6. The Renewable Energy Sources Act (EEG)

6.1 The EEG – Story of an Unlikely Revolution

The Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz, short: EEG), introduced in 2000, was designed to raise the share of renewable energies (wind, photovoltaics, biomass, hydropower, geothermal energy) in electricity production and to encourage their effective market entrance, on behalf of environmental and climate protection and sustainable development. It created a sheltered niche for the thriving growth of green energies. Looking back, the EEG is today acclaimed as an outstandingly efficacious instrument of renewables promotion and referred to as the starting point of a unique success story.

Indeed, albeit Germany does not quite appear as the ideal place for renewable energy production in terms of poor geographical conditions – as for receiving only little solar radiation, most particularly –, the country experienced an unforeseen rise of renewables from less than 5% in 2000 up to more than 25% of electricity demand in 2013, with a continuous upward trend. The spectacular growth of renewables greatly overachieved even optimistic expectations (AEE, 2009; Hirschl, 2008, p. 59; Scheer, 2010, pp. 42-55). The situation is aggravated by additional obstacles that made this success story everything but likely: Given the inherent inertia of the centralized energy system in place, heavily relying on coal and nuclear fuels, and the entrenched interests of seemingly powerful corporations with a closely knit political network evolved over decades, this far-reaching shift in energy supply was all but likely, the more so as the large number of veto points in German federalism rather slows down policy change than accelerating it. A handful of large energy corporations have been (and still are) dominating the market, creating a quasi-oligopolistic situation stemming from the times of the monopoly of the German electricity market. These corporations owned the almost entire electricity supply system, including grids and power plants, and barely pursued any interest in giving up their market power (see chapter 4.3). Given the economic power of the fossil-nuclear energy corporations and the immanent resilience against change of an established energy system, along with the absence of a professional renewables lobby, “the introduction of nationwide feed-in tariffs to promote the development of renewable energy seemed next to impossible” (Stefes, 2013, p. 10). Bearing these circumstances in mind, this paper investigates why and how the seemingly weak renewables movement could win over the theoretically strong anti-renewables lobby.1

The EEG goes back to the first SPD/Green government coming into office in 1998. Unlike the preceding regulation stipulated in the Electricity Feed-in Act, the new statutory provisions granted cost-covering feed-in tariffs for electricity from renewable sources, which presented a paradigm shift in the renewables policy field. Since the EEG went into force in 2000, it has
undergone a whole string of major amendments under several governments with varying party composition, with reforms in ever-shorter intervals and with steadily increasing volume of regulation. Initially, the EEG was scheduled for revisions every four years to adjust to market and technological developments; yet, against the backdrop of the fast success of market introduction along with fundamentally changing economic and technological conditions, the legislator held adjustments to be necessary much more often, with ever-shorter intervals in the recent years, amended even annually. At the same time, the volume of regulation has drastically grown from only 11 paragraphs in the original version as of 2000 up to 88 paragraphs and five appendices in the version as of 2012. In this time span, the following major reforms occurred:

1. EEG 2000: replacement of the former 1990/91 Electricity Feed-In Act by a comprehensive and ambitious promotion scheme for renewable energies;
2. EEG 2004 (with preceding PV Interim Act and Special Equalisation Scheme Act 2003): overall improvements for almost the entire range of renewables; inclusion of large hydropower; introduction of cost reliefs for large industrial consumers;
3. EEG 2009 (with preceding “Small EEG Amendment” 2006): improvements for the entire range of renewables; considerable elevation of the expansion target; introduction of sustainability criteria for bioenergy; extension of industry privileges;
4. PV Act 2010: cuts in solar tariffs, yet in combination with the extension of own consumption incentivation; introduction of a flexible cap on photovoltaic capacity;
5. EEG 2012 (with preceding PV Interim Act 2011): maintenance and specification of expansion targets, yet no acceleration despite nuclear phase-out; adjustments of solar tariffs; reform and tightening of the flexible cap on photovoltaic capacity;
6. PV Act 2012: deep cuts in solar promotion and introduction of a total cap on PV capacity.

In a synopsis of the reforms (see table 24 on the next page), it clearly comes to light that the advocates of renewables prevailed. Only the solar industry suffered a defeat in the recent past and had to accept severe cutbacks. The advocates of fossil-nuclear energy were not capable to obviate the triumph of renewables, while energy-intensive industries have been increasingly unburdened from promotion costs.
### Table 24: Overview of EEG Reforms

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**Notes:** The symbols indicate if the policy result was favorable (+), indefinite/mixed (+/-) or detrimental (–). n/a means “non applicable”, i.e. the items were not addressed in the respective law. “EEG principles” are defined as compulsory priority grid access with guaranteed feed-in tariff. Source: own table

### Fig. 36: Renewable Electricity Generation in Germany (1990-2012)

*Notes:* Geothermal electricity generation is not shown due to the small quantities involved. ¹ incl. biogenic solid fuels and liquid biomass, biogas, sewage and landfill gas, and biogenic waste. Source: BMU, 2013b, p. 19
6.2 Constellation of Actors

At an aggregated level of analysis, actors can be clustered into two advocacy coalitions along the dividing lines in renewables politics: the Economic Coalition that encompasses opponents of comprehensive renewables promotion and protects the fossil-nuclear status quo, versus the Environmental Coalition that supports the comprehensive renewables promotion and challenges the fossil-nuclear status quo (Reiche, 2004, pp. 139-150; Dagger, 2009, pp. 47-68; Lorenz, 2010, pp. 34-36; similarly: Gmelin, 2012, pp. 47-48; Hirschl, 2008, pp. 192-196; Altegör, 2013). Even though the assignment of some actors is not clear-cut due to varying or ambiguous positions, this aggregation allows for a heuristic analysis without neglecting the internal conflicts within both camps.²

The anti-renewables (or: economic) advocacy coalition, consisting of the four big electricity producers and the manufacturing industry, does not necessarily categorically reject renewables per se but subordinates their expansion to the condition of economic viability under market competition. The promotion framework should therefore focus on the most cost-effective sources and on large-scale plants, instead of decentralized, small installations of all available technologies across the board – hence the preference for (cheaper) wind over (costly and small-scale) photovoltaics. The subsidies must be limited to avoid negative impacts on electricity prices, employment and competitiveness. To this end, feed-in tariffs that pass on the promotion costs to the electricity price are rejected, and instead, tenders or renewables quotas with tradeable certificates are preferred as the more market-oriented instruments. Energy-intensive industries should be exempted from subsidy costs to secure their competitiveness.

The pro-renewables (or: environmental) advocacy coalition, comprising environmental organizations, renewables industry, farmers, the metal workers unions (IG BCE), the engineering association (VDMA), partially the German Confederation of Skilled Crafts (ZDH), as well as some industrial corporations with renewables division, advocates for the strong promotion of the full range of all renewable energies with a preference for small-scale systems in the hands of citizens, hence with a preference for photovoltaics over offshore wind farms. The goal is to replace fossil and nuclear fuels by renewables as fast and far-reaching as achievable, envisaging a complete transition towards 100% renewables in energy supply, aiming at the mitigation of greenhouse gases, the alleviation of the hazardous dependence on exhaustible fossil fuels, and the exit from nuclear power. Concerns over possible negative impacts of renewables subsidization on electricity prices or competitiveness are considered exaggerated and perceived as easy to cope with. Cost-covering feed-in tariffs are regarded to present the most effective instrument for market entrance of renewables, whereas quotas or tenders are rejected.
Aside from innumerable technical details that can be neglected in a political science perspective, the main lines of political conflict that proved permanently and highly contested in the course of the reform processes were the following:

- **feed-in tariffs vs. market integration:** Foremost at the early stage, the model of feed-in tariffs as such was under attack from the economic coalition which preferred other instruments such as tenders or quotas over feed-in tariffs.3

- **cost effectiveness:** The economic coalition advocated for economic incentives as even as possible across all energy technologies and system sizes, so that development of each respective technology is left to the market. In contrast, the environmental coalition claimed technology-specific remunerations with a preference for small-scale systems, so that all renewables can be effectively introduced to the market.

- **cost distribution:** The industry pushed for far-reaching exemptions from cost burdens caused by renewables subsidization, whereas the environmental coalition wanted to keep these exemptions at a low level as cost reliefs for industrial consumers correspond with cost increases for other consumers.

- **level of photovoltaics subsidization:** As solar energy was very expensive in the beginning and then endangered the profitability of conventional peak load power plants, the economic coalition wanted to keep the remuneration at a low level or/and impose capacity limits; on the other hand, solar energy enjoys high popularity among citizens, in particular homeowners and farmers, who partnered up with the solar industry to advocate for a high levels of solar remuneration.

- **onshore wind power in the low-wind inland:** The environmental coalition wanted to evenly promote onshore wind power also on low-wind inland sites, whereas the economic coalition put the focus on strong-wind coastal areas only. State governments in the inland opposed wind power in their territory to protect their natural scenery, whereas state governments in the North and East of Germany welcomed wind power as means of industrial production and job creation.

- **offshore wind:** Deep-sea offshore wind farms are large projects with high capital need and with the prospect of steady strong wind, which is why the conventional large energy suppliers favored offshore wind. In contrast, renewables associations and environmentalists remained rather reluctant, though not entirely opposite, as they preferred smaller onshore wind power plants with benefits for medium-sized renewables companies, and raised concerns on potential negative effects on wildlife and nature conservation in the coastal ecosystems.

- **biomass: how and how much?** Environmental and development organizations were criticized distinct patterns in the use of biomass for energy production, with respect to the competition over land use between energy and food crops as well as regarding the
environmental sustainability of the monocultural cultivation of corn for biogas or problematic imports from rainforest areas. However, bio-energy plants can be well-regulated – in contrast to fluctuating sources such as solar and wind – and are therefore indispensable for security of supply in a renewable energy system.

One of the most striking moments when the conflicts between proponents and opponents of renewables were revealed was the debate on energy costs in 2012: “With subsidies, the energy transformation will tank”, industry lobbyists campaigned against the EEG – provoking a counter-campaign of the online activism platform Campact and the anti-nuclear network ausgestrahlt, as shown in figure 40: “Only nuclear corporations moan about the EEG!” These conflicts informed the competition of interest groups for influence over the past decades – to be explored in the remainder of this chapter.

*Fig. 40: Same Issue – Different Views: Renewables Promotion*

*With subsidies, the energy transformation will tank*: 2012 campaign against the EEG, run by the “Initiative New Social Market Economy”, a public affairs institute funded by the metal industry.

*Source: INSM 2012*

*Make an end to the nuclear horror! Only nuclear corporations moan about the EEG*: Counter-campaign of the online platform Campact and the anti-nuclear network “ausgestrahlt”, in support of the EEG.

*Source: Campact/ausgestrahlt 2012*
6.3 Historical Background: The Electricity Feed-in Act (1991)

The Electricity Feed-in Act (Strömeinspeisungsgesetz, short: StrEG), enacted on 1 January 1991 by the CDU/CSU/FDP government under Helmut Kohl (CDU), was the first legal regulation of electricity feed-in to the grid. By then, operators of small power plants could only feed electricity into the grid under a non-binding, voluntary framework provided by the grid owners themselves, which were identical with the large energy producers in legally foreclosed regional monopolies. This has led to the situation that the old energy monopolies obstructed or entirely refused the feeding into the grid for independent competitors, and granted remuneration only based on averted costs for energy utilities, coming with very low rates and unreliable investment conditions (Bechberger, 2000, p. 4). Owing to these unfavorable conditions, renewable energies accounted for negligible 3.4% of total electricity consumption in 1990, including traditional hydropower (BMU, 2013a, p. 18).

The Electricity Feed-in Act, a very lean law with six paragraphs only, tackled this unsatisfactory situation and established a market regulation based upon three main principles (Oschmann, 2009, p. 263; WD, 2014, p. 7):

1. compulsory connection of all renewable power plants to the grid;
2. priority feed-in for renewable electricity to the grid;
3. guaranteed remuneration for renewable electricity (feed-in tariff) over 20 years.

The remuneration was coupled to the development of electricity prices; wind and solar power was remunerated with 90%, hydropower and landfill gas with 80% of the average electricity price of the year of installation (equal to approx. 8.5 ct in the mid 1990s), to be paid by grid operators and passed on to the electricity customers. The costs amounted to some 50 m. DM per year (≈ 25 m. €), making up roughly 0.1% of the utilities’ revenues (Illing, 2012, S. 174-175). The Electricity Feed-in Act induced the first boost to renewables in Germany, mainly brought forward by wind power, whereas photovoltaics was not able to overcome its soaring costs and remained only viable for off-grid and small-scale consumers (BSW, 2012c, pp. 4-5; AEE, 2010, pp. 9, 26). Today, the Electricity Feed-in Act is referred to as by then most decisive step for the development of renewables (Reiche, 2004, p. 65; Jacobsson & Lauber, 2006, p. 264). As the feed-in tariffs were insufficient to pay off prime costs and overcome investment barriers, supplementary market introduction programmes under responsibility of the research ministry were tailored to advance solar and wind energy with low-interest loans: the 1,000-Roofs-Photovoltaics-Programme and the 100-MW-wind-programme (later increased to 250 MW), featuring the first remarkable market entrance programmes for sun and wind energy (AEE, 2010, pp. 9, 26; Reiche, 2004, p. 65).

Mounting latent problem pressure on fossil and nuclear fuels preceded this early victory of renewables, nurturing the political will to promote the market introduction of renewable
energies, as Stefes (2013, p. 10) points out: “The oil crises demonstrated that industrialized countries’ dependence on Middle Eastern oil was an Achilles’ heel of their economies. Subsidies for German coal production were challenged in the courts. And Chernobyl made it abundantly clear that nuclear power was not a politically viable solution to Germany’s energy needs either. Moreover, a strong environmental movement and the Green Party, which entered the Bundestag for the first time in 1983, placed global warming on the political agenda and generated some public support for renewable energy as an alternative to fossil fuels and nuclear energy”. However, as the financial means granted for the promotion of renewables remained trivial in comparison to the immense subsidies for coal and nuclear, the impact of renewables was limited. Besides, the traditional energy industry downplayed the potentials of renewables, with their political allies widely sharing their skeptical stance. In the course of the 1980s, the first proposals for feed-in tariffs infiltrated the parliament. Small associations such as foremost the Association for the Promotion of Solar Power (SFV) – a group of solar energy enthusiasts – and Eurosolar, as well as the Association of German Water Power Plants, elaborated the first concepts for feed-in tariff schemes (Jacobsson & Lauber, 2006, p. 264; Suck, 2008, pp. 169-170), and several German cities started to experiment with them. Besides, also the traditional environmental organizations stood up for the enhanced renewables promotion yet without taking a solid preference for feed-in tariffs or any other instrument (Flasbarth, 2014, interview). These ambitions, however, met the opposition of the economics ministry as well as CDU/CSU and FDP who instead favored small market introduction programmes for wind and solar power under responsibility of the research ministry, and attempted in vain to convince energy suppliers to introduce voluntary renewables quota (Stefes, 2013, p. 11; Reiche, 2004, p. 161).

In the late 1980s, however, a couple of “parliamentary backbenchers” (Stefes, 2013, p. 12) of CDU/CSU and Green politicians closed ranks to advocate for the promotion of wind energy and hydropower. They soon learned that the economics ministry that was then in charge of energy policy would never support their cause, so they drafted the law proposal on their own and assembled support within the incumbent CDU/CSU group and from diverse other corners of parties and interest groups (AEE, 2010, pp. 9, 21; Bechberger, 2000, p. 4; Dagger, 2009, pp. 69-73), forming quite an unlikely coalition: farmers with stakes in wind and biogas; machinery manufacturers out for new business areas; industry representatives who blamed the large utilities to abuse their monopolistic market position to impede competition and enforce excessive electricity prices; churches and environmental associations; SPD and Green parliamentarians affiliated with renewables associations, in particular the Green politician and phycisist Wolfgang Daniels; the CDU-led environmental ministry that was just established in 1986 in response to the Chernobyl catastrophe; a handful of CDU/CSU politicians with stakes in small-scale hydropower, in particular the CSU parliamentarian
Matthias Engelsberger, then honorary president of the Federal Association of German Water Power Plants and referred to as father of the Electricity Feed-in Act (Berchem, 2006).

As proponents and skeptics of renewables alike severely underestimated the factual impact of the law, intra-party resistance was easy to come by. “This is all about one little quarter of a procent only, thus one quarter of a hundreth of electricity generation”, as an SPD politician mocked in the Bundestag debate, looking at the perceived triviality of the provisions. “There is no reason to expect that this tiny law will contribute to environmental protection and unfold any noteworthy effect” (BT, 1990, prot. 11/224, p. 17752). As potential impacts were limited, the CDU/CSU group leadership accepted the proposal to appease dissenters (Lauber & Mez, 2004, p. 601). Neither did the conventional electricity producers spend considerable lobby efforts to impede the law, as they did not fear great burdens. Aside from that, their lobby capacity was tied up in the challenging integration of the East German energy market in the course of German reunification in 1990. As a result, the Electricity Feed-in Act did not face severe resistance by the old energy monopolies (Hirschl, 2008, pp. 54-55; Reiche, 2004, pp. 145-146; Suck, 2008, pp. 170-172). “In short, a small group of policy entrepreneurs with little political clout linked the problem, political, and policy streams to take advantage of an emerging critical juncture. Under normal circumstances, [there] would have been no match for the guardians of the traditional energy system. However, adding contingency to the mix, the anti-renewable energy coalition was unprepared to put up a fight, as the utilities were preoccupied with taking over the East German energy system” (Stefes 2013, 12).

The Electricity Feed-in Act led to a strong impulse for wind energy and photovoltaics, though starting from a very low level, and nurtured the formation of the renewables industry and their lobby organizations, most remarkable the establishment of the Federal Association for Renewable Energy (BEE) in 1991, the Biogas Association in 1992, the Federal Wind Energy Association (BWE) in 1996 and the Federal Association for Bio-Energy (BBE) in 1998. These organizations represented the very first branch associations of the national renewables industry; until then, a professional lobby for renewables was de-facto absent (Gmelin, 2012, pp. 12-13, 48-52; Reiche, 2004, pp. 92-96).

Facing the small yet steadily increasing market shares of renewables – now accounting for 4.8% of total electricity generation in 1996 (BMU, 2013a, p. 18) – opponents launched attacks against the Electricity Feed-in Act. The Federal Association of German Energy Industry (VDEW) and the utilities repeatedly challenged the law in German and European courts. In 1996, the VDEW lodged a complaint with the European Commission for the violation of EU provisions on state subsidies. Thereafter, the FDP-headed economics ministry proposed drastic cuts in tariffs, foremost for wind power. In 1998, the utility PreussenElektra – an E.ON predecessor – filed a suit before the European Court of Justice
against the Electricity Feed-in Act for similar reasons of violation of EU state aid law. Yet all legal complaints, however, failed (Stefes, 2013, p. 14; Bechberger, 2000, pp. 12-13).

After the economics ministry launched plans for severe cutbacks in 1997, a “wave of protest” (Hirschl, 2008, p. 163) emerged, formed inter alia by renewables industry associations – foremost the BWE –, environmental organizations, unions, churches, the Engineering Association (VDMA). In the face of protests by a heterogeneous coalition of interest groups that created public pressure and warned against economic downsides in the industries affected, the government reined in the economics ministry’s aspirations. For the first time, the pro-renewables coalition jointly organized to defend its interests against undesired policy change (Gmelin, 2012, pp. 59-60; Hirschl, 2008, pp. 136-137; Lauber & Mez, 2004, p. 603).

Nonetheless, the development of renewables reached a bottleneck in the late 1990s when structural flaws of the framework came to light (Bechberger, 2000, pp. 5-13; Dagger, 2009, pp. 72-73; Suck, 2008, pp. 191-195):

- **volatile remuneration**: The coupling of feed-in tariffs to the electricity price turned out as too volatile to ensure investment security, along with declining prices in the wake of the liberalization;

- **uneven distribution of burdens**: In strong-wind regions, grid owners had to feed more renewables electricity into the grids and thus also take higher payments for feed-in tariffs than in weak-wind areas. A nationwide compensation mechanism that would distribute the financial burdens more evenly did not exist. In a provisional reform in early 1998, a “double 5% cap” was created that should limit and balance the costs by limiting the compulsory purchase of electricity to 5% of total electricity sales of each energy supplier, and – if this threshold is reached – the upstream grid operator was liable to bear the additional costs up to a second 5% limit. After reaching this cap, eligibility for feeding into the grid ceased. Despite limiting renewables growth, the cap still caused a regionally unequal distribution of expenses for grid operators, at the detriment of PreussenElektra that operated in strong-wind areas and had to bear significantly higher costs for wind power than its competitors. Moreover, pending suits before the constitutional court against the cap created massive legal uncertainty, which discouraged investors and brought the expansion of wind energy to an end.

- **expiring market introduction programmes**: The market entrance programmes for photovoltaics and wind expired, which added a major investment barrier.

In the view of these shortcomings, the need for reform was pressing. Overall, the Electricity Feed-in Act may not have allowed for a comprehensive energy transformation, yet still fostered the establishment of a renewables industry, brought the pro-renewables coalition together and therewith laid the foundations for more progressive policies yet to come.
6.4 The Renewable Energy Sources Act (EEG 2000)

The victory of the SPD/Green coalition under Chancellor Gerhard Schröder (SPD) in the elections in 1998 opened an opportunity window for change in energy politics (Kern, Koenen, & Löffelsend, 2003, p. 13), with the first participation of the Greens in federal government in history. The new government dedicated special salience to the expansion of renewable energies and proclaimed a paradigm shift in energy policy, which meant an important condition for the reform of the Electricity Feed-in Act (Bechberger, 2000, p. 8; Hirschl, 2008, p. 133), which has been considered necessary in any case due to structural shortcomings of the regulatory framework, so the topic was already on the agenda. In the coalition treaty, SPD and Greens agreed: “Renewable energies […] have priority […]. This also requires non-discriminatory access to the grid through a clear legal regulation and the creation of fair market opportunities for renewable and domestic energies and a just distribution of costs for these sustainable energies. […] The new federal government will remove the remaining barriers that still today impede an increasing use of renewable energies” (SPD & Grüne, 1998, p. 22). At the time, in 1998, renewables made up for 4.5% of total electricity consumption (BMU, 2013a, p. 18). This share was earmarked to rise to compensate for the aspired nuclear phase-out and to fulfill international climate protection goals.

The Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz, short: EEG) was adopted by the Bundestag on 25 February 2000 by SPD, Greens and PDS against CDU/CSU and FDP, passed by the Bundesrat on 17 March 2000 and entered into force on 1 April 2000, in replacement of the 1991 Electricity Feed-in Act. It maintained basic elements of the existing regulatory framework yet entailed fundamental changes that constituted a paradigm shift in renewables policy (Bechberger, 2000, pp. 13-14; BSW, 2012c, p. 6), foremost a structurally enhanced tariff system and the introduction of the goal of dynamic renewables growth. In detail (WD, 2014, pp. 8-12):

**Basic Principles:** The EEG maintained the three core elements of the Electricity Feed-in Act: (1) the obligation for grid operators to connect renewable electricity systems to the grid; (2) the compulsory priority access of renewables to the grid; (3) granted feed-in tariffs over a period of 20 years.

**Tariff System:** In replacement of the former coupling to electricity market process, feed-in tariffs were now specified in absolute terms. The tariffs differentiated between technologies (photovoltaics, onshore and offshore wind, hydropower, biomass, geothermal energy, gas from sewage plants, mines or landfill), the size of the plant (smaller plants receive more, larger plants less remuneration) and electricity yield (wind power plants in low-wind areas receive higher tariffs than plants in strong-wind areas). These differentiations were targeted at the cost-covering operation plus a profit margin, up to a tariff of 51 ct/kWh for photovoltaics.
(in comparison with roughly 8.5ct/kWh heretofore). Offshore wind, geothermal energy and mine gas were newly inserted in the promotion framework.

The EEG furthermore introduced an annual gradual reduction ("degression") of tariffs for new installations put into operation after a certain cutoff date, in order to exert cost-pressure on manufacturers and hence to encourage technological innovation and cost reductions. Degression rates differed: 1% for biomass, 1.5% for wind and 5% for PV. For wind, a reference yield system was inserted: For the first five years, all wind power plants receive the same initial tariff, afterwards this initial tariff is paid further on for a certain time to low yield plants but reduced for high yield plants, meant to promote an even expansion of wind power also in weak-wind areas. For PV, a total cap of 350 MW maximum capacity eligible (later raised to 1,000 MW in 2002) should address concerns over exploding funding costs.

The economics ministry was assigned to issue a bi-annual Progress Report, in order to periodically adjust degression rates and tariffs to technological and market development and therewith avoid over-subsidization yet maintain sufficient incentives for further investments.

Expansion target: The EEG aimed at a “significant increase” of the share of renewables in electricity production and at least a doubling of the share of renewables in total energy production until 2010.

Compensation scheme: A nationwide compensation scheme stipulated that the funding costs are passed on from regional grid operators to electricity suppliers and evenly spread across all utilities, which pass them on to their customers in the form of a surcharge to the electricity price (so-called “EEG levy”). The “5% cap” in the Electricity Feed-in Act, that had led to unequal costs for grid operators and caused legal uncertainties, became redundant.

100,000 Roofs Photovoltaics Programme: In supplement, the 100,000 Roofs Photovoltaics Programme, starting in January 1999 with low-interest loans for 300 MW solar capacity, should overcome the initial investment barrier for homeowners and initiate an early growth phase for photovoltaics, building upon the experiences made with the earlier 1,000 Roofs Programme. Meeting unexpectedly high demand, credit institutes were overstrained with the high number of requests (Hirschl, 2008, p. 150). “The EEG and the subsidized loans did not merely complement each other, since the tariff of 51€ct per kWh was not sufficient to make the investment into a PV system cost-effective, it was the additional low-interest loan which made the investment viable. Hence, both instruments reinforced each other. The credit risk for solar systems was reduced by the feed-in tariff which in turn had a positive effect on the readiness of commercial banks to offer loans” (BSW, 2012c, p. 6). Hence, the combination of both instruments unfolded great effects on solar energy growth.
The fossil-nuclear coalition suffered a defeat. In the view of the incumbent power companies, the EEG was “mistaken in its very approach” and led to excessive subsidization. They had wanted not less than a totally different promotion model in the form of quotas or tax funding (Bechberger, 2000, p. 51). By contrast, environmental groups applauded the EEG as “the best what Red-Green has decided so far: a breakthrough for environmental and climate protection in Germany”, as Helmut Röscheisen put it, then secretary general of the federal peak organization of nature conservation and environmental protection associations (DNR) (neue energie, 1/2000, p. 10). The renewables branch expanded at a breathtaking pace and scale, along with technological leaps and considerable reductions in production costs (Gmelin, 2012, pp. 16-17; Hirschl, 2008, p. 150; Oschmann, 2004, p. 910). The share of renewables in electricity supply increased from 6.2% in 2000 to 9.3% in 2004, along with a rise in the EEG levy from 0.25ct to 0.54ct (BMU, 2013a, pp. 18, 38). Wind power and biomass tripled their production within four years only. Solar energy reached a great success, too, yet starting from a much lower level. For hydropower, the law only enabled the maintenance and modernization of old plants. With regard to geothermal energy, only first research and demonstration projects have been initiated due to particularly high investment costs involved.
An Unlikely Alliance vs. the Old Energy Industry

The pro-renewables coalition linked multiple stakeholders from a broad and heterogeneous spectrum as never before in national energy politics (Bechberger, 2000, pp. 51-52): renewables branch associations (such as the BEE), the metal workers union (IG Metall), the Farmers Association, environmental organizations, solar citizens’ initiatives and churches. Most remarkably, with the German Engineering Association (VDMA), also an important conventional industry sector was among those on board. The VDMA explicitly positioned against its umbrella organization, the Federal Association of German Industry (BDI). Also some corporations with renewables divisions, such as the oil company Shell with its “Shell Solar” photovoltaics manufacturing, took an open stance. In addition, also the large electricity supplier PreussenElektra (merged in 2000 to form E.ON) welcomed the nationwide compensation scheme as it suffered competitive disadvantages under the preceding regulation, and explicitly voiced this support in the course of parliamentary consultations. The IG Metall stressed that the EEG would create several ten thousands of new jobs and compensate for job losses in coal and nuclear power industry due to liberalization and rationalization. The integration of large diversity of economic and idealistic interest groups into a joint alliance with fairly high congruence in policy preferences meant the decisive actor for success (Bechberger, 2000, pp. 28-29, 51-52; Gmelin, 2012, pp. 58-66; BSW, 2012c, p. 5). The successful linkage of economic power and idealistic grounds, involving a broad range of actors with most of them relying on high levels of public trust, was key for lobby success.

At the time, the renewables industry lobby was de-facto non-existent. Branch associations were negligible in membership, poor in economic and financial resources, and highly fragmented in their organizational structure. The solar branch was divided into four competing associations (BSE, DFS, DGS and UVS), while the wind branch was split into three associations (Federal Association for Wind Energy, Federation of German Wind Power and Wind Power Trade Association), besides the VDMA as fourth player in the wind sector. Most renewables branch associations have been founded just shortly before in the mid-1990ies, and lacked financial means, lobby experience and political contacts alike. Intrinsically motivated SPD and Green politicians – foremost Hermann Scheer (SPD) and Hans-Josef Fell (Greens) – therefore dedicated much effort to actively forge alliances between and with the associations and to push them to develop coordinated positions and line up with proposals made by politicians rather than lobbying for genuinely own proposals (Fell, 2014, interview; Oschmann, 2014, interview). “The EEG was a pure brainchild, there was no business interests behind it”, as Eckhard Fischer, then SPD energy group coordinator
In the first place, it was not the renewables industry itself that pushed for cost-covering feed-in tariffs, but foremost SFV and Eurosolar, i.e. two essentially non-business solar groups, with the latter founded and chaired by the charismatic SPD energy politician Hermann Scheer (BSW, 2012c, pp. 4-5; SFV, 1999). Only after initial internal quarrels, the individual branches finally came up with coordinated concepts that came close to the ideas of the renewables enthusiasts among SPD and Greens (see Bechberger, 2000).

The economic coalition concentrated enormous economic power: Seemingly the united national industry firmly rejected the EEG, including the Federation of German Industry (BDI), the Association of German Electricity Industry (VDEW) and large energy suppliers. However, they appeared stricken by the loss of important dissenters: The VDMA, one of the largest members of the BDI, partnered up with the pro-renewables camp, which undermined the ability of the opponents’ ability to speak with a clear and unified voice (Dagger, 2009, pp. 65-66). The utility PreussenElektra endorsed the reform of the compensation scheme and, to this end, lowered its resistance to the EEG – and found itself in open conflict with RWE that benefited from the status quo, which meant a rare case of internal disagreement within the conventional electricity industry and impaired their persuasion power (Bechberger, 2000, pp. 51-52; Gmelin, 2012, p. 58; Hirschl, 2008, pp. 144-145).

Aside from erupting fragmentation, energy corporations did not spend much attention to the EEG. Their lobby capacities were reasonably absorbed by the parallel negotiations about the nuclear phase-out (see chapter 5.3), which they considered to have much more impact on their economic future (Bechberger, 2000, p. 51). However, the decisive factor was that the fossil-nuclear camp thoroughly underestimated the technological potential of renewables, misconceiving them as only suitable for negligible niches rather than as risk to the business model. EnBW CEO Gerhard Goll described renewables as “models for dollhouses” (Goll, 1999), and RWE board member Werner Hlubek believed that renewables would cover not more than 6% of electricity supply in 2005 and 10% in 2020 (Hlubek, 1996, p. 136) – in retrospect, a striking error of judgement. According to BDI energy expert Joachim Hein (2014, interview), all actors including the large business associations greatly underestimated the effects the EEG would unfold, falsely assuming that renewables were economically unfeasible and only something for “do-gooders”, and therefore did not quite try a lot to obstruct the reform. Following Hein, the expected small increase in renewables did not cause so much harm; hence neither the BDI nor the large utilities saw the need for counteractive lobbying. In line with this, also then SPD group energy advisor Eckhard Fischer (2013, interview) remarks that the large energy corporations did not even consider the EEG hazardous, since they assumed renewables to remain in a negligible niche and “nothing but nonsense”, and behave nearly neutral to the reform. Also Jochen Flasbarth (2014, interview),
then president of the environmental association NABU, confirms that the energy corporations missed to dedicate much attention to the EEG, as they assumed that renewables could never grow big.

Indeed, not only the industry completely underestimated the potential of renewables – so did almost the entire political and scientific community at the time (AEE, 2009; Hirschl, 2008, p. 59; Kern, Koenen & Löffelsend, 2003, p. 15). The CDU energy spokesperson Kurt-Dieter Grill made a mockery of the EEG when he said in the Bundestag debate that the EEG could most optimistically double the share of renewables to then 8%, which would still be sufficient to substitute conventional fuels (BT, 2000, prot. 14/91, p. 8492). But not only the opponents underestimated the renewables potential; in fact, the growth of renewables surpassed even the most optimistic expectations, including ambitious scenarios by environmental research institutes or studies commissioned by the Green-led environmental ministry substantially underestimated the future development of renewables (see figure 41). The widely held misperception of the technological potential of renewables constituted a key factor why the fossil-nuclear lobby has let the reform pass.

Fig. 41: Forecasts vs. Reality: Development of Renewables in Germany

Note: Blue thick line = real development. In TWh final energy. Source: AEE, 2009.
Economics Ministry vs. Parliament

In their ambitions for a committed renewables policy, the SPD/Green parliamentary groups met resistance of the economics ministry under former RWE/VEBA energy manager Werner Müller (independent, links to SPD) was in charge of energy policy, including renewables, while the environmental ministry under Jürgen Trittin (Greens) was barely involved at all.

In May 1999, shortly after the government took office, the preparations for the reform of the Electricity Feed-in Act began. The Green energy working group launched a discussion paper on 28 June 1999, which adopted some proposals voiced by renewables branch associations but also declined a number of other positions, such as the BEE’s demand to maintain the coupling of tariffs to market prices (a position that only changed in the ongoing process). The final Green basic points paper as of 23 August 1999 requested a reform as fast as possible, since many wind projects found themselves in danger due to the 5% cap and declining electricity prices, and earmarked specific tariffs substantially higher than the status quo, with the specific figures based on recent scientific studies. Only a specific PV tariff was not yet included, as a costly PV tariff was controversially discussed and could impede the further discussion. Shortly thereafter, also the SPD energy working group issued a basic points paper, with in large parts overlapping positions. However, the paper also included an alternative proposal of a variation of a quotas model, yet an idea that was soon set aside as the SPD economic politicians gave in to the EEG proponents. The Federal Association for Renewable Energy (BEE) promptly reacted with a coordinated position as of 5 September 1999, wherein the BEE still pushed for a coupling of the tariffs to market prices in combination with a minimum remuneration. With regard to PV, it proposed a cost-covering tariff of only 24.48 Pf – a relatively low figure – in combination with a 100,000 roofs loan programme (Bechberger, 2000, pp. 19-25).

In first meetings with incumbent parliamentary groups in September and October 1999, the economics ministry still assumed a collaborative approach and agreed to several positions of environmental politicians and the renewables branch, such as the differentiation of tariffs between technologies, the objection of coupling of remuneration to electricity prices, or the inclusion of additional sources such as geothermal energy. Also with respect to the reform of the flawed "5% cap" in the Electricity Feed-in Act, the ministry appeared open to find a fast solution, also to respond to then virulent court proceedings. However, the ministry seemed to intentionally delay the drafting of the first law proposal, refused to send working drafts to parliamentarians and made only vague statements in response to parliamentary inquiries. Eventually, the Greens received the working drafts not from the economics ministry but from BWE and PreussenElektra that had been consulted in the drafting process. In the course of the ongoing drafting process, the economics ministry rejected more and more of the
guidelines set by the incumbent parliamentary groups. While the first official working draft still came close to the parliamentarians’ proposals, the second draft removed geothermal energy and dropped the solar tariff, and the final draft as of 25 November 1999 only provided for a very low solar tariff of 16.5 Pf (in comparison to 25 Pf in the initial version) and for a sharp degression of 5% per year for all energies – contrary to the demands by parliamentarians (see in detail: Bechberger, 2000, pp. 26-36). Economics minister Müller furthermore sought to delay the reform with reference to judicial issues under EU state aid law, which would need clarification before the law could enter into force.12

In response to the increasingly obstructive behavior of the economics ministry, a handful of Green and SPD environmental politicians finally draw the lead to themselves and drafted an own law proposal, largely overlooking the ministry. Specialized politicians of the incumbent parliamentary groups acted as leading figures: Hans-Josef Fell (Green spokesperson for research policy), Michaele Hustedt (Green spokesperson for energy policy), Hermann Scheer (no prominent group function; president of Eurosolar) and Dietmar Schütz (SPD deputy spokesperson for energy policy). Building upon the existing drafts, they launched their own proposal on 13 December 1999, for the first time under the new name “Renewable Energy Sources Act” instead of “Electricity Feed-in Act”, meant to highlight the paradigm shift envisaged from a mere grid regulation to a renewables promotion framework. In comparison with the ministry’s version, the new draft included geothermal energy, raised the tariffs for biomass and wind power, and drastically increased the PV tariff to 99 Pf (compared against 16.5 pf in the ministerial draft). Aiming at addressing concerns over excessive subsidization, a maximum PV capacity of 350 MW was introduced (Bechberger, 2000, pp. 28-53; Dagger, 2009, pp. 75-76; Stefes, 2013, p. 14; Illing, 2012, p. 198).

Finally, the government approved the parliament’s law proposal in the absence of economics minister Müller who found himself overruled by the parliament. In the course of the law formulation, Green group leaders and the Green environmental minister Jürgen Trittin constantly intervened with Chancellor Gerhard Schröder to secure his support for the reforms. Aside from this, the environmental ministry was otherwise barely involved (Fell, 2014, interview). Müller eventually conceded to accept the revised law: “We want to use the reform that is necessary anyhow to produce substantially more electricity from renewable energies. […] I personally have no objection against more attractive tariffs in this sector” (BT, 1999, prot. 14/79, p. 7243).

Although the SPD group was not as committed to the EEG as the Greens, the group gave in to the proponents around Hermann Scheer, as they did not expect the EEG to evoke large costs given the limited market potential of renewables (Fischer, 2013, interview),13 and furthermore grounded on reasons of climate protection and job creation (Schütz, cited in AEE, 2010, p. 11). After all, the political conflicts were less severe between the Greens vis-à-
vis the SPD than between the incumbent parliamentary groups vis-à-vis the “own” economics minister (Bechberger, 2000, pp. 51-53; Hirschl, 2008, p. 147).

Different from the 1990/91 Electricity Feed-in Act, CDU/CSU and FDP opposed the EEG as they held the high renewables growth targets for utterly illusory. However, a few dissenters from the environmental wings of the opposition parties supported the EEG, amongst them Dietrich Austermann (CDU), Peter Ramsauer (CSU) and Walter Hirche (FDP), who launched a joint declaration together with Scheer, Schütz and Hustedt in support of the EEG (Bechberger, 2000, pp. 39-40; Hirschl, 2008, p. 146).

It was decisive that the parliamentarians did not have to set up the EEG from scratch but could build upon legislation in place. “Prior experiences with the StrEG [i.e., the Electricity Feed-in Act] proved crucial in getting the EEG on paper and through the Bundestag. Without the StrEG, the EEG would have been much less ambitious and probably less successful. The EEG therefore did not mean a fresh start, but the continuation of an already chosen path” (Stefes, 2013, p. 16). Also the evaluation of feed-in tariff systems introduced on a communal scale proved helpful in the design of a similar system on national level (BSW, 2012c, p. 5). Policy heritage therefore created new path dependence with positive feedback effects. In addition, also the parallel nuclear phase-out negotiations reinforced the search for alternative energies to compensate for the shutdown of nuclear power plants. Given the climate protection targets laid down in the Kyoto treaty, in EU law and in national legislation, fossil fuels with their high specific greenhouse gas emissions were not suitable to substitute nuclear power; only renewables could fill in the gap (Stefes, 2013, p. 16). This gave environmental politicians convincing arguments to push for enhanced renewables funding.

**Bundesrat: “Buying-Out” of opposing State Governments**

The EEG was subject to mandatory consent legislation, as it assigned jurisdiction to the courts on state level. Originally, parliamentarians had deliberatedly sought to design the law in a way that it would not require the Bundesrat’s approval, facing incongruent party majorities in the chamber. Purely due to a sloppy mistake in law formulation, the need for approval arised (Fell, 2014, interview).

Notwithstanding lacking party majority, the Bundesrat approved the reform on 17 March 2000 with 41 out of 69 votes, as also the CDU-governed Thuringia voted in favor (Bechberger, 2000, p. 50; Bundesrat, 2000). As Thuringia was home to solar cell factories, the solar promotion turned into a regional economic interest to the state, thus environmental politicians and local industries were able to convince the state government to support the EEG (Fell, 2014, interview).
Also state governments had to be accommodated to secure their approval of the EEG and other environmental policies at stake, despite congruent party composition. Most striking, the so-called “GuD compromise” (GuD, short for “Gas- und Dampfkraftwerke”, i.e. gas power plants with the efficient cogeneration of power and heat) tied up a package deal to secure the approval of the SPD-governed North Rhine-Westphalia: Parallel to the EEG, negotiations about the ecological tax reform took place, impeded by North Rhine Westphalia regarding the exemption of natural gas power plants from eco-taxes if run in efficient combined-cycle power plants. In the first place, a temporary exemption was planned for power plants with an efficiency of at least 55%, later intensified to 57.5%, i.e. the limits of technological feasibility, on initiative of the SPD coal wing striving to safeguard coal power against gas power plants. However, the SPD prime minister of North Rhine Westphalia, Wolfgang Clement, was still concerned over the economic viability of the coal project Garzweiler II. Clement therefore pressed to insert an additional time limit for the commissioning of new gas power plants and threatened to otherwise block the ecological tax reform in Bundesrat. On 22 November 1999, the coalition leadership accepted Clement’s demand. In turn, the Greens that had pushed for the more climate-friendly gas power were accommodated with a concession in the EEG reform: a high PV tariff of 99 Pf/kWh, yet coupled with a cap on the maximum capacity eligible to address concerns over excessive subsidization costs (Bechberger, 2000, pp. 32-34; Gmelin, 2012, p. 15). Another path to secure the support of North-Rhine Westphalia for solar energy in the EEG was the involvement of North-Rhine Westphalian’s prime minister Wolfgang Clement in the inauguration of the solar cell factory in Gelsenkirchen, North-Rhine Westphalia, built by the oil company Shell in 1999, where Clement sought to present himself as modernizer and promoter of innovative technologies. On the initiative of the Green parliamentarian Hans-Josef Fell, Shell contacted Clement’s speechwriter and asked to mention a PV tariff of 99 Pf in the opening speech. Clement indeed publicly committed to this claim, to the disapproval of economics minister Werner Müller who was also present at the opening. With the support by Clement, the renewables alliance secured the approval of a key figure in the SPD (Fichtner & Werner, 2010; Fell, 2014, interview).

**Interim Summary**

The pro-renewables coalition prevailed, although the renewables industry lobby was weak and fragmented and did not engage in relevant lobby efforts, whereas the opponents of renewables promotion – conventional electricity suppliers and the largest part of industry – suffered a defeat, even though they relied on high conflict and organizational capacity. This unexpected policy result is in need of explanation.
The key factor for success was the dedicated commitment of a small group of parliamentarians who forged an alliance between various business groups, unions as well as environmental associations and other idealistic interest groups. This collaboration of economic and idealistic interest groups helped to argue with jobs and economic advantages on the one hand and to rely on high levels of trust – i.e. the positive public reputation of environmental NGOs – on the other hand. In contrast, the camp of opponents was fragmented, since industry associations (VDMA), unions (IG Metall) and electricity suppliers (Preussen Elektra) supported the swift reform of the outdated Electricity Feed-in Act. The Economic Coalition of conventional electricity suppliers and industry relied on high conflict and organizational capability; however, negotiations over the nuclear phase-out absorbed their lobby efforts. Furthermore, the support of parts of industry and of unions for the EEG diminished the cohesion of the opponents.

As favorable framework conditions, the parallel negotiations over a nuclear phase-out gave a reason to promote renewables in order to substitute for nuclear energy. In addition, the pre-existing Electricity Feed-in Act was in urgent need for reform anyway due to virulent legal uncertainties and market disruptions.

Without the pre-existence of the 1990/91 Electricity Feed-in Act the smooth success of pro-renewables would have been hard to imagine, as parliamentarians did not have large capacities available to draft a completely new law solely on their own without the administrative support from the ministerial bureaucracy. The political heritage of the Electricity Feed-in Act had created a constituency of a few industry companies and plant operators who pushed for improvements, and the experiences gathered and the need for reform facilitated the preparations of the EEG. In that way, an apparently incremental policy reform in 1990/91 triggered new path dependence and helped to bring about consecutive, more far-reaching policy change.

The divide ran through political parties rather than between parties: In a cross-party alliance, politicians from SPD, Greens, CDU/CSU and FDP pressed for the EEG, whereas the Green environmental minister was of lower relevance as he had no competence in renewables policy, and incumbent SPD and Green politicians positioned themselves against the obstructive behavior of the own economics minister. Rather than party membership, his affiliation to the environmental or economic wing within a party was vital for the positioning of a politician. This issue dualism underlines the striking inner fragmentation and inconsistency of decision-making within political parties and the government alike.

Although the Bundestag had striven to circumvent the Bundesrat and design the EEG in a way that it does not require the approval of the chamber of states; in spite of this strategy of veto avoidance, the law became subject of mandatory legislation due to technical errors. Environmental politicians needed to “buy out” the SPD state government of North Rhine-
Westphalia to give her consent to the EEG in intra-party negotiations as well as the Bundesrat, while the CDU-governed Thuringia gave her consent despite different party affiliation and opened up the way for the EEG to survive the Bundesrat. For the states, particular regional interests – in Thuringia, the promotion of the domestic solar industry – was of more importance for political positioning than the party composition.


After the federal elections in 2002, the SPD/Green government remained in office. The SPD lost votes (–2.4% down to 38.5%) whereas the Greens gained votes (+1.9% up to 8.6%). This electoral shift strengthened the Greens who could successfully assert the transfer of leading responsibility for renewables policy from the economics to the environmental ministry. Wolfgang Clement (SPD) now headed the economics ministry, while environmental minister Jürgen Trittin (Greens) remained in office.


- implementation of EU law,\(^\text{15}\) mainly legal formalities such as the definition of renewables or proof of origin of electricity produced,
- compensation for the expiration of the 100,000 Roofs Programme for photovoltaics,
- cost relief for electricity-intensive industries, in the light of rising EEG cost burdens,
- continuation and specification of growth targets, as renewables had expanded faster than anticipated.

First EEG Amendment: Special Equalisation Scheme (2003)

The first EEG amendment as of 16 July 2003 introduced the Special Equalisation Scheme (\textit{Besondere Ausgleichsregelung}), meant to unburden electricity-intensive industries from the rising EEG levy.\(^\text{16}\) Since then, companies were eligible for cost relief if they fulfill three criteria (WD, 2014, pp. 11-12):
• electricity consumption of more than 100 GWh/a,
• electricity expenses of more than 20% of gross value added,
• considerable impairment of competitiveness of the company.

The Special Equalisation Scheme should avoid that the EEG substantially impairs the competitiveness of the industry and lower the opposition of industries against the EEG. The scheme redistributed the EEG levy from privileged to non-privileged consumers whose surcharge correspondingly rises. The benefits for electricity-intensive companies hence directly increased the costs for all other companies as well as private households. However, the strict criteria allowed only a low two-digit number of companies to apply for exemptions.

The Special Equalisation Scheme was introduced as the result of pressure by the economics ministry. In exchange for the environmental politicians’ consent, economics minister Wolfgang Clement agreed to the establishment of a regulatory authority for the electricity market (Dagger, 2009, pp. 78-79; Reiche, 2004, p. 153).

During the preparation of the law, quite the entire German industry and power suppliers stood up for more far-reaching exemptions for industrial consumers. Proponents included the Federation of German Industry (BDI), the Association of the Chemicals Industry (VCI), the Industrial Energy Association (VIK), the Association of German Electricity Industry (VDEW), the Metals Producers Association (WVM), and individual energy-intensive companies such as the HydroAluminium aluminium producer. In addition, they criticized that the governmental draft was overly bureaucratic and did not provide sufficient investment security, in particular the case-by-case assessment and discretionery power by the Federal Office of Economics and Export Control (Bundesamt für Wirtschaft und Ausfuhrkontrolle, BAFA) that was in charge to decide if a company is eligible or not. They also firmly rejected the criterion “impairment of competetiveness” due to the lack of legal definition of the term (VIK, 2003; WVM, 2003; BDI, 2003a; Hydro Aluminium, 2003; VDEW, 2003).

Environmental and renewables associations remained rather passive and did not speak with a unified voice. The Federal Association for Renewable Energies (BEE) opposed the Special Equalisation Scheme per se, arguing that it violated the polluter-pays-principle and met acceptance problems of all non-privileged costumers. If such as cost relief is introduced at all, privileges should be limited to a small number of large electricity-intensive companies exposed to intense international competition, proven in a case-by-case assessment (BEE, 2003). The IZES research institute, close to the environmental movement, similarly supported the limitation of exemptions to the most affected industries in order to keep the redistributive effects within limits, and therefore held the government proposal suitbale; adjustments could be made in further reforms if necessary (IZES, 2003). The German Confederation of Skilled Crafts (Zentralverband des Deutschen Handwerks, ZDH),
welcoming the “important economic potential” of renewables for skilled crafts, objected privileges for large consumers at the expense of smaller consumers. If an exemption is granted, it should cover all companies (ZDH, 2003). The Association of German Transport Companies (Verband Deutscher Verkehrsunternehmen, VDV) claimed exemptions for trains and trolleybusses to secure the competetiveness of environmentally friendly means of transportation (VDV, 2003).

The Bundestag’s environmental committee passed the government draft with a small modification (fixed surcharge limitation to 0.05 ct above 100 GWh instead a legally uncertain formulation of “up to” 0.05 ct), following the proposal made by the Bundesrat. SPD and Greens argued that the scheme would provide for necessary exemptions in individual cases yet avoid a needless increase of the burdens for remaining customers. CDU/CSU and FDP, in contrast, shared the criticism brought forward by the industry, arguing that the provisions were insufficient, arbitrary and legally uncertain (BT, 2003, doc. 15/1121).

Table 26: Constellation of Interests and Policy Output (First EEG Amendment)

<table>
<thead>
<tr>
<th>Economic Coalition</th>
<th>Environmental Coalition</th>
<th>First EEG Amendment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Equalisation Scheme</td>
<td>surcharge reduced to 0.05 ct/kWh &gt; 10 GWh if share of electricity costs &gt; 5% of gross value added and to 0.025 ct/kWh &gt; 100 GWh if electricity costs &gt; 10% (BDI/VIK)</td>
<td>no joint position</td>
</tr>
<tr>
<td></td>
<td>threshold of 4% electricity costs instead of 5% gross value added (VDEW/VCI)</td>
<td>BEE: against Special Equalisation Scheme per se; if introduced: surcharge reduced to approx. 0.1 ct/kWh &gt; 1 TWh</td>
</tr>
<tr>
<td></td>
<td>legally certain provisions, no discretionary power</td>
<td>IZES: surcharge reduced to 0.05 ct/kWh with restrictive thresholds (100 GWh and 20% electricity costs in gross value added)</td>
</tr>
<tr>
<td></td>
<td>no criterion for “impairment of competetiveness”</td>
<td>discretionary power is necessary for case-to-case assessments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>inclusion of trains and trolleybusses in Special Equalisation Scheme</td>
</tr>
</tbody>
</table>

0.05 ct >100 GWh/a electricity costs >20% of gross value added

impairment of competetiveness must be proven
discretionary power


Second EEG Amendment: PV Interim Act (2003)

The PV Interim Act\(^\text{18}\) as of 22 December 2013 raised the PV tariffs with effect from 1 January 2004, in particular for small rooftop installations, as for to compensate for the discontinuation of the low-interest loans under the expiring 100,000 Roofs Programme that exhausted its funding volume faster than planned and ended ahead of the scheduled date already on 30 June 2003. With the discontinuation of loans, a market disruption and the collapse of PV sales threatened. Moreover, the entry into force of the periodic EEG Reform scheduled for 1
January 2004 was delayed due to lengthy negotiations. Therefore the PV tariff adjustments were advanced (Reiche, 2004, p. 152). Although the 100,000 Roofs Programme carried forward the successful market introduction of PV, it was associated with a certain level of investment insecurity as it was tied to annual budget reservations and limited in time and funding volume, which impeded larger industrial investments. The PV Interim Act abated the investment risk and kicked off a boom of the solar industry in an unexpected dimension (BSW, 2012c, pp. 6-8). In detail, the amendment enacted the following provisions:

- PV tariffs were raised to balance for the expiration of the 100,000 Roofs Programme.
- A system of differentiated tariffs along size ranges of PV installations was introduced, raising the tariffs for small installations and cutting the tariffs for large installations, to ensure that all investors receive even profit margins since large installations have cheaper investment costs per capacity unit. A further differentiation was made between systems mounted on roofs, fronts and open areas.
- Also large freestanding PV systems were now eligible for remuneration, through the removal of the former 100 kW size limitation.
- The cap on PV maximum capacity eligible for remuneration (1,000 MW) was removed.
- The degression remained at 5% per year.

The PV Interim Act was the result of a parliamentary initiative to avoid a PV market disruption (Dagger, 2009, p. 77; Oschmann & Müller, 2004, p. 26; Fell, 2014, interview). The parliament refrained from an expert hearing; only one session of the environmental committee took place (BT, 2003, doc. 15/2084). Besides incumbent parties SPD and Greens, also the CDU/CSU voted in favor of the law as for being matter of industry policy and with reference to their overall support of solar energy. Even more so, solar energy was regarded as promising economic mainstay for farmers in the CDU stronghold state Baden-Württemberg and the CSU stronghold state Bavaria (Dagger, 2009, pp. 77-78; Evert, 2005, p. 74). The Bundesrat refrained from calling the mediation committee in order to preserve the developing solar industry (BR, 2003, doc. 881/03).

Table 27: Constellation of Interests and Policy Output (Second EEG Amendment 2003)

<table>
<thead>
<tr>
<th>Economic Coalition</th>
<th>Environmental Coalition</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>no specific claims; overall against the inclusion of PV in the EEG and for lower tariffs</td>
<td>higher tariffs to compensate for expiring 100,000 roof programme, differentiation: higher tariffs for small PV systems, lower tariffs for large PV systems; further differentiation between systems on roofs, fronts and open areas, inclusion of large freestanding PV systems, abolishment of PV cap</td>
<td>higher tariffs to compensate for expiring 100,000 roof programme, differentiation: higher tariffs for small PV systems, lower tariffs for large PV systems; further differentiation between systems on roofs, fronts and open areas, inclusion of large freestanding PV systems, abolishment of PV cap</td>
</tr>
</tbody>
</table>

Sources: own table, based on BSW, 2012c, pp. 6-8.
The EEG 2004 replaced the EEG 2000 with effect from 1 August 2004. In October 2003, the environmental ministry released the first preliminary proposal, followed by negotiations with the economics ministry. After parliamentary debate and a number of changes by the environmental committee, the Bundestag passed the final version on 2 April 2004. The Bundesrat called the mediation committee on 14 May 2004, which hammered out a compromise on 17 June, finally approved by both chambers (BT, 2004, doc. 15/2539, 15/2327, 15/2845, 15/3385, prot. 15/103, p. 9336; BR, 2004, doc. 15/04, 290/04, 512/04). Due to initial attempts for a cross-party consensus, internal disagreements within the CDU/CSU, and negotiations with the Bundesrat, the amendment entered into force late with effect from 1 August instead of 1 January 2004 as originally scheduled (Dagger, 2009, p. 83; Evert, 2005, p. 83; Reiche, 2004, p. 158).

The basic promotion framework remained unaffected (i.e. obligatory priority feeding into the grid and fixed tariffs for 20 years), thus a fundamental course change did not occur. However, the tariff structure was substantially modified and more differentiated, as for to better relate to the economic viability of different power plants. Tariffs for biomass, solar and geothermal energy were improved, whereas tariffs for onshore wind and small hydropower were reduced, based upon the government’s progress report. Many new detailed regulations were made to account for increasing market complexity, minimize unjustified windfall profits and strengthen incentives for innovation and cost-reduction. Moreover, industry privileges were extended. With new bonuses, new size categories and more differentiated degression rates, the EEG became more complicated, mirrored in the number of paragraphs going up from 13 to 21. In detail, the following changes have been enacted (Oschmann & Müller, 2004; BMU, 2004d; Oschmann, 2004):

**Expansion target:** The expansion target was specified, elevated and continued: The share of renewables should now increase to at least 12.5% in electricity production until 2010 (in comparison: EEG 2000: “significantly increase”) and to at least 20% until 2020.

**Solar:** The tariff for rooftop-mounted PV systems was raised along different size ranges (57.4ct below 30 kW, 54.6ct below 100 kW, 54.0ct above 100 kW), supplemented with an additional bonus of 5.0ct for integrated facade systems. Freestanding systems are only remunerated if built outside of ecologically sensitive areas and adherent to a communal land-use plan, with a higher degression of 6.5% (in comparison to 5.0% for other PV systems).

**Onshore wind:** The tariffs for new onshore wind power plants were slightly reduced: the initial tariff was cut by 0.1ct to 8.4ct, the base tariff by 0.5ct to 5.5ct. This was meant to take the technological progress of wind energy into account and avoid over-subsidization in strong-wind coastal areas. The degression was intensified to 2% (previously: 1.5%). The eligibility
was tied to a minimum reference yield of 60% of a defined electricity production amount; this requirement must be proven in the planning process to receive EEG remuneration. Thereby, the construction of wind power plants in weak-wind areas in the inland should be prevented. The repowering, i.e. the replacement of old and less efficient plants by modern and larger plants, was better incentivized.

Offshore wind: Aiming at the swift build-up of offshore wind parks in the deep sea and given the stagnation in construction efforts, the conditions were enhanced. The deadline for new constructions eligible for the high initial tariff of 9.1ct was postponed from 2006 to 2010. The larger the distance to the shore, the more the initial period is extended before the lower base tariff of 6.18ct applies. The degression was set to start only in 2008. Wind parks must be located outside of nature conservation and bird protection areas.

Biomass: Small installations were better incentivized. Therefore, a new size category of small systems below 150 kW with a relatively high tariff was introduced (previously, the smallest size category has been at 500 kW). Also tariffs for larger biomass systems were enhanced along different size categories (11.5ct up to 150 kW, 9.9 ct above 500 kW, 8.9ct up to 5 MW, 8.4ct up to 20 MW). The degression was strengthened to 1.5% (previously: 1%). In addition, a new system of special bonuses supplemented the base tariffs:

- **fuel bonus** for the incineration of renewable raw materials, i.e. special energy crops as well as plant residues from agriculture and forestry (so-called „Nawaro“, abbreviation for “Nachwachsende Rohstoffe”). By then, biomass plants could only be economically operated with old wood or cheap organic waste that did not have to be purposefully produced at first. The fuel bonus amounted to 6.0ct up to 500 kW and 4.0ct up to 5 MW, paid additionally to the base tariff. For wood incineration, a bonus of 2.5ct applied.
- **cogeneration bonus** for electricity produced in combined heat and power coupling, an efficient means of energy generation, amounting to 2.0ct.
- **technology bonus** for certain innovative technologies (e.g. thermochemical gasification, fuel cells, gas turbines, organic-rankine-systems), amounting to 2.0ct.

Small hydropower: The tariffs for hydropower were raised by 2ct to 9.67ct for small plants up to 500 kW, and remained unchanged at 6.65ct for medium-sized plants up to 5 MW. The tariff was also granted to modernizations or extensions of existing plants. A degression remained nonexistent due to the maturity of the technology. The previously exceptionally unlimited funding period was limited to 30 years. Small hydropower plants now had to fulfill nature conservation criteria to be eligible for EEG remuneration; precisely, a “good ecological status” under water law had to be achieved or improved. This was meant to create a balance between the energetic use of rivers and human interferences in natural waterways.
Large hydropower: Large hydropower plants above 5 MW up to 150 MW were newly inserted in the promotion scheme, eligible under three conditions: modernization or extension completed until end of 2012, increase of electrical working capacity by at least 15%, and improvement of ecological status. The remuneration is only paid for the additional electricity production through modernization and declines along capacity categories from 7.67ct for the smallest category to 3.70ct for the largest size category. The funding period was limited to 15 years, the degression set to 1%.

Geothermal energy: Aiming at the promotion of the market introduction of a so far poorly developed technology, the tariffs for geothermal energy were significantly improved as well as differentiated between size ranges: 15ct (up to 5 MW), 14ct (up to 10 MW), 8.95ct (up to 20 MW), 7.16ct (above 20 MW). A soft degression of 1% was introduced, starting in 2010.

Special Equalisation Scheme: The cost relief for industry was considerably extended, as eligibility criteria were relaxed (minimum consumption of 10 GWh/a instead of 100 GWh/a; share of 15% instead of 20% minimum share of electricity costs in gross value added; removal of the criterion “impairment of competitiveness”). Moreover, the exemptions now also applied to track railways as an environment-friendly means of transportation. In combination, a redistribution cap was introduced: As the industry privileges lead to an increase of the EEG levy for non-privileged consumers, this increase was limited to 10%.

Other: The amendment clarified some legally uncertain provisions and strengthened the legal position of renewable power plant operators against grid operators such as by the elimination of obligatory contracting and more transparency and legal certainty in grid connection costs.

Table 28: Constellation of Interests and Policy Output (EEG 2004)

<table>
<thead>
<tr>
<th>Promotion framework</th>
<th>Economic Coalition</th>
<th>Environmental Coalition</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed-in tariffs should be lowered, made more degressive and limited in time</td>
<td>At least 12.5% until 2010 and 20% until 2020</td>
<td>Maintain EEG basic system</td>
<td>Maintain EEG basic system</td>
</tr>
<tr>
<td>Feed-in tariffs to be substituted by tender invitations or cost coverage from tax funds (instead of a electricity price surcharge) or premium payments in addition to the market price</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target</td>
<td>Overall promotion of renewables; against specific expansion targets</td>
<td>VDMA: open Special Equalisation Scheme for medium-sized companies</td>
<td></td>
</tr>
<tr>
<td>Special Equalisation Scheme</td>
<td>0.1ct &gt; 1 GWh/a</td>
<td>0.05ct &gt; 100 GWh/a and electricity costs of &gt;5% in gross value added</td>
<td>0.05ct &gt; 10 GWh/a and electricity costs &gt;15% of gross value added</td>
</tr>
<tr>
<td></td>
<td>0.05ct &gt; 100 GWh/a and electricity costs of &gt;5% in gross value added</td>
<td>Eliminate criterion „impairment of competitiveness“</td>
<td>Criterion of „impairment of competitiveness“ eliminated</td>
</tr>
</tbody>
</table>

VDMA: Verein Deutscher Maschinen- und Anlagenbau
<table>
<thead>
<tr>
<th>Sector</th>
<th>Details</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no deductible in relative terms above threshold</td>
<td>deductible of 10% of electricity consumption (only for new companies; no deductible for companies eligible under the previous Scheme)</td>
</tr>
<tr>
<td></td>
<td>no redistribution cap</td>
<td>redistribution cap of 10%</td>
</tr>
<tr>
<td></td>
<td>may include railway tracks and services</td>
<td>inclusion of track railways</td>
</tr>
<tr>
<td>PV</td>
<td>to be excluded from EEG (instead: R&amp;D); no additional tariff increases</td>
<td>rooftop-mounted PV systems: 57.4ct below 30 kW 54.6ct below 100 kW 54.0ct above 100kW depression: 5%</td>
</tr>
<tr>
<td></td>
<td>integrated facade systems: additional 5.0ct</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(no written statement available)</td>
<td>freestanding systems: no ecologically sensitive areas, accordance with communal land-use plans depression: 6%</td>
</tr>
<tr>
<td>onshore wind</td>
<td>minimum yield of 65% of reference value</td>
<td>minimum yield of 60% of reference value</td>
</tr>
<tr>
<td></td>
<td>no further specific claims</td>
<td>base tariff: 5.5ct initial tariff: 8.7ct</td>
</tr>
<tr>
<td></td>
<td></td>
<td>depression rate: 2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>repowering: repowering: blanket period of 24 months as in draft appropriate; condition: twofold increase in capacity</td>
</tr>
<tr>
<td>offshore wind</td>
<td>to be excluded from EEG (instead: tender invitations)</td>
<td>initial tariff: 9.1ct if in operation until 2010 (previously: until 2006); longer with larger distance to shore and water depth base tariff: 6.19ct</td>
</tr>
<tr>
<td></td>
<td>no exclusion of nature protection areas</td>
<td>first degression in 2008</td>
</tr>
<tr>
<td></td>
<td></td>
<td>exclusion of nature protection areas</td>
</tr>
<tr>
<td>biomass</td>
<td>strengthen degression (from 1% to 2%)</td>
<td>degression: 1.5%</td>
</tr>
<tr>
<td></td>
<td>reduce funding period (from 20 years to 15 years)</td>
<td>funding period: 20 years</td>
</tr>
<tr>
<td></td>
<td>no technology-specific bonuses</td>
<td>11.5ct up to 150 kW, 9.9 ct above base tariffs: 11.5ct ≤150kW 9.9ct ≤500kW 8.9ct ≤5MW 8.4ct ≤20MW five categories of system sizes; incl. new category of &lt;150kW promoted with higher tariff of 11.5ct</td>
</tr>
<tr>
<td></td>
<td>least differentiation between system sizes</td>
<td>no reduction in funding period (remain at 20 years)</td>
</tr>
<tr>
<td></td>
<td>no ecological criteria</td>
<td>increase base tariffs (above the tariffs proposed in the draft) and for all systems &lt;20MW at least three categories of system sizes; incl. new category of small systems &lt;150kW fuel bonus: solid biomass:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11.5ct ≤150kW 9.9ct ≤500kW 8.9ct ≤5MW 8.4ct ≤20MW five categories of system sizes; incl. new category of &lt;150kW promoted with higher tariff of 11.5ct</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>hydropower</td>
<td>no ecological criteria</td>
<td>equal treatment of small and large hydropower (e.g. same funding period)</td>
</tr>
<tr>
<td></td>
<td>no inclusion of large hydropower (VfK) vs. inclusion of large hydropower and least restrictions (no thresholds) (VDEW)</td>
<td>no inclusion of large hydro</td>
</tr>
<tr>
<td></td>
<td>increase tariffs (1-50kW: 10.23ct instead of 7.67ct; 51-100kW: 9.1ct instead of 7.67ct; 101-5000kW: no changes); no degression</td>
<td>tariffs in draft appropriate; degression 5%</td>
</tr>
<tr>
<td>geothermal energy</td>
<td>to be excluded from EEG (instead: R&amp;D, individual demonstration projects)</td>
<td>(no written statement available)</td>
</tr>
</tbody>
</table>

Result: Success for Renewables Coalition, Cost Relief for the Industry

The pro-renewables coalition could achieve a clear victory, assert most of its preferences and overall improve the funding conditions. When nature conservation conflicted with renewables growth, the default solution applied was to promote renewables but coupled to certain ecological requirements. The EEG 2004 granted significantly more favorable conditions to PV, biomass (in particular: small farm systems and new technologies), offshore wind and geothermal energy, whereas onshore wind and small hydropower rather defended the status quo (Dagger, 2009, p. 83; Lauber & Mez, 2004, p. 611). Solar power generation thereupon multiplied from 550 GWh in 2004 to 4,420 GWh in 2008 (AEE, 2010, p. 38). Biogas power production tripled to 23,000 GWh in 2008, as the raised tariffs in combination with the bonuses system enhanced the economic profitability. In particular, the fuel bonus made biogas attractive while food crops prices were declining. Demand for corn as fermentation substrate increased. Farmers benefited as operators of biogas facilities or as suppliers of raw materials (ibid., p. 46). Wind power continued its growth, though not as
thriving as in previous years. Hydropower rather stagnated, also due to new ecological criteria that were associated with higher construction costs (ibid., p. 22).

Turning to the development promotion costs, a solid assessment was hardly possible at this point in time, as all projections were dependent on future market development in a highly dynamic and volatile environment. Yet it was foreseeable that the rather weak provisions for cost limitation (higher degression, minimum reference yield for wind power plants) would be (over-)compensated by the new stimuli inserted (special bonuses for wind power and biomass) and the partially higher tariffs, with the consequence of a higher EEG levy.

The economic coalition was not capable to exert visible influence, with the exception of extended cost relief for electricity-intensive industries (Dagger, 2009, p. 83; Evert, 2005, p. 83), whereas fossil-nuclear energy corporations were sent away empty-handed. The reform of the Special Equalisation Scheme went not as far-reaching as the maximum demands of industry groups, yet was substantially extended and took the industry’s preferences into account fairly well. By then, only about 40 companies with approx. 26,000 GWh have been eligible, foremost from chemical, steel and metals industry. With the 2004 reform, 120 to 350 companies with electricity consumption of 45,000 to 144,000 GWh were estimated to be eligible (BT 2004, doc. 15/2370, pp. 2, 7-9; VIK, 2004, p. 21). Eventually, the privileged share therewith has climbed from previously 4% to now 9% of the total EEG electricity volume (Illing, 2012, p. 102). Since the industry claimed unbearable burdens imposed by the risen EEG levy, politicians were willing to limit undesired negative economic impacts without compromising the renewable energy transition.

**Advocacy Coalitions and Lobby Efforts**

The EEG remained highly contested. Large parts of the industry and the big energy corporations stood up against the feed-in tariffs that already had begun to unfold their impact on the energy market. They had immense economic power and financial resources at their strong ties to policymakers stemming from the corporatist tradition of interest intermediation. Energy-intensive industries and conventional energy suppliers firmly opposed the EEG as a whole, criticizing the excessive over-subsidization of expensive technologies at the expense of the general public. All the more so, they argued that the EEG would turn into a ecologically useless yet economically costly instrument as soon as the European Emission Trading Scheme entered into effect in 2005 and imposed an absolute cap in climate gas emissions, which made any additional expenses for climate protection redundant and pointless (BDI, 2004, pp. 16, 37; see also: BMWA, 2004). As suitable alternatives, the proposed a EU-wide tender system, tax funding or premium payments to supplement the market price (VIK, 2004, pp. 11-12, 28, 36; VDEW, 2004, p. 25). Nonetheless, they emphasized their in principle
positive stance towards renewables for the sake of climate protection and explicitly encouraged temporary state subsidization and the establishment of a domestic market for the development, testing and production of renewable technologies, though primarily meant for the export to foreign countries with better geographical conditions (BDI, 2004, p. 35; WVM, 2003, p. 1).

Nonetheless, considerable segments of the manufacturing industry assumed an ambiguous position. The innovation-driven industry branches embraced renewables as new business field, while the cost pressure of electricity prices at the time remained relatively low. Traditional industry corporations such as Schott, Bosch and Siemens set up renewables divisions that benefited from the new market sector, and chemical corporations such as Wacker invested in the production of silicon for photovoltaics. Also mineral oil companies such as Shell and BP built up photovoltaics divisions. The electrical engineering association (ZVEI) and the engineering association (VDMA) pursued an explicitly positive stance towards the EEG, though trying to escape the cost burdens as well. According to BDI energy expert Joachim Hein (2014, interview), not even individual corporations took a consistent position on the EEG, as the renewables subsidiaries unequivocally welcomed the EEG whereas the parent company was equally concerned over increasing electricity bills resulting therefrom. For branch association and all the more the BDI, it was ever more difficult to settle a joint position beyond merely general statements. Following Hein, the BDI therefore was not even a sought-after partner for incumbent policymakers, as its advice was not appreciated.

Moreover, the attention of business associations has been occupied by parallel political efforts for controversial “Hartz” labour market reforms, which they considered much more relevant for the country’s economic future. Energy politics was of less importance as costs of renewables subsidization still remained at a relatively low level (Hein, 2014, interview). In consequence, business associations – even though financially well equipped – did not spend great efforts to bring down the EEG.

Indeed, although observing the forceful dynamic of the development of renewables, conventional industries and their political allies held on to their belief that renewables could not cover substantial parts of electricity supply and would soon reach their technical limitations. In the context of the EEG consultations, the VDEW doubted that the political target of 12.5% of renewables in electricity supply by 2010 was technically feasible due to technical limitations in the grid infrastructure (VDEW, 2004, p. 18). Not different did the FDP think of renewables as being only meaningful in “suitable climate regions” – not in Germany where they could only play “a marginal role” (FDP, 2005, p. 401). The then CDU/CSU parliamentary group chairwoman Angela Merkel declared shortly after the new EEG entered into force: “It is hardly realistic to raise the share of renewables in electricity consumption to 20%. I believe that it is unrealistic to expect that renewable energies can close a gap that
would be opened by the early shutdown of nuclear power” (Merkel, 2005). By the same token, advocates for renewables completely underestimated the cost development; in 2004, the Federal Association for Renewable Energies (BEE) forecasted the differential costs to reach 4.4 bn. € in 2010 and 7.0 bn. € in 2020 (BEE, 2004, p. 52). In comparison: the factual costs amounted to 8.2 bn. € in 2010 and to 20.4 bn. € in 2013 (BMU, 2013b, p. 37).

The pro-renewables coalition embraced a highly heterogeneous alliance of interest groups. Aside from the “usual suspects” of the renewables industry and environmental organizations, also farmers, unions, parts of the manufacturing industry (such as the VDMA) and the craft sector (ZDH) supported the EEG. Despite conflicts over how to reconcile the strong expansion of renewables with nature and landscape conservation, all actors lined up for the common cause to defend and further develop the EEG. Though, since the coalition was not able to speak with a unified voice when it came to the subordinate elements of the reform, politicians could freely pick which interests they were willing to recognize and which not.

At the same time, the renewables industry – formerly fragmented, amateurishly organized and financially weak – deliberately started to consolidate and establish professional lobby structures, and gained in financial and economic power in the course of renewables growth. Their conflict capacity steadily increased, as the renewables branch developed into a meaningful industry sector that created employment and contributed to electricity supply. An internal BSW report elaborates on the lobbying efforts of the solar energy branch in 2003/04: “associations intensified their political relations with the government in Berlin and took a very active part in the discussion about a suitable support scheme. The associations DFS, UVS, and BSE increasingly coordinated their positions and held personal meetings with relevant politicians. At the same time, public relations efforts were intensified and targeted public awareness campaigns were planned and carried out before important political decisions were taking place” (BSW, 2012c, p. 6; classified as confidential, on file of the author). At the same time, the still fragmented solar industry lobby took the first initiative to merge into a joint association. DFS united with BSE to establish the German Solar Industry Association (Bundesverband Solarindustrie, BSi) in 2003 and moved their office to Berlin, to the same building where also the UVS office was located. The two remaining solar industry associations coordinated their activities more closely in the “ARGE Solarwirtschaft” working group and finally merged in 2006. At the time, “UVS mainly concentrated on political lobbying and public relations. BSi and UVS coordinated their talks with politicians. With regards to the media, activities were focused on frequent press releases and press conferences. The homepage of the association provided information to and held press meetings with journalists. Furthermore, discussion rounds with Members of Parliament were organized on a frequent level in order to inform interested politicians with up-to-date data, news and positions of the solar market” (ibid., pp. 6-7).
A further effort to strengthen the collaboration within the Environmental Coalition was the establishment of the "Alliance Renewable Energies" (Aktionsbündnis Erneuerbare Energien) on 1 September 2003. The alliance encompassed the BEE, Eurosolar, the Farmers Association, the German Association of Small and Medium-Sized Businesses (Bundesverband Mittelständische Wirtschaft, BVMW) and the unions ver.di, IG Metall and IG BAU. This coalition of a broad range of actors from business, unions and environmental movement, advertised renewables as motor for growth and jobs, and raised its voice several times in the run-up to important events and decisions such as the EEG 2004 consultations, the International Conference on Renewable Energies in Bonn 2004 and the government’s Energy Summit in 2006 (Gmelin, 2012, pp. 60-61; Reiche, 2004, pp. 134-135). For example, an "Action Day Renewable Energies" (Aktionstag Erneuerbare Energien) on 5 November 2003 right at the beginning of the EEG consultations attracted 5,000 participants and was supported by 30 organizations (Gmelin, 2012, pp. 61-62).

After all, the organizational capacity of the pro-renewables coalition was strengthened due to the merger of previously fragmented associations and the institutionalized collaboration between different actors within the coalition. Furthermore, the mobilization of small investors and homeowners for renewables by giving them the opportunity to participate in profits was essential to firmly anchor the cause of renewable energies in the midst of society (BSW, 2012c, p. 7) and turn it from a purely idealistic belief into a private economic objective.

After Government Change: The Environmental Ministry gains Power

In recognition of electoral gains for the Greens in the 2002 elections, the responsibility for renewables policy was moved from the economics ministry to the environmental ministry. This reallocation of responsibilities was central for the pro-renewables alliance and significantly impacted the EEG policy formulation (Gmelin, 2012, pp. 70-71; Jacobsson & Lauber, 2006, pp. 268-269; Reiche, 2004, p. 203). “[W]hen authority over the renewable energy sector switched from the BMWi [i.e. the economics ministry] to the BMU [i.e. the environmental ministry] in the early 2000s, the Green-led BMU rapidly expanded its expertise with the help of renewable energy advocates and it has since then dominated the periodic revisions of the EEG. The BMU also forced its way into the energy summits that are irregularly convened by the Chancellery and brought with it representatives of the renewable energy sector. It thereby opened the last bastion of the traditional energy sector” (Stefes, 2013, pp. 15-16). Renewables associations benefited a lot from the shift of competence, as the environmental ministry devotes higher priorities to climate protection and renewables, pursues positions that widely overlap with the preferences of renewables and environmental
associations, and is staffed with officials driven by intrinsic motivation. Only when it comes to subordinate aspects, such as the specific level of feed-in tariffs, renewables associations sometimes had different preferences and needed to actively convince the ministry (Oschmann, 2014, interview).

In analogy, the economics ministry was strengthened through the merge with the former labour ministry, under minister Wolfgang Clement (SPD), a known EEG critic and former prime minister of North Rhine-Westphalia, a state with stakes in coal mining and heavy industry (Hirschl, 2008, p. 190; Reiche, 2004, p. 203).

The structural conflict between the economics ministry and the environmental ministry also informed the EEG reform. A joint governmental position was practically absent, given the fundamental conflicts between both ministries (Hein, 2014, interview). Clement repeatedly put the EEG as a whole into question, claimed a less progressive promotion policy and favored a quota model (Dagger, 2009, p. 82; Reiche, 2004, p. 157). The economics ministry dedicated special effort to push for the enlargement of industry exemptions (Hirschl, 2008, p. 189) and sought to influence further aspects. For instance, the original draft by the environmental ministry proposed a minimum reference yield of 60% for wind power, whereas the economics ministry pressed for the concession of a stricter 65% reference yield in the final government draft (Dagger, 2009, p. 82; Evert, 2005, pp. 82-83; Reiche, 2004, p. 157). However, Clement was confronted with the great popularity of the EEG among both incumbent parliamentary groups that attacked him for his aggressive anti-EEG course, by which he isolated himself within the SPD (Scheer, 2003; 2008, p. 30; Lauber & Mez, 2004, p. 611). Given the leading responsibility of the environmental ministry for law drafting and the strong EEG support among the SPD, Clement faced constraints for putting up resistance.

In government, two conflicting poles competed against each other for influence, and the final government position crucially depended on the distribution of competence between the ministries. This added a good deal of contingency to the preference formation processes and puts the notion of consistent preference formation into question. Indeed, the SPD parliamentary group collaborated with the Green environmental minister against the own SPD economics minister – a striking example of both issue dualism and veto inconsistency.

**Bundestag: Backbone of the Renewables**

The Bundestag constituted the backbone of the pro-renewables advocacy coalition. Along with the shift in competence for renewables policy from the economics ministry to the environmental ministry, the leading responsibility in the Bundestag correspondingly shifted from the economic to the environmental committee, which strengthened the environmental wing of the SPD and enhanced the access of pro-renewables interest groups to the political
decision-making. Both incumbent groups SPD and Greens voiced their irritation about the procrastination of the EEG draft within the government due to lasting conflicts between the economics ministry and the environmental ministry, and urged for faster proceedings. The SPD group firmly criticized the own economics minister Wolfgang Clement for his pro-coal and anti-EEG course; also the economic wing of the SPD did not put up resistance as long as exemption clauses protect the energy-intensive industry (Scheer, 2003).

The incumbent parliamentary groups sought to achieve a cross-party consensus on the EEG reform, keeping up with the parliamentary tradition of renewables as cross-party project as in the case of the Electricity Feed-in Act in 1990/91. While the FDP firmly rejected the EEG as such and was not worth considering as dialogue partner (Gmelin, 2012, p. 44; Reiche, 2004, p. 155-157; Hirschl, 2008, p. 157), the CDU/CSU was open to negotiations yet had to manage intra-party conflicts that added lots of contingency to the decision-making process. Although the CDU/CSU had voted against the EEG 2000, the proponents increased in number, such as parliamentarians from East Germany who were pleased with regional investments in the otherwise economically underdeveloped area. Although different views remained regarding the funding volume or the particular roles of the individual technologies in the future energy system, a reliable compromise appeared feasible. In the attempt to cope with intra-party fights, the CDU/CSU finally offered its support in exchange for the temporary limitation of the law until 2007. As the governing parties could not accept this condition, the CDU/CSU eventually voted against the law. Several CDU/CSU parliamentarians deliberately stayed away from the vote as they supported the amendment but did not want to deviate from group discipline (Dagger, 2009, p. 82; Reiche, 2004, pp. 155-157; Scheer, 2008, p. 30). However, the CDU/CSU already had begun to moderate its opposition against the EEG and to approach the pro-renewables coalition (Reiche, 2004, p. 142).

As the EEG had meanwhile acquired high complexity, parliamentarians needed the expertise of the environmental ministry to design succeeding reforms. Incumbent parliamentary groups conducted early and intense consultations with the environmental ministry, which then elaborated the draft based upon the guidelines of parliamentarians. The final government draft already incorporated the preferences pursued by the incumbent groups, which did not consider crucial adjustments necessary (Fell, 2014, interview). However, the environmental committee made several modifications: Some tariffs were raised, funding periods extended and degression rates alleviated. For instance, biomas and small hydropower were granted more favorable conditions, the minimum reference yield for wind power was removed, and repowering was better incentivized (BT, 2004, doc. 15/3385). Economics minister Clement left almost empty-handed and could only insist on reduced wind power tariffs, whereas the remaining part of the law was designed by collaboration of the groups with environmental ministry against his preferences (Lauber & Mez, 2004, p. 611).
Bundesrat: Informal Grand Coalition

Although the EEG 2004 was not subject to mandatory consent legislation, the Bundesrat could call the mediation committee and delay legislation. On 14 May 2004, the CDU/CSU-led majority in the chamber of states indeed called the mediation committee, with the consequence that the EEG could not enter into force on 1 June 2014 as originally planned, putting investment security and cost relief for energy-intensive at stake. Among other things, the Bundesrat claimed to eliminate the expansion target of 20% renewables by 2020 and to prevent the promotion of wind power in low-wind inland sites through the re-introduction of a minimum reference yield. Therewith, the chamber of states was at the side of the large energy suppliers that also owned the grids and sought to obviate increasing shares of wind power, also taking into account concerns of Bavaria and Baden-Württemberg over negative impacts on the natural scenery (BR, 2004, doc. 290/04).

The Bundestag could have overruled the appeal and passed the original version with a majority of its members, yet the incumbent coalition was willing to enter negotiations to foster cross-party support for the EEG. After all, the mediation committee, meeting on 26 May, made only minor modifications, most important the re-introduction of a minimum reference yield of 60% for wind power plants (BT, 2004, doc. 15/3385; Dagger, 2009, p. 82; Lauber & Mez, 2004, p. 611).

Also between CDU/CSU-led state governments as well as between the state associations of the parties, different positions towards the EEG came to light (Reiche, 2004, p. 142), particularly looking at the heterogeneous preferences concerning the role of individual technologies in the energy mix. Agricultural states backed bio-energy, the coastal states in the North advocated for wind energy, the East and Southern states for photovoltaics – largely independent from the party composition of the state government.

This time, the opposition activated the Bundesrat as veto point and used it to slow down policy change and impede renewables, even though its approval was not mandatory under constitutional rules – due to the search for unanimous consent in an informal grand coalition between both major parties SPD and CDU/CSU.

Judicial Review: Minor Relevance

The threat of judicial litigation has diminished, since the compatibility of the EEG with constitutional and European law was reasonably clarified in in 2001/2002 positive judgments both by the Federal Court of Justice and the European Court of Justice as well as by the stop of state aid proceedings by the European Commission (Oschmann, 2009, pp. 14-15).24 The
European Court of Justice recognized the compatibility of German feed-in laws with the EU rule of free movement of goods, though against the backdrop of modest shares of renewables in electricity production, which is why a part of jurisprudence still raised doubts over the compatibility when renewables reach a certain market perforation. Renewables advocates furthermore pointed to the EU Renewable Energy Directive in 2001 that explicitly allowed for price regulations for renewables promotion (cf. ibid.). In all, the threat of judicial defeat appeared banned.

Interim Summary

In the EEG 2004 reform, the pro-renewables coalition prevailed. The establishment of ecological criteria successfully addressed surfacing concerns over nature conservation. The manufacturing industry was accommodated with additional exemptions from the levy, whereas the conventional electricity suppliers failed to make their claims heared.

The constellation of interest groups was considerably different than in 2000. Along with the growth of the renewables industry and employment, the increasing number of homeowners with stakes in solar power and of farmers with a second mainstay in renewables, the EEG had created its own constituency and strengthened the conflict capacity of the Environmental Coalition. A multitude of heterogeneous actors from economic and idealistic backgrounds supported renewables promotion, including growing segments of business. The pro-EEG lobby could rely on striking employment figures and regional economic importance as well as high trust levels in the public. To the very contrary, the big four electricity corporations lost in trust as the consequence of their dramatic underestimations of renewables growth and their obstructive behavior towards the popular renewables promotion.

Incumbent parliamentary groups drove the EEG 2004, with support from the Green-led environmental ministry yet against the resistance of the SPD-led economics ministry. The leading responsibility of the environmental ministry, transfered from the economics ministry after electoral gains of the Green junior coalition partner, strenghened the pro-renewables coalition, the Greens and the SPD environmental wing, as also in the parliament it was now the environmental committee, not anymore the economic committee that had the lead for renewables policy. In particular, also considerable parts of the CDU/CSU group now were supporting the EEG and its main elements, due to the “baby care” for the successor of the initial Electricity Feed-in Act that was enacted under the CDU/CSU/FDP Kohl government – thus, a success story that they did not want to sacrifice to the political opponents – and shifting interests in their core electorate. The involvement of the CDU/CSU finally only failed due to the obstructive behavior of their economic wing, while environmental politicians were
in favor of the reform. Self-reinforcing path dependence effects tracing back to the political heritage of earlier, seemingly minor reforms can be clearly observed.

The Bundesrat protected the old status quo and raised an objection to impede renewables. However, various state governments were already shifting their positions towards renewables, independent from their party affiliation. As the EEG 2004 was not subject to mandatory approval, the Bundesrat had only limited influence but the search for unanimous solutions in with the large opposition party fostered a compromise. Still, the federal government sought to achieve a consensual solution and made concessions, to foster the collaboration of states in the implementation of the law and future amendments.

6.6 Second EEG Revision under the Grand Coalition (2009)

Federal elections in September 2005 resulted in government change. The SPD/Green Schröder coalition was replaced by a CDU/CSU/SPD grand coalition under Chancellor Angela Merkel (CDU). Sigmar Gabriel (SPD) now controlled the environmental ministry, while Michael Glos (CSU) headed the economics ministry.

However, government change did not affect the fate of the EEG too much (Dagger, 2009, p. 310). On the contrary, the grand coalition essentially continued the energy policy goals of the preceding government, also with respect to the EEG. The coalition agreement determined that “the environmentally and economically sound expansion of renewable energies” shall constitute an “important element” of energy policy (CDU/CSU/SPD, 2005, pp. 51-52; see also: Dagger, 2009, pp. 101-103; Hirschl, 2008, pp. 168-171). More precisely, the coalition agreement held on to the existing targets for renewables growth (at least 12.5% by 2010 and 20% by 2020), levering out previous resistance within the CDU/CSU economic wing against ambitious expansion goals. The EEG should be maintained in its basic structure yet the particular conditions (tariffs, degression, funding periods) should be adjusted to the economic efficiency of the different technologies, with focus to be placed on the repowering of onshore wind and the advancement of offshore wind. Irrespective of the new party composition, the government was not in a hurry: The EEG reform adhered to the regular time schedule and entered into force only in 2009, that is more than three years after the new government took office. Only the Special Equalisation Scheme was immediately reformed.

Against the background of international climate debates and a historic high of energy prices, energy and climate policy advanced to the top of the agenda. This surrounding environment also impacted the political constellation around the approaching EEG reform.

In order to involve stakeholders in the preparation of a new energy strategy, Chancellor Angela Merkel convened three energy summits on 3 April 2006, 9 October 2006 and 3 July 2007 (Dagger, 2009, pp. 105-107; Hirschl, 2008, pp. 174-175). Besides environmental minister Gabriel, economics minister Glos and research minister Annette Schavan, representatives from energy suppliers, industrial and private electricity consumers, unions and the scientific community took part. For the first time and in contrast to the earlier energy consensus talks under the SPD/Green Schröder government in 1999/2000 and the CDU/CSU/FDP Kohl government in the mid-1990ies, also representatives of the renewables branch were invited, which was widely recognized as a political signal that Chancellor Merkel will not rely on fossil and nuclear energy only. Nonetheless, environmental NGOs were not invited (Bundesregierung, 2006a, pp. 13-14).

At the first meeting, central issues discussed were security of supply, competitive energy prices, research, energy efficiency and renewables. In the context of the summit, the energy industry announced planned investments amounting to 30 bn. € in the conventional electricity sector and 33 to 40 bn. € in the renewable energy sector until 2012. In addition to expenses in the heat and fuels sector, the branch intended investments of more than 71 bn. € in total. The participants agreed to promote energy efficiency, subsidize the modernization of buildings and raise state expenses for energy research. In addition, the federal government’s renewable energy expansion target of 20% was confirmed, and a more progressive target of 25%, declared aim of the environmental minister, was mentioned as technically, economically and politically realistic (Bundesregierung, 2006a). Business representatives questioned the nuclear phase-out during the meeting, yet Chancellor Merkel rejected the claims as she held on to the coalition agreement (Dagger, 2009, p. 105).

At the second meeting, international issues of secure energy supply and climate protection were on the agenda (Bundesregierung, 2006b). In the third meeting, subsequent to the German G8 and EU presidency (see sector further below), the government announced to elaborate an Integrated Energy and Climate Programme (Integriertes Energie- und Klimaprogramm, IEKP) that should encompass renewables (including the basic points for the EEG reform), cogeneration, energy efficiency, modern coal power plants, CCS and further issues (Bundesregierung, 2007). The IEKP was launched on 5 December 2007, just in time to advertise it at the UN Climate Conference in Bali, Indonesia (BMWi/BMU, 2007).
The time period 2006 to 2009 was marked by various heated public debates on different topics of energy politics. In 2006/07, climate protection reached a peak in public salience, unleashed by the coincidental accumulation of several major events: the release of the former US Vice President Al Gore’s movie *An Inconvenient Truth*, the launch of a seminal British government report on the economic costs of global warming, and the new UN report on global climate change (see chapter 2.2). Furthermore, the German government coincidentally held both the presidency of the G8 and the EU Council at the same time. Chancellor Angela Merkel exploited this opportunity to present herself as climate champion and advertise climate protection goals on European and international level.\(^{25}\)

An explosion in oil prices followed the climate debate. In early 2008, oil prices exceeded the symbolic 100 US$ threshold, reaching a historic all-time high of almost 150 US$ in July 2008, yet dropped again in 2009 in the wake of the global economic recession (OECD, 2012). The unprecedented rise in oil prices raised concerns over the future of fossil fuels and attracted sympathies for renewable alternatives in media reports. Environmental politicians used the worrying trend in oil prices to advertise renewables support, even though electricity production costs are not directly connected to oil prices. Both CDU/CSU politician Maria Flachsbarth and SPD politician Ulrich Kelber, the groups’ rapporteurs on the EEG, held that renewables reduced the dependence from fossil fuels imports and served the long-term economic affordability and security of supply, defending them against aspired cutbacks (Flachsbarth, 2008; Seils, 2008) The high oil prices enhanced the political support for renewables in the upcoming EEG reform, according to state officials in the environmental ministry (Oschmann, 2009, p. 1).

At the same time, a heated debate on the harmful competition in land use between bioenergy and food production emerged. The bioenergy branch faced heavy media and public criticism and suspected a media campaign to be orchestrated (Bundesverband Pflanzenöle, 2008, p. 1). The public criticism on imports of palm oil for biomass plants, supposedly produced on cleared rain forest areas, harmed the reputation of bioenergy. TV reports headlined about the “climate killer palm oil – the dirty business with cogeneration power plants”,\(^{26}\) environmental magazines warned against the “environment killer biofuels” in their front cover story,\(^{27}\) and rainforest activists and anti-hunger organizations turned against bio-energy which they blamed to destroy rainforests, edge out food crops production and make millions of people suffer from hunger (Rettet den Regenwald, 2009; AGU, 2009). Also established environmental NGOs such as Greenpeace claimed for “bread instead of biofuels”. Besides questionable imports, the sharp increase in domestic cultivation of corn for biogas plants (so-called “Vermaisung”) was at the center of criticism (neue energie, 08/2011, p. 66). Nature
conservationists blamed biogas subsidization to cause ecologically delicate monocultures with devastating effects on biodiversity and water quality, and farmers in some regions moreover complained about higher prices for farmland leasing.

The vivid debate on “fuel or food” (“Tank oder Teller”) shaked the environmental movement and divided the renewables coalition with respect to this particular issue (Austrup, 2014, interview). In connection with the parallel introduction of the E10 petrol with 10% admixing of bio-ethanol, the debate spread over to car drivers. The bioenergy branch, confronted with damages of her public image, attempted to foster a differentiated judgment of bio-energy but also often trivialized and downplayed the problems. Environmental NGOs and other idealistic interest groups backed by large resonance in media coverage and the general public pressured politics to take a critical re-assessment of the role of biomass as such. Notwithstanding the political will to further ascribe an indespensible role to bioenergy in the future energy mix, the need to respond to nature conservation concerns was virulent and informed the controversial debate on the EEG reform ahead.

European Climate and Energy Politics 2007/2008

The European Union tackled climate protection and renewable energies in the course of 2007 and 2008 (Dagger, 2009, pp. 90-100). On 8/9 March 2007, the EU Council under German presidency approved a new energy policy package, including the seminal “20-20-20 targets” by 2020: 20% renewables in total EU energy consumption, 20% energy efficiency increase and 20% greenhouse gas reduction (30% if further states follow) (Council of the European Union, 2007). Also Germany had to do its contribution to comply with the binding targets. The EU Commission issued specific national targets on 23 January 2008, with a target of 18% renewables in Germany by 2020, as well as a draft for the EU Renewable Energy Directive and further proposals. The EU Council approved the package on 12 December 2008 and the European Parliament on 17 December 2008.

The decisions were driven by climate change concerns in order to provide a signal for the upcoming UN climate negotiations as well as in response to rising fossil fuel prices. The German government particularly advocated for a determined climate and renewable energy policy given the relatively high domestic share of renewables and the country’s historic success in greenhouse gas reductions. Greater demand from other countries for clean and renewable energy technologies would open export markets for the German industry. Second, sympathies for climate protection and renewables among the general public helped Chancellor Merkel to create a positive image as “Climate Chancellor”. This profile, in combination with the new EU goals, reinforced the pro-renewables course of the CDU/CSU and the German government (Hirschl, 2008, p. 395; Dagger, 2009, pp. 108-110).
In 2008, the EU Commission cherished intentions to push for EU-wide quota models for renewable energies – running against the German model of feed-in tariffs and putting the environmental coalition in turmoil. In the Bundestag, the incumbent groups CDU/CSU and SPD, together with the opposition groups Greens and Left Party (with the exception of the FDP), passed a resolution wherein they requested the government to take action against the plans for quota models (BT, 2008, prot. 16/142, p. 15018). The German government, in particular the environmental ministry, and other European governments that used feed-in tariffs opposed the plans of the EU Commission and eventually prevailed (Dagger, 2009, pp. 97-100). This joint position against the EU Commission tied the domestic EEG supporters together and reinforced the CDU/CSU pro-EEG course.

The Greening of Political Parties

The SPD strengthened her pro-renewables course (Gmelin, 2012, pp. 36-37). The party elaborated an ambitious concept with progressive expansion targets, a strategy paper “Moving Away from Oil” and claimed a National Action Plan for Renewable Energies (SPD, 2009, pp. 25-27), devoting greater programmatic salience to renewables in both quantitative and qualitative terms, despite the continuous commitment to coal. The SPD parliamentary group proposed an expansion target of 29% until 2020, i.e. significantly higher than the 20% goal laid down in the coalition agreement (SPD-Bundestagsfraktion, 2007, p. 10).

Looking at the upcoming elections in 2009, the SPD felt affronted by the shining public appearance of Angela Merkel who portrayed herself as “Climate Chancellor”, whereas the SPD perceived herself – and not the CDU/CSU – as the truly leading environmental force within the government. Environmental minister Gabriel (SPD) and environmental politicians in the parliament hence pressed ahead with a clear profiling in energy and climate policy (Dagger, 2009, p. 207). Gabriel stated in a letter: “It is unacceptable that the Chancellor boosts her profile as Climate Chancellor and in fact CDU/CSU block everything. [...] Hence I plead for an absolutely strict line against the CDU/CSU” (quoted in Dagger, 2009, pp. 278-279). Rolf Hempelmann, chairman of the working group on energy, held in a letter to the parliamentary group: “Energy and climate policy is no longer a niche topic. [...] Especially in the election (campaign) year 2009 it must concern us [...] to present ourselves as the driving force for energy policy in the coalition. This implies that we self-confidently bring up for which government agreement we consider more ambitious goals to be achievable” (Hempelmann, 2008, p. 9).

framework conditions strengthened the party’s environmental wing: the commitment to the 
EEG in the coalition agreement and the 2007 Integrated Energy and Climate Programme, the 
growth of the renewables sector into a noteworthy industry, the stakes of many CDU/CSU 
members in renewables, and the public reputation of “Climate Chancellor” Angela Merkel. 
Furthermore, the EEG built upon the Electricity Feed-in Act, which stemmed from the CDU-
led Kohl government, which is why the CDU sought to claim the success of renewables 
promotion as their own. Therefore, the CDU/CSU parliamentary group now explicitly backed 
the EEG (Jung, 2014, interview) and agreed upon ambitious expansion goals of at least 30% 
renewables in electricity generation (CDU/CSU-Bundestagsfraktion, 2007a, p. 4), i.e. 1% 
above the SPD goal and 10% above the 2005 coalition agreement. The emphasis, however, 
was still on the goal of economic and social compatibility (CDU/CSU-Bundestagsfraktion, 
2007b, pp. 4-6). The new 2007 basic programme dedicated several pages to climate 
protection and renewables, including the goal to generate 20% of electricity from renewables 
until 2020 and the main part of electricity supply from renewables until 2050 and – not least – 
the explicit will “to consequently continue on the path for renewables we have embarked 
on”, including the EEG (CDU, 2007, pp. 77-78).

The FDP reversed her profound anti-EEG position at the party congress in May 2009, on an 
initiative by the Bavarian environmental politician Horst Meierhofer – contrary to the position 
of the party leadership and with a narrow majority of 55% of votes by secret ballot 
(Meierhofer, 2012, interview). Lobbying efforts of the solar industry fostered this 
programmatic shift, according to accounts of branch representatives. BSW board members 
Frank Asbeck (Solarworld) and Klaus Hofmann (Schott) used their connections into the FDP 
to raise support for the EEG. Also the lobby work of the Agency for Renewable Energies and 
BSW lobbyists Carsten Körnig and Rainer Brohm at the FDP party congress helped to 
convince delegates of the EEG in numerous individual talks. In particular, the chairmen of 
FDP state associations from Bavaria, Thuringia, Saxony-Anhalt, Brandenburg and Berlin 
signaled their support for the amendment (Der Spiegel, 3.3.2010).

EEG Revision 2009

The regular EEG reform took place against the background a continuous boom of renewables: 
In 2009, renewables already accounted for 16.3% of total electricity generation – in 
comparison to only 9.3% in 2004. Along therewith, the EEG levy more than doubled from 
0.54ct to 1.33 ct (BMU, 2013a, pp. 18, 38). As the expansion of renewables turned out more 
dynamic than expected, since the legally defined target of 12.5% renewables by 2010 has 
been already surpassed ahead of time in 2007, readjustments were necessary at any case to
respond to vigorous market development. The unprecedented success brought along not only steadily rising costs but also challenges for grid integration.

The EEG reform constituted the key element of the Integrated Energy and Climate Programme (IEKP), outlined in the government’s closed session at the Meseberg castle in August 2007 and launched on 5 December 2007 including the first government EEG draft. In May 2008, the incumbent groups CDU/CSU and SPD passed an adjusted version of the original proposal. The final EEG passed the Bundestag (6 June 2008) and the Bundesrat (4 July 2008) and entered into force on 1 January 2009, in replacement of the preceding EEG 2004 (for a very detailed description of the genesis of the law, see Dagger, 2009).^{31}

The EEG 2009 brought about a tremendous complexity of details. The overarching goal of the reform was not necessarily the purely quantitative growth alone but equally the correction of market distortions and the better consideration of market and grid integration and economic efficiency, such as the avoidance of windfall profits for the solar industry due to rapidly declining production costs, and the adjustment of tariffs to the rise of commodity prices as of copper, steel and aluminium that made particularly wind power more costly. The number of paragraphs skyrocketed from 21 to 66, supplemented by five multipage appendices, in particular owed to the rectification of the wording of the law and the elimination of legal uncertainties by more specific definitions (BMU, 2008a; Oschmann, 2009, pp. 7-14; Dagger, 2009, pp. 290-304). In detail:

*Expansion target:* The renewables target was elevated to at least 35% in total electricity production by 2020 (previously: 20%), 50% by 2030, 65% by 2040 and 80% by 2050.

*Solar:* The PV tariffs were reduced, yet cutbacks remained modest and still were on a high level. For small systems, which cover the great majority of the PV market, the tariff was only slightly cut (from 44.41ct to 43.01ct), whereas the tariff for large systems decreased more significantly (from 41.79ct to 33.0ct). The degression was tightened from previously 5% to now 8-10%, depending on system size. In addition, a new “own consumption incentive” granted a fixed tariff (25.01ct) for electricity self-consumed by the plant operator in the own house. Moreover, a “flexible cap” was introduced, which provided for an increased degression rates tied to the development of solar capacity build-up. If new capacity installed grows faster than envisaged (exceeding the growth corridor of about 1,100 and 1,900 MW p.a.),^{32} the degression is tightened by 1%; if the build-up falls below the corridor, the degression is relaxed correspondingly.

*Onshore wind:* The conditions for onshore wind were clearly improved. The initial tariff was raised from 7.87ct to 9.2ct. Also the repowering bonus was increased, and an additional system service bonus^{33} (0.5-0.7ct) was granted for certain technical innovations, such as the
ability to maintain voltage if the transmission grid failed. The minimum reference yield of 60% was maintained.

**Offshore wind:** The support for offshore wind was significantly topped up. The tariff was raised by 4ct to 13ct. An additional “early starter bonus” was introduced for plants put into operation prior to 2015. The regression was set to start in 2015. Parallel to the EEG, a separate loan programme was established with a volume of 5 bn. € under the auspices of the state-owned KfW bank, aiming at the build-up of a capacity of 25 GW by 2030.

**Biomass:** The support of biomass was also increased, yet the multitude of special bonuses for virtually every specific use of biomass, ruled in three detailed appendices, made the promotion framework highly intransparent. Overall, small plants as well as plants fired by residual materials benefited. The basic rate for small plants (<150kW), the cogeneration bonus and the fuel bonus were raised by 1ct each, and a new slurry bonus was introduced (ranging between 4ct for small plants <150kW and 1ct for larger plants >500kW). Biomass had now to fulfill certain ecological requirements to be eligible for remuneration. In response to concerns over corn monocultures and the import of soy and palm oil grown on cleared rain forest areas, the government was authorized to specify such criteria in a “Sustainability Ordinance”. Furthermore, vegetable oil powered cogeneration plants were imposed strict size limits to only 150 kW, as liquid biofuels faced particular environmental criticism.

**Hydropower** benefited from considerably raised tariffs, in particular for small and micro power plants. Yet the cut in the funding period from 30 to 20 years ate up the tariff increases.

**Geothermal energy** was considerably stronger promoted by an increase in base tariffs and the cogeneration bonus (by 1 ct to 3ct) as well as a new early starter bonus (4ct) for plants put into operation prior to 2016.

**Market integration** of renewables should be enhanced by a new “direct marketing” mechanism, which gave operators the possibility to choose on a monthly basis if they wanted to sell the electricity by themselves or receive the EEG tariff. As overall market prices mostly fell below feed-in tariffs, the direct marketing mechanism had rather symbolic meaning and should only test out how the mechanism works in practice.

**Special Equalisation Scheme:** The industry privileges did not encounter significant modifications. Only some administrative burdens were relaxed.

**Compensation scheme:** The government was authorized to issue an ordinance on the reform of the compensation scheme, i.e. the rollover, calculation and distribution of electricity amounts and promotion costs among grid operators and electricity utilities. This was due to concerns over compatibility with EU law and for the sake of transparency of cost calculation. This was preceded by an extension of the Special Equalisation Scheme in a small EEG amendment as of 1 December 2006, as announced in the coalition agreement.
and passed by the Bundestag on 28 September 2006 and by the Bundesrat on 13 October 2006 (not subject to mandatory legislation). The amendment incorporated the modifications laid down in the coalition agreement, that is the removal of the 10% redistribution cap and the limitation of the EEG levy to 0.05ct for energy-intensive industries, besides technical adjustments (Dagger, 2009, p. 105; Hirschl, 2008, p. 172; for a jurisprudential evaluation, see: Oschmann & Thorbecke, 2006).

Green power privilege: The Green Power Privilege – i.e. the exemption of electricity suppliers with a minimum quota of renewables from the EEG levy – was specified in details and limited to avoid unjustified windfall profits at the expense of non-privileged suppliers.

Grid integration: For the regulation of bottlenecks in the grid, a new feed-in management was introduced. Simply put, this allowed grid operators to temporarily limit wind turbine output in times of network congestion, with compulsory compensation for the plant owner for remuneration lost; in particular wind power plants benefited therefrom.

Table 29: Constellation of Interests and Policy Output (EEG 2009)

<table>
<thead>
<tr>
<th>Economic Coalition</th>
<th>Environmental Coalition</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>promotion system</td>
<td>maintain feed-in tariffs</td>
<td>maintain feed-in tariffs</td>
</tr>
<tr>
<td>expansion target</td>
<td>(no specific claims articulated in written statements; consumer association: at least 30% in 2020 and further growth)</td>
<td>at least 35% renewables in total electricity production until 2020 (previously: 20%) at least 50% until 2030 at least 65% until 2040 at least 80% until 2050</td>
</tr>
<tr>
<td>PV</td>
<td>- cuts by max. 7%; no large cuts, in particular spare small home systems - degression oriented towards technological progress - no hard cap on capacity - least restrictions for freestanding systems - privileges for own consumption</td>
<td>- tariff for small systems slightly cut (from 44.41ct to now 43.01ct); tariffs for large systems considerably decreased (from 41.79ct to 33.0ct) - degression: 8-10%, depending on system size - flexible cap: moving degression rates tied to the development of build-up - new own consumption incentive: fixed tariff (25.01ct) for electricity self-consumed by the plant operator in his own house</td>
</tr>
<tr>
<td>wind onshore</td>
<td>- abolition of the system service bonus</td>
<td>- initial tariff raised from 7.87ct to 9.2ct - repowering bonus increased - new system service bonus (0.5-0.7ct) - minimum reference yield (60%)</td>
</tr>
</tbody>
</table>
| wind offshore | (not indicated) | - raise tariffs
- principally: offshore has subordinate priority to onshore
BWE and VDMA supported the provisions in the draft
VKU: higher initial tariff of 14ct instead of 12ct in the draft
governmental authorization to issue an ordinance on tariffs and grid connection requirements was rejected | - initial tariff raised by 4ct to 13ct, basic tariff lowered
- additional „early starter bonus“ introduced
- degression postponed to 2015
- parallel to the EEG: loan programme |
| hydropower | - apply tariffs for new hydropower plants on equal terms to modernizations
- no degression
- no nature conservation criteria | - adjust tariffs to risen costs
- apply tariffs for new hydropower plants on equal terms to modernizations
- no degression
- keep funding period
- no nature conservation criteria | - raise in tariffs, in particular for small and micro power plants
- cut in funding period from 30 to 20 years compensated for tariff increases |
| biomass | - degression should remain sharp at 1.5%
- favorable conditions for large plants and cogeneration
- relaxed rules for splitting of systems
- no obligatory use of cogeneration
- cogeneration bonus to be increased for new and existing facilities
- technology bonus to be extended to large plants
- size limitations to be removed
- technology bonus for fuel cells to be raised
- methane loss allowed for biogas conditioning to be relaxed to 2% | - no reduction in basic tariffs; increase tariff for small plants <150kW
- degression: 1.0% (not applicable to bonuses)
- pro sustainability standards (except: farmers)
- fuel bonus: increase (e.g. biogas: 8ct)
- slurry bonus: 2ct
- no general size limitations for particular biomass types
- CHP bonus: 3ct
- if new technical conditions are introduced, only for new installations
- technology bonus: 2ct; flexible technology list (body at environmental ministry with branch participation)
- bonus for feeding-in at day/night time
- increased bonuses also for existing plants
- feed-in management: exclude bioenergy; in particular: exclude existing plants and plants below a de-minimis size; financial compensation by grid operator
- splitting prohibition: yes, but exempt existing plants
- Authority for government to issue ordinances only with approval of Bundestag | - degression: 1.0% (including bonuses)
- increased tariff for small plants <150kW: +1ct to 11.67ct
- CHP bonus: 3ct (by then: 2ct)
- fuel bonus: increased (e.g. biogas: 47ct, depending on plant size)
- new slurry bonus introduced (1-4ct, depending on plant size)
- technology bonus: 2ct; technology list provided in law
- increased bonuses for new facilities only
- sustainability standards introduced; government authorized to specify
- vegetable oil powered cogeneration plants: size limits to only 150 kW
- obligatory use of cogeneration >5 MW
- feed-in management: biomass included, with de-minimis size and financial compensation by grid operator
- splitting prohibition: yes (including existing plants)
- authority for government to issue ordinances, mostly with approval of Bundestag |
| geothermal energy | (not indicated) | substantial increase of tariffs:
20ct <10MW, 12ct >10MW
CHP bonus: 3ct
Technology bonus: 6t | Increase in tariffs:
16 ct <10MW, 10.5ct >10MW
CHP bonus: 3ct
Technology bonus: 4ct
Early starter bonus: 4ct
applicable to existing plants
Degression 1% (incl. bonus) |
**grid integration**
feed-in management: supported
feed-in management: supported; exempt bioenergy, provide financial compensation
feed-in management: introduced; de-minimis limits and financial compensation provided

**market integration**
strengthen direct marketing, with lock-in period of 1 year (at least ½ year)
- maintain fixed tariffs; direct marketing model and optional market premium rejected
- instead: bonus for virtual power plants
- governmental ordinance only with approval of parliament
- BBE: short lock-in period at least for biomass

Direct marketing mechanism introduced

**green power privilege**
(not indicated)

Special Equalisation Scheme
- lower entry barriers
- gradual relief instead of absolute cutoff thresholds
- ease administrative burdens

should be limited to avoid redistribution of promotion costs

no important changes; administrative burdens partly lowered

Governmental authorization to issue an ordinance

Result: Clear Success for the Pro-Renewables Coalition

The EEG 2009 raised tariffs for almost all energies, in particular for offshore and geothermal energy, with the exception of PV due to heavy reductions in production costs. The pro-renewables coalition achieved a clear success, just as in previous reforms (see also: Dagger, 2009, pp. 290-308). This success is most visibly expressed in the ambitious expansion target of 35% by 2020 – noteably more progressive than the first governmental draft which still forwarded a compromise of “25% to 30%” und even more progressive than the 20% target of the coalition agreement, and directed against the CDU/CSU economic wing as well the positions of industry associations (such as the VIK) that opposed any target above 20%.

The solar industry was capable to prevent severe cutbacks and prevailed claims for heavy tariff cuts raised by conventional energy suppliers, industry and the consumer organization. The BSW solar association was contented and saw the risk of market collapse to be succesfully banned (neue energie, 06/2008, pp. 16-19). The wind branch achieved better conditions for onshore and offshore alike. The BWE wind energy association spoke of a “positive signal” and an “upward trend” (ibid.). The strongly improved offshore promotion is also to be seen as concession for the large energy utilities, since only big corporations have sufficient financial capabilities for projects of this size, whereas the BWE explicitly preferred onshore. The introduction of the feed-in management furthermore entitled the wind power plant operators for full compensation for losses due to grid bottlenecks. Also the bioenergy branch and farmers were capable to succesfully fight for their interests: The system of
bonuses and tariffs was modified to support particularly small farm biogas plants, bonuses were raised, and a new slurry bonus turned residual materials into an economically viable resource (Oschmann, 2009, p. 16; AEE, 2010, pp. 40-41). Nature conservationists successfully pressed for the introduction of sustainability criteria for biomass, albeit they still regarded them as insufficient. Also hydropower as well as geothermal energy were considerably better promoted, even though the geothermal branch only covered neglectable quantities of electricity supply and lacked a strong lobby organization. Also with regard to hydropower, small and micro plants benefited, whereas large plants usually operated by big companies came away empty-handed.

The heterogeneous and broad alliance of renewables proponents as it had appeared in previous reforms continued to exist (Bundesverband Pflanzenöle, 2008; BWE, 2008; DBV, 2008; SFV, 2008; VDMA, 2008; VDZ, 2008; VKU, 2008; see also: Fh-ISI, 2008). Even though internal disputes such as concerns of nature and landscape conservatists or distribution conflicts between the individual renewable energy branches intensified, all actors managed to moderate internal differences and foster coherent appearance (Oschmann, 2014, interview). Tensions between branch associations within the BEE, however, increasingly complicated the integration of diverging interests within the peak association. According to Johannes Lackmann, former BEE president until he resigned in 2007, the BEE at the time was not willing anymore to voluntarily accept economically reasonable tariff reductions but rested on a “silent pact” with policymakers to not continue subsidization. The renewables branch began to defend her subsidies in the same way as the coal industry, turning into a “normal” industry that largely lost her genuinely idealistic drive (Schröder, 2013, p. 34). Nonetheless, renewables industry still maintained a positive image unharmed by emerging disputes, with the exception of the solar industry that faced criticism over cost burdens and overconfident lobby behavior (Oschmann, 2014, interview). The good image helped to immunize the branch against criticism, such as from the consumers association.

Compared against the year 2000, the equation of interest groups power has fundamentally changed (cf. Kelber, 2008). Over the course of the dynamic growth of renewables, the Environmental Coalition gained in economic importance. The renewables industry now made remarkable revenues and profits. Also the public relations work became more professional, as an internal BSW analysis elaborates: “The merger of the associations and the strengthening of the industry clearly increased the power and the scope of the public relation work. The political work was accompanied by intensive, industry-wide PR-efforts covering all current policy issues, especially the amendment of the EEG. [Therewith it] was possible to communicate the role that PV could play in the future energy mix to the public, and to prevent drastic cutbacks of subsidies several times” (BSW, 2012c, p. 9).
The Economic Coalition, on the very contrary, has lost both in electricity market shares and trust, and widely failed to establish alliances with civil society – against all predictions of electricity suppliers, renewables indeed proved capable to cover substantial parts of electricity supply. The conventional energy industry and energy-intensive industry branches still demanded the feed-in tariff per se and pressed for a fundamental review of the EEG, even though they must have been aware of the great cross-party support for the EEG. In their more specific proposals, they focused on the market integration of renewables, the exemption of industrial own power generation from the EEG levy and the further extension of the Special Equalisation Scheme. Mainly the BDEW made some more specific suggestions on tariff reforms (BDEW, 2008; VCI, 2008; VIK, 2008; WV Stahl, 2008; vdp, 2008).

The Economic Coalition was weakened by inner fragmentation and diverging interests. In particular parts of the energy-intensive yet innovation-driven industry showed ambiguous positions, since chemical corporations, glass producers, the electronic industry and steel manufacturers benefited as suppliers for the solar and wind industry. On the other hand, the very same industries were increasingly burdened by EEG promotion costs. This triggered internal disagreements made often subsidiary companies support the EEG, whereas the parent company still rejected it. The crafts sector and the engineering association were in favor of renewables promotion anyways. The endorsement by industry corporations helped the pro-renewables alliance to frame her goals as being in line with the goals of job creation and economic prosperity, and to build up economic threat potential. The industry foremost pushed for further cost reliefs and the reduction of the relatively high solar energy promotion, yet was not able to speak with one voice on details of the EEG reform and only forwarded abstract criticism that has fallen on deaf ears after the change of course of CDU/CSU and FDP, losing the most important political allies.

The consumer association played a diffuse role. Albeit in support of the EEG and firm distrust in the conventional electricity suppliers, the consumer organization turned against the rising promotion costs for private households and particularly criticized the excessive windfall profits for the solar industry at the expense of consumers and system operators, hence tariff cuts and degression needed to be strenghtened (VZBV, 2007, pp. 2, 12-14, 17-18).

**PV Tariff Cuts: The “Solar Battle” begins**

The most virulent conflict between environmental and economic coalition sparked off over solar energy promotion. PV was the by far most costly renewable energy with comparably high tariffs, accounting for 24.6% of total EEG remuneration payments but supplying only 6.2% of renewable electricity production in 2008 (RWI, 2009, p. 9). Many considered this
subsidization inefficient: too much money spent for too little return. On top, the solar industry made huge profits, since the attractive tariffs triggered enormous demand that met an undersupply in solar panels production.

A 2008 report by the RWI economic research institute warned against the swelling costs of PV promotion and claimed for a severe tariff reduction by 30% (Frondel, Ritter & Schmidt, 2008). Media coverage well picked up the point and headlines on the “subsidization madness” appeared (stern, 29.5.2008). In this view, a few solar profiteers filled up their pockets with money from the general public. According to RWI, the EEG tariffs for PV installations put into operation until end of 2007 accumulated to 31 bn. € over the next 20 years. If tariffs remained unchanged, the total cost burden would increase to 73.5 bn. € for all PV systems installed until the end of 2010. Every job in the solar industry would then be subsidized with 153,000 € per year.

The high multi-billion figures appeared overdrawn to a certain extent, as they were spread over a time period of nearly three decades, which was often not well-understood in public reception. With this in mind, the solar promotion would be rather comparable to other subsidy cases such as for coal production or tax privileges for aviation fuel (LBBW, 2010, p. 4). However, other recognized experts confirmed the main findings of the RWI (VZBV, 2010a, p. 5; PHOTON, 2010, p. 3). A counterexpertise by the Wuppertal environmental research institute (WI, 2010a), commissioned by the Agency for Renewable Energies, criticized some methodological shortcomings of the RWI calculation, yet was again subject of methodological criticism (Frondel, Schmidt & aus dem Moore, 2010; WI, 2011). After all, also many EEG proponents considered the PV promotion costs overly disproportionate, particularly in the light of high profit margins of solar manufacturers at the expense of electricity consumers.

Disregarding heavy reductions in production costs, the solar industry maintained the public perception of “expensive solar power” that must be nurtured by state support, instead of actively communicating the cost reductions. The BSW refused large cutbacks and argued that industry and employment would be put at risk (neue energie, 01/2008, p. 18), exerting economic threat potential on politicians and exploiting the good public image of solar energy. In the view of the leading Green energy politician and EEG co-author Hans-Josef Fell, the solar branch has impeded and delayed a sound reform of PV promotion, did not come up with own reform proposals to manage the rising costs and instead only reactively claimed that cuts should be less severe than policymakers wanted (Fell, 2014, interview). In 2008, the BSW declared that cuts should be limited to 7% in the upcoming year 2009, and considered the reduction by 9.8% as envisaged in the EEG draft to endanger the branch due to risen silicium prices. Only from 2010 onwards, more significant cuts were held feasible (Reuters, 5.5.2008). Solarworld CEO Frank Asbeck stated that approximately 80% of German solar
companies would become unprofitable with the envisaged degression of 10%. Already a degression of only 7% would be challenging (Handelsblatt, 4.5.2008).

According to Rainer Brohm, head of politics at BSW, the BSW applied a cautious approach towards tariff reductions because manufacturing costs were still relatively expensive at the time and in pursuit of the goal to get the most out of state promotion aiming to establish a sustainable market beyond the short-term optimum. The BSW was aware that excessive tariffs could jeopardize political acceptance, with the political risk of radical retrenchments if political acceptance is lost. However, many companies applied too short-term strategies to cope with virulent market uncertainties; so at least political framework conditions should provide a stable environment (Brohm, 2014, interview).

The unexpected strong growth of solar capacity and the mounting costs arising therefrom strengthened political support for more far-reaching tariff cuts. Also the Greens, then in the opposition, assumed relevant potentials for cost reduction (Fell, 2008, p. 27). The consumer organization, actually an opponent of the conventional energy industry, in this instance lined up with the large utilities and other pronounced EEG critics in the demand for considerable cutbacks in PV tariffs. Nonetheless, factual potentials and effects of tariff reductions remained outside of objective consideration, as the most up-to-date profit margins as well as the impacts of competitive pressure were subject to different scientific evaluations. Hence, policymakers had to decide under circumstances of high uncertainty. Politicians struggled to find a position: On the one hand, the solar industry secured jobs and was considered a promising industrial branch that should be protected; on the other hand, increases in electricity prices should be tackled (Fischer, 2013, interview).

The solar industry partnered up with the metal workers union and environmental NGOs to lobby against retrenchments, thus forming an alliance of actors from industry, unions and environmental movement, and relying on broad public support for solar energy. Furthermore, some actors within the solar branch, equipped with financial means, ventured to apply peculiar lobby instruments to support their political advocates. An illuminating example for this new lobby style is the solar industry’s support for the SPD energy politician and EuroSolar president Hermann Scheer: Scheer was direct candidate in the electoral district of Waiblingen, opposition candidate to CDU economic politician and prominent EEG critic Joachim Pfeiffer. In the election campaign 2005, a special edition of the “Solarzeitung” magazine, funded by the PV manufacturer Solarworld, was distributed to all households in the region, featuring a comprehensive interview with Scheer and a picture of the candidate with the popular film star and US politician Arnold Schwarzenegger. Solarworld confirmed that the magazine, although released nationwide, was only distributed extensively in the Waiblingen electoral district (Fichtner & Werner, 2010). This incident illustrates the new, targeted lobbying strategy of the renewables industry – though, in this case, without success:
Pfeiffer still won the electoral district, whereas Scheer was elected via the party list. The new lobby methods employed, however, harmed the trust in the solar industry and evoked sharply worded criticism also among renewables proponents (Fell, 2014, interview).

In particular, the CDU/CSU economic wing pushed for far-reaching cutbacks, whereas the SPD defended solar energy against heavy retrenchments. Aiming at a compromise, the incumbent groups agreed to spare small PV systems – i.e. the great majority of the PV market – and only cut the tariffs for larger systems. In addition and most important, in nighttime negotiations on 3 June 2008, they adopted the idea of a flexible cap, which was originally elaborated by Green politicians. The future growth of photovoltaics should now follow a certain, legally defined growth corridor, with additional degression if actual build-up surpasses the politically intended targets, and hence meant to contain promotion costs (Fell, 2008, pp. 27-28). The flexible cap “saved” photovoltaics, as Hans-Josef Fell (2014, interview) remarks. In its specific design, however, the flexible cap had rather symbolic character (Oschmann, 2009, p. 16), given that the additional degression above the growth path was too small to mitigate unleashed market growth.

The PV branch could obviate comprehensive retrenchments – for now. The branch was still capable to close ranks with the SPD and the environmental wing of the CDU. However, the trust amongst politicians in the branch was already impaired.

**Government: Ministerial Conflicts continue**

Just as in previous reforms, conflicts marked the intragovernmental consultations between environmental and economics ministry (Dagger, 2009, pp. 147-149, 170-171). Finally, the environmental ministry prevailed to a great extent and could push through most of its demands such as ambitious expansion targets, a new feed-in management, the market premium in the direct marketing model, and higher wind tariffs through the detour of a new system service bonus – all against the will of the economics ministry. With respect to photovoltaics, both ministries pursued similar views and agreed upon minor cuts. The obviation of a compulsory energy management system as eligibility criterion for the Special Equalisation Scheme was one of the few successes of the economics ministry (Dagger, 2009, pp. 122-188, 290-304; see also: BMU, 2007b; 2007c).

The environmental minister Sigmar Gabriel (SPD) found himself in a specific political constellation. After he had suffered an electoral defeat as candidate for the prime minister in Lower Saxony, he faced the lurking downfall of his political career – serving as “spokesperson for pop politics" at the time. The office as environmental minister presented the perhaps last opportunity to regain political standing. As a consequence, he engaged in a
confrontational attitude against the economics ministry to sharpen his profile (cf. Bischoff, 2014, interview). In combination with the institutional role of the environmental ministry as advocate for renewables, this logic of political competition strengthened the environmental party wings and pro-renewables interest groups.

The economics ministry under Michael Glos (CSU) was reined in the coalition agreement’s commitment to the continuation of the EEG. Despite moving away from the previous fundamental rejection of the EEG as such, the economics ministry still criticized the lacking economic efficiency and the rising costs of the EEG, in particular the over-subsidization of PV, and showed little ambition for ambitious renewables growth targets (Dagger, 2009, pp. 142, 147). With respect to numerous details, though, the economics ministry remained passive and did not submit specific proposals. As the economics ministry was not in charge anymore for renewables policy, it rather sought to push the environmental ministry to take economic objectives better into account (ibid., pp. 160-162).

Apart from the Lead Study of the environmental ministry concerning the reform of the EEG (BMU, 2007b), also the economics ministry commissioned a study in the preparation of the EEG, elaborated by the Institute for Energy and Environment (IE) and Prognos (2006). Contrary to earlier publications launched by the ministry’s economic advisory board that had claimed for the entire abolishment of the EEG (BMWA, 2004), the new study did not advertise the entire abolishment or abatement of the EEG but rather made moderate proposals, partly identical with the environmental ministry’s preferences. For instance, the study proposed only a modest tariff reduction for PV roof systems as well as improvements for offshore wind power and small hydropower plants (IE & Prognos, 2006, pp. 259-272). In fact, both the environmental ministry’s Lead Study and the economic ministry’s study suggested mainly improvements for renewables (Dagger, 2009, pp. 120-121; Hirschl, 2008, p. 172). Nonetheless, the environmental ministry reacted irritated. State secretary Michael Müller (SPD) criticized that the economics ministry wasted taxpayer’s money for superfluous studies in fields outside its tasks (BMU, 2007g; see also: Dagger, 2009, pp. 110, 121).

Already in the early negotiations, the economics ministry largely accepted the draft. At the Meseberg session on 23/24 August 2008, the ministries agreed on several compromises. Concerning expansion targets, they agreed on a target of “25% to 30%” until 2020, and to steadily raise the share thereafter. PV depression should be tightened, yet large cutbacks should be avoided. Offshore tariffs should be adjusted in response to risen costs; the conditions for the repowering of onshore wind power plants and for geothermal energy should be improved. For biomass, cogeneration of heat and power should be better supported and ecological criteria introduced. In addition, the feed-in management should be reformed (BMWi/BMU, 2007, p. 10; see also: Dagger, 2009, pp. 140-146, 188-189).
The success of the environmental ministry was owed to favorable framework conditions: the concessions in the coalition agreement towards the SPD, the new EU targets for renewables expansion and climate protection, and the reputation of “Climate Chancellor” Angela Merkel in times of a heated climate change debate. On top, the Chancellor decided to present the first EEG draft prior to the UN Climate Summit in Bali in December 2007, which tightened the time schedule and impeded the influence of the economics ministry on the drafting process. Moreover, the environmental ministry had larger human resources and internal expertise available, whereas the economics ministry coped with staffing constraints (Dagger, 2009, pp. 122-189, 307-309). The agriculture ministry under Ilse Aginer (CSU) advocated for the farmers’ interests and advertised improvements for bioenergy, successfully pushing through the slurry bonus despite concerns of both the environmental and economics ministry (that regarded slurry as being a free material for farmers without need for subsidization), the increase of the fuel bonus for biogas and its participation in the formulation of sustainability criteria for biomass (Dagger, 2009, pp. 157-161, 295-296).

Bundestag: Support for Renewables despite CDU/CSU Intra-Party Fights

In the course of parliamentary consultations, the incumbent groups made various improvements for renewables in comparison with the government draft: the increase of the expansion target from “25 to 30%” to “at least 30%” in 2020, the increase of tariffs for onshore and offshore wind, improvements for biomass (extension of the cogeneration bonus, increase of gas treatment bonus and fuel bonus), improvements for geothermal energy (introduction of early starter bonus, increase of heat use bonus and technology bonus), and improvements for hydropower (in particular for modernized small plants). The only exemption was a more far-reaching cut of PV promotion (strengthened degression, introduction of a flexible cap), as concession to the CDU/CSU economic wing (BT, 2008, Envi. Committee, doc. 16(16)446; BT, 2008, doc. 16/9477; Dagger, 2009, pp. 205-289).

The CDU/CSU faced heavy internal conflicts. The environmental wing, as organized in the working group on the environment, took a clearly positive stance on the EEG draft (e.g.: Flachsbarth, 2008). On the contrary, the economic wing, namely the working group on economy as well as politicians from North Rhine-Westphalia, advanced an overall skeptical position and particularly insisted on high PV cuts by 30%, referring to RWI recommendations (e.g.: Fuchs, 2008; FAZ, 4.6.2008). Leading economic politicians such as Laurenz Meyer, spokesperson for economic policy, proposed the introduction of an absolute cap on PV capacity as an alternative to higher tariff cuts (Handelsblatt, 4.5.2008). However, they were only capable to win the majority of the CDU/CSU group for somewhat more far-reaching cuts
than suggested in the government draft, but by far not as far-reaching as actually claimed. Also Marieluise Dött, spokesperson for environmental policy, heavily criticized the large expenses for solar power but she proposed less severe reductions due to the need for coalitional compromises with respect to other issues at stake and the high levels of reputation of PV in the general public; a situation where the CDU/CSU can be blamed for “killing” solar energy should be avoided (Dött, 2007, p. 2).39

The CDU/CSU leadership sought to accommodate the resistance of the economic wing with concessions made in subsequent negotiations between the coalition leaders on 3 June 2008, just in the morning before the decisive group meetings. In this negotiation, the coalition partners agreed on the introduction of a flexible cap for photovoltaics. However, this concession was rather of symbolic character, compared with the original demands for severe tariff reductions by 30% raised by the economic wing (BT, 2008, Envi. Committee, doc. 16(16)446; Dagger, 2009, pp. 276-277; Fell, 2014, interview). The SPD agreed to the flexible cap and to the CSU’s claims for improvements for hydropower, in exchange for the CDU/CSU’s agreement to only moderate PV tariff reduction. Aside from the PV conflict, the CDU/CSU forwarded great sympathies for biomass (higher basic tariffs, slurry bonus), with the exception of the fuel bonus for energy crops that had led to large cornfields criticized for negative impacts for nature and landscape. Politicians particularly from Lower Saxony and Bavaria had stakes in biomass, others from Schleswig-Holstein and Lower Saxony pressed for wind power improvements, while economic politicians favored offshore and repowering (Dagger, 2012, interview; Scheer, 2008, p. 31).

The intra-party conflict within the CDU/CSU culminated in the group session when the final EEG draft was put to vote. The meeting was exceptionally turbulent. Many parliamentarians raised fierce criticism over various elements of the draft and especially the only slightly reduced PV promotion. Environmental politicians, such as Katharina Reiche and Maria Flachsbarth, defended the amendment, whereas politicians from the economic wing expressed their discontent and particularly stressed the swelling costs for PV promotion for which the CDU/CSU would be blamed in the future. The group’s approval “hang by a thread”, according to participants. A failure was conceivable. Chancellor Merkel asked confidants, such as CDU secretary general Ronald Pofalla, not to leave early, and intervened three times in the debate, as often and intense as rarely.40 Eventually, the vote ended positive with nine votes against and three abstentions (with 223 members in total). To prevent damage to the party’s image and to occupy the topic of climate protection, critics eventually gave in, as a failure of the EEG – pars pro toto for the Meseberg IEKP package – as affront against the Chancellor and CDU chairwoman. Leading economic politicians such as Laurenz Meyer, who still had voted against the reform in the group board, finally voted in favor of the amendment. Meyer argued that, for being former CDU secretary general, he was aware that the CDU
needed to occupy the topic of climate protection. Former research minister Heinz Riesenhuber stated that he supported the amendment only out of necessity, faced with an uncomfortable choice: “Either we cut photovoltaics, or we cut the Chancellor.”41 Other group members stated that the government had to achieve more legislative success prior to the upcoming federal elections and must observe coalitional reliability, since otherwise also the SPD could not be held reliable anymore. An important concession was the SPD’s consent to the introduction of the flexible cap that was meant to serve as cost-limiting mechanism and pick up the demands of the CDU/CSU economic wing (Dagger, 2009, pp. 277-281, 308-309; Feldkirchen, Neukirch, & Schwennicke, 2008, pp. 26-27; FAZ, 4.6.2008; Focus, 3.6.2008). In the plenary, 181 conservatives eventually voted in favor of the reform, 11 against, 2 abstained, and 29 did not vote. Most remaining opponents were members of the economic or budget committee (Dagger, 2009, p. 288).

All in all, the Bundestag exerted clear influence on the EEG reform and backed the pro-renewables coalition; this was particularly owed to the leading responsibility of the environmental committee that steered the negotiations and put up resistance against the economic wing, as well as the political competition between the CDU/CSU as party of the “Climate Chancellor” Angela Merkel and the SPD’s attempts to sharpen her profile in climate politics. The resistance of the economic wing within the CDU/CSU was alleviated by compromises and eventually ruled out by political power considerations and party discipline.

**Bundesrat: Latent Influence in Support for Renewables**

Although the EEG was not subject to mandatory legislation and despite a congruent party majority in the Bundesrat, the federal government still involved the state governments in policy formulation, aiming to avoid the further delay of the entry into force through a possible appeal to the mediation committee, and to secure the support of the states for other legislation at stake as well as the implementation of the law. The different states pressed ahead with specific interests: Bavaria (CSU) and Baden-Württemberg (CDU) wished improvements for biomass, hydropower and geothermal energy. Mecklenburg-Vorpommern (SPD/CDU), Saxony-Anhalt (CDU/SPD) and some other states advocated for the extension of the fuel bonus and a higher slurry bonus. All five East-German state governments turned against severe PV cuts, owed to the importance of the solar industry in these states, and intervened in the early negotiations, among other with a joint letter to the CDU/CSU and SPD parliamentary groups. Thuringia (CDU), Brandenburg (SPD/CDU) and Saxony-Anhalt (CDU/SPD) advocated for only 7% of PV depression instead of 9% envisaged. Brandenburg’s CDU economic minister Ulrich Junghanns warned against “the horror
scenario of dramatic cutbacks”. The Northern states, in turn, wished for improvements for wind power, since many wind farms were located in their territory (neue energie, 03/2008, pp. 18-20; neue energie, 06/2008, pp. 16-19; Dagger, 2009, pp. 189-205, 237-242, 294). In a statement passed on 15 February 2008, prior the Bundestag consultations, the Bundesrat made an exhaustive number of suggestions which – besides many legal and technical details – mainly were directed to strengthen the promotion of renewables, as higher or modified tariffs for hydropower, biomass and geothermal energy (BR, 2008, doc. 10/08; Dagger 2009, pp. 189-205). In their consultations, Bundestag and federal government also took these concerns into account.

On 4 July 2008, the Bundesrat passed the EEG (BR, 2008, doc. 418/08) together with other parts of the Integrated Energy Climate Programme, including the renewable heat law and the cogeneration law. The final version already accommodated wishes of the states: the tariffs for solar power have been reduced less than initially intended, whereas the conditions for wind, biomass and geothermal energy have been improved.

Although the Bunderat only exerted minor influence (Dagger, 2009, p.24), the wishes of state governments were taken up in governmental and parliamentary consultations and largely supported pro-renewables interest groups. The CDU/CSU approached environmental interests and moved closer to SPD and Greens, which also became visible in the positioning of state governments in the Bundesrat.

**Interim Summary**

The political landscape has encountered fundamental shifts: In response to a growing constituency with stakes in renewables – such as homeowners, farmers and craftsmen – and the increasing industrial importance of renewables, CDU/CSU and FDP turned into explicit proponents of the EEG, despite persistent intra-party conflicts particularly focusing on PV. Moreover, the image of Angela Merkel as “Climate Chancellor” and the high salience of climate protection in public debate contributed favorable framework conditions for pro-renewables interest groups.

The EEG 2009 proved as victory for the pro-renewables coalition. The EEG per se was not seriously put into question anymore. Both major mainstream parties CDU/CSU and SPD explicitly accepted and actively endorsed the feed-in model and moved closer to the positions of the Greens – quasi a “grand green coalition” for renewables. Even the FDP, a former opponent of the EEG, changed her course. Nonetheless, vigorous intra-party conflicts
between the economic and the environmental wing marked particularly the CDU/CSU, with a focus on the high PV tariffs.

The leading responsibility of the environmental ministry strengthened the environmental wings of both incumbent parliamentary groups. The support of the ministerial bureaucracy proved indespensible, as the EEG has become an extensive and complex matter to such an extent that the parliamentarians were not anymore capable to cope with the heavy workload on their own capacity.

The state governments have been involved in the negotiations before the final draft entered the Bundesrat, which is why the Bundesrat refrained from calling the mediation committee. State governments pursued pro-renewables positions, largely independent from their party composition.

6.7 PV Act (2010) under the CDU/CSU/FDP Government

After federal elections in September 2009, the new CDU/CSU/FDP coalition replaced the previous CDU/CSU/SPD grand coalition. The environmental ministry was now headed by Norbert Röttgen (CDU), the economics ministry by Rainer Brüderle (FDP). The new government launched a new National Energy Concept in September 2010, which continued the existing ambitious goals for renewables of 35% until 2020, 50% until 2030, 65% until 2040 and 80% until 2050 (Bundesregierung, 2010b, pp. 4-5), yet also emphasized the imperative necessity for more cost-effectiveness in the expansion course.

Just after the elections, need for action on the solar energy remuneration became clear. The factual PV capacity growth surpassed even the most optimistic forecasts as brought forward by branch associations. In 2009 alone, 3,800 MW capacity was newly installed – about three times more than the environmental ministry’s 2008 Lead Study had forecasted (1,300 MW). Already in 2008, the capacity growth of 1,933 MW had exceeded the ministerial estimation that only expected 1,250 MW (BMU, 2008b, p. 171; BNetzA, 2012). As direct consequence, promotion costs skyrocketed, owed to the relatively high feed-in tariffs granted for solar energy. An additional round of PV tariff cuts found support across political parties to steer the unleashed boom and to dampen the EEG levy.
Economic circumstances proved complex. Nonwithstanding the boom of solar energy, the German solar industry faced severe economic challenges. During the period of stagnation and partial increase of PV market prices between 2004 and 2006 when high demand met shortage in production, solar manufacturers achieved high profits while solar system operators had to cope with rather low returns. After 2006, however, PV system prices began to decline and dropped by approx. 30% in 2009 alone, caused by cheap imports from China where a large solar industry had rapidly developed. Albeit the decline in domestic production costs also progressed in faster pace than expected,\(^1\) it was still not as fast and strong to catch up with the decline in world market prices, with the effect that the German solar industry was not capable to compete against cheap imports. As consequence of massive production overcapacities and the sharp drop in prices, profits of the solar industry decreased, whereas returns of solar system operators strongly increased, the latter owed to the relatively high feed-in tariffs. This situation triggered a clearance-sale like skyrocketing demand for solar systems at the end of 2009, as homeowners were keen to participate in high-return investments just in time before the next cut in tariffs, scheduled in the EEG 2009 for the turn of the year, came into effect (Fh-ISE, 2010, pp. 7-9).

The decline of world market prices did not go along with a similar decline in production costs in German solar industry (LBBW, 2010, p. 5). Many domestic manufacturers, also major ones, have not been able to cope with the drop in solar modules prices. In comparison with

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\(^1\)\text{source: Energytransition.org. Cf. also Quaschning, 2011, p. 27.}
Chinese competitors such as Suntech, Trina or Yingli, even large European solar firms such as Bosch Solar – the then largest solar cells producer in Europe – were relatively small and could therefore not benefit from economies of scale (Vorholz, 2012b, p. 29). A sizeable number of companies, also major and successful ones, were drawn into crisis (Fehmel, 2009): Q-Cells (in Saxony-Anhalt), the just emerged world market leader, recorded losses and released 500 employees. Also Solon (in Mecklenburg-Vorpommern and Berlin) suffered losses and reduced the production. CSG Solar (in Saxony-Anhalt) had to stop production in December 2008 and release most of employees. City Solar (in Rhineland-Palatinate), one of the leading manufacturers of large solar power plants, went bankrupt in January 2009.

Politicians found themselves torn between the protection of the domestic solar industry and the limitation of promotion costs resulting from the overshooting growth of PV capacity. The prevalent feelin was that tariffs should be adjusted; yet market uncertainties made it difficult to judge how far-reaching tariffs reductions could possibly go. These uncertainties opened up a gateway for lobby influence.

Results of the PV Act 2010

The new coalition planned to readjust the PV tariffs to reflect price decreases. After coalitional talks, the first draft for the PV Act was issued on 23 March 2010. The Bundestag adopted the PV cuts on 6 May 2010 in the final version as decided by the environmental committee (BT, 2010, Envi. Committee, doc. 17/1604), against the votes of the opposition (SPD, Greens, Left Party). Yet the Bundesrat called the mediation committee on 4 June 2010, which presented its proposal on 5 July 2010. The Bundesrat agreed to the compromise on 8 July 2010 and the Bundesrat on 9 July 2010. The PV Act entered into force retroactively with effect from 1 July 2010. In its final version, the PV Act contained the following:

- **drastic reduction in tariffs**: cut by 8-13% depending on the system type (8% for converted land areas installations, 12% for other freestanding systems, 13% for buildings installations, in effect 1 July 2010) and an additional cut by 3% in a second step (in effect 1 October 2010, with transitional provisions for freestanding systems);
- **reform of the flexible cap**: the growth corridor was doubled and now ranged between 2,500 and 3,500 MW per year, along with tighter growth-dependent degression rates of 1-12% additional to the ordinary degression by 9%. If capacity growth falls below the growth corridor, the ordinary degression is relaxed accordingly;
- **own consumption privilege**: the consumption of self-generated electricity was better promoted. The incentive was significantly raised to an equivalent of approx. 8ct (beforehand: 3.6ct) and the eligibility extended to large systems up to 500 kW (beforehand: small systems up to 30 kW only). The own consumption privilege
differentiated between system sizes and between less than 30% share of own consumption (lower tariff) and above 30% (higher tariff);

- **free-standing systems**: re-establishment of eligibility (in revision of the temporary limitation until 2015 in place) yet restricted to converted land areas with a broad definition; agricultural areas were excluded, apart from an interim arrangement for projects in planning. The definition of converted land areas was specified and extended.

The new round of PV tariff cuts met an utmost insecure and volatile market. Amongst independent analysts, skepticism prevailed. Financial market analysts such as Unicredit and LBBW spoke of a “negative” or even “devastating” message for the solar sector that would be exposed to enormous consolidation pressure. The stock markets promptly reacted with a decline in share prices of solar companies (Handelsblatt, 16.1.2010; Der Spiegel, 15.1.2010). Also the solar industry, renewables initiatives and environmental NGOs protested against the cuts that were, in their view, too severe to reach the goals of renewables growth. Industry and large energy suppliers associations remained reluctant in the formulation of specific positions, but pressed for the limitation of solar remuneration without proposing specific numbers. The BDEW suggested a 16% cut, as envisaged in the draft (13%+3%).

Who won? At the first glance, the cuts appeared indeed quite far-reaching, and the solar lobby was not able to obviate these cuts. However, the start date – originally scheduled for 1 April – was postponed to 1 July, which is to be understood as concession to the solar business as it extended the high demand for solar panels by two months and brought a boom in sales. Solely owing to the political debate over new PV cuts, the demand for PV skyrocketed so operators could still obtain the higher tariffs (LBBW, 2010, p. 13). But first and foremost, the solar industry achieved a more subtle yet decisive compensation: the own-consumption privilege created a loophole to soften the tariff reductions, because system operators could compensate the reduced tariffs for electricity feed-in with higher tariff for electricity self-consumed. Therewith, instead of 16%, the de-facto cuts amounted only to max. 10.88% (Der Spiegel, 12.2.2010b). This compensation was advanced by the BSW and explicitly politically intended (Fell, 2014, interview). Environmental minister Röttgen expected a “participation impulse for citizens” associated therewith, and energy politicians from the coalitional groups spoke of a “special treat”. One of them stated: “This is [the position of Solarworld CEO Frank] Asbeck in pure form” (Fichtner & Werner, 2010). In contrast, the conventional energy industry opposed the own-consumption privilege, given the redistributional effects to the benefit of solar system operators (benefiting from savings of grid charges and electricity taxes given their lower electricity purchases) and the negative impacts on grid stability perceived (disturbance in load profile planning, no relaxing effect for grids). In this instance, the solar business could clearly succeed.
### Table 30: Constellation of Interests and Policy Output (PV Act 2010)

<table>
<thead>
<tr>
<th>Interest</th>
<th>Economic Coalition</th>
<th>Environmental Coalition</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tariff cuts</td>
<td>≈16% (BDEW)</td>
<td>≤10% (solar industry, unions, crafts) ≤15% (environmental NGOs) ≈30% (consumers)</td>
<td>8-13% depending on system type (8% for converted land areas installations, 13% for buildings installations, 1 July 2010) additional 3% (1 October 2010)</td>
</tr>
<tr>
<td>Growth target</td>
<td>(no position retrievable)</td>
<td>- 3,000 MW (environmental NGOs, market researchers) - 8,000 MW (consumers) - 10,000 MW (Photon)</td>
<td>3,000 MW</td>
</tr>
<tr>
<td>Flexible cap</td>
<td>yes (consumers)</td>
<td>yes (solar industry, energy consumers, some environmental NGOs) above growth target no (metal workers union, independent solar consultants, some environmental NGOs)</td>
<td>yes: additional degression 1-12% above 3,500 MW (vice versa alleviated degression below 2,500 MW)</td>
</tr>
<tr>
<td>Freestanding systems</td>
<td>exclusion of arable land (energy industry)</td>
<td>- no exclusion of arable land - no tariff reduction for converted land areas - good transitional provisions</td>
<td>- exclusion of arable land - medium tariff reduction for converted land areas - good transitional provisions</td>
</tr>
<tr>
<td>Incentives for own consumption</td>
<td>no</td>
<td>yes, high (solar industry, crafts) no (environmental NGOs, Photon)</td>
<td>yes, high (8ct)</td>
</tr>
</tbody>
</table>


#### The Lobby Efforts of the Solar Industry

The EEG has created its own constituency: The PV industry had developed into a significant industry that secured about 60,000 jobs in 2009 (BSW, 2010a), including the craft sector, in particular in economically underdeveloped areas in East Germany. Other business associations and unions, such as crafts and metal industry, shared the same goal of a strong domestic solar industry. They partnered up with environmental NGOs, despite differences over some subordinate aspects of solar promotion. Jochen Flasbarth, president of the Federal Environment Agency at the time and today state secretary in the environmental ministry, holds that the new organizational capacity of the beneficiaries of solar promotion became visible and tangible for the first time when solar industry and unions demonstrated in front of the Chancellery. With the emergent industry sector capable of articulating itself and form societal alliance, the EEG had changed the logic of political weight (Flasbarth, 2014, interview).
Yet, critics from within the solar community – most outstanding, experts from the recognized solar consultancy and magazine Photon – pointed to the risen profits of solar operators, which complicated the uniform public appearance. In particular, the solar lobby lost the consumer association as an important ally, since costs for solar remuneration had skyrocketed with consecutive impacts on private households' budgets. The consumer association vigorously pressed for considerably heavier cutbacks than the BDEW.

The BSW protested against the tariff cuts as envisaged by the government, and blamed the government to endanger the existence of the German solar industry and to jeopardize 50,000 jobs, claiming for a “reliable promotion policy” with “a sense of proportion” (BSW, 2010a; BSW, 2010c; BSW, 2010b; Der Spiegel, 25.9.2009). Besides rejecting drastic cuts, the branch particularly advocated for the enhancement of the own-consumption privilege. Branch representatives advertized this model in public as well as in meetings with politicians and state officials (Asbeck, 2010; Der Spiegel, 12.2.2010).

Media reports picked up the financial downsides of renewables promotion. Media coverage increasingly leaned towards a critical stance on the rising costs and the social redistribution effects, producing for a “reliable promotion policy” with “a sense of proportion” such as “Expensive Green Energy: Solar Boom triggers explosion of subsidies” (Der Spiegel, 24.8.2009) at a regular intervall. The metaphor of “solar debts”, a terminus coined by RWI economists, was widely used in media coverage. This intense cost debate reinforced the public image of PV as expensive form of electricity production, although prices had already dropped. The BSW was aware that increases in the EEG levy could jeopardize public acceptance and was concerned over the tipping point of public acceptance (Brohm, 2014, interview).

Nonetheless, public opinion still remained on the side of the solar industry. In a survey by polling firm Forsa in January 2010 on behalf of BSW, 71% of respondents stated that they were willing to bear an increase of the EEG levy from 3% at the time to 5% in their electricity bill within the next five years. 27% were not willing to do so. However, only 41% of respondents were willing to accept a further-reaching cost increase beyond the 5% mark (forsa, 2010).

Representatives from the solar branch and consumer organizations convened with the environmental ministry in January 2010 for consultations about the reduction of solar tariffs. In the run-up to the meeting, the BSW proposed to advance the half of the tariff reduction scheduled for end of the year to 1 July. If this reduction was sufficient to reflect the price drop and limit the promotion costs was controversially discussed, given that the solar capacities were growing much faster than projected, so the increasing electricity generation would over-compensate the tariff cutbacks. In the past, BSW forecasts had systematically underestimated the growth in solar capacity: According to a 2008 BSW projection, a build-up of 682 MW was to be expected for 2009, whereas the factual build-up amounted to approx. 284
3800 MW, i.e. four times higher than predicted. Associated therewith, the total promotion costs skyrocketed from 2.4 bn € (BSW forecast) to 10.4 bn € (in reality). Critics such as the consumers association and the consultancy Photon blamed the solar industry to deliberately operate with understated growth rates to artificially reduce dampen predicted costs.46 Also for the time period from 2010 until 2013, BSW forecasts assumed an annual growth between 600 and 700 MW only. Independent analysts, in contrast, projected a growth of several thousands of MW per year (Der Spiegel, 13.1.2010; 15.1.2010).

The BSW justified the inaccurate forecasts with high market uncertainty. According to Rainer Brohm, head of politics at BSW, it was unpredictable when exactly the branch would be capable to realize the reduction in system prices. If ill timed, a tariff reduction amounting to 25-30%, as claimed inter alia by the consumers association and CDU/CSU economic politicians, would have evoked fatal consequences for the solar industry. With this in mind, the BSW held a cautious tariff adjustment advisable (Brohm, 2014, interview).

Parts of the solar industry attempted to exert influence on the FDP, an opponent of PV promotion. The most striking example is Solarworld, one of the largest solar manufacturers in Germany. On 12 September 2009, shortly before the federal elections, Solarworld CEO Frank Asbeck invited 280 guests to an exclusive fundraising dinner, including nearly the entire FDP leadership. The donations raised went to the election campaign of FDP chairman Guido Westerwelle, who also attended the dinner. According to the FDP, the “unforgettable evening” raised a record sum of donations. Clear evidence on the causal effects of this lobbying evening cannot be retrieved. However, FDP circles put about that it was Guido Westerwelle who pressed to remove the demand for substantial PV cuts from the first draft of the coalition agreement, replaced by the demand for a “dialogue with the solar branch and consumers associations over adjustments of solar promotion”. The FDP denied a causal link between both incidents (Fichtner & Werner, 2010; SZ, 17.5.2010b; Der Spiegel, 23.1.2010; Kunze, 2013; Tillack, 2015, p. 240).

The reputation of the solar industry began to crack: Some solar lobbyists applied arguable methods and showed a credo that did not match with the positive public image of the renewables branch – first and foremost Solarworld CEO Frank Asbeck, who purchased castles, drove a Maserati sports vehicle, placed heads of foxes in his office and gave controversial campaign contributions to benevolent politicians in FDP and SPD. For his pretentious behavior, he was soon derided as “the Sun King” (“Sonnenkönig”) (Tillack, 2015, p. 240). This aggressive lobbying style made Asbeck unpopular in the environmental community and beyond, attracted hostile media reports and evoked harsh criticism also among Green politicians, with consecutive negative impacts for the image of the entire branch (Fichtner & Werner, 2010; Kunze, 2013; Sühlsen & Hisschemöller, 2014, pp. 5, 7). In addition, a growing number of actors within the renewables community blamed the solar
industry to defend her profits and to jeopardize the societal acceptance of the energy transition as such. Photon consultant Anne Kreutzmann held that the solar industry evidently portrayed the own market situation worse than it was in fact (Der Spiegel, 25.9.2009).\textsuperscript{47} Former BEE president Johannes Lackmann, one of the most outstanding pioneers of the renewables movement, stated that large parts of the branch got rid off their idealistic goals; he went on to say that this was a natural development, as firms were now “grown up” and had got rid of their idealism. The solar branch now represented a “normal industry” (Fichtner & Werner, 2010).\textsuperscript{48} Not least, it did not help the tarnished reputation of the BSW that the headquarter moved to the upper floor of the luxury department store Galeries Lafayette, which only underlined the new profits-driven politics style of the branch. The solar industry lost trust among policymakers and the public.

**Government: Swift Compromise-Building**

The “if” of reduction of tariffs as such was not controversial within the government, yet the precise “how” and “how much”. On 20 January 2010, environmental minister Norbert Röttgen presented his plans. He proposed a cut by 15% for roof systems with effect from 1 April, for freestanding systems on arable land by 25% and on other open spaces by 15% with effect from 1 July. In addition to the reductions provided in the EEG 2009, these additional cutbacks would have amounted to total cuts by 28.8% to 43.2% within 24 months. In contrast, economics minister Rainer Brüderle (FDP) advocated for a more severe tariff cut by 17% for roof systems (Der Spiegel, 19.1.2010). In addition, Röttgen proposed a growth corridor of 2,500 to 3,500 MW, with additional cuts by 2.5% if the corridor is exceeded, and to extend the own-consumption privilege (BMU, 2010b). In two meetings of the coalition committee in February (Der Spiegel, 12.2.2010; 9.2.2010), the proposal was revised in some details: The cuts for roof systems were intensified to 16% (instead of 15%), yet with the start date postponed to June. The later start date gave the solar industry more time for selling modules under the present tariff; as the legislative process needed more time anyway, the retroactive entry into force on 1 April would have created investment uncertainty for the entire solar market so that the later start date appeared advisable. Under pressure from the CSU, freestanding systems were entirely excluded from EEG remuneration, although the CDU and Röttgen only wanted to massively cut the remuneration but still keep their eligibility.\textsuperscript{49} In exchange, the tariff cut for converted areas was eased to 11% (instead of 15%). The own-consumption privilege was raised.\textsuperscript{50} Against the resistance of the FDP, Röttgen insisted on own-consumption incentives and accepted, in exchange, a slightly sharpened tariff reduction. The additional market-dependent degression of the flexible cap was split up into two steps of 2% and 3%. The government passed the agreements on 3 March 2010.\textsuperscript{51}
Bundestag: Safeguarding Solar

Caught up in conflicting goals of the preservation of the domestic solar industry and employment on the one hand and the pressure on electricity prices on the other hand, while facing economic pressure by cheap imports from Asia, it was challenging for parliamentarians to reconcile on a position, given the enormous uncertainties over future market development (Fischer, 2013, interview). In the course of consultations in the environmental committee, the Bundestag made some modifications to the government draft (BT, 2010, doc. 17/1147 and 17/1604): Most noteworthy, the additional degression rates if the capacity build-up surpasses the growth corridor were softened. Furthermore, the interim arrangement for freestanding facilities was extended. Yet, the own-consumption privilege was reduced for low shares of own consumption (yet still much higher than the status quo ante). The final version was passed by the incumbent groups on 6 May 2010 against the votes of the opposition (SPD, Greens, Left Party). The parliamentary intervention was also due to public pressure on politicians and uncertainties over market development. According to FDP environmental politician Horst Meierhofer, “the PV cut was merely an adjustment to decreased module prices. […] That will not save any company in Germany because the Chinese will always be cheaper. Yet the perception of the solar craftsman in my electoral district is: ‘You destroy the solar industry’” (Meierhofer, 2012, interview). Overall, the FDP parliamentary group was considered more renewables-friendly than the FDP-led economics ministry. Within CDU/CSU, the economic wing had pressed for higher cuts and an absolute cap on PV capacity (Der Spiegel, 19.1.2010), yet did not prevail against the environmental wing that relied on support by the CDU-led environmental ministry.

Bundesrat: Protection of the Status Quo

The PV Act was not subject to approval by the Bundesrat. However, the Bundesrat could delay the legislation process by calling the mediation committee. Such a delay was undesirable as the PV cuts had been planned for 1 April in the beginning and then already postponed to 1 June, and politicians did not wish to have the legislation to enter into effect retroactively, in order to avoid investment procastranation and disruptive market movements. State governments actively sought to cushion the PV cuts. In particular, Thuringia’s economics minister Matthias Machnig (SPD) sought to protect the industrial settlements in the Thuringian “Solar Valley”. As interests of solar associations and state governments proved identical to a large extent, both sought to exert pressure on the federal level. The federal government needed to tackle increases of the EEG levy, while the state governors
solely focused on the protection of their industries. State governments defended their domestic solar industry as matter of protecting their regional economic strength and strategy of blame avoidance (cf. Bischoff, 2014, interview).

The federal government relied on congruent party majority in the Bundesrat still at the beginning of 2010, yet faced imminent elections in North Rhine-Westphalia that put the majority at stake; indeed, it later turned out that the CDU lost the state election and, as the result, the governmental Bundesrat majority ceased on 15 July 2010. As this change in majorities was foreseeable, the federal government wished to pass the PV Act as fast as possible before the majority constellation changed and complicated the legislation process.

Despite congruent party majorities, the Bundesrat called the mediation committee on 4 June 2010, turning against the deep cuts. The Bundesrat demanded that tariffs should be reduced by only 10% (instead of 15-16%), disregarding different system sizes. Furthermore, the interim arrangement for freestanding installations on arable land should be extended and a more differentiated tariff system for freestanding installations should be introduced (BR, 2010, doc. 284/10). The mediation committee achieved a compromise on 5 July 2010. According to that, the reductions were not lowered but split into two steps, which made new installations more profitable than in the original plan (see table # for further details). After the adoption by Bundestag and Bundesrat, the PV Act went into force with retroactive effect (Der Spiegel, 5.7.2010; BT, 2010, doc. 17/2402).

Hence, the Bundesrat proved as decisive veto point, which was successfully exploited by the Environmental Coalition via the detour of the state governments. The Bundesrat impeded a drastic policy change and protected the status quo.

Table 31: PV Act 2010 – From the first Proposal to the Final Result

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>roof systems</td>
<td>-15%, from 1 April</td>
<td>-16%, from 1 June</td>
<td>-16%, from 1 June</td>
<td>-13%, from 1 June -3%, from 1 October</td>
</tr>
<tr>
<td>freestanding systems, open space</td>
<td>-15%, from 1 July</td>
<td>-15%, from 1 July</td>
<td>-15%, from 1 July</td>
<td>-12%, from 1 July -3%, from 1 October</td>
</tr>
<tr>
<td>freestanding systems, arable land</td>
<td>-25%, from 1 July</td>
<td>excluded</td>
<td>excluded (modifications in transitional period)</td>
<td>excluded (no changes)</td>
</tr>
<tr>
<td>freestanding systems, conversion areas</td>
<td>-15%, from 1 July</td>
<td>-111%, from 1 July</td>
<td>-111%, from 1 July</td>
<td>-8%, from 1 July -3%, from 1 October</td>
</tr>
<tr>
<td>flexible cap</td>
<td>additional -2.5% &gt;3500MW</td>
<td>additional -2%/-3% &gt;3500MW (2011/2012)</td>
<td>additional -1%/-3% &gt;3500MW (2011/2012)</td>
<td>additional -1%/-3% &gt;3500MW (2011/2012) (no changes)</td>
</tr>
<tr>
<td>promotion of own consumption</td>
<td>5ct</td>
<td>8ct</td>
<td>differentiation depending on share of own consumption (3,6ct &lt;30% ; 8ct &lt;30% ) for &lt; 500 kW</td>
<td>differentiation depending on share of own consumption (3,6ct &lt;30% ; 8ct &lt;30% ) for &lt; 500 kW (no changes)</td>
</tr>
</tbody>
</table>

Source: own table, based on: BMU 201b; BT doc. 17/1147; BT doc. 17/1604; BT doc. 17/2402
Interim Summary

In the face of strong PV growth and high funding costs resulting therefrom, along with a considerable decrease in system prices and high profits of system operators, politicians strived to adjust solar promotion to the new market conditions. In the PV Act 2010, feed-in tariffs were considerably reduced yet this reduction was compensated to a large extent by the better promotion of own consumption. Taken together, the overall reduction was rather moderate, bearing the strong price decline in mind.

This obviation of severe cuts was due to controversial assessments on the current market situation and high uncertainties on the future market development that politicians did not desire to stall by too far-reaching constraints, given the unharmed political goal of continuous solar expansion, the still high public acceptance of solar energy and the objective to safeguard industrial value creation and employment of the solar industry. Politicians feared to be blamed by the electorate for the ruin of the solar industry, which is why they hesitated to enact more severe tariff reductions. Not least, the solar lobby has been engaged in efforts to convince the FDP to recognize the need of photovoltaics promotion.

While the economics minister (FDP) fought for severe cutbacks, the environmental minister (CDU) sought to limit the reductions to an extent acceptable for the solar branch. The Bundestag backed the interests of the solar branch and improved several provisions of the government draft. In the Bundesrat, the state governments protected their solar industries and were able to further dampen the envisaged reductions, nonwithstanding the congruent party majority given.

Decision-making was informed by high uncertainties concerning the assessment of the current market situation, and the future market development. Policy-making hence took place under conditions of bounded rationality: time pressure – in order to react to fast-paced market changes and to tackle costs – and limited information in an utmost volatile and dynamic market environment. The trust in the PV lobby was already impaired, bearing past cost increases and controversial lobby tactics.
6.8 Third Grand EEG Revision (2012) and Preceeding PV Act (2011)

The growth of renewable energies continued. In 2011, green energy already contributed 20.4% of total electricity production (compared to 16.3% in 2009) with a still upward trend, along with a strong increase of the EEG levy to 3.53ct (compared to only 1.33ct in 2009) (BMU, 2013a, pp. 18, 38). In order to adjust the complex EEG provisions to the rapid market development and to react to the tumescent promotion costs, the CDU/CSU/FDP Merkel government planned a comprehensive EEG revision, in accordance with the periodic schedule laid down in the law.

The policy formulation was overshadowed by two major decisions in nuclear politics (see chapter 5). In 2010, the legislator had decided to extend the lifetimes of nuclear power plants in the country, tied to a nuclear fuel tax. However, in the aftermath of the nuclear disaster in Fukushima in 2011, the lifetime extension was withdrawn, whereas the fiscal levies were maintained. It would be plausible to assume that these events also informed the EEG negotiations, since renewables should be meant to compensate for the nuclear phase-out. Yet, the expansion targets for renewables remained unaffected: Neither were targets laid down in the EEG 2009 reduced in the new government’s Energy Concept as of September 2010, nor were they raised in the new Basic Points Paper on the Energy Transformation issued after the Fukushima accident in 2011. The 2020 renewables target remained unaltered in all concepts, aiming at 35% in 2020. That is, nuclear energy and renewable energy have been two different policy fields relatively independent from each other. Climate protection disappeared from public debate and ceased to play a major argument in the reform process. Security of supply and cost-effectiveness advanced to the top priorities.

The main shaping force for the EEG revision was the unbroken solar boom. In 2011, solar energy produced 19,599 GWh in comparison to only 11,729 GWh in 2010 and only 6,583 GWh in 2009 (BMU, 2013a, p. 18). Instead of 5,000 MW as foreseen as upper limit of the growth corridor, in fact 7,400 MW new capacity has been installed in 2010 (BMU, 2011a; BSW, 2014a). Regardless of tariff cuts in 2009 and 2010, this growth continued and led to an increase in the EEG levy. In 2011, PV was responsible for a share of 56% of total remuneration costs yet covered only 20% of renewable electricity production, whereas onshore wind had a share of only 14% of remuneration costs while contributing 44% of renewable electricity production (BMWi/BMU, 2012, p. 36). This striking disparity, along with increasing EEG costs, triggered political pressure to limit PV expansion.

In addition, owed to the merit order effect – a complex price formation mechanism at the electricity spot market (see chapter 2.3) –, the economic viability of gas power plants, politically desired for being both efficient and flexible means of energy production with low carbon emissions, was at risk. This was because photovoltaics reaches its peak electricity
production at noon and feeds it into the grid – i.e. at a time when usually gas power plants are switched on. This diminishes the need for gas power plants, which endangered their economic feasibility and also hit other fossil and nuclear power plants as the profit margins at demand peaks disappeared. The market distortions coming along therewith

**PV Interim Act 2011**

The environmental ministry pursued to tackle the overheated solar market. After consultations with the BSW, environmental minister Norbert Röttgen (CDU), on 21 January 2011, announced his proposal to advance the next PV tariff adjustment. This proposal was made in cooperation and with the clearly expressed consent of the BSW. It advanced the next tariff reduction (originally scheduled for 1 January 2012 in the recent EEG 2012, now entering into force on 1 July 2011 for roof systems and 1 September 2011 for freestanding systems) and modified the flexible cap to better control the growth of PV capacity (BMU, 2011a; 2011b; 2011c). Following Röttgen, the growth of PV “shows the success of photovoltaics in Germany and proves the great potential of renewables in Germany. The promotion must, however, be cost-effective in the interest of electricity consumers and flexibly adjusted to the respective market development. A fast and overheated build-up of photovoltaics would raise the costs resulting from the EEG levy and cause serious acceptance issues [...] The support by the branch itself bears high responsibility and economic rationality. An overheated market leads to highly volatile prices and harms the competitive position of German solar companies” (BMU, 2011b). In the negotiations, exclusively the solar branch participated. Other relevant interest groups, such as consumers, grid operators or the conventional energy industry were not involved.

**EEG Reform 2012**

The EEG 2012 replaced the previous EEG 2009 with effect from 1 January 2012. It was adopted by the Bundestag on 30 June 2011 and by the Bundesrat on 8 July 2011. The new EEG pursued to advance the dynamic expansion of renewable energies, improve cost efficiency, enhance market and grid integration and hold on to the basic principles of the feed-in system.

With considerable and continuously increasing shares of renewable energies from decentralized and mostly fluctuating sources, the optimization of system integration, i.e. the interaction of renewable and conventional energies as well as electricity storages and consumers, gained in importance. The system integration required particularly the qualitative and quantitative expansion of grid infrastructure (smart grid) as well as, in the medium and
long term, additional storage capacity. Besides regulations in the energy market law, these challenges also affected the EEG, e.g. incentives investments in storages, flexible electricity generation of biogas plants or measures for the grid integration of solar systems. The introduction of a new market premium was meant to prepare renewables for the market and, in the medium term, lower their dependence on state support. With respect to the feed-in tariffs, excessive promotion should be strictly avoided yet the cost-covering operation must still be sustained. For this reason, excessive tariffs were reduced (e.g. photovoltaics and small biomass plants) and incentives for cost reduction were strengthened (e.g. sharpened depression for onshore wind), while conditions for sectors with promising growth potential were improved (e.g. offshore wind). These reforms were meant to dampen undesired impacts on electricity prices while maintaining the expansion of renewables (BMWi/BMU, 2012, pp. 40-44; BMU, 2011g; WD, 2014, pp. 19-22). In detail:

*Expansion targets:* The expansion targets, as inserted from the government’s 2010 Energy Concept, pursued a minimum share of renewable energies in total electricity production of 35% in 2020, 50% in 2030, 65% in 2040 and 80% in 2050, i.e. remained unchanged.

*Solar:* The existing flexible cap for PV capacity, as being considered a suitable mechanism to keep PV growth within the politically envisaged growth corridor, was unalteredly maintained, with bi-annual adjustment just as in 2011. The own-consumption privilege remained in force as well and was extended until the end of 2013. Freestanding systems on nature conservation areas were excluded from remuneration. Of particular importance were new measures for grid integration: PV systems were included in the feed-in management, i.e. could be limited in feed-in during grid overload, yet eligible for compulsory compensation for the loss of revenues. Thus far, the feed-in management only applied to other renewables. Besides, the government was authorized to issue an ordinance on the retrofitting of PV systems to avoid the 50.2 Hz problem (i.e. risk of large-scale blackout due to the self cut-out of PV systems if mains frequency increases to 50.2 Hz).

*Onshore wind:* The tariff structure was in principle maintained. Yet the degression was tightened from 1% to 1.5% to incentivize efficiency improvements. The system services bonus, so far limited until end of 2013, was extended to until end of 2014 (for new plants) or end of 2015 (for existing plants). The repowering bonus was improved, although limited to plants installed previous to 2002 to avoid windfall profits. Onshore wind was expected to deliver the largest shares of renewable energy production at relatively low costs.

*Offshore wind:* Conditions for offshore wind gained enhancements, in order to overcome the delay in development, which was due to the high financial risks and the high volume of investments required for the immature technology. The basic tariff remained unchanged at 3.5ct. The existing early starter premium (2ct) was integrated in the initial rate that increased therewith from 13ct to 15ct. The start of degression was postponed from 2015 to 2018, due
to delays in offshore expansion, while in turn the degression rate applied thereafter was intensified from 5% to 7%. A new, optional and cost-neutral acceleration model was established: The initial tariff can increase to 19ct but is then granted for eight instead of twelve years; thereafter, the ordinary tariffs apply. Other administrative provisions were improved, such as the removal of the time limit for the obligatory grid connection for transmission system operators in the energy market law.

**Biomass**

Tariffs were lowered by 10-15% on average, in particular for small systems, oriented towards declining costs. The degression was intensified from 1% to 2%, applied to the basic tariff only, not anymore to the bonuses. The complicated tariff system was greatly simplified, with four size categories (basic tariffs between 6.0ct and 14.3ct) and two fuel categories (tariffs between 4-8ct; residual wood: 2.5ct). Further modifications included:

- Fuels could now be mixed and were remunerated proportionally, which eased the use of ecologically advantageous fuels such as scrap landscaping materials.
- The tariff for wood combustion was abolished to ease utilization competition.
- A special category for small farm systems with 80% minimum slurry share was newly introduced and granted a high tariff (25ct), serving climate protection by avoiding methane emissions and groundwater conservation by avoiding nutrient discharge.
- The use of corn in biogas plants was limited to max. 60% to prevent ecologically negative monocultures.
- The technology bonus was removed; only a bonus for biogas refinement to natural gas quality was maintained (bonus 1-3ct).
- A minimum of 60% heat production or 60% slurry use was introduced, or direct marketing must be used. That is, it was not sufficient anymore to produce electricity to be eligible for EEG remuneration, rather an additional benefit was required.
- Liquid biomass was excluded from remuneration for new plants to address concerns over negative impacts of biofuels on rainforests and food production.
- A flexibility premium was introduced to incentivize the demand-oriented electricity generation from biomass plants through the subsidization of gas storages.
- Large plants were enforced to participate in direct marketing from 2014 onwards.

The reforms were meant to make the promotion framework more transparent, reduce the multitude of bonuses, retrench over-subsidization, and correct misdirected incentives that have led to ecologically undesirable developments, and therewith to tackle utilization competition (e.g. wood) and nature conservation (e.g. corn monocultures).

**Hydropower**

Given the relatively small expansion potentials for hydropower, changes mainly served the simplification of the complex tariff structure. The degression now uniformly amounted to 1%, the funding period uniformly 20 years. Ecological requirements were
adjusted to the Water Resources Act and hence simplified. Storage power plants with natural inflow were included.

**Geothermal energy:** Against the backdrop of a lasting delay in geothermal energy build-up, the tariff was raised and the start of the degression postponed to 2018, yet in turn with increased degression rates. In addition, the cogeneration bonus and the early starter bonus were integrated into the basic tariff and hence were omitted.

**Electricity storages** were fully exempted from grid charges and supported by a special research programme, in order to avoid dual burdening by charging ingoing as well as outgoing electricity, and to promote the build-up of storage capacity for an energy supply with higher shares of fluctuating energy sources.

**Special Equalisation Scheme:** Industry privileges were extended to more companies and the tariff privileges were further improved (eligibility requirements lowered from 10 GWh to 1 GWh p.a. electricity consumption, with new gradual eligibility to avoid threshold effects, and from 15% to 14% electricity expenses in gross value added). As a consequence thereof, the number of privileged companies increased from 734 (2012) to approx. 2,057 (2013), while the privileged electricity volume only increased from 84.7 TWh (2012) to approx. 97 (2013) given the relatively small electricity consumption of the newly privileged companies (BMWi/BMU, 2012, pp. 36-37).

**Industrial own consumption** of electricity self-generated, hitherto fully exempted from the EEG levy, was now subject to the surcharge if the public grid was used for the transport of electricity, unless the company owned the power plant and consumed the electricity in a spatial context. This was meant to prevent the misuse of the own consumption privilege in the form of specialized business models (contracting).

**Market integration:** The introduction of an optional market premium supported the demand-oriented electricity production. The market premium is calculated as difference between the EEG tariff and the average stock market price. An additional management premium compensated for administrational costs and alleviated market risks. For large biogas plants (>750kW), the use of direct marketing was made compulsory from 2014 onwards. An additional flexibility premium was introduced for gas storages at biogas plants (see above). The details of the market premium were to be ruled in a governmental directive that was subject to parliamentary approval.

**Green Power Privilege:** Energy suppliers whose portfolio comprised more than 50% EEG-funded renewables were imposed a reduced 2ct surcharge (previously fully exempted). This was done because the considerably risen EEG surcharge put a disproportionate incentive to use the Green Power Privilege and led to windfall profits – which is why the electricity volume under the Green Power Privilege had skyrocketed from only 1 TWh in 2010 to bulky 22.5
TWh in 2011. In addition, a minimum share of 20% of fluctuating sources (i.e.: wind and solar) was introduced.\textsuperscript{56} As a result, the importance of the Green Power Privilege declined to 6.3 TWh (2012) and 2.6 TWh (2013) (BMWi/BMU, 2012, p. 37).

**Grid integration:** To give an incentive to consider the grid situation in the site selection for new plants, the compensation in the case of output limitation was reduced to 95%, yet total losses were limited to not more than 1% of annual revenues. For photovoltaics, further specific provisions were made (see above).

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<th>Table 32: Constellation of Interests and Policy Output (EEG 2012)</th>
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<tr>
<td><strong>Economic Coalition</strong></td>
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<td><strong>expansion target</strong></td>
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<td><strong>EEG basic system</strong></td>
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<td><strong>PV</strong></td>
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<th></th>
<th>Onshore Wind</th>
<th>Offshore Wind</th>
<th>Hydropower</th>
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</table>
|                | - extend system services bonus  
- no increase in degression (BDEW) | - maintain tariffs  
- no increase in degression (remain at 1%)  
- maintain the repowering bonus, without sharpened restrictions  
- extend system service bonus | - higher tariffs vis-a-vis the government draft; better promotion of small hydropower and of storage power plants  
Nature conservationists: removal of small hydropower (<500 kW) and very large hydropower (> 20 MW) from remuneration; also existing plants shall adhere to new ecological criteria |
|                | Tariffs in principle maintained  
degression tightened from 1% to 1.5%  
system services bonus, so far limited until end of 2013, extended until end of 2014 (for new plants) or end of 2015 (for existing plants)  
repowering bonus was improved, limited to plants installed previous to 2002 | Basic tariff: 3.5ct; initial tariff: 15ct (integration of early starter bonus)  
Start of degression: postpone to 2018; no increase in degression  
on optional acceleration model: initial tariff of 19.5ct for 9 years (VKU)  
loan programme  
remove restrictive administrational provisions | Tariff structure simplified: uniform degression of 1%, uniform funding period of 20 years  
ecological requirements adjusted to Water Resources Act (hence simplified)  
storage power plants with natural inflow included |
|                |                | basic tariff: 3.5ct; initial tariff: 15ct (integration of early starter bonus)  
start of degression postponed from 2015 to 2018, degression rate intensified from 5% to 7%  
new, optional acceleration model: initial tariff increases to 19ct but granted for 8 instead of 12 years; thereafter, the ordinary tariffs apply  
special loan programme for offshore wind to ensure the funding of ten wind parks with a loan volume of 5 bn. €  
other restrictive administrational provisions were improved, such as the removal of the time limit for the obligatory grid connection for transmission system operators |                |                |
|                |                |                | biomass |
|                | BDEW:  
- maintain tariffs at sufficient level  
- no compulsory minimum heat usage  
- no limitation of mains usage  
paper industry:  
- introduce minimum heat usage | - no basic tariff reductions; increase tariffs for small farm systems  
- exempt bonuses from degression  
- no restrictive technical requirements  
- maintain fuel bonuses, also for liquid biomass  
- maintain old wood bonus  
- maintain slurry bonus, also | - tariffs lowered by 10-15% on average, in particular for small systems  
- degression intensified from 1% to 2%, applied to basic tariff only (not anymore to the bonuses)  
tariff system greatly simplified: four size categories (basic tariffs between 6.0ct and 14.3ct) and two fuel categories (tariffs between 4-8ct; residual wood: |
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<tr>
<th>Industry</th>
<th>Changes</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Wood industry</td>
<td>- Increase depression</td>
<td>- Relax principle of exclusive use for fuel bonus</td>
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<td></td>
<td>- Relax principle of exclusive use for fuel bonus</td>
<td>- Maintain eligibility of liquid biomass; remove size limit of 150kW for vegetable oil</td>
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<td></td>
<td>- No strict minimum heat usage quota</td>
<td>- No co-incineration of biomass in conventional power plants</td>
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<td></td>
<td>- No limitation of maize usage</td>
<td>- Introduce flexibility premium or/and consistency bonus for heat or gas storages,</td>
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<td>- No co-incineration of biomass in conventional power plants</td>
<td>- Relax the principle of exclusive use for the fuel bonus to enable the co-incineration of old wood and landscaping materials</td>
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<td></td>
<td>- Relax the principle of exclusive use for the fuel bonus</td>
<td>Nature conservationists:</td>
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<tr>
<td></td>
<td>- Relax the principle of exclusive use for the fuel bonus</td>
<td>- Pro minimum quota for heat usage</td>
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<td>- Remove old wood bonus</td>
<td>- Pro limitation of maize usage</td>
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<td></td>
<td>- Stronger promotion of small plants</td>
<td>- Remove old wood bonus</td>
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<td>for plants installed previous to 2009</td>
<td>- Relax the principle of exclusive use for fuel bonus</td>
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<td>- Special category for small farm systems with 80% minimum slurry share newly introduced,</td>
<td>- Use of maize limited to max. 60%</td>
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<td>- Only a bonus for biogas refinement was maintained (1-3ct)</td>
<td>- Technology bonus removed;</td>
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<td>- Minimum of 60% heat production or 60% slurry use was introduced, or direct marketing must be used</td>
<td>- Liquid biomass excluded from remuneration (new plants)</td>
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<td>- Flexibility premium introduced (subsidization of gas storages)</td>
<td>- Large plants: compulsory direct marketing from 2014 onwards</td>
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<td>- No strict minimum heat usage quota</td>
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**Geothermal Energy**
- Raise basic tariff
- Postponement of degression
- Integration of early starter bonus and cogeneration bonus into basic tariff
- Tariff raised
- Start of degression postponed to 2018, increased from 1% to 5%
- Cogeneration bonus and early starter bonus integrated into the basic tariff

**Electricity Storages**
- Market introduction programme (external to EEG), in particular also for PV
- Fully exempted from grid charges and supported by a research programme

**Special Equalisation Scheme**
- Extend: lower entrance threshold (from 10 GWh to 5 GWh annual consumption) and gradual eligibility
- No further restrictions such as an obligatory energy management system
- Limit (environmental NGOs) or delete (consumers association)
- Extend (unions)
- Extended: lower entrance threshold: >1 GWh, then gradual eligibility (previously: >10 GWh, threshold)
- >14% electricity costs in gross value added (previously: 15%)

**Industrial Own Consumption**
- Maintain the exemption of self-generated industrial electricity from surcharge, including electricity transported through the public grid and without spatial link between generating and consuming facility
- Subject to EEG levy if the public grid used for the transport of electricity. Exception: company owns the power plant and consumes the electricity generated in a spatial context; no exception of contracting

**Market Integration**
- Strengthen direct marketing; introduce optional market premium
- Introduction of market premium and management premium (0.65ct in 2012/2013)
- Compulsory direct marketing for large biogas plants
premium should amount to 0.65ct  
FK: compulsory direct marketing for as many renewables as feasible, at least for biomass and hydropower

against market integration model for PV systems (percentual limitation of remuneration)

against government authorization for market integration ordinance

introduce consistency bonus / other incentives for reliable renewable capacity, such as for adjustable combined power plants

green power privilege

maintain (BDEW)

- advantage shall remain at 2.5ct at least
- minimum quota for fluctuating sources: not more than 15%, annual average basis

grid integration

- maintain compensation of 100% in case of output limitation
- unions: reduction to 90% acceptable


Result: Success for Wind Power and Manufacturing Industry

The multitude of actors and interests along with the high complexity of technical details created a confusing situation. The number of paragraphs further increased from 66 to 88, and the number of statements handed in from 19 to 32. Even specialized politicians and lobbyists lost the overview. The overall decision-making process thus took a rather isolated approach with little systemic thinking. The reform was based, to a large extent, on internal planning following the progress report prepared by the environmental ministry. The schedule was very tight, since the reform should be passed along with the nuclear phase-out and a number of further energy-related laws in an energy law package framed as response to the Fukushima catastrophe. Associations had only two days to prepare a statement on the government draft (which was passed on 6 June, while the parliamentary hearing of experts took place two days later on 8 June), evidently insufficient to hand in a well-founded opinion.

In the overall result, the Environmental Coalition achieved a victory, albeit being not completely contented: Existing expansion targets remained unaltered, although the government declared to push for an acceleration of the energy transformation in the aftermath of Fukushima; however, these targets were now explicitly formulated as minimum targets and shall not be misunderstood as limiting caps. Second, an imbalance to the benefit of large investors was visible.
The solar branch successfully prevented a rigid cap on capacity growth, while tariff cutbacks turned out very moderate and by far not as severe as pressed for by economic politicians. The overall framework for solar energy promotion did not encounter disruptive breaks.

Also the wind industry succeeded, both onshore and offshore. Original plans for severe retrenchments for onshore wind promotion could be avoided; instead, the status quo of the tariff structure was maintained and repowering improved. The better promotion for offshore was to the benefit of the large conventional energy suppliers since only large investors could cope with the investment volume and market risks associated with large projects of this kind.

For the bioenergy sector, the picture was mixed. Albeit some originally intended severe cutbacks (in particular retroactively for existing facilities) could be obviated, some new technical requirements were held to endanger the economic feasibility in particular of small bioenergy facilities. The reform put the emphasis on the support of large industrial facilities, whereas small farm systems were neglected. Nature conservationists were capable to make their concerns heard, such as the limitation of corn usage, the exclusion of liquid biomass and the reduction of the old wood bonus. Related to this, also economic interest groups such as the food industry, the water industry and the wood-processing industry had pushed for ecological restrictions. Hence nature conservationists and industry allied – yet informally without close collaboration – to advance their joint interests.

Geothermal energy was granted considerable improvements, in response to the persistent delay in build-up. Nonetheless, geothermal energy was still quite costly, contributed only neglectable shares to electricity supply and did not rely on an economically strong lobby.

The industry obtained a further extension of cost relief; industry exemptions now comprised a large number of medium-sized companies. On the other hand, the industry was not capable to obviate the reduction of the privilege for industrial own consumption.

The constellation of interest groups was substantially different from the situation a decade ago: The renewables industry had left its mere niche existence and advanced to a major business sector that contributed 20.4% of electricity supply and secured 381,600 jobs in 2011, including the craft sector (BMU 2013b, S. 18, 32). Moreover, as most renewables plants such as wind power, solar power and biogas facilities are installed in rural areas, and the manufacturing industries were often located in structurally underdeveloped areas such as the East-German states, they have become big sources of employment and tax revenues for states and regional districts. Owed to the risen economic importance of the renewables industry and the alliance with idealistic interests of climate protection, the Environmental Coalition combined conflict capacity and high levels of trust, which still bolstered her assertiveness. “Climate protection has found an economic sparring partner”, as Jochen Flasbarth, state secretary for the environment, put it (Flasbarth, 2014, interview) At the same
time, the conventional energy industry represented in the BDEW reviewed various positions
and now clearly spoke out not only for offshore wind energy, but also for onshore wind
energy as well as for biomass. This new and distinct support from a former strong opponent
helped the pro-renewables coalition to assert her interests, despite ever more intensifying
internal conflicts between the individual renewables branches (Rid, 2014, interview).

PV Promotion: The Solar Industry strives to regain Trust

The solar industry was found herself exposed to an intense cost debate that threatened her
credibility and questioned the acceptance of solar promotion. In media coverage and political
debate, the reproach was made that the solar branch would deliberately resort to flawed
forecasts and other delicate lobbying methods to safeguard profits, by which the branch lost
reputation amongst policymakers (illustrative: Der Spiegel, 21.4.2011). With an open and
collaborative approach and the consent to tariff cuts in the PV Act 2011, the BSW sought to
restore its tarnished credibility and recognition amongst policymakers. This collaborative
approach of the BSW and the first proactively offered proposal for tariff adjustments were
meant to regain the recognition of the BSW as reliable partner, to maintain political
acceptance for solar promotion and to foster sustainable market development (Brohm, 2014,
interview). Through the consent to an early round of tariff cuts and the modification of the
flexible cap, the BSW was capable to obviate more severe retrenchments in the forthcoming
EEG 2012 revision, since the early reform enabled the environmental minister to argue that
the reforms just enacted were sufficient to bring PV capacity growth back under political
control (BMU, 2011d).

At the same time, given the impaired political recognition of the branch and to foster public
acceptance, the BSW ran an eight-month public affairs campaign, starting in May 2011,
based on strategy concepts commissioned at the leading public affairs agency Hill &
Knowlton. A confidential concept paper (BSW, 2011a, on file of the author) reveals key
points of the political strategy: Merkel and Röttgen should be supported and strengthened as
long as they do not openly turn against PV. In a first step, arguments against PV opponents
should be addressed in a sober and objective manner. In further escalation steps, the public
should be mobilized and PV should be framed as question of principle. Alliances with other
actors should be fostered and supporters should be made publicly visible. The debate should
be deliberately emotionalized and personalized. If the branch goals are in danger, Merkel
should be portrayed as “turncoat”, the reform proposals labeled as “rollback”, the CDU as
being unable to reform and failing in an essential question of economic politics, and the anti-
PV course should be framed as putting coalitional options with SPD and Greens at risk and
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alienating critical segments of the electorate. The consequences of additional PV cuts should be pointed out, such as economic uncertainty, job losses and insolvencies. State governments in support of PV, in particular the East-German states, should be backed.

The campaign strived to equip supporters with information and arguments in order to establish the solar industry’s point of view in the political community, and to influence media coverage. Part of this lobby campaign was a BSW-organized calling action, where hundreds of solar firms called politicians and stressed the negative impacts of solar tariff cutbacks, aiming to exert threat potential on politicians (Körnig, 2012).

In another confidential paper (BSW, 2012c, on file of the author), the BSW points out that “lobbyists of the conventional energy sector have repeatedly tried to include a restriction in the EEG to limit the annual construction of PV to 500-1,000 MW, thereby reducing the development of PV to a group”. Also the “growing resistance from the energy-intensive industry” against the considerably increasing EEG levy was noted. Yet a rigid cap and the reduction of the growth corridor could be avoided: The “BSW managed to prevent the reduction of the annual cap for PV support. This was only made possible through the bundling of the interests of the solar companies and strong communication and persuasive power resulting thereof” (BSW, 2012c, p. 10).

The BSW sought to regain trust, build up alliances with other economic actors as well as civil society, frame the public debate over PV as an issue of employment and climate protection, and portray PV as fundamental question of the Energiewende.

The Government's EEG Proposal

In her government statement on the accelerated nuclear phase-out on 9 June 2011, Chancellor Angela Merkel laid out the decisions taken by the coalition leadership on 29 May 2011 and the law draft as of 6 June 2011. She stressed cost efficiency and market integration as guidelines for the EEG amendment, while maintaining the feed-in tariff system. The future expansion shall focus on wind, solar and biomass, while the main focus will be on onshore and offshore wind energy, in particular repowering. The surcharge shall not surpass approx. 3.5ct, aiming to limit the costs for citizens and companies. The Special Equalisation Scheme for energy-intensive industries shall be extended (Bundesregierung, 2011b). Conflicts between the environmental ministry under Norbert Röttgen (CDU) and the economics ministry under Philipp Rösler (FDP) did not break ground in the public debate and could be settled within the government. Röttgen assured that the levy would remain stable also with continued renewables growth because of degression of tariffs and further measures
The governmental draft met fierce criticism by the renewables branch for worsening various funding conditions, for instance tariff cuts for onshore wind, another cutback for solar power, removal of arable land from eligibility for freestanding solar systems, cutbacks and constraints for biomass (e.g. removal of liquid biomass from eligibility), which would slow down the energy transformation. Numerous projects would lose their economic viability (BEE, 2011a; 2011b; 2011c).

**Bundestag: Intra-Party Conflicts, yet continuous Support for Renewables**

The Bundestag exerted major influence and enacted several notable changes of the original government draft (BT, 2011, doc. 16/6071 and 17/6363; BT, 2011, Envi. Committee, doc. 17(16)281(neu)). Although the economic wing of the incumbent CDU/CSU and FDP groups put forward utterly severe restrictions on solar power, the environmental wing prevailed, foremost because the pro-renewables Environmental Committee was responsible for the EEG, not the Economic Committee (Fischer, 2013, interview).

The CDU economic wing advocated for massive cutbacks in PV promotion and a rigid cap on PV capacity, but remained unsuccessful. The FDP, usually a strong critic of the EEG in general and PV promotion in particular, hesitated to press for massive PV funding retrenchments. The FDP environmental wing, in particular Michael Kauch and Horst Meierhofer, resolutely rejected a rigid cap on PV growth and defended solar energy funding.

In a speech at an energy conference, Kauch highlighted that the solar branch had her "best time" under the CDU/CSU/FDP government and stressed that the PV capacity build-up was as strong as never before. He furthermore stated that the obviation of a hard cap was owed to the FDP parliamentary group who had vetoed the cap against the CDU economic wing. In particular, the FDP explicitly endorsed favorable conditions for freestanding solar systems as being the most cost-effective renewable energy (Der Spiegel, 38/2013). Solar companies cultivated contacts to supportive FDP politicians by donations to relevant FDP associations in Dortmund (Kauch) and Regensburg (Meierhofer). The solar branch had also established connections to other high-rank FDP politicians. For instance, Solarworld CEO Frank Asbeck supported FDP party leader Guido Westerwelle (Der Spiegel, 38/2013; Kunze, 2013). Finally, the parliament took a rather supportive position towards PV and extended the own consumption privilege.

Also the wind branch benefited from enhancements in the course of parliamentary consultations: The system service bonus was extended and the provisions for repowering were improved, contrary to original intentions in the environmental ministry to remove both bonuses. However, the depression remained at 1.5%, despite prior agreements between
government and Bundesrat to ease the regression to 1.0%.\textsuperscript{60} Also the promotion scheme for offshore wind under the so-called acceleration model was improved. The BWE devoted enormous lobby efforts to exert influence on the parliament to obviate constraints of the repowering bonus and the system service bonus. According to Thorsten Bischoff from the environmental ministry (2014, interview), it came to light later that one leading BWE lobbyist owned a wind park himself and benefited from the EEG modifications, which impaired the reputation of the wind park as trustworthy partner.

Besides, also hydropower relied on parliamentary support, owed to the advocacy of CSU parliamentarians with stakes in hydropower. The hydropower association did not even have to lobby for their interests, as regional politicians took over the advocacy function without active pressure by interest groups (ibid.).

Also a number of further changes mostly asserted the interests of pro-renewables interest groups: The character of the expansion targets as minimum targets was explicitly highlighted, the limitation of corn usage in biomass plants was relaxed (from 50% to 60%), the flexibility premium for biomass plants was extended to existing facilities, the minimum size for the compulsory direct marketing of large biomass plants was eased, the management premium for controllable renewable energies was raised (by 0.2ct), and the Green Power Privilege was modified (at least 20% fluctuating energy sources, instead of 25%, annual average instead of monthly measurement period, transitional provision for regional marketing).

**Bundesrat: Backing Renewables**

The Bundesrat proved as crucial actor that mitigated radical change and protected the status quo, once again to the benefit of pro-renewables interest groups. Aspirations within the economic wing of the Bundestag groups and the FDP-led economy ministry to severely inhibit solar promotion were particularly prevented through the resistance of state governments prior to the formal Bundesrat involvement. However the EEG was not subject to approval of the Bundesrat, the chamber of states could still slow down the reform by calling the mediation committee. In 2011, the federal government only held 44.9% of congruent party votes in the Bundesrat and thus the Bundesrat represented an open veto point.

The states leaned towards the interests of their local industries and businesses, rather than following pure party line voting. In particular in the economically weak East-German states, a solar industry was built up and nourished with state subsidies. In Thuringia alone, some 5,000 employees worked in the solar industry, which made the CDU/SPD government a decided supporter of the solar branch (SZ, 5.3.2012). Other states, in particular from coastal Northern Germany, fought for wind power.
On 17 June 2011, the Bundesrat passed a large number of requests concerning the EEG amendment, mainly supporting interests of the Environmental Coalition. The states foremost objected the worse conditions for biomass, the market premium, the compulsory derating of small PV installations, the worse own-consumption privilege for PV and the worse conditions for freestanding PV systems, and furthermore proposed improved conditions for onshore wind (BR, 2011, doc. 341/11). The federal government rejected most of the requests, however needed to accommodate the Bundesrat to prevent delays and to secure the states’ support in the sound implementation of federal law, for instance with regard to planning provisions for wind power. Foremost with regard to wind power (system service bonus, repowering bonus, degression rate), the federal government showed willingness to meet halfway. On 21 June 2011, the federal government accepted improvements for the degression of wind power plants and the own-consumption privilege for solar power, improvements for bioenergy and the Green Power Privilege (BR, 2011, doc. 341/11).

Eventually, on 8 July 2011, the Bundesrat passed the EEG and refrained from calling the mediation committee, regardless of a number of unmet recommendations made by the Bundesrat that had claimed the in-depth review of the draft, including improvements for solar power (in particular no inclusion of small PV systems in the feed-in management, re-introduction of arable land in eligibility), wind power and biomass, as well as more ambitious expansion targets. The committees had argued that the draft bill did not make a contribution to the envisaged acceleration of the energy transformation and in particular criticized the inclusion of small PV systems in the feed-in management, which would devalue investments undertaken by citizens and jeopardize the overall acceptance of renewable energies, since solar energy had symbolic meaning for the energy transformation (BR, 2011, doc. 392/11).

Judicial Review

Constitutional restrictions did not constitute a virulent concern. Only some isolated elements were exposed to constitutional reservations regarding the protection of legitimate expectations, such as the reduced compensation within the feed-in management regulation or the limitation of the Green Power Privilege. Also the extension of industry privileges was debated, due to the discrimination of non-privileged companies; expert opinions commissioned by the environmental ministry recommended to specify the category of beneficiaries (F-ISI et al., 2011; Müller, 2011).
Interim Summary

The EEG 2012 was tied to the accelerated nuclear phase-out after the Fukushima disaster. As key element of the envisaged energy transformation, the EEG had at least to maintain the status quo of funding conditions. Given conflicting goals of continuous expansion of renewables on the one hand and the limitation of costs on the other hand, a more qualitative approach towards market and system integration of renewables was required rather than their sheer quantitative growth. These challenges informed the EEG reform.

The solar branch signaled willingness to collaborate and gave her proactive consent to an early tariff reform in 2011, which is why further severe cutbacks in the EEG 2012 were absent, in spite of the fact that CDU/FDP circles along with parts of the energy-intensive industry and conventional energy suppliers had pressed ahead with additional severe retrenchments. The wind branch benefited from the reform; here, the economic wing did not put up resistance, as wind power was the most cost-effective source of renewable energy. Turning to bioenergy, compromises between competing interests of nature conservationists, bioenergy lobbyists and various industries were made. Hydropower was of low importance, given the rather exhausted potential. Geothermal energy was granted better funding conditions due to the delay in market introduction.

The Bundestag proved again as ally of the pro-renewables lobby and made various improvements to the government draft. The CDU/CSU economic wing was not assertive enough to push for massive solar cutbacks, as the environmental wing was structurally strengthened by the leading responsibility of the CDU-led environmental ministry. Also the junior coalition partner FDP was hesitant to cut solar tariffs as the party’s environmental wing had achieved to alter the party’s position to accept of the EEG system. The intra-party conflicts within both incumbent parties led to erratic positioning, adding a fair deal of contingency to the preference formation process. The political spectrum was however already shifted as the result of path dependence: The conflict was not anymore on the question of “for” or “against” the Energiewende, as also the economics ministry and the FDP now accepted elevated renewables targets. Also the Bundesrat advocated for improvements in renewables promotion, rather independent from party composition but bound to their regional economic interests.

Regardless of all cutbacks, the solar boom still continued faster than anticipated. In 2011, new capacity installation achieved a historical record. In December 2011 alone, approx. 3,000 MW PV capacity was put into operation – as much as the total growth target for the entire year (BNetzA, 2012). This boom was triggered by the upcoming tariff cuts under the EEG 2012 at the turn of the year and the emerging political debate over the introduction of a restrictive cap on PV promotion, hence investors wanted to exploit the still favorable funding conditions. The flexible cap, inserted in 2010 and revised in 2011, proved ineffective to better steer capacity growth.

Fig. 40: Development of the EEG levy (2001-2013)

Note: * since 2010 in accordance with the Equalisation Scheme Ordinance. Source: BMU, 2013b, p. 38.

In addition, new forecasts launched in November 2011 revealed that the EEG levy would by far exceed the politically desired threshold, inter alia owed to the uncontrolled increase in solar electricity generation. Already for 2012, the EEG levy was predicted to climb to 3.6ct and further onto between 3.66ct and 4.74ct in 2013, with upward trend thereafter (BMU, 2011f). Although additional external factors such as the merit order effect and the introduction
of a liquidity reserve partially accounted for this surge (BMWi/BMU, 2012, p. 31), the government was under pressure to act, given prior commitments to keep the levy limited to not more than 3.5ct (Bundesregierung, 2011b). The sharp cost increase indeed constituted the next focusing event after Fukushima (Rid, 2014, interview). For the first time, costs became the determining factor for the energy debate (Tillack, 2015, p. 236-237). In combination with the overshooting PV capacity growth, the escalation of the EEG levy ruined the credibility of the solar industry and exceeded the borders of political acceptance. In consequence, politicians were determined to regain control over the unleashed solar growth (Brohm, 2014, interview). “If the branch fails to get a grip on the costs, she jeopardizes the Energiewende project”, as former BEE president Johannes Lackmann put it in 2012 (cited in Tillack, 2015, p. 237).

The price collapse of PV systems and consecutive tariff cuts had already considerably lowered the additional costs of new solar energy production. PV tariffs were by then close to the level of offshore and biogas. Hence, additional PV capacity growth had only little impact on the EEG levy (BSW, 2012d, pp. 1-2). However, policymakers feared that, if not better controlled, the sheer quantitative expansion of PV capacity would still heavily increase promotion costs, at the expense of private consumers. The new tariff cuts were meant to further adjust the tariffs to the continuous decline in market prices. In retrospect, however, the PV Act 2012 reduced the tariffs partially below the threshold of economic feasibility.

**Fig. 44: PV Tariffs and System Prices (2006-2012)**

Note: blue line: EEG tariff for system <100kW; orange line: system price <100kW according to BSW market price index. Red area highlighted by the author. Source: BSW, 2014a.
At the same time, the merit-order effect of solar electricity supply increasingly took dampening effects on electricity prices at the stock market, since PV power generation is high at times of high solar radiation at noon when also electricity demand reaches its peak, and therefore reduces the need for costly peak load power plants. Every Gigawatt PV capacity reduced the stock market price at ever more hours per year, meanwhile not only in winter and low-load weekends but also in spring and fall as well as high-load weekdays (PHOTON, 2012, p. 5). This distorting effect made conventional power plants less economically viable (Großmann, 2012b, p. 10; 2012a, p. 5; Neuhaus, 2013).

Already in January 2012, i.e. just after the EEG 2012 entered into effect, environmental minister Norbert Röttgen (CDU) announced new consultations concerning further tariff reduction steps. It was the fourth time within two years that the government had to deal with cutbacks for the solar branch (Der Spiegel, 6.1.2012). Not even two months previously, the environmental ministry still refused a new debate on solar promotion, since the new EEG was not even into force yet and hence should be allowed to demonstrate its limitation mechanisms (BMU, 2011d). However, the assumption of the ministry that the flexible cap could effectively limit and steer PV capacity growth proved wrong in December when an unprecedented boom in demand for solar panels occurred and falsified all forecasts. The political conflict in 2012 was not anymore about the “if” of the cutbacks but the “how” and “how much”, given the determined political will to better control the growth of solar energy.

The environmental and the economics ministry swiftly presented a joint proposal (23 February 2012), aiming to manage the solar capacity build-up with respect to grid stability and cost limitation as well as to preserve the domestic solar industry (BMU, 2012d). After short parliamentary consultations, the Bundestag passed the PV Act on 29 March. However, 308
the Bundesrat partly rejected the PV cuts and called the mediation committee on 11 May. After labourious negotiations between federal government, parliament and state governments, the mediation committee came up with a compromise that was eventually passed by Bundestag and Bundesrat (28/29 June). After months of tug-of-war, the PV Act could finally enter into force, retroactively with effect from 1 April, entailing comprehensive changes to the PV tariff system (WD, 2014, pp. 23-25; BMU, 2012e):

- **tariffs:** The tariff cut amounted to up to 30% with effect from 1 April 2012 (therewith, the tariff cut scheduled in the EEG 2012 for 1 July was advanced and tightened from originally 15%). Tariffs ranged now between 13.5ct and 19.5ct for roof systems, depending on system size, with a maximum size of 10 MW. The tariff categories along system sizes were reformed (below 10kW, below 40kW, below 1000kW and below 10,000kW). A new category of 10-40 kW was introduced, while freestanding systems were limited to 10 MW. The tariff for freestanding systems was reduced to 13.5 ct.

- **degression:** The regular standard degression was set to 1% per month, equal to 11.4% per year (replacing the previous bi-annual adjustment).

- **flexible cap:** The growth corridor remained unchanged at 2,500 to 3,500 MW per year. If new capacities over exceed this corridor, the degression rises by 1.0% up to 2.8%.

- **hard cap:** An absolute cap for total photovoltaic capacity subsidized was introduced, amounting to 52 GW (in comparison: 27 GW existing PV capacity in mid of 2012). After exhausting this cap, new installations lose eligibility for EEG promotion. The cap reflected the already existing political growth target of 52 GW until 2020, equal to 8% in total electricity production (Bundesregierung, 2010d, p. 111).

- **own-consumption privilege:** Incentives for own consumption were removed for new installations, as grid parity was already met: The feed-in tariff for roof systems (19.5ct after the reform) was lower than average electricity price for private households (23ct).

- **new market integration model:** As the EEG was meant to serve as instrument for market introduction, it ought to be designed in a way that technologies could leave state aid at a certain time. Already in 2017, a part of solar systems was predicted to reach market feasibility. The market integration model therefore reduced the eligibility for remuneration of PV systems between 10kW and 1000kW to 90% of their electricity production (from 2014 onwards). The residual electricity could be self-consumed or sold on the market.

Despite some improvements in the final version compared to the original government proposal, the solar industry clearly lost the battle. Renewables associations and environmental NGOs had fiercely fought against restrictions such as the new market integration model, the rather unambitious growth corridor and the introduction of a hard cap (BEE, 2012a; 2012b). Yet, the solar industry had to accept a bitter defeat: the retrenchments were so hard that the actual growth fell much below the political growth targets.
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The Crisis of the Solar Industry

Since cheap imports from China and large production overcapacities led to a collapse in market prices from 2010 onwards and put a heavy strain on the German solar industry, the branch did not move out of the crisis. Since then, bankruptcies and economic difficulties became ever more frequent (BörseARD, 2013). In December 2011, the solar producers Solon and Solar Millenium went bankrupt. In April 2012, the former world market leader Q-Cells applied for insolvency procedures. In the same month, the leading manufacturer First Solar announced to close its factories in Frankfurt/Oder (Brandenburg) and release 1,200 employees. In August, the solar company Sovello (Saxony-Anhalt) stopped production and dismissed 1,000 employees. In October, the solar technology producer SMA Solar (Hesse) announced to release 450 employees and 600 temporary workers. Also the former role-model company Solarworld coped with increasing difficulties. In January 2013, Solarworld CEO Frank Asbeck announced negotiations with creditors about a debt cut. In March, the technology corporation Bosch gave up its solar division, after reporting a loss of more than 1 bn. € in the previous year. About 3,000 employees were affected.

Meanwhile, the entire global PV market has got into distress. Worldwide production capacities amounted up to 70 GW compared with sales of approx. 27 GW only in 2011 – a clear imbalance that entailed massive price erosion and brought cost difficulties for producers worldwide. Also factories in China and Malaysia reported losses or even had to close. Hence shutdowns in Germany were not caused by reductions in feed-in tariffs but rather by intensifying global competition due to massive supply overcapacities (BMU, 2012c).

On 6 September 2012, the EU Commission initiated anti-dumping proceedings against solar panel imports from China, threatening with punitive duties. The Commission argued that the Chinese government violated international competition law by subsidization of its national solar industry (European Commission, 2012a). The BSW remained neutral in this matter, given the vital risk of reciprocal partitioning of foreign markets and, not least, the fact that also Chinese solar firms meanwhile counted among her members (Körnig, 2012; Brohm, 2014, interview). However, the majority of the German solar industry pushed for those punitive duties to protect themselves against stern price competition. However, this course was highly controversial within the branch and the political scene. Traditional political allies such as the leading Green energy politician and EEG co-author Hans-Josef Fell explicitly opposed the punitive duties. Following Fell, climate protection and the aspired expansion of renewable energies would suffer from such an artificial partition, resulting in job losses. Also parts of European manufacturers opposed the sanctions, given that 60% of the Chinese modules in fact derived from European value creation (Fell, 2012a). The debate over punitive duties, though, ran mainly parallel to the conflict over EEG adjustments. Several state
governments, mainly Thuringia and Brandenburg, vainly attempted to protect their local solar industries with industrial policy measures against rougher international competition.

Different from the tariff adjustments in 2011, which had been co-ordinated with the BSW, this time the branch was surprised by the new plans. The BSW agreed to moderate reductions in line with the perceived decline in prices, but fiercely opposed the envisaged drastic cutbacks. Meeting great political discontent about recent price increases, the BSW argued that the continued expansion of PV would not raise promotion costs significantly anymore, given the reductions already in place; hence, the politically envisaged limitation of PV growth would be unnecessary and undesirable (BSW, 2012a).

The BSW built an alliance with unions, environmental NGOs and political parties to frame the PV cuts as fundamental question of the Energiewende per se and to make the broad support of PV visible to policymakers and the general public (Brohm, 2014, interview; Mayer, 2014, interview). In this critical moment, the mobilization of citizens with stakes along the decentralized value chain was conceived as key lobby instrument – indeed an instrument that opponents such as the large energy corporations or the BDI cannot rely on (Brohm, 2014, interview). In Berlin, some 11,000 employees and environmentalists joined a rally on 5 March 2012 against the so-called “solar phase-out” (Solarausstieg), jointly organized by BSW, DGB, IG Metall, IG BCE and the German Environmental Relief (DUH). Other environmental associations, however, did not actively participate. High-rank politicians from then opposition parties SPD, Greens and Left Party assured their support for the workers of the solar branch. The BSW warned against a market collapse of 75% if tariff cuts are enacted as foreseen. New solar installations would turn economically unviable, a wave of insolvencies would be inevitable and 100,000 jobs would be put at risk. The “solar exit law” meant an “intolerable turn-around” and “put the entire energy transition at risk” (BSW, 2012a; 2012d; SZ, 5.3.2012). Also former critics of the high PV promotion, such as PHOTON, now expressed their concerns that the reform at stake would serve the interests of fossil-nuclear electricity corporations instead of renewables (PHOTON, 2012, p. 2).

The solar branch still enjoyed an overall good public reputation. In a representative survey in February 2012 conducted by polling firm TNS Emnid on behalf of BSW, 65% of citizens considered it wrong to more than halve the annual solar expansion in comparison to the two previous years. 65% of respondents rejected cuts in PV tariffs by 30% to 40% (BSW, 2012b). In a ZDF survey in March 2012, 60% of all respondents said that the cuts were wrong, 35% said they were right. The support for solar energy promotion also relied on majorities in the conservative camp: 51% of CDU followers responded that the PV cuts were wrong, compared to 64% of SPD followers and 71% of Green followers (ZDF Politbarometer, 2012).

However, the image of the solar industry was irrevocably tarnished. As the cited surveys reveal, already a third of the general public supported substantial retrenchments – quite
unusual considering the otherwise high popularity of solar energy. In the general public and particularly among policymakers, the strong increase in the EEG levy weakened the acceptance of high PV tariffs. The BSW and some large solar firms had overplayed their lobby efforts in the past and provided misleading information to politicians, which made them appear unreliable. High profit margins for solar manufacturers and solar system operators have harmed the image of the solar industry as genuine partner for climate protection. BSW director Carsten Könnig had meanwhile acquired the reputation as most aggressive and most controversial lobbyist in the alternative energy branch (Tillack, 2015, pp. 238-244). In consequence, the BSW had forfeited its position as trusted partner and lost its say in political consultations (interviews: Bischoff, 2014; Fell, 2014; Fischer, 2013; Oschmann, 2014; Werner, 2014). As decision makers in parliament and ministries felt deceived by the solar branch, their aversion towards the solar branch strongly increased and made corporatist cooperation impossible (Oschmann, 2014, interview). As an important side factor, the solar wing in the SPD was weakened. With the death of Eurosolar president Hermann Scheer in 2010, the leading figure of social-democratic renewables politics had disappeared. Another leading advocate of solar energy, vice group leader Ulrich Kelber, had received donations amounting to 75,000 € in 2007-2009 from Solarworld alone (Kelber, 2015), and now faced troubles to justify his pro-solar position as the negative image of the solar industry rubbed off on his reputation, too. In contrast to the EEG reform in 2009, when the SPD successfully fought for less drastic PV cuts, this approach was not feasible anymore. At the same time, conflicts within the renewables branch intensified, as other branches feared that the increasingly negative image of the solar industry and the cost increases due to solar promotion could entail negative impacts on the entire renewables branch. Displaying an utter unwillingness to offer concessions, the BSW completely sidelined and removed herself from the ability to negotiate (Anonymous A, 2014, interview). In the same fashion, environmental organizations turned away from the solar industry, not overly stressed in public discourse but rather in elite discussions. The large environmental associations, except for the DUH, did not explicitly support the BSW’s protest. According to Greenpeace political expert Tobias Austrup (2014, interview), the solar branch had carried lobbying too far and frequently circulated exaggerated horror scenarios to obviate or alleviate tariff reductions that had been in fact adequate, with the result of excessive profit margins for solar industry and system operators at the expense of electricity consumers. This exaggeration in lobbying broke the trust amongst policymakers, allied interest groups and increasingly in the general public. With the loss of trust, the solar lobby lost their key lobby resource and, directly resulting therefrom, political influence. In the eyes of policymakers, the BSW was not recognized anymore as reliable and legitimate partner, as Austrup holds.
The BSW understood that the political acceptance of her interests was at stake, as politicians felt that they lost control over the development (Brohm, 2014, interview). However, without adequately responding to the change in political mood, the BSW still aimed for a continued fast growth of solar energy, virtually “the more, the better”. Given the political will to break the fast growth of solar capacity, the BSW therefore was hence not recognized as an appropriate advisor. In addition, the BSW had frequently provided inaccurate forecasts that damaged her credibility: Market prices for solar systems had declined faster, capacity had grown faster and EEG levy costs had increased faster than the BSW had predicted – with the result of high profit margins for PV system operators at the expense of electricity consumers. The BSW was blamed to have deliberately understated the branch forecasts – e.g., in 2009, the BSW estimated that the EEG levy for solar power would never rise above 0.9ct, whereas the respective surcharge in fact made up 2.0ct in 2011. Even supportive politicians distanced from the BSW. The leading Green energy politician Hans-Josef Fell, one of the main authors of the original EEG, criticizes: “The BSW never made proposals, or only when it was already too late, but then it should be just a little less than foreseen anyways, and was never pro-active. [...] If the branch had provided own reform proposals earlier on, the situation would look different today, as the tariff reduction could have been made more moderate” (Fell, 2014, interview). The BSW denied accusations of intentional misinformation and justified the inaccurate forecasts with incomplete market overview, underestimated market dynamic and further distorting effects such as the unexpected extreme boom in demand for solar panels and the enlargement of the Special Equalization Scheme (Körnig, 2012; Brohm, 2014, interview; Mayer, 2014, interview). Rainer Brohm, head of politics at BSW, stresses that the BSW’s influence was damaged when the BSW lost trust and, as an immediate consequence, impaired the acceptance of solar promotion. Following Brohm, parts of the solar branch had applied too short-term business and political strategies, coping with a volatile market and facing stern competition and market uncertainties. The BSW turned out to be not satisfactorily capable to moderate exacerbating internal conflicts (Brohm, 2014, interview).

Notwithstanding the trust crisis, the BSW strived to obviate new tariff cuts and did not see any need for reform. Only parts of the solar branch suggested to openly negotiating reforms instead of the obstructive and defensive course. Within the branch, the opinions were differentiated, also due to the ever-higher specialization of business models. For instance, the CEO of Orange Solar, Daniel Brandl, held in an internal pleading to other BSW members that the solar industry should exercise modesty and actively search a viable compromise. The behavior of the branch reminded him of “an overweight child who gets the chocolate taken away”.63 Solarworld CEO Frank Asbeck proposed a size limitation for freestanding systems, which would hit foremost his competitors. Juwi, a large renewables company, suggested in an internal letter a step-by-step plan that would decrease the tariff in monthly
intervals by a fixed degression rate of 2% each, instead of bi-annual market-depending cuts; already in 2011, the company had made similar proposals to apply small yet steady and predictable cuts in short intervals, meant to mitigate the cyclic booms in demand. While the BSW pursued the concern that short intervals would create market uncertainties, as any delay in build-up would raise worries about the actual eligibility, the model was more and more considered as the “lesser evil” within the branch (Der Spiegel, 14.1.2012). Also managers from solar companies admit that, in retrospect, parts of the branch made political mistakes. In hindsight, Jochen Magerfleisch (2013), Juwi chief operating officer, admits that larger tariff cuts should have been accepted in the first place instead of lobbying against them: “This question is to be answered with a clear YES, of course. Yet it is always easy to name the mistakes after they have been made.”

Government: Interministerial Conflicts remain

Interministerial negotiations were marked by a bipolar conflict between the environmental ministry under Norbert Röttgen (CDU) and the economics ministry under Philipp Rösler (FDP). However, the government was bound to her commitment to limit the EEG levy to 3.5ct (Bundesregierung, 2011b) and solar growth has repeatedly exceeded the political growth corridor, with consecutive impact on electricity prices. Economics minister Rösler demanded a fundamental reform of the EEG and repeatedly pushed for a restrictive growth corridor and severe solar tariff cuts. In its current version, the promotion framework had outlived his usefulness, he claimed, and proposed to replace the feed-in tariffs by an obligation for energy suppliers to generate a certain quota of their electricity supply by renewables, for the sake of affordability and reliability of energy supply. He proposed to significantly reduce the growth target from 3,000 MW to 1,000 MW in order to effectively limit promotion costs (Rösler, 2012; FAZ, 18.11.2011). In a law proposal launched on 12 January 2012, he suggested to limit the eligibility of PV to 8 GW additional capacity (in comparison: 25 GW total capacity installed at the end of 2011 and 7.5 GW new capacity installed in 2011 alone). The growth target in the current year 2012 should be reduced to only 1 GW (in comparison: growth target of 3 GW and actual growth of 7.5 GW in 2011) (BMWi, 2012b). In contrast, still in the government’s 2011 National Action Plan for Renewable Energies, a PV capacity of 52 GW in 2020 was foreseen, albeit not necessarily in need of state aid. By this proposal, the minister strived to strengthen his profile as economics minister and the overall profile of the FDP as advocate for a liberal market-economy. In the light of low levels of electoral support in the polls, the FDP saw herself forced to sharpen her profile and reach out to niche constituencies. At the traditional “Dreikönigstreffen” meeting on 6 January 2012 in Stuttgart, the FDP, suffering from constantly low election results, took a
strategic reorientation of her political course in order to re-emphasize her profile as opposite pole of the ecological mainstream, advocate of free markets and opponent of state subsidies (Dausend, Fritz, & Pinzler, 2012). The previous pro-EEG course that had been enacted at the party congress in June 2009 was therewith overruled.

By his initiative for a constrained growth target, Rösler caused panic amongst retailers and investors and unleashed a new run on solar systems: Homeowners wanted to install a solar system on their roof and larger investors wanted to set up freestanding systems as soon as possible prior to probable cutbacks. Due to this panic-striken push in build-up, Rösler achieved the very opposite of what he actually desired, videlicet a new peak instead of a slowdown in capacity growth (PHOTON, 2012, p. 4). As this development was conceivable bearing similar market reactions to past tariff reforms in mind, Rösler may have intentionally used this strategy to unsettle the market, to dramatize the costs and destroy acceptance for renewables as part of the FDP’s new political profile (Fell, 2012b; Fischer, 2013, interview). 66

In stark contrast, environmental minister Röttgen opposed a hard cap and sought to cushion the heated cost debate (BMU, 2011e). On 19 January 2012, he met with the solar branch for consultations, yet without negotiating specific agreements. Rather, he used the meeting to merely inform the branch about his plan to modify the flexible cap (monthly instead of bi-annual adjustments) with tariff reductions of up to 24% per year (BSW, 2012e). On request of the energy working groups of the parliamentary groups, he was forced to present a report on the future limitation of the EEG levy to the Coalition Committee and to suggest measures how to effectively limit the costs of PV remuneration. As the debate involved the risk of escalation, Röttgen sought to embark a strategy of blame avoidance by proactively responding to the exacerbating cost debate and demonstrating ability to act.

Environmental minister Röttgen found himself in a vulnerable situation. At the time, he ran for prime minister in the early elections in North Rhine-Westphalia on 13 May 2012. During the election campaign, Röttgen faced severe criticism by party colleagues for tactical mistakes and for his pro-environmental stance in energy policy. On the one hand, Röttgen prepared for a coalition with the Greens in his state and therefore did not want to engage in conflicts that would make a CDU/Green coalition impossible. On the other hand, he had to take the interests of electricity suppliers and heavy industries in North Rhine-Westphalia into account if he wanted to win the elections. Eventually, he suffered a bitter defeat with large vote losses for the CDU (–8%). After his failure in the elections, Chancellor Merkel removed him from office three days after the electoral defeat and installed the then CDU/CSU parliamentary secretary Peter Altmaier as his successor.

The PV Act belonged to the last official acts of Röttgen, who sought to cushion the CDU economic wing but still foster his image as “Green” minister at the same time. At the beginning, interministerial negotiations could not come about because the ministers either
could not agree on the location of the meeting, or the meetings took place but the results turned out to be interpreted in different ways (SZ, 23.2.2012). Nevertheless, on 23 February 2012, both ministers agreed on a joint position for immediate cutbacks that advanced and tightened the tariff cuts of the EEG 2012. The overall aim was to stabilize the EEG levy. The understanding, serving as basis for the government draft as of 29 January 2012, contained the following essential elements (BMU, 2012a):

- The PV tariffs should be reduced by 20% to 30% with effect from 9 March 2012. In particular freestanding systems as well as roof systems between 20 and 100 kW were affected.
- Only a certain percentage of electricity generation should be remunerated (85% for PV systems smaller than 10 kW, 90% for PV systems larger than 10 kW). Therefore the total cutback amounted to partially more than 30% (e.g., for PV systems ranging from 10 to 30 kW, the proposal meant a direct tariff reduction by 32%).
- In addition, the tariff should be reduced in monthly steps by a fixed amount of 0.15 ct (= 1.8 ct per year). Therewith, the overall cuts would amount to approx. 50% until the end of the year.
- The growth corridor in 2012 and 2013 should remain at 2.5 to 3.5 GW, with further reductions by 400 MW per year from 2014 until 2017. If the growth corridor is exceeded, the federal government should be authorized to issue an ordinance about an additional reduction.

**Bundestag: Environmental Wing protects Status Quo**

The debate about a new round of PV cuts had already reached the parliament even before the EEG 2012 entered into force. Right after the new surcharge forecasts were launched in November 2011, the CDU economic wing – led by Michael Fuchs, Joachim Pfeiffer and Thomas Bareiß – pushed for measures for cost limitation and brought the introduction of a hard cap into the play (Fuchs & Pfeiffer, 2011; FAZ, 18.11.2011; Der Spiegel, 14.1.2012). On request of the coalitional working group on energy, where the economic wing played an important role, CDU/CSU and FDP parliamentary group leaders Volker Kauder und Rainer Brüderle as well as the CSU parliamentary leader Gerda Hasselfeldt sent an internal letter to the ministers Rössler and Röttgen as of 28 November 2011 (Kauder, Brüderle, & Hasselfeldt, 2011, on file of the author), wherein they requested the government to present a report on measures for cost limitation until 25 January 2012 and demanded a reform of PV funding,
either by the lowering of the growth target to 1,000 MW or/and the tightening of the degression rates. This put pressure on the environmental ministry to act.

Yet, this position was not necessarily backed by parliamentary majority, as the letter was not co-ordinated for instance with the working group on environment, where solar supporters were stronger. Also some economic politicians protested against overly retrenchments. The spokesman for economic and energy policy of the CSU group, Georg Nüsslein, warned against “blind trench warfare” over a hard cap and the “abrupt termination of funding after reaching a maximum funding limit”. Renewable energies, he went on to say, “constitute a typical field of action for the middle class”, that would be exposed to greater uncertainties by hasty decisions (Nüsslein, 2012). Also the FDP parliamentary group did not endorse a hard cap, as environmental spokesperson Michael Kauch stated, and stressed that the group only requested the government to lay out measures for cost reduction (Kauch, 2011).

Indeed, in the course of parlimentarian consultation, the economic wing was not able to prevail. In contrast, the government groups made some modifications towards the interests of the pro-renewables coalition, on the initiative of the Environmental Committee, bringing the changes as follows (BT, 2012, doc. 17/9152; BMU, 2012d):

• The tariff system was modified and the cuts were partly alleviated (only 15% with additional 1-3ct depending on installation size, instead of 20-30%).
• The flexible cap was modified, with a regular monthly degression by 1% and an additional degression by 1.0% to 2.8% per month, depending on the build-up in the past 12 months. In difference to the flexible cap in force, which had provided for lower tariffs even in the case of stagnation in build-up, the reformed flexible cap provided for the suspension or raise of tariffs when build-up falls below the growth corridor.
• The market integration model was modified: Only 80% instead of 85% of electricity production shall be eligible for remuneration for small roof systems (<10 kW), yet 100% for large systems (> 1 MW).
• Transitional provisions were improved, in particular for freestanding PV systems.
• The authorization for the government to issue ordinances on the additional degressions and on the market integration model was removed.
• The promotion of electricity storage shall be intensified. The government was obliged to strengthen R&D efforts and issue suggestions for the promotion of storage technologies.

The parliament proved as crucial political arena where significant modifications were decided. In the internal fights between the economic and the environmental wing within the government groups, the environmental wing was able to enforce various claims. The Environmental Committee – and not the Economic Committee – was entitled with the leading responsibility for the EEG reform, hence central decision-making took place in a political
arena with an institutional inclination towards the interests of pro-renewable interest groups. Moreover, the CDU/CSU economic wing was strengthened as a CDU minister led the environmental ministry, which gave strategic advantages for negotiations to the CDU environmental politicians. However, in spite of the improvements enacted, the direction of the reform was not altered.

**Bundesrat: Veto for Solar Energy**

The federal government lacked a congruent party majority in the Bundesrat, and moreover, also several state governments with congruent party composition leaned negative towards the law. Although the PV Act was not subject to approval of the Bundesrat, the chamber of states could still raise an objection and herewith delay the legislation process. In the event that a two-third majority was attained, the chamber of states could even effectively veto the law.

Indeed, on 11 May, the Bundesrat called the mediation committee, with a surprisingly large 2/3 majority, with the votes of all SPD- and Green-led state governments and six CDU-led state governments. Only Bavaria (CSU/FDP), Lower Saxony (CDU/FDP), Hesse (CDU/FDP) and Schleswig-Holstein (CDU/FDP) voted in favor of the PV Act. In particular, Thuringia (CDU/SPD) strongly advocated for solar energy. A joint paper of the state government and the Thuringian solar industry inter alia proposed a large growth corridor of 5,000 to 7,000 MW, an energy storage bonus and more research funding. The current bill as passed by the Bundestag was criticized to pose an existential threat to the solar branch and to put 5,000 jobs in Thuringia at risk (Thüringer Landesregierung & Thüringer Solarwirtschaft, 2012). Also Saxony-Anhalt (CDU/SPD) and Berlin (SPD/CDU) belonged to strong advocates of the solar industry (Senatskanzlei Berlin, 2012). Lobbying efforts of the solar industry have not been even necessary at all to convince politicians to advance the regional solar industry’s interests, according to Milan Nitzschke, Solarworld chief commercial officer (cited in Müller, 2012, p. 33), since the state governments acted to defend the industry in their regions out of genuine political interests. According to Jochen Flasbarth (2014, interview), today state secretary in the environmental ministry, state governmmts attempted to save their solar firms in the same manner just as if a large construction corporation was in trouble.

The states demanded less severe degression, less severe cuts for medium-sized roof systems, better transitional provisions for freestanding systems and the removal of the market integration model. In the mediation committee, they achieved various concessions: The cuts for medium-sized roof systems turned out less severe than originally planned, the market integration model did not apply anymore to small systems, a greater percentage will
be remunerated for larger systems, the regulatory conditions for freestanding systems were eased and the eligibility of freestanding systems on converted land areas was re-established. In exchange, a cap for the maximum solar capacity eligible under the EEG was inserted, amounting to 52 GW, which accorded the government target for 2020; in comparison: there was 27 GW installed capacity at the time (BT, 2012, doc. 17/10103; BMU, 2012b; BMU, 2012e).\textsuperscript{68} In a protocol declaration as of 29 June 2012, environmental minister Altmaier furthermore consented a market incentive programme for solar energy storages, as pressed ahead inter alia by Saxony’s economics minister Sven Morlok (FDP) (Vorholz, 2013a, p. 25).

The 11 May 2012 marks a historic date in modern German energy politics: The veto of the Bundesrat with a striking 2/3 majority against solar retrenchments demonstrates that state governments have turned into political protectors of the energy transformation, independent from party composition, and use the Bundesrat to give thrust to their demands and preserve the status quo against regress.

**Judicial Review: negligible**

Constitutional reservations did not play a major role in decision-making. Only some minor elements of the legislation, foremost sufficient transitional provisions to protect legitimate expectations of investors, were subject of critical legal assessments (EuWID, 2012; Leisner-Egensperger, 2012). The PV Act as such was not likely to be challenged in court.

**Interim Summary**

The 2012 reform substantially reduced solar promotion. While the EEG was originally scheduled for adjustment after every three years and has indeed only been revised twice from 2000 to 2008, the PV Interim Act 2012 meant the third major intervention into the EEG framework within three years. The fact that it was adjusted more often than intended was inter alia due to the unexpected boom of solar energy.

As solar capacity has grown in much faster pace than expected, along with a sharp increase in promotion costs, politicians wanted to get a grip on PV capacity growth. The sharp price increase constituted a focusing event and opened a window of opportunity to attack solar promotion. However, the solar branch still remained reluctant to bring forward own reform proposals that would bring the factual growth into harmony with the politically desired growth
corridor. Instead, the BSW unalteredly advertised continuous growth and defended the status quo. In conjunction with false branch estimations on PV growth in the past and delicate lobby activities of parts of the solar branch, this obstructive behavior seriously impaired the already troubled reputation of the solar branch as trustworthy political partner. Several alliance partners, such as Greenpeace, set themselves apart from the solar branch association, and also formerly supportive politicians bluntly articulated their discontent over the new political style of the solar industry. This loss of trust was the decisive factor for the defeat of the solar branch. Her conflict capacity, on the contrary, was at the time higher than ever before: The number of jobs in the solar sector reached its historic peak just when the most severe cutbacks were enacted; employment dropped by some 40% from 100,000 jobs in 2012 to only 60,000 jobs in 2013 (BSW, 2014b). Conflict capacity alone can thus barely account for lobby influence. Instead, trust has become the key lobby resource that interest groups can employ.

Political advocates of solar energy were weakened: In the light of the failure of all control mechanisms, the environmental minister was not able to defend his moderate reform course and gave in to more far-reaching adjustments. If the solar industry had not been reluctant to the introduction of a sound flexible cap in the first place but kept fighting against any noticeable promotion cuts, recurrent debates on tariff cuts could have been prevented, the branch would have maintained its credibility – and obviated the crisis. In retrospect, branch representatives appear to regret that they missed to lobby for the flexible cap in the first place (Brohm, 2014, interview).

The incumbent parliamentary groups in the Bundestag eased the policy change without changing the direction. The 11 May 2012, the date when the Bundesrat vetoed the solar cutbacks with a striking 2/3 majority, constituted a historic landmark for German energy politics: The cross-party alliance of state governments successfully pushed for concessions and demonstrated that renewables have not only conquered public opinion but also political parties. The “green” status quo was protected by the Bundesrat as veto point, regardless of the party composition of the state governments.

Even though the reform was softened by the intervention of both chambers, the new framework still caused the collapse of PV capacity growth. In 2014, the growth only amounted to 2 GW, which is below the politically envisaged growth corridor of at least 2.5 GW. In past reforms, the solar lobby had pushed politicians too much; now, after sharp cost increases opened a window of opportunity for policy change, they had to suffer a defeat to an even greater extent – just like an overstretched pendulum that swings back with more force.

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6.10 Summary

In the overall picture, the Environmental Coalition was capable to assert her preferences vis-à-vis the Economic Coalition in all reforms but one, as sketched in table 33. The only exception was the PV Act 2012 when the Environmental Coalition suffered a defeat, notwithstanding the fact that also here the magnitude of policy change was alleviated by the intervention of Bundestag and Bundesrat.

Table 34: Winners and Losers in Renewables Policy

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<td>ENVI (EEG 2012)</td>
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Source: own table.

Unleashed by the introduction of the EEG in 2000, the renewables industry has grown out of its neglectable niche position and developed into a notable industry branch that created an increasing number of jobs and “gained importance on the industrial policy level” (BSW, 2012c, p. 6). Between 2004 and 2012 alone, the employment in the renewables sector more than doubled, whereas employment in the conventional energy sector constantly declined. The growth of renewables in energy production dwarfed all expectations and harmed the credibility of the old energy corporations. With every additional percentage in the electricity mix, the economic power of the renewables industry increased, whereas the economic power of the fossil-nuclear energy suppliers correspondingly decreased (for details, see chapters 2.2 and 4.3). Most remarkably, renewable electricity production finally outnumbered nuclear energy production in 2011, adding on to the diminished persuasion power of the nuclear industry. As a consequence, “the economic power of the renewable energy sector has spilled over into the political arena, shifting the balance of power towards the advocates of the Energiewende. Today, the trade associations of the renewable energy sector employ dozens of well-educated professionals who have built tight networks to ecological think tanks, state officials, and members of various parties. These connections have helped to make political inroads” (Stefes, 2013, p. 15). The growing importance of renewables also impacted the peak energy industry association that moderated her originally fierce opposition against renewables and endorsed both the nuclear phase-out and the promotion of offshore wind. By now, the renewables industry can put up the same political pressure as the old fossil-nuclear energy industry, based upon employment and regional economic strength. Along with their growing economic power, the renewables movement advanced from an ideals-driven “hobby lobby” to a professional lobby power with well-equipped resources.

Notwithstanding the increasing conflict capacity and organizational capacity of the pro-renewables alliance, fossil and nuclear fuels still made up about 80% of total electricity supply in 2012, hence their market position remained dominant. RWE alone currently
suppresses more than 60,000 jobs, just as much as the entire solar branch in 2013 – yet, the latter achieved higher political success. Hence, other factors but economic power must be at work to account for political influence.

The manufacturing industry largely opposed renewables promotion in the first place and took an increasingly ambiguous position in the course of renewables expansion. As considerable parts of the industry – be it steel, chemicals, electrical or mechanical engineering – accessed new business fields in the production of components for solar, wind or other power plants, they turned into general supporters of renewables promotion. At the same time, though, they suffered from rising electricity costs resulting from the EEG levy. The manufacturing industry, then, successfully lobbied for reliefs from the EEG levy, without changing the policy direction or magnitude of the energy transformation as such. The old conflict “business” vs. “environment”, that still shaped the political cleavages in the Bonn Republic, has abated appreciably. Since more and more companies have stakes in renewables, the industry is divided, and the peak associations BDI and BDEW alleviated their heretofore-determined anti-EEG course. The split in the industry weakened the detractors, as politicians could always refer to benefitors of their policy if they wished to ward off criticism.

To account for the political influence of the pro-renewables coalition, the factor trust comes in. Unleashed by the first major nuclear accident in Chernobyl 1986, public acceptance of nuclear power and trust in nuclear power plant operators dwindled. Also societal support for coal has been gradually decreasing in the wake of the climate change debate. Just contrary, solar and wind power constantly gained societal trust, boosted with the dynamic growth of renewables initiated by the EEG 2000, which proved the technical and economic feasibility of renewables. The alliance between renewables industry, farmers, homeowners and civil society linked economic and idealistic interests and fostered the high public reputation of renewables.

The renewables branch enjoyed the reputation of a moral, “green” industry. The branch started with minimal conflict capacity, yet was driven by idealistic motives of environmental and climate protection, the fears against fossil fuels running dry, and the distrust in nuclear energy and large corporations. Even though the renewables branch was more and more driven by profit interests rather than by idealistic motivation, the branch still maintained and cultivated her fabulous reputation as moral endeavour and medium-sized business close to citizens, in contrast to the image of the big fossil-nuclear electricity suppliers as greedy and irresponsible corporations, even more so after the Fukushima catastrophe provided a striking signal that recalled the risks of nuclear power. This trust was key for the assertiveness of renewables. However, two exceptions need to be made:

(1) The structural conflict between nature conservation and renewables expansion inhibited the alliance capacity between renewables branch associations with environmental NGOs,
most outstanding related to bioenergy (“food or fuel” debate, corn monocultures) and onshore wind power (negative impacts on natural scenery, bird protection). Yet, these conflicting positions could be married by the introduction of environmental criteria in the EEG. For instance, the bioenergy branch explicitly accepted the introduction of sustainability criteria for biomass, aiming to regain public and political acceptance. With respect to wind power, conflicts moved from the federal to the regional or local level over land-use planning.

(2) The solar branch lost its reputation as credible partner after real developments in capacity growth turned out much larger than predicted and had caused massive cost increases. Before a tipping point was reached in 2012, the branch has been always able to defend favorable funding conditions against an unlikely alliance between consumer protection experts and the “old” industry. Then, the branch was not recognized anymore as reliable and trustworthy partner in policymaking and excluded from decision-making. In addition, parts of the branch had shown an egotistic appearance and applied delicate lobby methods that did not correspond with the idealistic image of solar energy, whereby they pushed off political allies. This is why the solar branch suffered a severe setback in the PV Act 2012.

Besides the high trust in renewables and the successful linkage of economic and idealistic goals, specific features of political competition protected renewables promotion against retrenchments. Indeed, “the same veto points that once shielded the traditional energy sector now protect the various measures taken to accomplish the Energiewende” (Stefes, 2013, p. 13). Fairly independent from party affiliation and in spite of varying party majorities, both chambers of parliament strongly defended renewables promotion and, quite in every reform, modified the magnitude of policy change compared to the original governmental proposal, always to the benefit of the pro-renewables alliance (as sketched in table # below). As both major parties have shifted their programmatic objectives towards renewables, the level of conflict has moved from the ideological beliefs of the “if” of the Energiewende to the details of “how” to implement the transformation. In particular, parliamentarians protected the regional interests of their electoral districts; as renewables promotion had fostered decentralized energy production with homeowners, craftsmen, engineers, industrial workers and farmers as new stakeholders, more and more parliamentarians turned into advocates of renewables. In this way, the EEG in 2000 has created an own constituency that since protected the energy transformation against regress, and has hence induced self-reinforcing “green” path dependence.

Once established, also the Bundesrat defended the EEG, although the reforms have not been subject to mandatory legislation. Beyond the formal competence, state governments had a strong position and could successfully claim concessions. This is due to the willingness of all parties to find consensual solutions in renewables politics, the Bundesrat’s power to call mediation committee to delay and impede the legislation process, the need for approval of
In the case of the 2012 Photovoltaics Act, the Bundesrat even raised an objection with a stunning 2/3 majority, forcing the government to make modifications. In order to secure their support, the federal government sought to involve the states already during the preparation of the law proposals. Non-partisan interests come to light: Independent from their party composition, state governments are structurally disposed to advance specific state interests. Bavaria and Baden-Wuerttemberg advocated for hydropower and biomass (yet skeptical towards wind power on their territory), the North German states for wind power, the East German states for photovoltaics.

The constitutional court was only of relevance for subordinate elements of the reforms, but not for the reforms per se; mainly, transitional provisions had to be adhered to under constitutional law to protect the interests of investors.

Table 35: EEG Reforms and Institutional Framework Conditions

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Note: * changes claimed vis-à-vis original government draft. Source: own table.

Renewables promotion has always been driven by a group of convinced parliamentarians rather than by the government. Parliamentarians carried out the making of the initial EEG in 2000 and the preceding Electricity Feed-in Act in 1991, facing the economics ministry’s obstructive behavior. Parliamentarians heavily influenced also the following reforms, in fact already during the preparation of the government proposal – now in close collaboration with the environmental ministry that was granted the leading responsibility for renewables only in 2002. The economics ministry proved structurally inclined to favor the interests of the fossil-nuclear lobby, whereas the environmental ministry tends to favor the interests of the renewables lobby and environmental groups – fairly independent from party affiliation of the minister. Given this institutional issue dualism, it is decisive which ministry is assigned with the leading responsibility. However, in the light of path dependence, the gravity of inter-
ministerial conflicts has tempered: Also the economics ministry later agreed to renewables expansion goals, with preference for wind power as most cost-effective means of renewable energy generation, while the environmental ministry naturally still pursued a more explicit pro-renewables course. Notwithstanding remaining institutional conflicts, the proximity of political positions has become narrower, owed to the political heritage of previous EEG reforms.

In the first place, fossil-nuclear corporations had largely underestimated the growth potential of renewables and did not devote much lobby power to impede the EEG, since they believed that wind and sun would never be feasible to cover substantial parts of energy supply. When they realized that renewables indeed endangered their business model, it was too late to reverse the reforms. By now, facing the fundamental crisis of their business model, they feel forced to redirect their business strategies (Kungl, 2013, pp. 24-28). E.ON split off her nuclear-fossil power sector, RWE invested in renewables and services, Vattenfall just pronounced the end of coal mining (Der Spiegel, 1.5.2015), and the semi-state company EnBW – under the influence of the Green/SPD state government – also sees her future in renewables and mitigated against retrenchments for wind tariffs (Tillack, 2015, p. 244).

A key success factor was the involvement of broad parts of society – farmers, homeowners, engineers, craftsmen and industrial workers alike – in decentralized renewables energy production. As an idealistic motivation was now overlapping with economic interests among a large constituency, initial renewables promotion created a growing constituency across all political camps and triggered self-reinforcing new “green” path dependence, moving away from the old fossil-nuclear energy path. The changes in the electorate’s preferences impacted the positions of all political parties, moving towards renewables promotion. The costs of reversing the new path of the energy transition increased in the course of time, thus the retrenchment of the feed-in tariff system became ever more unlikely. When the old energy industry realized that renewables would harm their business model, it already was too late to impede them.

All major parties by now support ambitious goals for renewables growth and climate protection. The political weight of environmental politicians and environmental issues varies across parties and over time, they yet have gained much more political importance in comparison with the era of the Bonn Republic until the 1990ies. Despite periodical fluctuations and persistent intra-party conflicts with the economic wing in the CDU/CSU and the coal wing in the SPD – and the inconsistency of party positioning resulting therefrom –, both large parties have embarked on new path dependence towards the Energiewende. Since the FDP as only reluctant force remaining dropped out of the parliament after electoral losses in the federal elections in 2013, the Greens adopted the pivotal role as junior partner in coalition building. Both large parties CDU/CSU and SPD have to adapt to this new
constellation in majority building and remove obstacles that would inhibit successful coalition building. With this Grand Green Coalition, a rollback to the fossil-nuclear age has become unlikely. “One thing is clear: The old controversy about nuclear versus renewables, conventional fuels versus renewables, is marked off. The path moves towards the era of renewable energies, perhaps supplemented by some coal. Now it is imperative to make this path as efficient as possible, to address electricity prices and the social question, and to expand renewable energies as fast as possible”, as CDU environmental politicians Andreas Jung stresses (2014, interview).

The goals of the *Energiewende* look firm and unshakeable, yet the latest surge in the EEG levy and the credibility crisis of the solar industry have tarnished the reputation of the entire renewables sector and helped a new paradigm come across: Sparked off by the new environmental minister Peter Altmaier’s proposal for an electricity price break, the focus in the energy debate shifted from climate protection and democratic energy production towards the affordability of energy costs, placing a new frame with negative connotation on the energy debate and pushing the Greens into the corner (Zitzler, 2013). Since that, the image of the EEG has suffered. Indeed, the most recent revision of the EEG in 2014 under the new grand coalition – outside the scope of this work – induced the first steps for the gradual conversion of feed-in tariffs towards tenders, although without even the slightest step backward in terms of growth targets. The future of the *Energiewende* remains exciting – and will provide manifold opportunities for scholars to come to a better understanding of modern politics.
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<td>24/04/1998</td>
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<td>20/10/1998</td>
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<td>EEG 2000: entry into force</td>
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<tr>
<td>27/09/2001</td>
<td>EU Renewable Energy Directive enters into force</td>
</tr>
<tr>
<td>28/09/2002</td>
<td>SPD/Green Schröder government remains in office after federal elections. Greens gain in votes and the environmental ministry is therefore granted the competence for renewable energies.</td>
</tr>
<tr>
<td>09/04/2003</td>
<td>Special Equalisation Scheme (First EEG Amendment Act): government draft passed</td>
</tr>
<tr>
<td>19/05/2003</td>
<td>Special Equalisation Scheme: Bundestag hearing</td>
</tr>
<tr>
<td>16/07/2003</td>
<td>Special Equalisation Scheme: passed by Bundestag</td>
</tr>
<tr>
<td>27/11/2003</td>
<td>PV Interim Act 2003 (Second EEG Amendment Act): passed by Bundestag (SPD, Greens, CDU/CSU)</td>
</tr>
<tr>
<td>19/12/2003</td>
<td>PV Interim Act 2003: passed by Bundesrat</td>
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<tr>
<td>17/12/2003</td>
<td>EEG 2004: government draft passed</td>
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<tr>
<td>01/01/2004</td>
<td>PV Interim Act 2003: entry into force</td>
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<tr>
<td>02/01/2004</td>
<td>EEG 2004: government draft passed</td>
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<tr>
<td>13/01/2004</td>
<td>EEG 2004: Bundestag draft (identical with government draft)</td>
</tr>
<tr>
<td>02/04/2004</td>
<td>EEG 2004: Bundestag passes EEG 2004 with changes made by environmental committee</td>
</tr>
<tr>
<td>14/05/2004</td>
<td>EEG 2004: Bundesrat calls mediation committee</td>
</tr>
<tr>
<td>17/06/2004</td>
<td>EEG 2004: mediation committee achieves compromise</td>
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<tr>
<td>18/06/2004</td>
<td>EEG 2004: Bundestag adopts compromise by mediation committee</td>
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<tr>
<td>09/07/2004</td>
<td>EEG 2004: Bundesrat adopts compromise by mediation committee</td>
</tr>
<tr>
<td>01/08/2004</td>
<td>EEG 2004: entry into force</td>
</tr>
<tr>
<td>30/06/2006</td>
<td>Stern Review in the Economics of Climate Change launched by British government</td>
</tr>
<tr>
<td>28/09/2006</td>
<td>Small EEG Amendment 2006: passed by the Bundestag</td>
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<tr>
<td>07/10/2006</td>
<td>Small EEG Amendment 2006: passed by the Bundesrat</td>
</tr>
<tr>
<td>01/12/2006</td>
<td>Small EEG Amendment 2006: entry into force</td>
</tr>
<tr>
<td>10/01/2007</td>
<td>EU Commission passes a package of proposals for energy and climate policy</td>
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<tr>
<td>09/03/2007</td>
<td>spring summit of EU heads of state and government under German presidency passes proposals of the EU Commission and a European action plan on a joint energy policy</td>
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<tr>
<td>12/04/2007</td>
<td>Economics ministry under Glos (CSU) releases study that claims readjustments of the EEG</td>
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<tr>
<td>07/06/2007</td>
<td>G8 Summit in Heiligendamm under German presidency passes declaration on climate protection</td>
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<tr>
<td>15/12/2007</td>
<td>UN Climate Conference in Bali passes mandate for negotiations for a post-Kyoto-agreement</td>
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<tr>
<td>23/01/2008</td>
<td>EU Commission passes proposal for a EU Climate Package, including the Renewable Energy Directive and binding national targets for renewable energies (Germany: 18% until 2020)</td>
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<tr>
<td>12/12/2008</td>
<td>European Council passes EU Climate Package, European Parliament passes EU Climate Package, and therewith secures the EEG against suggestions of European-wide quota models</td>
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<tr>
<td>20/01/2010</td>
<td>PV Act 2010: environmental minister Röttgen presents his proposals for severe PV tariff cuts</td>
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<tr>
<td>03/03/2010</td>
<td>PV Act 2010: government passes PV tariff cut</td>
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<tr>
<td>04/06/2010</td>
<td>PV Act 2010: Bundesrat calls mediation committee</td>
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<tr>
<td>01/07/2010</td>
<td>PV Act 2010 enters into force (retroactively)</td>
</tr>
<tr>
<td>05/07/2010</td>
<td>PV Act 2010: Mediation committee presents compromise</td>
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<tr>
<td>08/07/2010</td>
<td>PV Act 2010: Bundestag approves mediation committee compromise</td>
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<tr>
<td>09/07/2010</td>
<td>PV Act 2010: Bundesrat approves mediation committee compromise</td>
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<tr>
<td>06/06/2011</td>
<td>EEG 2012: draft by government groups</td>
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<tr>
<td>28/06/2011</td>
<td>EEG 2012: change requests by government groups</td>
</tr>
<tr>
<td>26/09/2011</td>
<td>EEG 2012: Environmental Committee passes EEG draft</td>
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<tr>
<td>27/09/2011</td>
<td>EEG 2012: Bundestag passes EEG</td>
</tr>
<tr>
<td>13/12/2011</td>
<td>Solar industry crisis: the solar producer Solon goes bankrupt</td>
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<tr>
<td>21/12/2011</td>
<td>Solar industry crisis: the solar producer Solar Millennium goes bankrupt</td>
</tr>
<tr>
<td>12/01/2012</td>
<td>PV Act 2012: economics minister Rösler (FDP) launches plans for severe PV cuts</td>
</tr>
<tr>
<td>23/02/2012</td>
<td>PV Act 2012: economics minister and environmental minister agree on a compromise that provides for severe PV tariff cuts and growth limitations</td>
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</table>
Burdens from industry. The Special Equalisation Scheme introduced in 2003 was considered.

20 years for large hydropower above 5 MW equally to small hydropower (status). All relevant actors refused different rules and promotion periods for small and large hydropower (e.g. also proposed threshold of 15% impairment). VIK rejected the inclusion as it would lead to higher promotion costs, VDEW welcomed it as being the most cost-efficient technology and opposed restrictive clauses for modernizations (such as the proposed threshold of 15% improvement in electrical capacity and the requirement to improve the ecological status). All relevant actors refused different rules and promotion periods for small and large hydropower (e.g. also 20 years for large hydropower above 5 MW equally to small hydropower). Environmental criteria shall not be included as matter of principle, be it for biomass, hydropower or wind, in order to avoid overloading the EEG with excessive or legally uncertain criteria. Necessary regulation for nature protection were either pre-existing – hence redundant – or were better to be done exterior to the EEG.

Expansion targets: Any form of binding expansion target for 2020 was rejected; the further development should rather be left to the market.

Photovoltaics, Geothermal Energy and Offshore Wind: All technologies far from the market – namely PV, geothermal energy and offshore wind – should be entirely excluded from feed-in tariffs. Instead, research and development should be intensified. In particular, PV was fiercely attacked. “Photovoltaics has, given the current situation, even in a longer term little chances but in niches to become competitive” (BDI, 2004, p. 37). This would be just the same as if one wanted to cultivate pineapple on the north pole; technically certainly doable yet an absurd approach for economic reasons and for reasons of global division of labour.” (VIK, 2004c, p. 37). Therefore the politically intended rise in PV tariffs, to compensate the expiration of the 100,000 roofs programme, was refused. With regard to offshore wind, public invitations to tender were proposed as the more effective instrument, as large investments are needed for offshore wind projects which therefore could not be ruled under the EEG. The blanket exclusion of nature protection areas form offshore wind projects was rejected.

Onshore wind: Wind onshore was welcomed in principle, as the promotion should focus on the most efficient technologies. Also the introduction of a minimum reference yield of 65% for wind power plants was welcomed, as for to prevent the construction of wind power plants on low-wind inland sites.

Biomass: For bioenergy, the strengthened degression (from 1% to 2%) and the cutback of the funding period (from 20 years to 15 years), as suggested in the EEG draft, were welcomed. Technology-specific additive bonuses should be avoided as matter of principle, as they led to market distortions and to windfall profits for those power plants slightly above the standards required. Ecological criteria for biomass cultivation shall not be included.

Hydropower: With regard to the inclusion of large hydropower in the EEG, two different points of view were present. While the VIK rejected the inclusion as it would lead to higher promotion costs, the VDEW welcomed it as being the most cost-efficient technology and opposed restrictive clauses for modernizations (such as the proposed threshold of 15% improvement in electrical capacity and the requirement to improve the ecological status). All relevant actors refused different rules and promotion periods for small and large hydropower (e.g. also 20 years for large hydropower above 5 MW equally to small hydropower). Environmental criteria shall not be included.

Special Equalisation Scheme: Privileges for large electricity consumers should be extended in order to relief cost burdens from industry. The Special Equalisation Scheme introduced in 2003 was considered beaurocratic,
complicated, insufficient and with too high thresholds for medium-sized companies. The EEG levy should be limited to 0.1 ct/kWh for electricity consumption above a threshold of 10 GWh/a and to 0.05 ct/kWh for electricity consumption above 100 GWh/a and a share of electricity expenses of 5% in gross value added (compared to by then current provisions: electricity consumption of 100 GWh/a and share of 20% in gross value added). Thresholds with relative reference values were rejected as the led to planning and investment insecurity; this held e.g. for the proposal of a relative deductible of 10% of electricity consumption or the proposal of a redistribution cap that limited the Special Equalisation Scheme in the way that the EEG levy may raise by not more than 10% thereby. Furthermore, also railways and the service sector may be included, not only the manufacturing industry.

**Detailed Positions of the Environmental Coalition**


**EEG Basic System:** The EEG basic system of technology-specific feed-in tariffs shall be maintained. Competing promotion schemes, such as tenders, were strongly rejected.

**Expansion targets:** Expansion targets as formulated in the draft were supported (at least 12.5% until 2010 and 20% until 2020).

**Photovoltaics:** No written statement available.

**Onshore wind:** The wind branch agreed to the tariff reduction by 20% in real prices until 2010 (to then 6.63 ct) proposed in the draft, as this reduction could be compensated for by improvements in productivity and capacity. The degression should remain at 1.5% at the most; a higher degression rate by 2%, as provided for in the draft, was held economically unfeasible and thus rejected. The extended funding period for repowering to a blanket period of 24 months was welcomed, as any relative factors would lead to different effects for different sites (BWE, 2004, pp. 54-57). Also the VDMA claimed to limit the degression to 1.5% and for better conditions for repowering (twofold instead of threefold increase in capacity) (VDMA, 2004, p. 55). The 65% minimum reference yield (as proposed in the law draft to prevent the construction of wind power plants on low-wind inland sites) was rejected as otherwise suitable inland areas would not be economically viable anymore, which affected one third of the projects in planning. These inland sites were held necessary because repowering and offshore wind could only play a role in the mid-term perspective. The minimum yield should be reduced to 60% of a reference value, following BUND (BUND, 2004, p. 7). The verdi services union however supported the 65% minimum reference yield (verdi, 2004, p. 23). The VDMA proposed to eliminate the 65% threshold or, at least, lower it to 60%; otherwise, approximately every second project in Southern Germany would become economically unfeasible (VDMA, 2004, p. 55).

**Offshore wind:** Following the wind branch associations, offshore wind should be supported by higher tariffs, longer promotion period and later degression (first degression steps in 2013 instead of 2008 as proposed). The wind branch strongly rejected the exclusion of nature protection areas across the board from EEG promotion and considered it as being arbitrary, since the impact on nature and wildlife had to be assessed in the approval proceedings anyhow in every individual case. Furthermore, also „nearshore“ wind farms close to the coast line should be eligible for EEG remuneration; minimum distances required should be adjusted accordingly (BWE, 2004, pp. 42-80) (Verband Offshore Forum Windenergie GbR, 2004) (VVW, 2004) (VDMA, 2004). In contrast, environmental associations generally advocated for the exclusion of nature protection areas, yet individual projects should still be able to be realized if suitability is proven by environmental impact assessments (BUND, 2004, p. 7).

**Biomass:** BBE and the VDMA rejected the reduction in funding period (20 to 15 years) and the increase in degression rate (from 1% to 2%), as proposed in the draft, was rejected. These cutbacks would over-compensate the proposed rise in base tariffs for a part of facilities. Overall, the rise in tariffs as envisaged in the draft was held insufficient, thus higher tariffs were recommended. Furthermore, the rise in base tariffs should encompass all facilities up to 20 MW, not only small facilities below 5 MW. The tariff system should differentiate at least between three sizes of categories, to prevent over-subsidization yet create sufficient incentives. This differentiation was held necessary for bioenergy in particular as the economic viability of this energy form particularly depends from the size of the plant. The new category of small plants below 150kW was welcomed. The new fuel bonus was welcomed yet should be raised.71 The new CHP bonus was welcomed as well; it should be equally applicable to existing plants and additive to the new innovation bonus. Approval deadlines for residual wood power plants were rejected. Any environmental requirements were rejected, as all necessary environmental protection wallready laid down in agricultural legislation that also applied to biomass cultivation.

BUND and the Cogeneration Association proposed a bonus of +2ct for power plants with annual use efficiency of more than 70% (i.e. for CHP), in replacement of the technology bonus (BUND, 2004, p. 6). The BUND furthermore advocated for ecological criteria as condition for EEG remuneration.

The verdi services union (verdi, 2004) supported higher base tariffs for small power plants (≤150kW), the further differentiation along system sizes and the increased degression (2% instead of previously 1%) as well as a new CHP bonus of +2ct. Verdi furthermore supported ecological criteria for biomass cultivation, as well as the social criterion of workers payment coupled to collective wage agreements. The VDMA (VDMA, 2004) also supported a higher CHP bonus of +2.5ct and a higher technology bonus for all system sizes.
Hydropower: The hydropower association (BDW, 2004) rejected the criterion of the proof of a good ecological status, since environmental impact had to be evaluated in every individual approval proceeding anyways. Large hydropower should not be included in the EEG, as it would go beyond the scope of the EEG and benefit only large utilities who owned most of the large hydropower plants. The base tariffs should be raised (1-50kW: 10.23ct instead of 7.67ct; 51-100kW: 9.1ct instead of 7.67ct; 101-500kW: no changes). Any degression was rejected, as the technology was held mature and future technological improvements therefore could not compensate for tariff cutbacks.

In contrast, environmental associations such as the BUND found nature protection criteria to be necessary conditions for EEG remuneration and claimed to apply the same far-reaching requirements equally to small and large hydropower. The BUND furthermore supported the inclusion of large hydropower, the degression rates, the reduction in the funding period for large hydropower, and held the tariffs to be sufficient (BUND, 2004, pp. 9-10). Verdi also supported the inclusion of large hydropower yet with higher degression rates (verdi, 2004, p. 26). The VDMA (VDMA, 2004) supported the inclusion of large hydropower with less restrictive ecological criteria, higher tariffs and equal treatment of large and small hydropower with regard to funding period and ecological requirements.

Special Equalisation Scheme: The Special Equalisation Scheme should remain restrictive and should not be extended (BUND, 2004, pp. 5, 11) (verdi, 2004). Yet the VDMA (VDMA, 2004) claimed to open up the Special Equalisation Scheme also to medium sized companies; thresholds should be tied to total electricity costs instead of gross value added, which was considered to be the more relevant indicator for medium-sized companies.

**Box 5: Detailed Positions (EEG 2009)**

**Economic Coalition: Detailed Positions**

The energy-intensive industry and conventional energy suppliers still heavily criticized the feed-in tariff system as such and took a reluctant stance on the expansion of renewables. In detail, they demanded the following (BDEW, 2008) (VCI, 2008) (VIK, 2008) (WV Stahl, 2008) (vdp, 2008):

**Expansion target:** The existing 20% target for 2020 should not be raised; more ambitious goals for 2030 should not be formulated (VCI, 2008, p. 1; VIK, 2008, p. 2). Any further renewables growth was regarded only feasible after grid expansion (BDEW 2008, S. 2).

**Photovoltaics:** The BDEW objected privileges for the own consumption of self-generated solar power (BDEW 2008, S. 17-18).

**Onshore Wind:** The BDEW demanded the abolishment of the system service bonus, arguing that technical conditions for grid integration must be fulfilled anyways. If a special system service bonus should still be maintained, the technical conditions should be laid down in a government regulation to enable flexible adjustments to technical needs (BDEW 2008, S. 21-22, 26-27).

**Biomass:** Industry and energy suppliers were interested in favorable conditions for large plants and cogeneration: restrictions shall not be imposed (e.g. relaxed rules for splitting of systems, no obligatory use of cogeneration as often useful heat sinks are absent), the cogeneration bonus be increased for new and existing facilities alike, the technology bonus extended to large plants, and size limitations should be removed. The technology bonus for fuel cells should be raised and the methane loss allowed for biogas conditioning be relaxed to 2%. The degression should remain sharp at 1.5% (BDEW 2008, S. 4, 16, 26, 36-37; vdp 2008, S. 3-4).

**Hydropower:** The BDEW proposed to apply the tariffs for new hydropower plants on equal terms to modernizations (S. 16-17). A degression should not apply as the technology is already mature so that significant efficiency enhancements are not to be expected (S. 26). Nature conservation criteria shall be omitted, as environmental impact assessment and the adherence to ecological requirements was legally necessary anyway (S. 22).

**Market integration:** Direct marketing of renewable electricity should be incentivized by an optional market premium. This means that the renewable energy power plant operator sells the electricity at the market, either directly or through a specialized mediator, and is granted a market premium amounting to the difference between the average stock market price and the actual EEG tariff. This was meant to bring demand and supply of electricity into accordance, as the plant operator will sell the electricity in times of high demand, i.e. high stock market prices. The plant operator should be allowed to switch between the market premium or the EEG tariff, yet the lock-in period should amount to one year, at least half a year, and the prior notification period should be at least three months, as otherwise the plant operator could switch there and back just as market prices move up and down (BDEW 2008, 9, 12-13, 28, 37) (VCI 2008, 4-8) (VIK 2008, S. 7-14).

Other market integration approaches were rejected, such as a bonus/malus system – where the legislator provides certain higher or lower tariffs for particular time periods, because the market and not the government was needed to coordinate demand and supply (BDEW 2008, S. 29-30) – or an additional bonus for the interconnection of power plants to a so-called virtual power plant were rejected (VCI 2008, 5).

**Grid integration:** The feed-in management was supported which allowed to limit electricity output in particular from wind turbines in the case of network bottlenecks (BDEW 2008, S. 40-42).

**Industrial own electricity generation:** Industrial own electricity generation should remain fully exempted from the EEG levy, including so-called object grids (i.e. in own power plants or in quasi-own power plants operated by a
third party close to the industrial facility). If the electricity self-generated by the industry was burdened with the EEG levy, the economic operation of these plants was put at risk. This was also considered undesirable in environmental terms, as the industrial plants mainly run in efficient combined heat and power generation or with byproduct gases from the industrial production process that have not other usability (BDEW 2008, S. 2) (VCI 2008, 2-3) (VDP 2008, S. 3) (VIK 2008, S. 3-4) (WV Stahl 2008, S. 1).

Special Equalisation Scheme: After the extension of the Special Equalisation Scheme in the “Small EEG Amendment” in 2006, the Economic Coalition again pushed for lower entry barriers (5% instead of 15% share of electricity costs in gross value added) and gradual cost relief instead of absolute cutoff thresholds, in order to avoid that companies with similar electricity costs yet above and below a certain cutoff threshold are faced with very different financial burdens. In addition, new industrial facilities should be able to apply for exemptions based on forecasting data, as otherwise the operation of new facilities would be put at economic risk by waiting times of two years (BDEW 2008, S. 3) (VCI, 3-4) (VIK, S. 4-6, 9) (WV Stahl 2008, S. 3) (similarly: VDP 2008, S. 3-4).

Environmental Coalition: Detailed Positions

The Environmental Coalition was composed of a heterogeneous mix of actors, each with particular preferences and priorities. They focused on their respective own interests yet sought not to interfere with the interests of others; conflicts between nature and landscape conservation on the one hand, and the unrestricted expansion of renewables on the other hand proved virulent, and so did competition between the individual renewable energies amongst each other. However, the overarching goal of a decentralized, comprehensive and rapid energy transition remained the shared vision. Next to the branch associations of the renewables sector, environmental NGOs and public renewables initiatives, also other actors such as the farmers association, the VDMA German Engineering Association, the VKU Association of Municipal Companies and the VDZ Sugar Industry Association handed in position papers (Bundesverband Pflanzenöle, 2008) (BWE, 2008) (DBV, 2008) (SFV, 2008) (VDMA, 2008) (VDZ, 2008) (VKU, 2008) (FH-ISI, 2008). The consumer association played a diffuse role. Albeit in explicit support of the EEG and in firm opposition to the large conventional electricity suppliers, the consumer organization turned against the rising promotion costs for private households and particularly criticized the tremendous windfall profits for the solar industry at the expense of consumers and system operators, hence tariff cuts and depression needed to be strengthened (VZBV, 2007, pp. 2, 12-14, 17-18). The Environmental Coalition desired the reform to be swiftly passed to be enacted on 1 August 2008, aiming to avoid market uncertainties and to promptly adjust tariffs in response to rising prices for raw materials. In detail, their demands were as follows:

Expansion targets: No preferences articulated in written statements.

Photovoltaics: The SFV rejected any exceptional PV tariff reduction and proposed an annual depression by 4%. For very small systems on roofs and facades, the tariff should be raised to overcome the standstill of solar system constructions on family homes (+5ct for systems <5kW) (SFV 2008, S. 1-2). However, the consumer organization made an exception and advocated for tightened tariff cuts and depression (VZBV, 2007, pp. 2, 12-14). The BSW solar industry association did not submit a written statement.

Onshore wind: The BWE wind energy association and the VDMA objected any tariff reduction and any strengthened depression, given the risen construction costs for wind power plants due to strong increase of commodity prices for steel and copper (BWE 2008, 1-4; VDMA 2008, S. 1-4). Following BWE, the tariffs should be raised (initial tariff: 9.6ct; basic tariff: 6.1ct) and tied to a commodity price index, while the depression should be suspended or tied to efficiency improvements. The repowering bonus should be raised to 0.9ct to 1.4ct.

Offshore wind: BWE and VDMA supported the improved provisions made in the draft (BWE 2008, S. 2, 4; VDMA, S. 4). The VKU advocated for a still higher initial tariff of 14ct instead of 12ct as provided in the draft (VKU 2008, S. 18-19). A governmental authorization to issue an ordinance on tariffs and grid connection requirements was rejected (BWE 2008, S. 5).

Biomass: Biomass represented the most complex renewable energy sector – with differentiations between system sizes and fuels, a complicated bonus system and abundant technical aspects. In detail:

- Tariffs should be raised, following the branch associations, the engineering association and the farmers association, taking into account the strongly risen commodity and substrate prices (by approx. 1ct). In particular, small systems <150kW should be better funded. Yet both small farm systems and large industrial biogas facilities should be supported in a site-appropriate way. The depression should only apply to the basic tariff, not to the bonuses (BDEW 2008, S. 4, 8-9; DBV 2008, S. 2, 7; FV Biogas 2008, S. 4, 7-8; VDMA 2008, S. 2).
- Sustainable production of biomass should be ensured by a Sustainability Ordinance that prescribes ecological requirements and to be proven through a certification system, in order to prevent possible negative environmental effects of biomass imports (BDEW 2008, S. 3, 13; Bundesverband Pflanzenöle 2008, S. 1; VKU 2008, S. 13). This was a change in preferences in comparison to previous reforms, in response to severe criticism both in media and general public and resistance from nature conservationists. Only the farmers still rejected the sustainability criteria as dispensable, since being regulated in the agriculture law anyways (DBV 2008, S. 4). The consumer organization advocated for the deletion of palm oil and soybean oil from remuneration, to prevent the import of ecologically questionable biomass from cut rainforest areas, and objected the proposal of a certification system for sustainability criteria as being susceptible to manipulation (VZBV, 2007, pp. 2-4, 15-16).
The fuel bonus for renewable materials should be unitary for all system sizes and all forms of biomass, be it solid, liquid or gaseous, since size limitations would inhibit the construction of small biomass plants, and the intended sustainability of biomass was independent from its form (BBE 2008, S. 12-14; Bundesverband Pflanzenöl 2008, S. 1-2; VDMA 2008, S. 2; VKU 2008, S. 13-14). The fuel bonus should amount to at least 8ct (instead of 6ct before) (Bundesverband Pflanzenöl 2008, S. 2; FV Biogas 2008, S. 20). Over the relaxation of the so-called principle of exclusive use (i.e. only renewable materials, no fossil fuels may be used in plants eligible for EEG remuneration), different preferences were present; while the Biogas Association turned against the relaxation, as agricultural use of fermentation substrate would then be less incentivized, the Bioenergy Association and the Sugar Industry welcomed it (FV Biogas 2008, 6-7; BBE 2008, S. 12-14; vdz, S. 1-2, 5). The consumer organization demanded the abolishment of the fuel bonus for renewable raw materials as it incentivized corn monocultures and the import of ecologically questionable biomass from other countries (VZBV, 2007, pp. 15-16).

The slurry bonus should be raised. The maximum plant size should be at 500kW instead of 150kW. Special exemptions for liquid biomass should not apply. The bonus should amount to +2.0ct (BBE 2008, S. 13-14). Following the farmers association, for a proportional use of slurry to at least 50%, the bonus should amount to 3-4ct (DBV 2008, S. 6). Also the consumer organization proposed to raise the slurry bonus (VZBV, 2007, p. 16). Yet the Biogas Association took a critical stance, as the incentivization made the agricultural use of slurry for liquid manure less attractive; the size limit should hence be lowered and, in turn, the basic tariff be raised (FV Biogas 2008, S. 22).

The CHP bonus for efficient combined heat power generation should be raised from 2ct to 3ct (BBE 2008, S. 18; Bundesverband Pflanzenöl 2008, S. 2; DBV 2008, S. 4), decoupled from the additional costs of heat production, which were required to be at least 100€/kW in the draft to be eligible for the bonus (BBE 2008, S. 18; VDMA 2008, S. 14-15), and equally applicable for existing plants (BBE 2008, S. 18; DBV 2008, S. 4; VKU 2008, S. 20-21).

The technology bonus for biogas treatment should amount to 4ct to 8ct, with an allowed methane loss of 1%. The wood gas bonus should likewise amount to 8ct. Other technologies should be granted 2ct. All bonuses should be combinable (BBE 2008, S. 9-12; VKU 2008, S. 16-17). The cell fuel bonus should be significantly raised from 2ct to 5.5ct to 9.0ct along capacity categories (BBE 2008, S. 10-11; VDMA 2008, S. 3). A new bonus/malus system for feed-in during the day and at night (i.e. times of high and low electricity demand) was proposed (BBE 2008, S. 11-12; FV Biogas 2008, S. 18). In general, the list of technologies should be open and flexible (BBE 2008, S. 11; DBV 2008, S. 4-5).

A large number of rather technical details was addressed, such as the legal requirement of the verification of the biomass used through environmental verifiers. Here, several associations pointed out that the environmental verifier was a recently established profession and that there were not enough verifiers, so other verifiers such as the chambers of agriculture should be entitled with the verification (BBE 2008, S. 12; DBV 2008, S. 2; FV Biogas 2008, S. 16). Also the positive lists for allowed fuels or additionally incentivized fuels were subject to a large number of detailed wishes (DBV 2008, S. 5; FV Biogas 2008; vdz 2008, S. 2-5). The splitting of a large biogas plant into several smaller separated installations close to each other should be prohibited, to avoid windfall profits through higher tariffs for small facilities (DBV 2008, S. 2, 7). The new splitting rules should not apply to existing facilities (BBE 2008, S. 7-8; FV Biogas 2008, S. 6-7).

Hydropower: According to VDMA, the hydropower tariff should be raised, given the equally rising raw material costs: for modernizations by 0.5ct for plants <500kW (additional to the tariff rise in the draft) and by 2.0ct for plants <250MW (new size category). Modernized and new power plants should be granted equal tariffs. A bonus/malus system for feed-in should apply. The funding period should remain at 20 years for all plants independent from the size (VDMA 2008, S. 4-5).

Geothermal energy: The tariff for geothermal energy shall be raised and amount to 20ct below 10 MW and 12ct above 10 MW (instead of 16ct and 10.5ct provided in the draft), according to VDMA (VKU 2008, S. 19-20).

Special Equalisation Scheme: The Special Equalisation Scheme was heavily criticized due to its redistributing effects at the expense of private households and small businesses. Hence, industry exemptions needed to be limited. While the consumer organization proposed the complete removal of industry privileges (VZBV, 2007, pp. 2, 5-6), some renewables initiatives accepted them to dampen resistance of the industry (SFV, 2008, p. 2).

Grid Integration: The improved feed-in management was welcomed, since the generation management in the meantime has increasingly led to limiting wind turbine output in strong-wind areas with insufficient grid capacities. Yet, bioenergy should be exempted, in particular existing systems or with a de-minimis threshold of 500kW, yet at least 100kW, and all financial losses including lost revenues from heat production needed to be compensated (BBE, 2008, p. 5) (FV Biogas, 2008, pp. 4-5) (DBV, 2008, p. 3).

Market Integration: The direct marketing model and the optional market premium were rejected, given that plant owners usually do not have experience with selling electricity on the market. Instead, a bonus for the interconnection of power plants to a so-called virtual power plant and an optional bonus/malus for the feeding-in at certain times were proposed to better bring supply and demand into accordance (VDMA 2008, S. 2; Bundesverband Pflanzenöl 2008, S. 2; BBE 2008, S. 11-12; FV Biogas 2008, S. 18). At any rate, system operators should be allowed to alter between market premium and EEG tariff at short intervals of approximately one month, at least less than half a year (BBE 2008, S. 6-7, 21; FV Biogas 2008, S. 5-6).
The growth target of 3,000 MW (with a growth corridor between 2,500 MW and 3500 MW) was considered too low by the consumers association, the energy consumers association and Photon solar consultancy (VZBV, 2010a, pp. 11-12; Bund der Energieverbraucher, 2010, pp. 3-4; PHOTON, 2010, pp. 11-12). Environmental NGOs such as German Environmental Relief (DUH) and market researchers such as LBBW supported the growth corridor as long as the production costs need to decrease (DUH, 2010b; LBBW, 2010, p. 12). The BSW did not issue a written statement.

The deep cuts envisaged encountered fierce resistance from the solar industry, the metal workers union, the crafts association and the association of energy consumers. The reduction should remain at max. 10%. More far-reaching cutbacks posed a threat to the survival of the vast majority of German solar manufacturers. Double-digit reductions would overly benefit low-cost competitors from the Far East. Employment and value creation ought to be held in Germany and in particular the economically underdeveloped areas in East Germany (BSW, 2010b; IG Metall, 2010, pp. 1-3; ZVEH, 2010, p. 3; Bund der Energieverbraucher, 2010, pp. 1-2, 5; LBBW, 2010, pp. 7, 10).

In contrast, the politically aspired cuts of 16% were supported by the BDEW (BDEW, 2010a, p. 1; BDEW, 2010b, p. 6). Environmental NGOs such as NABU and DUH gave their consent to 15% reduction, however with a later start date to avoid market distortions (NABU, 2010; DUH, 2010b). Experts from the Photon solar consultancy proposed 20% (PHOTON, 2010, pp. 2-12; 38; Der Spiegel, 25.9.2009), while the consumer association even claimed for 30% reduction (VZBV, 2010a, pp. 4-6; VZBV, 2010b). They argued that the economically viable operation of solar systems with a reasonable profit margin remained feasible even after two-digit cuts, without negative impacts on German solar manufacturers that would need to reduce their production costs due to international competition, not due to low solar power remuneration.

The flexible cap with additional market-dependent cuts was heavily criticized by the metal workers union and environmental NGOs. They warned against repeated clearance-sale like demand cycles (so-called “pork cycles”) for solar panels before every other unforeseeable market-dependent tariff cutback and disruptive market movements resulting therefrom. Every year with high profit margins and therefore high capacity growth would be followed by a year with low profit margins and therefore a market collapse, followed again by high profit margins in the next year and the absorption of all available modules from everywhere, and so forth. As an alternative to the market-dependent flexible cap, the fixed depression should be slightly raised (annually 10% instead of 9%), possibly split up into two reductions per year. (IG Metall, 2010, pp. 4-6; NABU, 2010; PHOTON, 2010, pp. 8, 11-12; 15. 38). In contrast, the BSW solar association, scholars and the consumer association supported the flexible cap (BSW, 2010b, p. 3; Fh-ISE, 2010, p. 11; LBBW, 2010, pp. 9-11; VZBV, 2010a, p. 9).

Higher incentives for own consumption were demanded by the solar industry, to better match electricity demand and production with each other through adjustments in consumption behavior, investments in intelligent building technology and automated consumption management such as for freezer cabinets, heat pumps or decentralized electricity storages. The own consumption would help to relieve the grids and balance out peaks in electricity demand. The BSW proposed an incentive of 10ct, the crafts association of 8ct (BSW, 2010b, pp. 6-7; ZVEH, 2010).

Some environmental NGOs, the BDEW energy industry association, the consumer association and Photon solar experts rejected the promotion of own consumption. The incentives were not suitable to promote electricity storages, neither was a relief for the network to be expected because the solar energy producers would still need the same grid access to feed in electricity not needed (e.g. during absence in holidays) or to purchase electricity in times of low light (as in winter). Furthermore, taxes and duties for the electricity not purchased will be lost (NABU, 2010; BDEW, 2010a, pp. 2-8; BDEW, 2010b, pp. 2-12; VZBV, 2010a, pp. 20-22; PHOTON, 2010, pp. 23-36, 41-52). As an alternative, some thereof suggested a grid relief bonus for the usage of electricity storages.

The planned exclusion of arable land from remuneration and the cutbacks for freestanding systems on converted land were rejected by solar industry, environmental NGOs, the metal workers union and consumer organizations. Furthermore, the transition provisions for all freestanding systems should better take the protection of confidence of investors. They argued that the negative visual impacts of solar parks on the surrounding landscape are negligible, given the dwindling small land use; neither were usage conflicts with food crops identifiable. Negative effects on nature conservation were not given; in the very opposite, solar parks offered retreat for plants and animals amidst intensive agriculture. In addition, it seemed devious to restrict of all things solar parks as being the cheapest form of solar energy production (NABU, 2010; DUH, 2010b; BSW, 2010b, pp. 1-4; IG Metall, 2010, pp. 5-6; juwi/First Solar et al., 2010; VZBV, 2010a, p. 15; PHOTON, 2010, pp. 15-23, 39; LBBW, 2010, pp. 15-22). In contrast, the BDEW had no objections against the exclusion of arable land (BDEW, 2010b, pp. 3, 6).

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**Box 7: Detailed Positions (EEG 2012)**

**Environmental Coalition: Detailed Positions**

The Environmental Coalition engaged in a defence-fight against retrenchments of renewables promotion. Branch associations and environmental NGOs in particular proposed:

- increase of expansion goals;
- no market premium or at least increase of the management premium;
- introduction of a consistency bonus;
- no retrenchments in the green power privilege;
- reductions of industry privileges;
- solar power: no absolute cap; no drastic cuts; reintroduction of freestanding systems;
- wind power: maintenance of the system service bonus and the repowering bonus; no increase of degression rate;
- no constraints for biomass, such as the proposed minimum heat usage quota of 60% and the deletion of liquid biomass from remuneration; maintain the slurry bonus and the fuel bonus for old wood; overall, no tariff reductions for biomass.

In doing so, the structural conflicts between nature conservationists and renewables branches surfaced and needed to be tackled, foremost related to biomass. In detail, the actors pursued the following demands:

**Expansion targets:** The renewables coalition claimed for more ambitious expansion targets in response to the politically promised acceleration of the energy transition and the nuclear phase-out after the Fukushima accident (BEE, 2011d, pp. 5-6) (BUND, 2011, pp. 1-2) (AG BSI, 2011, p. 3) (DGB, 2011b) (SFV, 2011, pp. 1-2). They proposed to raise the targets to 40-45% until 2020, 60-65% until 2030 and 80-100% until 2040.

**Photovoltaics:** The solar branch tried to obviate any retrenchments and preserve the status quo. The BSW solar association demanded to maintain the flexible cap in the existing version with the existing growth corridor and the bi-annual adjustment (as introduced in the European Law Adaptation Act 2011) and to maintain the existing tariffs, degression and size categories. Unions generally supported this position. The BSW furthermore wanted to maintain and extend the promotion of own consumption, to obviate a maximum absolute cap on build-up and to preserve the existing political expansion target of 52 GW until 2020, to maintain the eligibility of 100% of solar electricity generation for vegetable oil power plants, to obviate proposals for a feed-in cut-off regulation for small systems and accepted the inclusion of photovoltaics in the feed-in management only for systems larger than a de-minimis limit of 100 kW. Instead, steady electricity supply should be incentivized, e.g. through a 100,000 storages programme, a grid service bonus or a consistency bonus. For freestanding systems, the BSW demanded the re-inclusion of arable land and the abolishment of any restrictions to specific land types, leaving the planning authority solely to the municipalities (BWW, 2011a, pp. 5-6). Also nature conservationists supported the eligibility of all land types for solar power (BUND, 2011, p. 5), and so did large solar companies (juwi, 2011, pp. 2-3) (BELECTRIC, 2011).

Also further proposals were raised, such as the introduction of a regional factor for the tariff system to take geographic differences of solar radiation into account (BSW, 2011c, p. 5) Smaller associations of solar system operators and environmentalists forwarded various more far-reaching positions than the BSW, with the SFV arguing against any additional market-dependent degression in the form of the flexible cap, and the Confederation of Bavarian Solar Initiatives demanding an enlarged growth corridor to 5,000 MW (SFV, 2011) (AG BSI, 2011).

**Onshore Wind:** The BWE wind association strived to protect the status quo, specifically to obviate increased degression, to maintain the repowering bonus without sharpened restrictions, and to maintain and extend the system service bonus. This position was also supported by VKU, BUND, DGB and solar initiatives (BWE, 2011, pp. 4-12) (VKU, 2011a, p. 2) (VKU, 2011b, p. 9) (BUND, 2011, p. 2) (DGB, 2011b, pp. 4-5) (AG BSI, 2011, pp. 4-6) (juwi, 2011) (Enertrag, 2011) (WVW, 2011).

**Offshore Wind:** The renewables coalition pushed for improvements for offshore wind, given the delay in expansion due to technical difficulties and economic risks, demanding the postponement of the start of the degression and a higher initial tariff, and advocated for a loan programme. The government draft already took these demands into account, so that BWE and DGB were contented. The Offshore Forum Wind Energy, the Association of Wind Power Plants, the German Engineering Association (VDMA), the VKU, and the Foundation Offshore Wind Energy furthermore proposed improvements in the so-called acceleration model (extended funding period or/and higher tariff). Also nature conservationists such as BUND backed offshore wind energy and contributed technical remarks for drilling techniques and cable routes to ensure nature conservation (BUND, 2011, p. 12) (BWE, 2011, p. 2) (VKU, 2011a, pp. 6-7) (DGB, 2011b, p. 4) (AG BSI, 2011).

**Biomass:** The bioenergy branch fought against retrenchments. The BBE bioenergy association turned against intentions to abolish the cogeneration bonus, to introduce a degression for bonuses, to reduce the old wood bonus, to entirely abandon eligibility for liquid biomass, to prescribe a minimum heat usage of 60%, to limit the share of maize usage to 60%, to allow the co-incineration of biomass in conventional power plants, and to remove the slurry bonus for plants installed prior to 2009. The BBE furthermore demanded the removal of the existing 150 kW size limitation for vegetable oil power plants, the stronger promotion of small farm systems (<50 kW), the introduction of a flexibility premium or/and consistency bonus for heat or gas storages, to relax the principle of exclusive use for the fuel bonus to enable the co-incineration of old wood and landscaping materials (BBE, 2011a) (BBE, 2011b) (juwi, 2011, p. 3). The farmers association largely endorsed the claims raised by BBE. Farmers demanded, inter alia, the stop of cutbacks in slurry bonus for existing facilities, the stronger promotion of small systems (<75 kW) that mainly use slurry, the removal of limitations for maize use and minimum heat usage quotas, and the introduction of a capacity/consistency bonus (DBV, 2011).

The Biogas Council demanded higher basic tariffs (to be increased by 2ct vis-a-vis the draft, to 23ct <1,200 kW / 21ct >1,200 kW), a higher bonus for biogas refinement, no differentiation of fuel tariffs along system sizes, and also turned against compulsory heat usage and the intended limitation of maize usage. The degression should amount to 1.5% or steady monitoring, as fuel costs are rather dependent from volatile world markets than from technological progress (Biogasrat, 2011).
Nature conservationists pursued different preferences than the biomass branch. They supported the minimum quota for heat usage, the limitation of mais usage, the entire exclusion of old wood from remuneration (due to ecologically negative impacts on forests and usage conflicts) and a stronger promotion of small plants (15ct for <75 kW). (BUND, 2011, pp. 2-5)

The Association of Municipal Utilities (VKU) generally endorsed the governmental draft and in particular the prescription for minimum heat usage (VKU, 2011a, p. 2) (VKU, 2011b, p. 7). The unions also generally welcomed the governmental draft, in particular the limitation of mais use and the flexibility premium (DGB, 2011b, pp. 6-7).

In difference, the SFV solar association spoke out against any further extension of energetic biomass use (SFV, 2011, p. 1).

Hydropower: Water suppliers claimed higher tariffs vis-à-vis the government draft (AöW, 2011, p. 2). Nature conservationists demanded the removal of small hydropower from remuneration (<500 kW) due to ecologically negative impacts and of very large hydropower (> 20 MW) due to sufficient revenues also without EEG promotion. Also existing plants should adhere to ecological criteria (BUND, 2011, pp. 5-6). Unions, in contrast, spoke out for the better promotion of small hydropower and of storage power plants with natural inflow (DGB, 2011b, pp. 7-8). The hydropower association did not submit a written statement.

Geothermal Energy: Unions supported a better basic tariff, postponement of regression, integration of early starter bonus and cogeneration bonus into basic tariff (DGB, 2011b, p. 7). A written statement of the geothermal association is not available.

Green Power Privilege: Environmental NGOs, renewables branch associations and municipal utilities engaged in the preservation of the green power privilege. The minimum quota of fluctuating sources, as of 25%-30% in the government draft, was held too restrictive and shall be eased to not more than 15%. The surcharge advantage for green power suppliers should remain at 2.5ct at least instead of only 2.0ct as envisaged. Also, the criteria shall apply to an annual average instead of a monthly basis, so the criteria are easier to fulfill (BUND, 2011, p. 6) (VKU, 2011a, p. 2) (VKU, 2011b, p. 5) (BWE, 2011, pp. 18-19) (BEE, 2011d, pp. 9-11) (juwi, 2011, p. 3) (BDEW, 2011a, pp. 2-3, 15; BEE, 2011b, pp. 6-7) (VVV, 2011, pp. 4-5).

Market integration: Renewables branch associations and environmental NGOs were skeptical towards the market premium proposed, as it only caused additional costs with no visible benefit for real market integration (BUND, 2011, p. 6) (BEE, 2011d, pp. 11-12). Yet, the idea of the market premium as such was on principle partly accepted, for instance by the BWE wind association, while the BBE bioenergy association and the VKU association of municipal utilities gave their consent if the management premium is significantly raised to make the market entrance economically feasible (from 0.1ct to approx. 0.4-0.55ct) (BWE, 2011, p. 17) (BEE, 2011a, p. 2; BEE, 2011b, p. 4) (VKU, 2011b, pp. 3-5) (VKU, 2011a, p. 2). Also unions welcomed the intention of market integration yet warned against windfall profits on the one hand and insufficient incentives for really demand-oriented electricity generation on the other hand (DGB, 2011b, p. 9). The further specification of the market premium in a governmental ordinance shall need parliamentary approval (Biogasrat, 2011, pp. 23-24) (BEE, 2011d, pp. 10-11), (BEE, 2011a, p. 16).

Grid Integration: The governmental suggestion to reduce the compensation for electricity generated but not fed-in due to grid bottlenecks from 100% to 95% was rejected by renewables branch associations (BEE, 2011d, pp. 6-8) (BWE, 2011, p. 15). The VKU association of municipal utilities accepted the reduction yet claimed for full compensation of lost heat revenues for cogeneration plants (VKU, 2011b, p. 2) Unions accepted the new regulation proposed (DGB, 2011b, pp. 5-6).

Special Equalization Scheme: Environmental NGOs and companies from the renewables sector wanted to reduce the volume of industry privileges to less companies (BUND, 2011, p. 7) (Enereal, 2011, p. 5). The consumer association even claimed for the deletion of the harship clause; companies should pay the same surcharge as private households (VZBV, 2010b). In contrast, unions proposed their extension by lowering the threshold from 10 GWh to 5 GWh and to entirely exempt track railways (DGB, 2011b, pp. 8-9).

Economic Coalition: Detailed Positions

The Economic Coalition proved rather divided between the energy industry organized in the BDEW and the energy-intensive industry organized in the VIK. While the BDEW mostly advanced positions overlapping with the renewables branch associations and therewith interestingly turned out as approaching the Environmental Coalition, the VIK focused on the specific interests of industry – such as exemptions in own consumption and surcharge payments –, and largely refrained from making proposals for individual tariffs. However, the VIK kept its course against the EEG as such; claiming for a change from a feed-in model to a bonus model and the freezing of the EEG levy at the present level and funding additional costs from the overall tax budget (VIK, 2011c, p. 20).

Expansion targets should be less ambitious given the delayed progress in grid expansion, following the energy-intensive industry (VIK, 2011c, p. 21).

Photovoltaics: No written statements retrievable.

Onshore wind: The BDEW was at the side of the wind industry, turning against the proposed abolishment of the system services bonus and against the increase in regression from 1% to 1.5% (BDEW, 2011, p. 5).

Offshore wind: The BDEW endorsed the stronger promotion of offshore wind energy and welcomed the acceleration model, yet proposed an improvement (tariff of 19.5ct for nine years) (BDEW, 2011, pp. 6-7)
**Biomass:** Also with respect to bioenergy, the BDEW was at the side of the bioenergy industry, opposed the compulsory minimum heat usage, forwarded doubts over the limitation of mais usage and suggested to raise the tariffs above the rates envisaged in the draft bill (BDEW, 2011, pp. 7-8). The paper industry supported the minimum heat usage, the increased degression and the relaxation of the principle of exclusive use for the fuel bonus (vdp, 2011). Wood-processing industry associations welcomed the removal of old wood from remuneration, given that, according to the Progress Report, the domestic old wood potential was exhausted and politically unintended imports took place, and usage conflicts with material use (BAV, 2011, pp. 1-6) (agr, 2011) (vdp, 2011, p. 2) (BVSHI, 2011, p. 4). Water suppliers supported a 50% limitation in mais use to protect waters against pollution caused by nutrients from mais cultivation and forwarded doubts over the fuel bonus for the cultivation of energy crops (AOW, 2011). The food industry demanded the complete removal of the fuel bonus, due to conflicts with food crops cultivation (VHKL, 2011).

**Market Integration:** Both BDEW and VIK endorsed the introduction of the optional market premium. While the VIK proposed the overall changeover from the feed-in model to a compulsory bonus model, with first steps to be taken for biomass and hydropower – and therewith put the fundamental principles of the EEG into question – and that details could be ruled in a governmental ordinance, the BDEW strongly advised a significant increase in the management premium (by 0.65ct) – and therewith lined up with the claims raised by renewables associations (VIK, 2011c, pp. 17-18) (BDEW, 2011, pp. 3-4).

**Green Power Privilege:** The BDEW strived to maintain the Green Power Privilege as for being currently the only feasible way of direct marketing; the political debate over potential abuse of the instrument was held overrated (BDEW, 2011, p. 4).

**Special Equalization Scheme:** Industrial electricity consumers put forward the further extension of industry privileges by lowering of the entrance threshold (from 10 GWh to 5 GWh annual consumption) and gradual access. They also opposed suggestions of an obligatory energy management system as new criterion for eligibility, for being impracticable, beaurocratic and legally uncertain (VIK, 2011c, pp. 1-9) (VEA, 2011) (vdp, 2011, p. 4).

**Industrial own consumption:** The energy-intensive industry strived to maintain the exemption of self-generated industrial electricity from the surcharge, including electricity transported through the public grid and without spatial link between generating and consuming facility – as the most economic site for the power plant may be not close to the factory –, and in particular for ecologically sound cogeneration and for electricity generation from industrial by-products such as blast furnace gases in steel production that lack another meaningful use (VIK, 2011c, pp. 9-12).

**Box 8: Detailed Positions (PV Act 2012)**

**Growth corridor:** The solar branch turned against reductions of the existing growth corridor, which should arther be increased than lowered (BSW, 2012d, p. 3) (PV Crystalox, 2012, p. 4) (Solarpraxis, 2012, pp. 5-6).

**Market Integration Model:** A broad range of interest groups – inter alia BDEW, BBE, BSW and unions – strongly opposed the market integration model proposed by government (i.e. the reduction of eligibility to certain percentages of electricity generation). In their view, this instrument would in fact take effect contrary to the political intention to better integrate solar energy in the supply system. According to BDEW, it would lead to an extension of own consumption along with all undesired side effects on the increased volatility of electricity supply and involve additional costs for grid operators for technical implementation. Instead, the BDEW proposed to strengthen the direct marketing scheme that requires the system operator to align electricity feed-in with market demand. This could be done by the compulsory use of direct marketing for large PV systems above 1 MW. The market integration model shall at least be modified by the limitation to eight months for PV system above a de-minims limit of 100kW (BDEW, 2012, pp. 4-12). In contrast, the renewables associations, foremost BEE and BSW, rejected the market integration model for different reasons, viz. to obviate the reduction of remuneration, which was also to be considered as break with the basic principles of the EEG and signal effect for other renewable energies. The model was regarded to indeed miss the goal of market integration, to be unfeasible – as the cut-off limit for remuneration can only be detected retroactively –, and to cause additional costs for system operators for technical equipment that is particularly costly for small systems (BEE, 2012c) (BSW, 2012d, p. 2) (Clean Energy Sourcing GmbH, 2012) (naturstrom, 2012). Some solar companies proposed that at least small systems below 100kW shall be exempted (Solarpraxis, 2012, pp. 3-5), while other solar companies as well as unions suggested that the model shall be tested for micro systems below below 10kW as they benefited from own consumption and did not rely on feed-in remuneration (PV Crystalox, 2012, p. 4) (DGB, 2012, p. 4). The consumers association, in an isolated position, accepted the market integration model (VZBV, 2012, pp. 3-4).

In particular, all statements handed in by interest groups clearly spoke out against the authorization of government to extend the market integration model to other renewable energies, which was seen to burden investment security. In any case, the parliament shall be required to give its approval (Solarpraxis, 2012, pp. 6-7) (DGB, 2012, pp. 4-5) (BEE, 2012c, p. 1) (BDEW, 2012, pp. 7-8) (BBE, 2012, pp. 2-3) (BWE, 2012) (ZVEI, 2012, p. 4).

**Own consumption privilege:** The BDEW as well as experts from Photon advocated for the removal of the special promotion of own consumption – given that own consumption was economically attractive anyways after having reached grid parity –, whereas the ZVEI electronic manufacturers‘ industry association as well as the unions favored the maintenance (BDEW, 2012, p. 6) (PHOTON, 2012, p. 9) (DGB, 2012, p. 4) (ZVEI, 2012, p. 5).
Tariff structure: While solar companies sought to maintain the existing structure of size categories to reflect cost differences, the BDEW supported the government’s plan to reduce the number of size categories, whose effect equaled a tariff reduction for small systems (Solarpraxis, 2012, p. 3) (BDEW, 2012, pp. 13-14).

Tariff cuts: With respect to the tightening of the regular tariff cut by 15% originally scheduled for 1 July 2012, different views were present. Unions rejected additional cuts, while the consumer association welcomed further cuts. The solar branch was skeptical towards more intense cuts, yet some companies also held an advanced and intensified cut to be feasible. The ZVEI electronic manufacturers’ association warned against too excessive cuts (PV Crystalox, 2012, p. 4) (Solarpraxis, 2012, pp. 2-3, 6-7) (BELECTRIC, 2012, p. 5) (DGB, 2012, pp. 2-5) (VZBV, 2012, pp. 3-4) (ZVEI, 2012, pp. 3-4).

Degression: The government’s plan to introduce a fixed degression in absolute terms (0.15ct/month) and to allow the government to decide about extraordinary cuts met the resistance of a broad range of interest groups – BDEW, BEE and BSW alike – as it burdened some market segments (with lower tariffs) stronger than others (with higher tariffs), in particular freestanding systems. The degression rate shall be defined in percentages instead of absolute terms, the flexible cap shall be maintained, and further tariff cuts shall still require parliamentary approval. Otherwise, investment security particularly for large projects with longer planning periods would be at stake (BSW, 2012d, pp. 2-3) (BDEW, 2012, pp. 14-15) (PV Crystalox, 2012, p. 4) (BELECTRIC, 2012, p. 5) (DGB, 2012, pp. 2-5) (BEE, 2012c, pp. 4-5).

Hard cap: The BDEW proposed the introduction of a hard cap on total solar capacity eligible for EEG remuneration (BDEW, 2012, p. 14).

Grid integration: Costs for retrofittings with new inverters shall be beared by system operators – following the consumers association and the BDEW – or passed on through the network charge to all consumers – following the opinion of solar companies. For the BDEW, also a funding through the EEG levy was an alternative. All statements rejected intentions to split the costs between system operators and grid operators (BDEW, 2012, pp. 14-15) (Solarpraxis, 2012, p. 9) (VZBV, 2012, p. 5).

Electricity storages: BDEW and ZVEI endorsed the exemption of electricity storages from the EEG levy and advocated for an extended list of storage technologies (BDEW, 2012, p. 16) (ZVEI, 2012, p. 5).

Freestanding systems: The solar branch rejected any size limitations for freestanding systems (draft: max. 10 MW) and least restrictions for the eligibility of plants in spatial proximity (BSW, 2012d, p. 2) (Solarpraxis, 2012, pp. 7-9) (BELECTRIC, 2012, pp. 3-4) (naturstrom, 2012, pp. 2-3). The BDEW gave its consent to a more restrictive definition of a “composed plant”, i.e. several smaller plants in spatial proximity would be considered as one large plant with an accordingly lower tariff (BDEW, 2012, p. 16).
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</tr>
<tr>
<td>depression</td>
<td>-</td>
<td>-</td>
<td>1% from 2010 onwards</td>
<td>1% from 2010 onwards</td>
<td>5% from 2018</td>
</tr>
<tr>
<td>Size limit</td>
<td>-</td>
<td>20 MW</td>
<td>20 MW</td>
<td>20 MW</td>
<td>20 MW</td>
</tr>
<tr>
<td>bonus</td>
<td>-</td>
<td>-</td>
<td>fuel bonus:</td>
<td>fuel bonus:</td>
<td>fuel bonus, cogeneration bonus and technology bonus removed; only a bonus for biogas refinement was maintained (1-3ct)</td>
</tr>
<tr>
<td>biomass</td>
<td>-</td>
<td>-</td>
<td>≤500kW: 6.0 ct</td>
<td>biomass 4-6ct, biogas: 4-7ct slurry bonus: 1-4ct, landscaping materials: +2-4ct</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>≤5MW: 4.0 ct</td>
<td>CHP bonus: 2.0 ct</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>wood ≤5MW: 2.5 ct</td>
<td>technology bonus: ≤5MW: 2.0 ct</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CHP bonus: 2.0 ct</td>
<td>technology bonus: 2 ct gast treatment: 1-2ct</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CHP bonus: 3 ct</td>
<td>technology bonus: 2 ct gast treatment: 1-2ct</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>technology bonus: ≤5MW: 2.0 ct</td>
<td>technology bonus: 2 ct gast treatment: 1-2ct</td>
<td></td>
</tr>
<tr>
<td>conditions</td>
<td>-</td>
<td>-</td>
<td>Sustainability standards introduced</td>
<td>Sustainability standards introduced</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vegetable oil plants: size limit 150kW</td>
<td>large plants: compulsory direct marketing from 2014 onwards</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>feed-in management: biomass included</td>
<td>feed-in management: biomass included</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>minimum of 60% heat production or 60% slurry use was introduced, or direct marketing must be used</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>use of maize in</td>
<td></td>
</tr>
<tr>
<td>Wind onshore</td>
<td>Wind offshore</td>
<td>Solar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>--------------</td>
<td>-------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>duration</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>20 years</td>
<td>20 years</td>
</tr>
<tr>
<td><strong>degression</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.5% from 2002</td>
<td>2% from 2005</td>
</tr>
<tr>
<td><strong>size limit</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>tariff (kWh)</strong></td>
<td>90% of revenue</td>
<td>initial tariff: 9.7ct</td>
<td>initial tariff: 8.7ct</td>
<td>initial tariff: 9.2ct</td>
<td>initial tariff: 8.93ct</td>
</tr>
<tr>
<td></td>
<td>basic tariff: 6.19ct</td>
<td>basic tariff: 5.5ct</td>
<td>basic tariff: 5.02ct</td>
<td>basic tariff: 4.897ct</td>
<td>basic tariff: 5.0ct</td>
</tr>
<tr>
<td><strong>bonus</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Repowering bonus: if increase of capacity installed by 3 times at least: initial tariff extension by 2 months for each 0.6% reference yield the actual production is above 150% reference yield</td>
<td>system service bonus: +0.5ct on initial tariff (limited until end 2013)</td>
</tr>
<tr>
<td></td>
<td>system services bonus: +0.5ct on initial tariff +0.5ct; min. 10 years operation of plants to be replaced, increase capacity by 2 times at least and 5 times at most</td>
<td>repowering bonus: +0.5ct, limited to plants installed previous to 2002 (improved)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>conditions</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>minimum reference yield of 60%</td>
<td>minimum reference yield of 60%</td>
</tr>
<tr>
<td></td>
<td>exclusion of nature protection areas</td>
<td>exclusion of nature protection areas</td>
<td>exclusion of nature protection areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>duration</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>20 years</td>
<td>20 years</td>
</tr>
<tr>
<td><strong>degression</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0%</td>
<td>0%; from 2008: 2%</td>
</tr>
<tr>
<td><strong>tariff</strong></td>
<td>initial tariff: 9.1ct (9 years)</td>
<td>initial tariff: 9.1ct (12 years)</td>
<td>initial tariff: 13ct (12 years)</td>
<td>initial tariff: 15.0ct (12 years)</td>
<td>basic tariff: 3.5ct</td>
</tr>
<tr>
<td></td>
<td>basic tariff: 6.9ct (if installed until end 2006)</td>
<td>basic tariff: 6.19ct (if installed until end 2012)</td>
<td>basic tariff: 3.5ct (if installed until end 2015)</td>
<td>new optional acceleration model: initial tariff increases to 19ct but granted for 8 instead of 12 years; thereafter, basic tariff applies</td>
<td>basic tariff: 3.5ct</td>
</tr>
<tr>
<td><strong>bonus</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>early starter bonus (2ct)</td>
<td>early starter bonus integrated into initial tariff</td>
</tr>
<tr>
<td><strong>conditions</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>exclusion of nature protection areas</td>
<td>exclusion of nature protection areas</td>
</tr>
<tr>
<td><strong>degression</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0%</td>
<td>0%; from 2008: 2%</td>
</tr>
<tr>
<td><strong>duration</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>20 years</td>
<td>20 years</td>
</tr>
<tr>
<td><strong>cap (hard)</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>250MW</td>
<td>250MW</td>
</tr>
<tr>
<td><strong>tariff (kWh)</strong></td>
<td>90% of revenue</td>
<td>basic tariff: 45.7ct</td>
<td>basic tariff: 5.8ct</td>
<td>basic tariff: 3.5ct</td>
<td>new design of size categories</td>
</tr>
<tr>
<td></td>
<td>&lt;30kW: 57.4ct</td>
<td>&lt;30kW: 57.4ct</td>
<td>&lt;30kW: 43.01ct</td>
<td>size limitation: 10</td>
<td>size limitation: 10</td>
</tr>
<tr>
<td></td>
<td>&gt;30kW: 54.6ct</td>
<td>&gt;30kW: 54.6ct</td>
<td>&lt;100kW: 40.91ct</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**biogas plants limited to max. 60%**
**liquid biomass excluded (new plants)**

**duration - 20 years**
**degression - 1%**

**size limit - -**
**tariff (kWh) 90% of revenue**
**initial tariff: 9.1ct**
**basic tariff: 6.19ct**
**initial tariff: 9.2ct**
**basic tariff: 5.02ct**
**initial tariff: 8.93ct**
**basic tariff: 4.897ct**

**bonus - Repowering bonus: if increase of capacity installed by 3 times at least: initial tariff extension by 2 months for each 0.6% reference yield the actual production is above 150% reference yield**
**system service bonus: +0.5ct on initial tariff (limited until end 2013)**
**system services bonus extended until end of 2014/2015 (new/old plants)**
**repowering bonus: +0.5ct, limited to plants installed previous to 2002 (improved)**

**conditions - minimum reference yield of 60%**
**exclusion of nature protection areas**

**duration - 20 years**
**degression - 1.5%**

**Wind offshore**

**Solar**

**duration - 20 years**
**degression - 20 years**

**cap (hard) - 250MW**
**tariff (kWh) 90% of revenue**
**basic tariff: 45.7ct**
**<30kW: 57.4ct**
**>30kW: 54.6ct**
**<100kW: 40.91ct**
**new design of size categories**
**size limitation: 10**
<table>
<thead>
<tr>
<th>Conditions</th>
<th>Duration</th>
<th>Degression</th>
<th>Flexible Cap</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>20 years</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>freestanding systems: no ecologically sensitive areas, accordance with communal land-use plans</td>
<td>-</td>
<td>5% from 2005</td>
<td>flexible cap: bi-annual adjustment of degression, following a growth corridor</td>
</tr>
<tr>
<td>freestanding systems: splitting prohibited own consumption privilege introduced: fixed tariff (25.01ct) for electricity self-consumed</td>
<td>20 years</td>
<td>5% from 2005 onwards freestanding systems: 6.5% from 2006 onwards</td>
<td>-</td>
</tr>
<tr>
<td>roof systems: ≤30kW: +11.7 ct &gt;30kW: +8.9 ct &gt;100kW: +8.3 ct if installed at facades: +5.0 ct</td>
<td>20 years</td>
<td>5% from 2005 onwards roof systems: 6.5% from 2006 onwards</td>
<td>-</td>
</tr>
<tr>
<td>&gt;100kW: 54.0ct if installed at faces: +5.0ct</td>
<td>20 years</td>
<td>5% from 2005 onwards roof systems: 6.5% from 2006 onwards</td>
<td>-</td>
</tr>
<tr>
<td>≤1MW: 39.58ct &gt;1MW: 33.0ct own consumption: 25.01ct freestanding systems: 31.94 ct</td>
<td>20 years</td>
<td>5% from 2005 onwards roof systems: 6.5% from 2006 onwards</td>
<td>-</td>
</tr>
<tr>
<td>roof systems: ≤10kW: 19.5ct ≤40kW: 18.5ct ≤1MW: 16.5ct ≤10MW: 13.5ct (for installations until 1.4.2012, further reduction by 15% on 1.7.2012 and continuously thereafter) freestanding systems: ≤10MW: 13.5 ct own consumption privilege extended until end of 2013 grid integration: inclusion into feed-in management, with simplified regulation for &gt;100kW; for small systems: optional alternative deration to 70%; governmental authorization to issue ordinance on retrofitting to avoid „50.2 Hz“ problem</td>
<td>20 years</td>
<td>5% from 2005 onwards roof systems: 6.5% from 2006 onwards</td>
<td>-</td>
</tr>
</tbody>
</table>
### Table 38: Development of the Special Equalisation Scheme

<table>
<thead>
<tr>
<th>Year</th>
<th>Privileged Electricity Amount (GWh)</th>
<th>Applications Made (no.)</th>
<th>Privileged Companies (no.)</th>
<th>Fictitious EEG Levy without SES (ct/kWh)</th>
<th>Factual EEG Levy (ct/kWh)</th>
<th>Raise of EEG Levy (ct/kWh)</th>
<th>SES Share in EEG Levy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>86.118</td>
<td>822</td>
<td>734</td>
<td>2.964</td>
<td>3.59</td>
<td>0.628</td>
<td>17.5%</td>
</tr>
<tr>
<td>2011</td>
<td>85.118</td>
<td>653</td>
<td>603</td>
<td>2.61</td>
<td>3.21</td>
<td>0.6</td>
<td>18.8%</td>
</tr>
<tr>
<td>2010</td>
<td>80.665</td>
<td>595</td>
<td>566</td>
<td>1.94</td>
<td>2.33</td>
<td>0.39</td>
<td>16.8%</td>
</tr>
<tr>
<td>2009</td>
<td>65.023</td>
<td>n/a</td>
<td>n/a</td>
<td>1.14</td>
<td>1.31</td>
<td>0.17</td>
<td>13.0%</td>
</tr>
<tr>
<td>2008</td>
<td>77.991</td>
<td>n/a</td>
<td>n/a</td>
<td>0.98</td>
<td>1.15</td>
<td>0.17</td>
<td>14.8%</td>
</tr>
<tr>
<td>2007</td>
<td>72.050</td>
<td>n/a</td>
<td>n/a</td>
<td>0.82</td>
<td>0.96</td>
<td>0.14</td>
<td>14.6%</td>
</tr>
<tr>
<td>2006</td>
<td>70.161</td>
<td>n/a</td>
<td>n/a</td>
<td>0.74</td>
<td>0.85</td>
<td>0.11</td>
<td>12.9%</td>
</tr>
</tbody>
</table>

Remarks

1 This study only discourses technological or economic aspects where necessary to understand the political process. A comprehensive review of the state of the art of renewable energies is provided in IPCC, 2012.

2 The classification proposed is to be understood as tool of analytical abstraction aiming to mark the decisive lines of conflict between multitudes of actors with sometimes ambiguous beliefs and interests, rather than making the bold claim that the entire political landscape can be precisely split up in absolute opponents and unconditional supporters of renewable energies. For instance, "opponents" may indeed generally welcome renewables but favor different paths, paces and instruments of the transition envisaged, while "environmental" actors may act out of economic rather than environmental motivation (see chapter 3.1).

3 The price-driven model sets feed-in tariffs to incentivize generation of electricity from renewable sources. Small and independent operators are granted a fixed tariff for every kilowatt-hour generated from renewable energies, while all purchasers of electricity are required to pay to their net operator a price surcharge equivalent to the costs. Feed-in tariffs encourage technology-specific promotion and can trigger cost-reductions by dynamic depression of tariffs. Critics warn against market-distorting effects of feed-in tariffs, the inefficiency and planning-economy character of technology-oriented tariff systems, and rising electricity prices. In contrast, the quantity-driven model defines quotas based on tradable certificates, either on a national or European level. The government obliges electricity suppliers to generate a certain minimum share of renewable energies and leaves it to the market how to fulfill the quotas. Utilities can, then, either produce the renewable energy required or purchase certificates from other suppliers that overachieve their targets. If the legislator abstains to differentiate particular targets for the various renewable energy sources, it is left to the utilities which renewables to pick, so they would prefer the cheapest options and undermine the development of those renewable energies that are still more expensive. Critics make the point that a quota system would allow large utilities to discriminate against independent producers and therewith impede the decentralization of energy supply. Citizens would thus not be involved in the energy transition. Furthermore, critics point to international experiences in a number of countries where quota models have failed to achieve desired renewables expansion – as projects eventually have not been realized due to economic unfeasibility – and have not resulted in cost decreases – as planning uncertainties resulted in a risk premium. For a discussion of empirical and theoretical arguments on renewables promotion regimes, cf.: (European Commission, 2008c; IEA, 2008; Oschmann, Ragwitz, & Resch, 2006; Ragwitz & al., 2007)

5 Bundesverband Deutscher Wasserkraftwerke
6 wind: from 55 MW (1990) to 1,100 MW (1995); PV: from 0.6 MW to 8 MW; biomass: from 20 MW to 66 MW
7 Gesetz für den Vorrang Erneuerbarer Energien (Erneuerbare-Energien-Gesetz – EEG), as of 29.3.2000
8 Gas from sewage plants, mines and landfill will be neglected in this paper because it plays only a marginal role and is not a classic renewable energy.
9 (wind from 7,500 GWh in 2000 to 25,500 GWh in 2004, biomass from 2,900 GWh to 7,960 GWh)
10 „Regenerative Energien sind in Deutschland gegenwärtig etwa zu 4 Prozent am Energiemix beteiligt, davon entfällt der größte Teil auf die Wasserkraft. Dieser Teil wird sich bis 2005 auf 6 Prozent gesteigert haben, im Jahre 2020 vielleicht auf 10 Prozent. Und immer noch müssen dann 90 Prozent anders gedeckt werden, das ist zu bedenken.“
11 „Eine Verdopplung vorausgesetzt, erreichen wir einen Anteil von 8%. Was ist aber mit den restlichen 92%?“
13 „Das EEG war eine reine politische Kopfgeburt, da sind keine Unternehmensinteressen dahinter gewesen. Scheer und Fell machten das, also zwei Visionäre. Die Fraktion war skeptisch, aber sagte sich: Na gut, die Spinne, das kostet ja nicht viel, lassen wir die ruhig mal machen. Dass man damit substanzielle Teile der Stromversorgung abdeckt, glaubte damals keiner.“
15 Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market. The Directive ruled also among other the obligatory feed-in and remuneration for renewables, yet with the EEG 2000 this had already been legislation in force in Germany.
16 Erstes Gesetz zur Änderung des Erneuerbare-Energien-Gesetzes, 16.7.2003. The draft was released on 8 April 2003 (BT doc. 15/810, identical with BT doc. 15/1067)
17 According to the BDI/VIK proposal, the surcharge should be limited to 0.05ct above 10 GWh if share of
electricity costs exceed 5% of at gross value added and to 0.025ct above 100 GWh if electricity costs exceed
10%. VCI and VDEW proposed an alternative threshold of 4% electricity costs in turnover.
18 Zweites Gesetz zur Änderung des Erneuerbare-Energien-Gesetzes, 22.12.2003
19 Such as the deductible of 10% only for companies newly eligible, as large electricity-intensive companies
would have been worse off than under the previous Scheme. For them, the old regulation applied.
20 inter alia: the German Energy Association (VEDEW), the Federation of German Industries (BDI), the
Industrial Energy Association (Vikh), energy-intensive industry branches such as the Metal Industry Association
(WVM), the Federation of German Steel Producers (WV Stahl), the Chemical Industry Association (VCI), the
German Cement Industry Association (BDZ), the German Gas Industry Federation (BV Glas) and the German
Paper Factories Association (VPD).
21 „Den Anteil erneuerbarer Energien am Stromverbrauch auf 20 Prozent zu steigern, ist wenig realistisch. Ich
glaube, es ist unrealistisch zu erwarten, dass erneuerbare Energien eine Lücke schließen können, die zum
Beispiel durch die frühzeitige Abschaltung von Kernenergie geöffnet würde.“
22 the Federation for Renewable Energy (BEE) and other renewables industry associations such as the Wind
Energy Association (BWE), the Wind Power Plants Trade Association (WVV), the Offshore Forum Wind Energy,
the Bioenergy Association (BBE) and Federation of German Hydropower Plants (BDW), as well as environmental
associations such as the BUND, unions such as verdi . They strongly committed to the feed-in tariff systems and
rejected any bid or quota models. The Bioenergy Association furthermore coordinated her positions with the
Farmers Association (DBV), the German Engineering Association (VDMA), the Biogas Association (FV Biogas)
and the Working Group of Forest Owners (Arbeitsgemeinschaft Deutscher Waldbesitzer).
23 Small hydropower: <5MW: funding period extended from 20 to 30 years; <500kW: tariff raised by 2ct to
9.67ct; deadline for new plants postponed by 2 years to 31.12.2007; wind onshore: minimim reference yield
reduced to 60% instead of 65%; higher tariffs if repowering leads to a tripled capacity; biomass: funding period
extended from 15 to 20 years (= status quo EEG 2000); fuel bonus increased from 2.5ct to 4.0-6.0ct; technology
bonus doubled to 2ct and extended to further technologies (biogas treatment, stirling engines); degression
alleviated from 2% to 1.5%.
24 BGH, VIII ZR 160/02, p. 21; Judgement of the European Court of Justice of 13.3.2001 in Case C-
379/98PreussenElektra AG vs. Schleswag AG, [2001] ECR I
25 Under her leadership, the G8 Summit held in Heiligendamm on 7 June 2008 adopted a final communique
on climate protection. For the first time in history, the G8 governments agreed that climate change is man-made,
accepted the scientific evidence represented in the IPCC reports and recognized the UN as negotiations platform.
Furthermore, they declared to substantially extend the share of renewable energies and to “consider seriously [to
strive for] at least a halving of global emissions by 2050” (G8, 2007, p. 14). This concession is to be considered
as breakthrough in international climate politics, against earlier resistance of the USA and Russia who have
blocked any progress. Environmental NGOs such as Germanwatch (2007) and WWF (2007) appreciated the new
leading role of industrialized countries and applauded the successful persuasion work by Chancellor Merkel.
At the UN Climate Change Conference in Bali, Indonesia, in December 2007, the participating governments
negotiated about a negotiation mandate for a follow-up agreement after the expiration of the Kyoto protocol in
2012. Amongst the contentious issues was also if the negotiation mandate should entail particular emission
reduction targets or restrict itself to an overall emission reduction without providing specific figures. The German
government advocated for prescribing a particular reduction goal. In the run-up to the conference, the government
had drafted her Integrated Energy and Climate Programme (IEKP) that allowed her to point to national ambitions
and strengthen her negotiation position. However, the final compromise achieved only committed to “deep cuts in
global emissions” with references to the IPCC recommendations, due to the resistance of Australia, Canada,
China, India, the USA and Russia (UNFCCC, 2008, p. 3). The echo by environmental NGOs was mixed, whereas
the German government and the scientific community in general welcomed the compromise for a negotiation
mandate (Dagger, 2009, p. 90).
27 „Umweltkiller Biosaft“, natur+kosmos Nr. 8/2007
28 Der Cheflobbyist der Biokraftstoffindustrie Helmut Lamp sagte: Die Debatte um indirekte Landnutzungs-
änderung vergleicht die Ex-CDU-Politiker mit der Suche nach dem Yeti, also einem Wesen, das viele gesehen
haben wollen, das aber nicht existiert. Andere Lobbyisten sprechen auch von einem „Phantom“ – wie z.B. der
UFOP-Chef Klaus Kliem in seinem Grußwort auf dem 9. Fachkongress für Biokraftstoffe am 23./24.1.2012 in
Berlin
29 „Es kann nicht sein, dass sich die Kanzerlin als Klimakanzerlin profiliert und CDU/CSU in der Realität alles
blockieren. [...] Ich plädiere deshalb für eine absolut harte Linie gegenüber der CDU/CSU.“
30 „Energie- und Klimapolitik ist längst kein Nischenthema mehr. [...] Gerade im Wahl(kampf)jahr 2009 geht es
darum, [...] uns als den energiepolitischen Motor der Koalition [zu] präsentieren. Dazu gehört auch, dass wir
seltbewusst diskutieren, bei welchen der auf Kabinettsebene getroffenen Verständigungen aus unserer Sicht noch ambitionierte Ziele erreichbar scheinen."


32 1,000-1,500 MW in 2009, 1,100-1,700 MW in 2010, 1,200-1,900 MW in 2011

33 Systemdienstleistungsbonus, „SDL Bonus”

34 The Sustainability Ordinance provided for the same standards as the pre-existing Biofuel Ordinance (Biokraftstoffverordnung) as of 5 December 2007 that stipulated sustainability criteria for biofuels (sustainable land management, respect for nature conservation areas, proof of CO2 reduction, etc.). Some nature conservationists regarded the criteria as insufficient as they did not limit the usage of certain plants and therewith failed to prevent corn monocultures.

35 Ordinance on the further development of the nationwide equalisation scheme compensation mechanism (Verordnung zur Weiterentwicklung des bundesweiten Ausgleichsmechanismus im EEG – AusglMechV), as of 17.7.2009, in force 1.1.2010. Under the previous regulation, electricity utilities had to accept a bandwidth of renewable electricity with costs and amounts unknown ex-ante. Large suppliers such as RWE or E.ON could cope with that, but for smaller suppliers such as municipal utilities this risk created problems without any societal benefit. The physical roll-over was replaced by a new redistribution mechanism that obliged suppliers to sell the EEG electricity amounts at the stock market and only were eligible for receiving the differential costs (i.e. difference between tariffs and electricity stock market price). For system operators, essentially nothing changed, but the roll-over of promotion costs to electricity customers was regulated more precisely – until then, utilities had more leeway how they wanted to calculate the costs. Now, a precise mechanism was established that granted transparency. Despite the reduction of economic uncertainties for utilities and increased transparency, a relevant argument was to bring the EEG in conformity with EU law, in the light of uncertainties that already had appeared in the case PreussenElektra against the Electricity Feed-in Act and now, with increasing shares of renewables, regained relevance (Rid, 2014, interview; Oschmann, 2014, interview; Anonymous A, 2104, interview). Green politicians, however, believe that the new calculation method was deliberately designed to exaggerate the actual promotion costs, since the differential costs increase along with declining stock market prices due to the merit order effect, despite stable tariff payments (Fell, 2014, interview). However, the EEG levy would also have risen under the old compensation mechanism.

36 such as the German Association of Energy and Water Industries (BDEW, successor of the VDEW), the Industrial Energy Association (VIK), the Chemical Industry Association (VCI), and the Federation of German Steel Industry (WV Stahl) and the Association of German Paper Factories (Verband deutscher Papierfabriken, vdp)

37 The WI analysis highlighted that the RWI calculations stretch across thirty years from 2000 until 2030, which is why the costs are not as immense as they appear at first glance. Moreover, methodological methods would overestimate the real costs: The RWI assumes that all new PV installations are small systems that receive the EEG electricity amounts at the stock market and only were eligible for receiving the differential costs (i.e. difference between tariffs and electricity stock market price). For system operators, essentially nothing changed, but the roll-over of promotion costs to electricity customers was regulated more precisely – until then, utilities had more leeway how they wanted to calculate the costs. Now, a precise mechanism was established that granted transparency. Despite the reduction of economic uncertainties for utilities and increased transparency, a relevant argument was to bring the EEG in conformity with EU law, in the light of uncertainties that already had appeared in the case PreussenElektra against the Electricity Feed-in Act and now, with increasing shares of renewables, regained relevance (Rid, 2014, interview; Oschmann, 2014, interview; Anonymous A, 2104, interview). Green politicians, however, believe that the new calculation method was deliberately designed to exaggerate the actual promotion costs, since the differential costs increase along with declining stock market prices due to the merit order effect, despite stable tariff payments (Fell, 2014, interview). However, the EEG levy would also have risen under the old compensation mechanism.

38 Environmental ministry: reduction by 6ct for large roof systems >1 MW; economics ministry: also by 6ct > 1 MW , yet an additional reduction of the basic tariff by 1ct each in 2009 und 2010 for all systems. Compromise: reduction by 6ct and furthermore only one instead oftwo additional reduction by 1ct. The depression for freestanding systems was sharpened, which was not controversial (Dagger, 2009, pp. 167-169).

39 „Subventionsstausbauer“

40 „Mehr war nicht möglich.“

41 "Deckeln wir die Photovoltaik, oder deckeln wir die Kanzlerin."

42 From 2000 until 2009, an average annual production cost reduction of up to 10% was factually observed, whereas still in 2004 an annual production cost decrease of only 5% had been projected (Fh-ISE, 2010, pp. 5, 11).

43 Erstes Gesetz zur Änderung des Erneuerbare-Energien-Gesetzes vom 11.8.2010 (Bt-Drs. 17/1147)

44 For an overview, see https://www.clearingstelle-eeg.de/eeg2009/aenderung5

45 „Rötting erhofft sich davon einen "Mitmachimpuls für die Bürger". Fachpolitiker in der Koalition sprechen von einem "Zuckerrüttel". Einer sagt: "Das ist Asbeck pur"." (Fichtner & Werner, 2010)

46 "Teile der Solarindustrie haben in den vergangenen Jahren viel zu geringe Zuwachsraten in Umlauf gebracht. So wurde versucht, die Kosten kleinzurechnen." Anne Kreutzmann, chief editor, Photon; ["Wir benötigen] eine verlässliche Zuka...wirtschaft […] Die bisher erstellten Mengenprognosen waren immer falsch" Holger Krawinkel, vzbv (Der Spiegel, 13.1.2010)

47 ... dass die Solorlobby ihre eigene Marktsituation schlechter darstelle als sie eigentlich ist, sei mittlerweile "auch für den gutgläubigsten Politiker offenkundig" (Der Spiegel, 25.9.2009)
"Der Idealismus ist in weiten Teilen verloren gegangen ... Die Solarbranche ist jetzt eine ganz normale Industrie."

Many CSU politicians complained about the visual impact of large solar parks on the surrounding landscape, and farmers – a core client of the CSU – complained that solar parks would consume valuable arable land and push up leasing prices for arable land. However, this position was controversial within the CSU, as many communities and farmers had stakes in solar parks. The FDP, in contrast, commended freestanding solar systems as being the cheapest form of solar energy generation. The solar industry was not united; some manufacturers gave their consent to put a brake on freestanding systems, since professional investors mainly use cheaper modules from foreign producers more often than home-owners do. Others feared that cheap imports would then press for smaller systems and drive out domestic modules from roofs. Nature conservation associations did not oppose solar parks because they offer refuges for animals and plants in an otherwise industrialized agriculture (Staud, 2010)

The tariff for own consumption was set 12ct lower than the feed-in tariff. As a consequence, the own consumption is already profitable if the electricity price is at 12ct (plus 14.287ct in taxes). With an average electricity price of 22ct (in 2010), the economic advantage therefore amounted to 8ct (in comparison: 3.6ct before the reform).

Formulierungshilfe für den Entwurf eines Gesetzes zur Änderung des Erneuerbare-Energien-Gesetzes

"Die Modulpreise sind runter, daher war das nur eine Anpassung. Das rettet aber keine Firma in Deutschland, weil die Chinesen immer billiger sind. Aber die Wahrnehmung beim Elektroinstallateur in meinem Wahlkreis ist: Ihr macht die PV kaputt."

If market growth surpasses 7,500 MW, an additional degression by 3% will result (before: 6,500 MW). With a market growth of less than 3,500 MW, no additional degression applies. The additional degression for 2011 is based on a market forecast based on the months March, April and May 2011 and could amount to 24% in total.

Translation by the author.

Gesetz zur Neuregelung des Rechtsrahmens für die Förderung der Stromerzeugung aus erneuerbaren Energien vom 28.7.2011

This change had already been made in the European Law Adaptation Act for Renewable Energies (Europarechtsanpassungsgesetz Erneuerbare Energien) that entered into force 1 May 2011.

Hill & Knowlton gained quite a delicate reputation due to a number of controversial lobbying activities foremost in the USA (Knightley, Steven: The Disinformation Campaign. In: The Guardian, 4 October 2001)

"Sie alle machen unter Schwarz-Gelb die besten Geschäfte; der Kapazitätsausbau unter Schwarz-Gelb ist so hoch wie nie zuvor. [...] Ohne die FDP-Bundestagsfraktion hätten Sie längst einen festen Deckel im EEG."

IBC Solar, operator of large PV parks, donated in 2010 each 5000€ to the FDP associations Dortmund and Regensburg. In Dortmund, Kauch was chairman, in Regensburg, Meierhofer was board member. (Der Spiegel, 38/2013)

"Sie alle machen unter Schwarz-Gelb die besten Geschäfte; der Kapazitätsausbau unter Schwarz-Gelb ist so hoch wie nie zuvor. [...] Ohne die FDP-Bundestagsfraktion hätten Sie längst einen festen Deckel im EEG."

The reasons for this change remain in the dark. Even the officials in the environmental ministry in charge for the changes could not precisely remember why this modification was made. Probably it was only due to changing world market prices for steel and other construction materials (Bischoff, 2014, interview; Oschmann, 2014, interview).

The slight decline in new installations in wind power plants in 2010/2011 was not due to low tariffs but to low designation of suitable sites which was under the authority of the states. For the future expansion, it was therefore decisive that the states designated sufficient sites to eliminate restrictive height limits (BMU, 2011g).


"Die Solarindustrie solle sich in Bescheidenheit üben, forderte Daniel Brandl. Sie müsse stärkere Einschritte in Kauf nehmen. Das derzeitige Verhalten in der Branche erinnere ihn an "ein übergewichtiges Kind, das man die Schokolade wegnimmt"."


Momentan setzt diese Degression erst ab 3 500 Megawatt pro Jahr ein. ... Ich komme immer mehr zu der Überzeugung, dass sich das EEG in seiner jetzigen Form überlebt hat und grundsätzlich reformiert werden muss ... Im Prinzip ist ein Mengenmodell ein wettbewerbsorientierter und technologieoffener Ansatz. Die Energieversorger würden damit verpflichtet, einen bestimmten Anteil ihres Stroms aus erneuerbaren Quellen zu liefern. Es bliebe ihnen selbst überlassen, aus welcher erneuerbaren Quelle der Strom kommt. Der Markt würde entscheiden.” (Rösler 2012) – “Die Reduzierung des Ausbaus auf 1000 Megawatt pro Jahr würde einen wirksamen Beitrag zur Kostenbegrenzung leisten” (FAZ 2011)

66 „Schwarzgelb hat dreimal die PV-Vergütungen gesenkt und dreimal einen Run auf PV ausgelöst, wie in einer wiederkehrenden Jahres-Endrallye. Wenn man’s einmal macht, ist es wohl Unwissenheit, wenn man es zweimal macht, vielleicht noch Dummheit, aber wenn man es dreimal macht, dann ist das System. Dahinter steckt die Strategie, die Stimmung für Erneuerbare kaputt zu machen und die Kosten zu dramatisieren.”

67 „Wir dürfen bei der Photovoltaikförderung nun nicht erneut in einen blinden Grabenkampf um das Thema pro und kontra ‘fester Deckel’ treten, bei dem es nach Erreichen der Förderhöchstgrenze zu einem abrupten Abbruch der Förderung käme. ... Die erneuerbaren Energien sind ein typisches Handlungsfeld des Mittelstands. Um hier eine weitere Verunsicherung zu vermeiden, darf es nun nicht zu Schnellschüssen kommen.”

68 In detail: The cuts for medium-sized roof systems turned out less severe than originally planned. For these PV systems, a new size category of 10-40 kW capacity (original request of the Bundesrat was: 10-100 kW) was introduced with a tariff of 18.5ct instead of 16.5ct. The market integration model was not applied anymore for small systems (<10 kW) and a larger percentage share of 90% will be renumerated for larger systems (10-1,000 kW). The Bundesrat had requested the complete removal of the market integration model, now a compromise was made. In exchange, a cap for the maximum capacity eligible for EEG remuneration was inserted, amounting to 52 GW (in comparison: 27 GW installed capacity at the time). The size limitation for freestanding systems remained at 10 MW but the definition of a composed plant was eased (area of 2km instead of 4km per community). In addition, the government was authorized to issue an ordinance to introduce a remuneration for PV systems on converted land areas with a capacity of more than 10 MW.

69 „Die Fotovoltaik hat nach derzeitigem Situation auch langfristig wenig Chancen – außer in Nischen – wettbewerbsfähig zu werden.”

70 „Das ist genauso, als wolle man aus politischen Gründen ‘Ananas am Nordpol anbauen’; technisch sicherlich machbar, aber aus ökonomischen und aus Gründen einer weltweiten Arbeitsteilung ein völlig absurdes Vorgehen;” – Similarly, the VDEW stated: „Photovoltaik wird sich nicht einmal langfristig am Markt durchsetzen” (VDEW, 2004, p. 18).

71 BBE/VDMA: solid biomass: ≤2MW: +8 ct; ≤5 MW: +6ct; ≤10 MW: +4 ct; ≤20 MW: +2 ct; biogas: 6ct instead of 2.5ct proposed, and should be extended to plants larger than 500kW, up to 2 MW (BBE) or 5 MW (VDMA).

72 In the splitting of one large biomass plants into several smaller separate systems close to each other, which was done by plant operators to receive the higher tariffs for smaller plants. However the BDEW regarded this splitting as useful in some instances, for instance if the heat cogenerated cannot be meaningfully used and then only one plant would have to run. Therefore the splitting into two plants should be allowed. Moreover, the splitting prohibition should be applicable only for new facilities, not for existing ones (BDEW 2008, S. 4).

73 Central Association of German Electronics and Information Technology Crafts (Zentralverband der Deutschen Elektro- und Informationstechnischen Handwerke – ZVEH) represents a branch with 317,000 employees and 32bn. € turnover. 37% of electronic crafts companies are engaged with the PV sector, that is 28,000 businesses that make 28% of their overall turnover with PV (ZVEH, 2010, p. 1)

74 In Germany, there are approx. 17m. ha farmland, thereof approx. 10,000 ha used for PV (equals less than 0.06%). (PHOTON, 2010, pp. 15-23, 39)

75 es dürfe „keine Ausweitung der energetischen Biomassenutzung geben“

76 Bundesverband der Altholzaufbereiter und -verwerter (BAV); Arbeitsgemeinschaft Rohholzverbraucher (agr): Verband der Papierhersteller (vdp), ebenso Säge- und Holzindustrie

77 Verband der Hersteller kulinarischer Lebensmittel