which was charged with evaluating the bill, declined to recommend it favourably to the parliament. The 'large majority' that opposed the bill reasoned that 'even at the municipal level, economic viability for energy consumers must remain the decisive criterion for entrepreneurial decisions'.⁵⁰

That the Greens' proposals made little headway was no surprise. They sat in the opposition, and their twenty-seven-member delegation comprised a mere 5 per cent of the parliament. And yet, regardless of the Greens' inability to pass legislation, their radical proposals to move the energy system away from market principles and economies of scale and towards democratic control at the local level made a marginal feed-in rate increase seem more reasonable. After the 1987 election, when the Greens

⁴⁶ Gesetzentwurf der Fraktion DIE GRÜNEN, 'Entwurf eines Gesetzes zur Förderung der Windenergie', Bundestag Drucksache 10/2255 (6 Nov. 1984); Antrag der Fraktion DIE GRÜNEN, 'Rekommunalisierung und Demokratisierung der Energieversorgung (Neuordnung der Energiewirtschaft und Novellierung des Energierechts)', Bundestag Drucksache 10/5010 (5 Feb. 1986).

⁴⁷ Deutscher Bundestag, Plenarprotokoll 10/171 (7 Nov. 1985), 12768.

⁴⁸ 'Energiesstrukturgesetz (Rekommunalisierungsgesetz)' (draft), Sept. 1985. Archiv Grünes Gedächtnis (hereafter AGG) B.II.1/6239. The draft clearly drew heavily on the Öko-Institut's 1985 publication *Die Energiewende ist möglich*, which emphasised the role of municipalities in transforming Germany's energy sector. Peter Hennicke, Jeffrey P. Johnson, Stephan Kohler and Dieter Seifried, *Die Energiewende ist möglich. Für eine neue Energiepolitik der Kommunen* (Frankfurt am Main: S. Fischer Verlag, 1985).

⁴⁹ DIE GRÜNEN, 'Rekommunalisierung und Demokratisierung'.

⁵⁰ 'Beschlussempfehlung und Bericht des Ausschusses für Wirtschaft (9. Ausschuss) zu dem Antrag der Fraktion DIE GRÜNEN, Bundestag Drucksache 10/5010'. Bundestag Drucksache 10/6777 (5 Dec. 1986). The committee on environment, meanwhile, did not even discuss the bill after its sponsor failed to appear at a hearing.

won fifteen additional seats in parliament, the government committed itself to securing just such an increase. In their new coalition agreement, the conservative Christian Democrats and the liberal Free Democrats pledged to review the 1935 Energy Economy Law as part of their effort to improve the 'ecological aspects of energy policy'. In contrast to the laundry list of reforms advocated by the Greens, the coalition agreement contained precisely one reason that this fifty-two-year-old law, enacted by the National Socialist regime, ought to be reviewed: 'Improvement of the conditions for feeding privately produced electricity into the grid'.⁵¹ Improved conditions for small-scale, independent energy production had become the central pillar of the government's renewable energy policy.

But hydropower plant operators remained unconvinced that a negotiated agreement with the VDEW would do much to improve their situation. They demanded more. Matthias Engelsberger, who owned a small hydropower plant in the Bavarian village of Siegsdorf, served as the BDW's president, and sat in parliament as a member of the arch-conservative sister-party of Chancellor Kohl's CDU, the Christian Social Union (CSU), played a key role in hydropower operators' ongoing advocacy. The utilities' 'two-fisted' negotiator, he later recalled, refused to consider an increase of the rate by 'even a tenth of a Pfennig'. Since the VDEW informed the Ministry of Economics in no uncertain terms that it had 'only developed its latest offer, in order to do a favour for Minister Bangemann and the political class', officials knew a further breakthrough in the negotiations was unlikely.⁵² Engelsberger came to the same conclusion. 'We [knew we] would not get any further here', he later recalled, 'a political solution was necessary'.⁵³ Though Engelsberger sought a 'political solution' for the problem of unmet expenses and lack of profits plaguing independent businessmen like himself, the Greens' advocacy, and the circumstances surrounding the Chernobyl meltdown, had knit the impasse between hydropower operators and the VDEW into a set of wider debates about alternative energy production. Setting feed-in rates for independently-produced electricity had become the focal point of discussions about alternative energy.

Embracing Economic Viability

With both sides agreed that promoting alternatives to nuclear energy would be beneficial, the debate over grid access came to turn increasingly on economic arguments. Officials claimed to see little growth potential for hydropower and considered the costs of wind and solar power far too prohibitive for those energy sources to become 'economically viable' anytime soon.⁵⁴ They suggested that renewables would never be more than a niche industry in Germany, and spoke of renewables' research as a project intended to 'alleviate economic and social problems in the third world'.⁵⁵ Renewables advocates, on the other hand, began to use economic calculations to support their own arguments that renewables could soon play an important role in the domestic energy mix. Struggling to stay in business, hydropower plant operators were already focused on the economics of electricity production. Soon, wind and solar advocates had adopted an economic outlook, too, by using the laws of supply and demand to describe how higher feed-in rates would open opportunities for economic growth. Thus, competing perceptions of the 'economic viability' of independent energy production came to frame the debate about renewable energy in West Germany at the end of the 1980s.

The negotiations of the late 1980s rallied advocates of hydropower, wind and solar around market principles despite dramatically different initial ideas about their particular needs and interests. The gulf between wind and solar advocates on the one hand, and hydropower plant operators on the other, was especially significant. Many of the era's wind pioneers had cut their teeth in the 1970s anti-nuclear movement; their engagement in protests against nuclear energy generation had eventually led

⁵¹ 'Die Koalitionsvereinbarungen', *CDU-Dokumentation* 9/1987, 24.

⁵² Schill to Engelmann, 10 Apr. 1987. BArch B 102/364815.

⁵³ Matthias Engelsberger quoted in Anton Zeller, 'Der Kampf um gerechte Strompreise', in *Wasserkraft in Bayern*, 12.

⁵⁴ See, for example: Dr. Kemper, 'Ergebnisvermerk', 2 Sept. 1986. BArch B 102/364813.

⁵⁵ Gutermuth (III D 4), 'Erneuerbare Energie (e. E.). Situation in der BRD', 12 Dec. 1989. BArch B 102/364821. See, also, for example: Deutscher Bundestag, Plenarprotokoll 10/171 (7 Nov. 1985), 12786.

them to go beyond turning nuclear energy down by promoting alternative energy futures.⁵⁶ In contrast to hydropower operators, then, who were concerned first and foremost with preserving family businesses, wind power advocates were out to change the system. One of the best-organised wind advocacy groups, the Interest Association for Inland Wind Power (*Interessenverband zur Förderung der Windenergienutzung Windkraft Binnenland*; IWB), promoted an eight-point plan to transform the energy sector. Ranging from public control of the grid to the repeal of the 1935 Energy Economy Law and the ‘implementation of a market economy for electricity’, IWB’s demands for reform linked concerns about the ‘enormous damages’ caused by the current organisation of the energy sector with a belief that renewable energies would outperform coal and nuclear energy on an open market, leading to ‘cheaper electricity and the saving of incalculable future costs for society as a whole’.⁵⁷

Matthias Engelsberger, the waterworks owner, conservative MP and BDW president, made the palpable initial tensions separating hydropower plant operators from wind advocates clear. In a 1985 parliamentary debate of Green Party initiatives to phase-out nuclear energy and bolster wind power, he declaimed against advocates of wind and solar power:

He who still believes we can dare to phase-out nuclear energy in favor of renewable energy sources – of which, I might add, only hydropower possesses economic significance, whereas solar energy, wind energy and energy from biomass are insignificant – and he who wants to convince others that the low efficiency of renewables has to do with lacking R&D efforts is either a dreamer when it comes to energy politics, or an incorrigible ignoramus.⁵⁸

Though Engelsberger could conceive of a common category of ‘renewable energy sources’, he found little common ground among the dreamers who advocated wind and solar on the one hand, and the sober-minded businessmen who earned their livelihoods operating hydropower plants on the other.

Despite such open animosity and seemingly discordant goals, hydropower plant operators and advocates of wind and solar power found themselves in a similar position. All were confronted by the monopolistic electricity system and the utilities’ unwillingness to treat them as legitimate electricity producers, let alone to pay them rates that would allow them to recoup their investments in turbines or photovoltaics. The Ministry of Economics’ celebration of the utilities’ August 1986 pledge to increase feed-in rates by 30 per cent caught the attention of wind power advocates, causing them to describe themselves as businessmen, too. Dietrich Koch, a teacher who had erected a grid-connected wind turbine outside his home in the town of Mettingen already in 1982 and chaired the IWB from its founding in 1985 until 1991, acted quickly after hearing of the utilities’ 30 per cent pledge.⁵⁹ In an October 1986 letter to his local utility, RWE, Koch bemoaned the incredibly ‘low price’ he received for the electricity his wind turbine generated. He demanded that the ‘[30 per cent] price increase’ be applied to his account as the first step towards ‘a new price arrangement’ that would allow wind energy ‘a chance at economic viability’.⁶⁰ At the same time, he began writing to the Ministry of Economics, demanding that government officials intervene in the dispute on his behalf.⁶¹

Minister Bangemann responded to Koch’s advocacy with his typical juxtaposition of bold commitments to ‘all sensible measures for the further development of the energy system . . . including, of course, all measures to exploit the potential of renewable energy’, and resigned assessments of renewable energy’s ‘unfortunately very limited potential in our country’. In a December 1986 letter to Koch, Bangemann trumpeted a set of pro-renewables measures that his ministry had had a hand in

⁵⁶ Helmut Häuser, interview with the author. Hamburg, 29 July 2021.

⁵⁷ Interessenverband für Förderung der Windenergienutzung Windkraft Binnenland, untitled flyer, n.d. BArch B 102/364820.

⁵⁸ Deutscher Bundestag, Plenarprotokoll 10/171 (7 Nov. 1985), 12793.

⁵⁹ Jan Oelker, *Windgesichter. Aufbruch der Windenergie in Deutschland* (Dresden: Sonnenbuch Verlag, 2005) 207–8, 222.

⁶⁰ Dietrich Koch to RWE Hauptverwaltung Essen, 22 Oct. 1986. BArch B 102/364814.

⁶¹ See, for example: Dietrich Koch to Bundesminister Martin Bangemann, 23 Dec. 1986. BArch B 102/364814.

implementing. Still, the minister was unwilling to promote higher feed-in rates. From his perspective, electricity produced independently at hydropower, wind or solar facilities would only be 'economically viable' when its producers could get by on payments equivalent to the utilities' own calculations of the costs they would avoid by not having to generate the electricity themselves.⁶² The divergence between the utilities' estimates of their avoided costs and the costs of generating electricity at independent power plants became a key sticking point in negotiations over the feed-in rate – and thus also the basis for arguments about whether or not renewable energy was, in fact, 'economically viable'.

Helmut Häuser, an engineer who had left a well-paid job as a department manager at the aerospace manufacturer Messerschmidt-Bölkow-Blohm in order to promote wind and solar power, quickly recognised the two sides of this debate as far more than rival negotiating positions. He came to see the rates paid to independent electricity generators as the key determinant of whether or not renewable energy production would take off in Germany. In the late 1980s, Häuser laid out the two positions' effects in a series of memos and letters to other renewables advocates.⁶³ The 1979 Associations Agreement had enshrined the utilities' 'avoided fuel costs' as the basis for the rates they paid for independently generated electricity. The 30 per cent increase that the utilities had pledged in summer 1986 was described as a switch to an 'orientation on current electricity provision costs' in order to remain within the framework of 'avoided costs'. In fact, in some cases, Häuser calculated, the new rate would be high enough to enable operators of struggling hydropower plants to make ends meet. But, because the increase would not make erecting and operating a wind turbine profitable, it would not lead to widespread expansion of wind energy generation.

Advocates of independently-produced energy, therefore, looked beyond the utilities' avoided costs to conceive of the value of the electricity they generated in a way that would cause more Germans to invest in wind turbines or solar panels. In the name of expediency, some renewables advocates wanted to make the rates paid out to independent producers the same as the prices that consumers paid for electricity. Not only would that proposal more than double the rates paid out to renewables operators, it would streamline rate-setting, and seemed 'fair', since small-scale independent producers were typically also electricity consumers. And yet, Häuser was deeply critical of a '1:1' rate. Especially for solar energy, he argued, a '1:1' rate would hardly change the situation, since a 'vicious circle' linked the high prices of solar panels with low demand. 'As long as panels are expensive', he observed, 'only a few people will buy them, as long as only a few people buy them, they will remain expensive'.⁶⁴ The only way to get more people to buy photovoltaic panels and connect them to the grid – and thus to induce mass production and cause prices to fall – Häuser argued, would be to insure individuals that they would recoup the cost of their investment. A '1:1' feed-in tariff could not possibly cover the costs of buying and installing photovoltaic panels without the introduction of 'massive state subsidies'.⁶⁵

In contrast to rates set on avoided costs, or even a '1:1' rate, a cost-covering rate departed from current calculations about the costs of electricity generated, bought and sold within the existing, monopolistic market. Rather than merely cracking open the door of the existing system to independent producers, a cost-covering rate prioritised independent production by paying independent producers in accordance with the costs of building and maintaining renewable energy generation facilities. Hence the costs would vary by the type of energy used to produce electricity and be set at a level that made building new renewable facilities of each type a sound investment. For wind power, such a rate might not be far off from the retail rate of approximately 28 Pfennig per kilowatt-hour. Due to the high costs of photovoltaic panels, however, a cost-covering feed-in tariff could easily be as high as 2 DM per kilowatt-hour for solar energy. Especially in the case of solar, therefore, Häuser argued that there

⁶² Der Bundesminister für Wirtschaft to Dietrich Koch, 23 Dec. 1986. BArch B 102/364814.

⁶³ Häuser wrote on behalf of Umschalten, e.V., a club he had co-founded with six other residents of Hamburg in Jan. 1987 in an attempt to 'flip the switch' and begin 'using new energy sources'. Oelker, *Windgesichter*, 301–3; Michael Franken, 'Rotoren mit Durchhänger', *taz am Wochenende*, 6 Nov. 1999.

⁶⁴ Helmut Häuser to Klaus [last name unknown], n.d. Helmut Häuser Papers (hereafter HHP).

⁶⁵ Helmut Häuser to Wolf von Fabeck, 8 Feb. 1989. HHP.

was a huge difference between the cost-covering rate and the other ideas on the table, since only a cost-covering rate would entice Germans to invest in solar panels on their own. Growing demand for photovoltaic panels would lead to mass production, and – as a study by one of Häuser's former colleagues at Messerschmidt-Bölkow-Blohm showed – cause the price of a 1.2 kW unit to drop from 25,000 DM to somewhere between 6,000 and 8,000 DM within a decade.⁶⁶ As the costs of the panels dropped, so too would the cost-covering feed-in rate. As such, the construction of 40,000 new panels each year would only lead to a retail price increase of somewhere between .03 and .07 Pfennig per kilowatt hour, an increase that most retail customers would hardly notice. Only a 'cost-covering tariff', Häuser concluded, could 'bring [photovoltaic panels] to market quickly'.⁶⁷

From Häuser's perspective, the future of renewable energy production hung on contrasting ideas about the place of independent electricity production within a market dominated by the utilities companies. Wind and solar advocates conceived the implementation of a cost-covering rate for independently produced renewable energy as an opening of the market that would do away with the 'obstructions of the energy economy' that had 'prevented a "market breakthrough"' for renewable energies.⁶⁸ The federal government, however, insisted that 'renewable energy can only play a larger role in the energy supply when it is competitive'. At present, there was 'no means within the government's economic and financial policies to compensate for renewable energy's current lack of economic competitiveness via subsidies [for renewables] or taxes on competing energy sources'.⁶⁹ Renewables advocates, on the other hand, were convinced that renewables could compete. Though independent hydropower owners were fighting to keep pre-existing turbines operating while solar advocates and 'wind pioneers' wanted to build a new sector in the energy market, both groups had come to see a feed-in rate that ensured pay-outs high enough to cover their costs – and maybe even to turn a profit – as their primary objective.

'The Wiggling of a Little Toe and No More'

Substantive discussions of renewable energy had been confined to back rooms at the Ministry of Economics and radical proposals from the fringes of parliament for most of the 1980s. At the end of the decade, however, Winfried Damm, a staffer with the Green Party's Working Group on Energy, noticed that the wind was changing. In a 1989 planning memo, Damm exclaimed that 'renewable energy has a positive connotation – but it won't be associated with the Greens much longer – the other parties . . . are on the verge of something substantial'.⁷⁰ Despite Damm's concern that action on renewables would come from outside the Green delegation, the movement he had noticed in parliament had little to do with the typical fights for position that pitted one party against another. Instead, the parliament's growing impetus to act, which Damm aptly observed, was brought about by individual MPs acting on account of personal and local interests, not party politics.

MPs were motivated to act on renewables for several reasons. A handful of parliamentarians, including most notably BDW President Matthias Engelsberger, were themselves small businessmen who owned and operated hydropower plants. Having long sought better conditions for their waterworks, they did not hesitate to advocate on their own behalf in parliament. By a similar logic, a wider group of MPs from southern Germany with independent waterworks in their districts were pulled into the debate, not least on account of advocacy carried out by members of the BDW's particularly active Baden-Württemberg branch. The game was changed, however, by the intervention of

⁶⁶ Dr.-Ing. Othmar Heise, 'Erneuerbare Energien und Energieversorgung' (revised version, unpublished discussion paper), 31 May 1990. BArch B 102/406168.

⁶⁷ Helmut Häuser to Wolf von Fabock, 8 Feb. 1989. HHP.

⁶⁸ Dietrich Koch to Bundesminister Haussmann, 21 June 1990. BArch B 102/40616.

⁶⁹ Antwort der Bundesregierung, 'Förderung und Nutzung "Erneuerbarer Energiequellen" in der Bundesrepublik Deutschland'. Bundestag Drucksache 11/2684.

⁷⁰ Winfried Damm, 'Regeneratives 1989' (15 Feb. 1989). AGG B.II.1 6227-1.

Erich Maaß and Peter Harry Carstensen, a pair of conservative MPs from coastal northern Germany, a region where conditions were poor for hydropower but ripe for the exploitation of wind energy. Maaß and Carstensen's efforts to promote investments in wind energy, which eventually attracted the support of Engelsberger and other hydropower advocates, shifted parliament's role in the debate over the future of renewable energy. Through their work, one particular means of supporting renewables – the implementation of a set feed-in rate – became the primary goal not only of extra-parliamentary advocates of renewable energy but of many parliamentarians, too.

Maaß, a Christian Democrat who represented the North Sea port of Wilhelmshaven in parliament, publicly pushed for a major policy shift on renewables just days after the 1987 Bundestag election kept his own party in power. In a cantankerous statement published in the Christian Democrats' internal organ *Deutschland-Union-Dienst*, Maaß claimed that 'wind energy production in North Germany will be competitive with electricity produced using domestic anthracite coal by the 1990s at the latest'. An annual investment of 1.5 billion DM in small turbines, he argued, would allow the realisation of an annual production of '15 billion kilowatt-hours of wind energy in Northern Germany by 2010', and create some 15,000 new jobs in an economically weak region.⁷¹ Soon Carstensen, who hailed from coastal North Frisia, joined Maaß in his attempt to force the government to act. In violation of the Christian Democratic parliamentary delegation's internal rules, which required leadership to approve backbench initiatives before they were publicised, the pair organised a press conference at which they launched a thinly veiled critique of the government's policy on renewable energy and announced their own plans to draft a resolution calling for increased investment supports and better feed-in rates for wind energy.⁷² They described the measures as a means of 'giving wind energy a fair chance' by opening up the electricity market in a way that would 'allow small businesses to enter the market as electricity suppliers'. To this end, they made perfectly clear, 'the Ministry of Economics, in particular, must act'.⁷³

The debate over Maaß and Carstensen's broadsides revealed fissures within the governing coalition, which divided party leadership and cautious ministerial officials on the one hand from insubordinate MPs on the other. Leading Christian Democrats dismissed the proposal offhand. The delegation's spokesperson on energy matters, Ludwig Gerstein, who himself represented a district in the coal-mining Ruhr region, explained dryly to a newspaper reporter, 'We must not wake false hopes that in renewable energies, we have discovered the philosopher's stone'.⁷⁴ Officials at the Ministry of Economics also considered Maaß and Carstensen's proposal a non-starter. Like Gerstein, they saw little potential for renewables. Not only were Germany's 'geographic and climatic conditions' inconducive, but renewables also suffered from 'grave competitive inferiority'. As such, 'there is no particular advantage to be found in using state measures to help create new small businesses in the field of the electricity sector just so that they can feed electricity into the grid'.⁷⁵ In effect, the very same battle lines that already divided extra-parliamentary renewables advocates from officials at the Ministry of Economics had been drawn within the governing coalition.

Increasingly, however, renewables advocates limited the scope of their demands and made common cause, pushing Christian Democratic party leadership and officials at the Ministry of Economics to act. In the spring of 1988, Engelsberger joined forces with Maaß and Carstensen. The trio of Christian Democrats filed a second, more focused resolution calling for higher feed-in rates and new supports for investments in renewable energy. Party leaders remained opposed to the initiative, but seventy

⁷¹ Erich Maaß, 'Energiequelle Windkraft nutzen!', *Deutschland-Union-Dienst*, 28 Jan. 1987, 3–4. BArch B 102-364815.

⁷² Udo Kords, 'Die Entstehungsgeschichte des Stromeinspeisungsgesetzes vom 5.10.1990. Ein Beispiel für die Mitwirkungsmöglichkeiten einzelner Abgeordneter an der Gesetzgebungsarbeit des Deutschen Bundestages', Diplomarbeit (Free University of Berlin, 1993), 50–1.

⁷³ Erich Maaß and Harry Peter Carstensen, 'Der Windenergie eine faire Chance', *Pressedienst der CDU/CSU Fraktion im Deutschen Bundestag*, 12 Aug. 1987. BArch B 102-364816.

⁷⁴ Wolfgang Hoffmann, 'Leichte brise aus Bonn', *Die Zeit*, 15 Apr. 1988.

⁷⁵ Nauroth, 'Vermerk. Betr. Förderung von erneuerbaren Energien in der Bundesrepublik Deutschland' (30 Oct. 1987). BArch B 102/364816.

backbenchers immediately signed the proposal. Within weeks of the resolution's publication, a third of the parliamentary delegation had signalled its support. After the authors threatened to solicit support from opposition MPs if their own party would not bring the resolution to the floor of parliament, party leadership bought time – and kicked the can back to the Ministry of Economics, which was in the hands of the liberal Free Democrats – by approving the submission of thirty-nine written questions on renewable energy to the government. The ministry, for its part, sought to minimise the 'risk' of 'interest-based initiatives in the political space', by both continuing to 'publicise [its] support for renewables' and re-upping longstanding efforts to foster a negotiated settlement between the utilities and renewables advocates.⁷⁶

The mixed messages and limited support coming from government simultaneously frustrated renewables advocates and compelled them to press ahead. A March 1990 hearing on feed-in rates organised by the Ministry of Economics exposed these tensions. Minutes after the meeting began, Deputy Assistant Under-Secretary Martin Cronenberg ejected hydropower advocate Manfred Lüttke from the building. Cronenberg was perturbed by Lüttke's claims that the ministry served only the interests of the utilities, not independent producers. Lüttke's ejection drew condemnation from his fellow hydropower plant operators, but also from wind advocates like Dietrich Koch, who saw it as 'motivated by Cronenberg's awareness of the solidarity among the renewables advocates'.⁷⁷ Even after Lüttke was gone, in fact, renewables advocates continued to present a shared position, which ministry officials summed up as a move towards the 'radical re-orientation of the energy supply economy, placing ecological exigencies at the forefront'. As immediate measures, the renewables advocates demanded that excess capacity at traditional power plants be shut off, that further construction or replacement of traditional power plants be halted, and that an emissions tax as well as cost-covering feed-in rates for renewable energies be implemented. What is more, ministry officials pronounced fearfully, 'Among the population, there is great acceptance of this sort of re-orientation'.⁷⁸

On account of the Christian Democratic backbenchers' straightforward, if limited, demands on the one hand, and the spectre of growing public interest in a larger 're-orientation' of the energy sector on the other, the governing Christian Democratic and Liberal parties came around to the idea of a legislated feed-in rate. By 1990, renewables advocates, too, had focused on moving forward along this particular 'track', where progress seemed possible.⁷⁹ In parliament, Matthias Engelsberger, having decided not to stand in the upcoming election, devoted himself fully to legislating a feed-in tariff before his parliamentary career ended. He began by soliciting support from his fellow backbenchers for a new resolution on 'Support for the Energies of the Future'. More limited, but also more outcome-oriented than earlier attempts, Engelsberger's latest resolution required the federal government to legislate an 'immediate and significant improvement in the feed-in rates for electricity produced using renewable energies' if the utilities proved unwilling to offer higher rates on their own.⁸⁰ Since years of negotiations had made clear that the utilities would not offer higher rates, the government began writing the legislation that would eventually force them to do so as soon as parliament passed the resolution.

That legislation became known as the Electricity Feed-In Law (*Stromeinspeisungsgesetz*). It mandated that the utilities purchase independently generated renewable electricity and set the rates they would have to pay for it. Specifically, the utilities were required to pay 75 per cent of the retail rate for electricity generated at small hydropower plants, and 90 per cent of the retail rate for electricity

⁷⁶ Gutermuth, 19 Jan. 1990. BArch B 102/406167. On the parliamentary manoeuvring that preceded the passage of the Feed-In Law, see also: Kords, 'Entstehungsgeschichte'.

⁷⁷ Dietrich Koch to Bundeswirtschaftsminister Dr. Helmut Haussmann, 16 May 1990. BArch B 102/406168. Other renewables advocates echoed Koch's complaints about Cronenberg's treatment of Lüttke. See, for example: Pfister to Haussmann, 2 Aug. 1990. BArch B 102/406170; Carstensen to Cronenberg, 6 Aug. 1990. BArch B 102/406170.

⁷⁸ III B 1, 'Vermerk: Gespräch zwischen Verbänden der erneuerbaren Energien VDEW und BMWi zum Thema Einspeisevergütung für erneuerbare Energien', 21 Mar. 1990. BArch B 102/406167.

⁷⁹ Helmut Häuser to Wolf von Fabek, fax 10 Aug. 1993. HHP.

⁸⁰ Antrag 'Förderung von Zukunftsenergien', Bundestag Drucksache 11/7169 (17 May 1990).

generated through photovoltaic panels or wind turbines.⁸¹ Even if they demanded yet higher rates, especially for solar energy, and the inclusion of further energy sources in the law's parameters, independent operators realised that they had much to gain from this law. They responded favourably to it – a striking contrast to their reactions to earlier proposals.⁸² Ministerial officials, though less pleased with the new legislation, could at least be satisfied that they had managed to exclude industrial cogeneration from new higher feed-in rates, and also to require a review of the new law's effects in a last-ditch effort to turn it into a temporary measure.⁸³

On the floor of the Bundestag, the bill was attacked from the opposition as too limited a compromise. The SPD MP Dr. Dietrich Sperling, who had participated in the Social Democrats' recent efforts to dramatically reform the Energy Economy Law, poo-pooed the proposed Electricity Feed-In Law as evidence of the 'naivete' that reigned in parliament. 'When it comes to addressing global climate change', he declared to the boisterous applause of his delegation, the feed-in tariff 'is not a step in the right direction, it isn't even a small, shuffling step, it's the wiggling of a little toe and no more!'⁸⁴ Sperling's claim was hardly unwarranted in the context of the broader reforms advocated from the opposition by his own Social Democrats as well as the Greens. And yet, the bill was passed with support from across parliament on 7 December 1990 and became law on 1 January 1991. Essentially, the two-page proposal was accepted precisely because it appeared so trivial; it affected the price utilities paid for less than 0.2 per cent of all electricity generated in Germany, and hardly seemed likely to transform the electricity market.⁸⁵

Yet, although parliamentarians and government officials had come to accept the idea of a set feed-in tariff, the utilities did not. Still caught up in the long-standing debate with hydropower plant operators, Joachim Grawe, the spokesperson of the utilities' association, derided a legislated feed-in tariff as a means of channelling support to existing waterworks. Raising rates for 'already existing powerplants', he grouched, was 'short-sighted as a matter of energy economy, risky as regulatory politics, and vulnerable to legal challenge'. A legislated feed-in tariff, he concluded, would 'not lead to a single additional kilowatt-hour of renewably produced electricity'.⁸⁶ In fact, not only Grawe's embittered evaluation of the new law but also opposition MPs' pessimism about its relevance proved short-sighted.

For one thing, the law aided a variety of independent electricity producers. Grawe was, of course, correct to predict that the Feed-In Law would benefit operators of existing independent hydropower plants. In many cases, they received twice as much compensation as before. But others benefitted, too. After reunification, the law effectively incentivised the restoration of small hydropower plants in the former East Germany.⁸⁷ In the wind energy sector, it had a greater effect still. Together with the federal government's 100 MW Wind Program, which paid subsidies to a limited number of wind projects that passed through a lengthy application process, the Feed-in Law turned wind turbines into a safe and

⁸¹ The 75 per cent rate was valid for hydropower plants with a capacity below 500 kW. Larger independent hydropower plants would receive 65 per cent of the retail rate. 'Gesetz über die Einspeisung von Strom', 2633–4.

⁸² See, for example: Zeller, 'Tischvorlage zum Gespräch mit dem Bundesministerium für Wirtschaft, Herrn MR Dr. Cronenberg', 7 Aug. 1990. BArch B 102/406170.

⁸³ Schönleiter (III B 1), 'Vermerk: Betr.: Einspeisevergütungsgesetz; hier: Ressortgespräch am 27.06.1990', 29 June 1990. BArch B 102/406169.

⁸⁴ Deutscher Bundestag, Plenarprotokoll 11/224 (13 Sept. 1990), 17752.

⁸⁵ All told, of the 550 terrawatt hours (TWh) of energy produced in Germany in 1990, independent hydropower plants produced only about 0.8 TWh, while wind accounted for an absolutely miniscule .007 TWh. On small hydropower capacity as of 1986, see: Eberhard Wagner, 'Kleinwasserkraftanlagen für die öffentliche Elektrizitätsversorgung im Jahre 1986', *Elektrizitätswirtschaft* 86 (1987), no. 24, 1046–8 (here: 1048). Reprinted in *StromDISKUSSION – Nutzung erneuerbarer Energien durch die Elektrizitätsversorgung*. On wind and total hydropower by 1990, see: Umweltbundesamt, 'Zeitreihen zur Entwicklung der erneuerbaren Energien in Deutschland' (Dec. 2020), 6.

⁸⁶ 'VDEW stellt weitere Vergütungs-Modell vor: Stromversorger fördern regenerative Energien', *Strom Linie* 33/90 (15 Aug. 1990).

⁸⁷ Local subsidy programs were also important here. Eberhard Wagner and Udo Rindelhardt, 'Stromgewinnung aus regenerativer Wasserkraft in Deutschland – Überblick', *Ew* 106 (2007), no. 25–6, 54–5.

profitable investment. As a result, it created precisely the sorts of small businesses advocated by Maaß and Carstensen. Within just a few years, glossy brochures invited Germans to benefit from the ‘boom in the wind energy sector’ by making an ‘ecological investment’ in ‘Electricity from Wind’.⁸⁸ Not least on account of such initiatives, Germany went from 55 MW of installed onshore wind energy generation capacity to 6,097 MW within a single decade.⁸⁹

What is more, as hydropower and wind energy became, for all intents and purposes – and despite officials’ arguments that renewables were uneconomical – verdant economic enterprises in Germany, this diverse group of producers even began to see itself as a single market sector. With a basis in hydropower operators’ long-standing networks, representatives of hydro, wind and solar organisations organised a new umbrella group shortly after the passage of the Feed-in Law. The Federal Association for Renewable Energy, which they founded in December 1991, ‘bundled the strength’ of the previously ‘splintered, smaller organizations’ dedicated to individual renewable energy sources.⁹⁰ Among its immediate priorities was the ‘struggle to defend the law’. Expecting continued attacks from the utilities, the Association’s founders were convinced that ‘only a strong federal association . . . can serve as a counterweight’.⁹¹ Even after the Feed-In Law’s passage, in other words, the ongoing struggle over independent electricity producers’ place in the German energy market shaped the way renewable energy was understood and promoted. The future of the newly emerged renewable energy sector depended on enticing individual Germans to invest in single turbines or small windfarms and in protecting those independent power plants’ hard-won access to the electricity market.

Conclusion

The terms by which renewables became a significant part of Germany’s energy mix were set amid the feed-in fights of the 1980s. Though utilities companies had little interest in shutting down their coal and nuclear power plants, and government officials declined to mandate renewable energy production, independent producers were eager to bring the electricity generated by their waterworks and wind turbines to market. In this context, arguments for and against renewable energy became struggles over the conditions by which independent producers could access the electric grid. The 1990 Feed-In Law soothed these debates by mandating higher rates for independent producers’ renewably generated electricity. But, in so doing, it also set the onus on independent producers to make a future for renewables in Germany. As the tremendous increases in Germany’s wind and solar capacity over the past three decades show, independent producers were surprisingly successful at this task. Over time, then, the effects of the Feed-in Law proved that economic incentives could play a key role in fostering the bottom-up creation of a new sector within the energy market.

When it comes to evaluating the feed-in tariff’s social impacts, however, measuring the consequences of the economic logics that have invigorated Germany’s widely celebrated increases in renewables capacity becomes more complicated. In the context of the previously closed energy market, feed-in tariffs can be perceived as ‘democratic’ in that they have expanded access to the electric grid. Indeed, as the renewables advocate and co-author of Germany’s 2000 Renewable Energy Sources Act, which expanded the 1990 Feed-in Law, Hans-Josef Fell, puts it, feed-in tariffs allow ‘everyone to take part in the market economy under fair conditions’.⁹² The success of Germany’s feed-in tariff program, therefore, embodies the idea that, once the right regulatory frameworks are in place, economic incentives will encourage citizen participation and mitigate climate change more

⁸⁸ Windpark Saar, ‘Strom aus Wind. Die ökologische Kapitalanlage. Machen Sie mit!’, 30 Aug. 1994. HHP.

⁸⁹ Umweltbundesamt, ‘Zeitreihen zur Entwicklung der erneuerbaren Energien’, 6.

⁹⁰ ‘Pressebericht zur Sitzung des Bundesverbands Erneuerbare Energie BEE in Frankfurt am 26.04.1991’ (26 Apr. 1991). HHP.

⁹¹ Bundesverband Deutscher Wasserkraftwerke (Dr. Veit Welsch) to Arbeitsgruppe des Bundesverbandes der Deutschen Erneuerbaren Energien. 29 Jan. 1991. HHP.

⁹² Hans-Josef Fell, interview with the author. Munich, 30 Sept. 2020.

effectively than top-down government control. And it goes without saying that the same economic incentives that enticed those Germans with enough resources to invest in wind turbines or photovoltaic arrays have lowered the price of turbines and photovoltaic panels.

By the very same token, however, the feed-in tariff has delegated the societal challenge of shaping the energy mix to individuals, who may elect to invest in renewable energy to their own economic advantage – or even for the good of the climate. As such, it is a form of promoting renewable energy that has uneasy parallels with the ‘deflection campaigns’ that fossil fuel companies deploy in order to make individual choices responsible for the fate of the planet while large carbon emitters continue to act as they please.⁹³ It is hardly surprising, then, that despite tremendous growth in renewable energy generation, and meaningful decreases in carbon emissions since 1990, Germany’s per capita carbon emissions remain well above the EU average.⁹⁴ Even in 2020, 23 per cent of all electricity generated in Germany came from coal, and a freshly legislated coal phase-out will allow coal-fired power plants to operate until 2038.⁹⁵

Narrating the feed-in tariff’s emergence as part of a bottom-up movement to take down monopolistic utilities companies provides much needed hope by reminding us that grassroots activism has brought about significant change in the energy sector. And yet, that same story reveals how essential the context of struggles over access to the electricity market informed that activism – and how that context shaped its consequences. It would be a stretch, in other words, to argue that the Feed-in Law rebuilt the commons in the name of rising to the climate challenge. Even if it was no more than the ‘wiggling of a little toe’ in terms of radical social change, however, the feed-in tariff did constitute a significant shift to the rules governing the German electricity market. By easing individual Germans’ pathway into that market, it helped to prove the economic viability of renewably generated energy and inspired the construction of thousands of new, profitable wind turbines.

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⁹³ On ‘deflection campaigns’, see, for example: Michael Mann, *The New Climate War: The Fight to Take Back Our Planet* (Victoria: Scribe, 2021), esp. 47–62.

⁹⁴ German reunification, and specifically the addition of East German power plants to the Federal Republic’s balance in 1990, skews Germany’s overall carbon reduction trajectory, since many of the most polluting power plants in the former East were shut down shortly after 1990. See, for example: Benjamin Becker and Caspar Richter, ‘Klimaschutz in Deutschland: Realität oder Rhetorik?’, *momentum quarterly. Zeitschrift für sozialen Fortschritt* 4, no. 1, 9. On per capita CO₂ emissions, see: European Commission, ‘Fossil CO₂ Emissions of All World Countries, 2020 Report’. It is worth noting that Germany’s nuclear phase-out, which is set to be completed at the end of 2022, has also played a role in the trajectory of the country’s carbon emissions. See, for example: Patrick Graichen and Fabian Hein, ‘10 Jahre nach Fukushima: Welche Folgen hat der Atomausstieg für die Energiewende? 10 Antworten auf klassische Fragen’ (Mar. 2021) (https://static.agora-energiewende.de/fileadmin/user_upload/10_Jahre_Fukushima_Agora_v4.pdf) (last accessed 14 Mar. 2022).

⁹⁵ The 24 per cent figure includes both lignite (brown) and anthracite (black) coal, which comprise 16 per cent and 7.4 per cent of Germany’s total power production respectively. ‘Bruttostromerzeugung’, AG Energiebilanzen, e.V. On the coal phase-out, see Federal Ministry for Economic Affairs and Energy, ‘Final Decision to Launch the Coal Phase Out – a Project for a Generation’, 3 July 2020.

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