4
Climate Change Law: Objectives, Instruments and Structures of a New Area of Law*

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Abstract

Over the past two decades, Germany has created a sophisticated climate change legislation framework which in many instances implements international and particularly European Union (EU) requirements. This article points out that in some areas Germany has played a pioneering role in shaping the development of EU law. As an environmental problem of truly global scale, climate change mitigation is heavily reliant on the achievement of international consensus. But it also requires effective, level-specific solutions to problems at all rungs of the multilevel policy hierarchy comprising the international community, the EU and the Federal Republic of Germany with its sixteen states and numerous cities and municipalities. Much progress has therefore already been made, but efforts must be greatly intensified right across the board.

A. Introduction: Climate Change Policy in Germany and the European Union: Objectives and Strategies

As a European Union member state, Germany was an early starter in efforts to specify emission reduction commitments[1] under the United Nations Framework on Climate Change Convention and in pursuing what were at

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1 See SRU (2002:para. 427ff.); SRU (2004:para. 15ff.); SRU (2008a:para. 104ff.).

the time ambitious reduction targets of its own: the German government aimed to cut greenhouse gas emissions from German sources by 25% by 2005 based on 1990 levels.[2] Subsequent to the Kyoto Protocol,[3] Germany agreed under the EU burden-sharing scheme to reduce its greenhouse gas emissions by 21% during the period 2008 to 2012 compared with 1990 levels.[4] This target will be met.[5]

A milestone in Germany's more recent climate policy came in the form of the Meseberg Resolutions on Integrated Energy and Climate Policy adopted by the German government on 23–24 August 2007.[6] This climate change programme affects almost all significant emitter groups (industry, transport, buildings and consumers) and comprises 29 measures with quantified CO_2 reduction targets for the period up to 2020. On this basis, Germany aims to cut greenhouse gas emissions by 40% by 2020 based on 1990 levels.

The core components of the Meseberg Energy and Climate Programme involve improving energy efficiency by, among other things, promoting combined heat and power, and a range of measures relating to electricity consumption in buildings. Also, use of renewable energy is to be considerably intensified in the electricity and heating sector. For the transport sector, use of biofuels and the integration of shipping and air transport into the

2 Emissions in CO_2-equivalents 1990: 1,036 million tonnes; of which 15.7% from the transport sector, 40.1% from the energy industry, 20.9% from private households and private consumers, 14.9% from the manufacturing sector, and 8.1% from industry; see also the table in UBA, Nationale Trendtabellen für die deutsche Berichterstattung atmosphärischer Emissionen seit 1990, Emissionsentwicklung 1990–2007 (information as of 12.11.2008). See Emissionsentwicklung 1990 – 2010, Treibhausgase, inkl. erweiterte Auswertung und Äquivalentemissionen der Treibhausgase, available at http://www.umweltbundesamt.de/emissionen/publikationen.htm#AktuelleBerichterstattungen.

3 Ratified by Germany by law enacted 27 April 2002; BGB1 II 2002, 966.

4 See Council Decision 2002/358/EC of 25 April 2002 concerning the approval, on behalf of the European Community, of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the joint fulfilment of commitments thereunder, 2002/358/EC, Official Journal of the European Union – Legislation (OJ L) 130, 15 May 2002, 1. For the subsequent period see Decision 406/2009/EC by the European Parliament and the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020, OJ L 140, 05 June 2009, 136.

5 For the German Government's opinion see, BMU (2007a); BMWi & BMU (2007); UBA (2007); UBA (2009:2ff.); SRU (2008a:para. 102ff.).

6 See BMU (2007a); BMWi & BMU (2007); and also Bosecke (2008:122); SRU (2008a:para. 104ff.); UBA (2009:4ff.).

Emissions Trading Scheme will lead to significant reductions in CO_2 emissions. The Meseberg Programme is less clear as regards ways to reduce greenhouse gas emissions in agriculture – each of the approaches it contains requires considerable further enhancement of prevailing (climate change) law.[7] This will be addressed in more detail later (in Section C).

The Meseberg Energy and Climate Programme serves as Germany's contribution to achieving the ambitious targets agreed on by the EU heads of state and government under the German EU presidency on 9 March 2007. Accordingly, by 2020, greenhouse gas emissions in the EU are to be reduced to 30% below 1990 levels, subject to other industrialised countries agreeing to comparable targets and emerging economies reducing their emissions commensurate with their abilities and resources. Aside from this package of measures, the EU has agreed to reduce its emissions by 20% by 2020 in any event, even though under the Kyoto Protocol the EU is only required to cut emissions by 8% by 2012.[8]

In advance of the Climate Change Conference in Copenhagen in December 2009, which in many respects failed, the European Union and Germany adopted very clear positions, and not just in respect of the 2°C target[9] long called for by the scientific community.[10] The EU repeatedly and vigorously called for global warming to be restricted to 2°C compared with pre-industrial levels. At the same time, the EU proposed specific reduction targets and associated measures linked to financing models. The German government spoke out strongly in favour of complying with the 2°C target.[11] Unfortunately, in the Copenhagen Accord, the Copenhagen Conference achieved little more than half-hearted political recognition of the 2°C target. International climate change policy is consequently at risk of collapse.

Climate Policy Post-Copenhagen[12] is more challenging than ever. The EU continues in its efforts to present a credible example and has analysed ways of moving forward on the road to a reduction target of 80–95% by 2050

7 See BMWi & BMU (2007). The report contains 14 proposals for primary and secondary legislation. See also the background report by BMU (2007a).
8 See EU Council Conclusions 7224/01/07 REV 1, in the version dated 2 May 2007.
9 See WBGU (2009a:9ff.); and WBGU (2007).
10 For greater detail see the Communication from the EU Commission (2009a); see also EU Commission, (2009b); WBGU (2009b); German Government (2008:5).
11 Statement by Chancellor Angela Merkel, German Government (2009a:7ff.).
12 Thus the title of a WBGU policy paper, WBGU (2010).

and of reaching a binding commitment on the 30% target.[13] The German government endorsed these aims in its Energy Concept of 28 September 2010.[14] Negotiations in advance of the Conference of the Parties (COP16), held at Cancún in December 2010, went in two directions, one concerning a continuation of the Kyoto Protocol and the other a new global climate change accord.[15] As we now know, the conference in any case brought legal recognition of the 2°C target. The Conference of the Parties (COP17) in Durban in December 2011 achieved an agreement to negotiate an accord for climate protection which binds all member states and defined a second stage of Kyoto beginning in 2013. The UN Climate Summit in Doha in December 2012 finally developed a binding agreement with the following main items:

- An obligatory second obligation period based on the Kyoto Protocol from 2013–2020, and
- A working plan for the negotiation of a new global convention for climate protection to come into force in 2020.

B. Climate Change Law: A New Area of Law

Climate change policy has in the meantime produced a steadily growing body of legislation. From a legal systematics standpoint, the subject of climate change policy in the law is followed with growing interest and increasing intensity[16] and is now often recognised as a legislative field (climate change law) in its own right.[17] In agreement with Gärditz, it appears reasonable to define climate change law as "the sum of legal standards designed to protect the climate against anthropogenic effects".[18] It must also be remembered in this regard that climate change law is a cross-sectoral area,

13 COM 2010 (265) final: Analysis of options to move beyond 20% greenhouse gas emission reductions and assessing the risk of carbon leakage.
14 BMWi & BMU (2010:4).
15 For an academic perspective on the two options see Hansjürgens (2009).
16 Koch & Caspar (1997); Koch & Behrend (1996); Koch & Verheyen (1999); Bail et al. (2003:§ 54); Köck (2007); Weinreich (2006); Müller (2008); Czybulka (2008).
17 Winkler (2005); Gärditz (2008); Kloepfer (2008:10); Müller & Schulze-Fielitz (2009:15); for a still cautious view, Schlacke (2010:121), with a useful overview of the diversity of regulatory regimes.
18 Gärditz (2008); concurring Müller & Schulze-Fielitz (2009:12).

which has been integrated along with its objectives and instruments into a myriad of regulatory resources, and must continue to be so integrated in the future.[19] Also, climate change law is typical of multilevel legislation with rules that apply at international, EU and national level. It is virtually paradigmatic for the increasing globalisation of environmental law.[20]

International, European and national climate change law has acquired clear structures in its just under 20 years of development. Structure-giving regulatory strategies in climate change law can be grouped – broadly – into strategies for the reduction of greenhouse gas emissions (climate change law in the strict sense) and climate change adaptation strategies (climate change adaptation law). Regarding greenhouse gas reduction strategies, the action areas to be distinguished comprise substitution of fossil fuels with renewable energy sources, improving energy efficiency, and the (as yet under-developed) measures relating to arable and livestock farming.

With regard to energy efficiency, sector-specific command-and-control regimes have been created for buildings, energy-using or energy-related appliances and equipment, and motor vehicles. Greenhouse gas emission trading has been or is being established for industry and aviation and may be established in future for shipping; promotion of combined heat and power (CHP) is a further instrument targeting energy efficiency. Alongside these sector-specific arrangements is the cross-sectoral approach taken in the Energy Services Directive, which has now been transposed into German law. This targets absolute energy savings by way of improvements in energy efficiency.

Concerning the substitution of fossil fuels with renewable energy, notable legislation includes the Renewable Energy Sources Act (EEG) – descended at some distance from the former Electricity Feed-in Act (Stromeinspeisungsgesetz) – and the recently overhauled EU Renewable Energy Directive. The instrumental core of the former Electricity Feed-in Act has been retained in Germany, in compliance with European law: grid operators must purchase renewables-generated electricity on a priority basis and must pay for it a price set by the state.

The core provision of the more recent Renewable Energies Heat Act (EEWärmeG) consists of a statutory obligation to use renewable energy for

19 Koch & Verheyen (1999:2); Gärditz (2008:325); Müller & Schulze-Fielitz (2009:11).

20 See Koch & Mielke (2009).

a proportion of a building's heat needs. The proportion itself depends on the type of energy used.

With regard to fossil fuel substitution, a binding biofuel quota has been adopted that must be met by all business enterprises placing motor fuels on the market. With a view to land-use conflicts and the need to safeguard nature conservation interests under increased biomass crop farming, the EU has laid down sustainability requirements for the growth of biomass crops in the Renewable Energy Directive. These requirements are transposed into German law in more specific form in the Biofuels Sustainability Ordinance (Biokraftstoff-Nachhaltigkeitsverordnung/Biokraft-NachV).

Detailed analysis of the regulatory regime in all its diversity leads, quite naturally, to difficult legal issues, as well as an on-going need for harmonisation and also individual points needing correction. At the same time, it may be concluded that in just under two decades a body of climate change law has been created that is diverse, complex and, in its core structures, essentially suited to the task. By the very act of undertaking a synoptic review of this new area of law, the academic law discipline is able to provide the kind of critical and constructive support that is ever necessary for the on-going legislative process. It is nonetheless important to distinguish between the level of sophistication achieved by the body of law itself and the standard needed to attain climate policy targets. In this light, the conclusion to be drawn is that efforts must be stepped up considerably in all areas if the 2°C target is not to become unattainable in the near future.

The analysis in the following section is restricted to the main decarbonisation strategies, i.e. to the legal frameworks for the promotion of energy efficiency and for the promotion of renewable energy.[21]

C. Legal Framework for the Promotion of Energy Efficiency

A dramatic increase in energy efficiency is a vital prerequisite for successful climate change mitigation.[22] The general consensus is that there are huge efficiency reserves. The European Union and Germany have therefore

21 A comprehensive treatment including constitutional issues, legal issues concerning the reduction of greenhouse gas emissions in agriculture and legal approaches for climate change adaptation is published in GfU (2011).

22 For an in-depth view see SRU (2008a:para. 109ff.).

launched an energy efficiency initiative in all key sectors.[23] Notable sectors involved in the implementation of successful energy efficiency policy include:

- Boosting competition in energy efficiency in the course of energy market liberalisation[24]
- Promoting energy efficiency in residential buildings[25]
- Efficiency requirements for energy-using appliances and equipment[26]
- Creating the conditions to increase energy efficiency in motor vehicles,[27] and
- Promoting energy efficiency in industrial facilities.

Both the European Union[28] and Germany[29] have introduced a range of statutory regulatory regimes in the key sectors mentioned above. While these are largely promising, they must still be enhanced and developed further. The following sets out the most important elements of the regulatory regime.

I. Promotion of Energy Efficiency Using Combined Heat and Power (CHP)

With the major revisions of the Combined Heat and Power Act (KWPG) in 2008 and 2009 under the framework of the German government's Integrated Energy and Climate Programme,[30] the percentage share of high-efficiency CHP plants in electricity and heat generation (primary energy use over 90%) is to be increased from 12 to 25% (Section 1 KWPG).[31] District heat networks will also be expanded. According to the statutory definition in the first

23 EU Commission (2006a); BMU (2007a); and also SRU (2008a:para. 104ff.); and further BMWi (2007).
24 SRU (2008a:para. 123ff.).
25 (ibid.:para. 129ff.).
26 SRU (2008a: para. 147ff.).
27 SRU (2008a:para. 152 ff.).
28 See the instructive overview by Reimer (2009); further see Prall (2010:§ 9); for a comprehensive treatment of European and German law, Keyhanian (2008).
29 See the comprehensive critical appraisal by SRU (2008a:para. 104 ff.).
30 Gesetz für die Erhaltung, die Modernisierung und den Ausbau der Kraft-Wärme-Kopplung (KWKG) [Act on the Conservation, Modernisation and Development of Combined Heat and Power (CHP)] of 19 March 2002, BGB1 I 2002, 1092, last amended on 21 August 2009, BGB1 I 2009, 2870 and on 25 October 2008, BGB1 I 2008, 2101.
31 See BMWi & BMU (2007:9).

sentence of Section 3 (1) KWKG, combined heat and power is "the simultaneous conversion of primary energy into electrical energy and useful heat in a stationary technical installation". In this way it is possible to attain a primary energy conversion efficiency of over 90%, compared with 35 to 50% in electricity generation without CHP and up to 58% in a combined cycle gas and steam power plant.[32] CHP also enables substantial reductions of CO_2 and other emissions.[33]

The more recent overhaul of the Combined Heat and Power Act significantly improved the set of policy instruments used to promote CHP. The central instrument is a statutory obligation on grid operators to connect CHP units to the grid and to purchase and pay for the generated energy (Sections 4 to 8 KWKG).[34] Under Section 4 (1) KWKG, grid operators are required "to connect CHP installations within the meaning of Section 5 to their grid and to purchase the CHP-generated electricity from such installations on a priority basis. The purchase obligation is of equal rank to that for electricity from renewable energy sources" (second sentence of Section 4 (1) KWKG).[35]

Remuneration is provided on a finely graded scale (see Sections 5 to 7 KWKG). Remuneration normally consists of a price – a negotiated price or the prevailing price – plus a surcharge as a special incentive to build and upgrade CHP units. The major revision of the Act in 2008/2009 brought important changes in this regard that promise an improvement in its economic effectiveness:

- Whereas under the previous act only existing CHP units were promoted with the surcharge and the construction of new units was left to private-sector initiative (since found wanting), the surcharge is now additionally payable for CHP units with an electrical capacity of over 2 MW taken into operation after 1 January 2009 that meet the criteria for high-efficiency cogeneration under the EU Cogeneration Directive[36] and do not displace existing district heating systems (Section 5 (3) KWKG).

32 See Keyhanian (2008:footnote 1318 with further references).
33 See data provided by the BMU (2007b:9).
34 On the deficiencies of the previous regime see Keyhanian (2008:356ff.).
35 See below, section D. I.
36 Directive 2004/8/EC on the promotion of cogeneration based on a useful heat demand in the internal energy market and amending Directive 92/42/EEC, OJ L 52, 21 February 2004, 50; for greater detail see Keyhanian (2008:267ff.).

- A sharper distinction is applied with regard to existing units, with modernised and most of all high-efficiency modernised CHP units attracting a larger surcharge than old and new existing units (Section 5 read in conjunction with Section 7 KWKG).
- Under Section 4 (3a) KWKG, CHP electricity consumed by the unit operator is also subject to the surcharge.

Over and above this, the targeted expansion of CHP use is promoted by the newly introduced surcharge entitlement for new and upgraded district heat networks (Sections, 5a, 6a and 7a KWKG).

An interim review, notably with a view to the German government climate policy goals, is due to be carried out in 2011 by the Federal Ministry of Economics and Technology (BMWi) and the Federal Environment Ministry (BMU) in collaboration with industry associations.[37] The new Energy Concept of September 2010 does not provide any additional stimulus with regard to CHP.

II. Promotion of Energy Efficiency in Buildings

Buildings account for some 40% of final energy consumption in the EU, and also in Germany. The building sector generates 25 to 30% of all CO_2 emissions.[38] The potential for energy savings through energy efficiency gains is generally rated as large and by the German government in its new Energy Concept as "huge.[39] The main potential savings are in the existing stock of older buildings: about three-quarters of the residential housing stock were built before the inception of modern policies on thermal insulation with the first Thermal Insulation Ordinance of 1979.[40] For economic reasons, however, the requirements under the Thermal Insulation Ordinance in its various versions and the later Energy Saving Ordinance (EnEV) generally lagged significantly behind the state of the art, including the requirements for new buildings. The existing housing stock has largely been spared demands to upgrade insulation. Stricter requirements have only been laid down more recently in the major revisions of the EnEV in 2007, 2008 and 2009, with

37 For further detail on the promotion of CHP see Burgi (2009).
38 For further detail and additional references see Keyhanian (2008:370ff.).
39 BMWi & BMU (2010:26).
40 For an instructive discussion of the saving potential see Keyhanian (2008:373ff.).

notable impetus from the EU Energy Performance of Buildings Directive.[41] The resulting regulatory regime can be outlined as described below.

The Energy Saving Ordinance (EnEV)[42] distinguishes between residential and non-residential buildings and takes an integrated energy efficiency approach in that the legal requirements target total building energy demand. In this it implements the corresponding requirements of the EU Energy Performance of Buildings Directive. Accordingly, under Section 3 (1) EnEV, it must be ensured that the annual primary energy requirements for heating, water heating, air conditioning and ventilation do not exceed those of a reference building. A point worth special note is the focus on 'primary' energy requirements, so that system conversion losses, losses in energy transmission and all other upstream losses are taken into account.

The rules limiting the total primary energy requirement are supported by more rules on thermal insulation. Section 5 (2) EnEV sets maximum limits for thermal transmission losses from heat-transmitting external surfaces. Section 6 EnEV lays down rules for the air-tightness of building elements; Section 7 EnEV demands a minimum of thermal insulation in accordance with generally accepted standards. The purpose of these cumulative rules on thermal insulation is to prevent sole focus on total energy requirements from creating too much leeway for builders. Otherwise, for example, an ultra-efficient heating system could be taken as a reason to save on thermal insulation. The scope for trade-offs of this kind is limited by the rules on thermal insulation. One point of criticism does remain, however, and that is the use of 'generally accepted standards' as a benchmark rather than the 'state of the art', as this results in efficiency levels that fall short of what is actually attainable.[43]

The rules in EnEV 2007, however, only apply to existing buildings when carrying out major renovation work (see Annex 3 EnEV). In such instances, the rules are also significantly less stringent than for new buildings (see

41 Directive 2002/91/EC of the European Parliament and the Council of 16 December 2002 on the energy performance of buildings, OJ L 1, 4 January 2003, 65.

42 Verordnung über energieeinsparenden Wärmeschutz und energieeinsparende Anlagentechnik bei Gebäuden [Ordinance on Energy-saving Thermal Insulation and Energy-saving Appliances in Buildings], BGBl I 2007, 1519, most recently amended by Article 1 of Ordinance dated 19 April 2009, BGBl I 2009, 954; for an instructive discussion of the EnEV 2007 see Keyhanian (2008:394ff.); for the ensuing revisions see Stock (2008:648).

43 See, with further references, Keyhanian (2008:403f.).

detailed rules in Section 9 EnEV).[44] This is owed partly to the strict concept of economic viability applied under Section 5 (1) of the Energy Saving Act (EnEG). While some form of grandfathering arrangement is called for under the constitutional safeguards for property owners, given the large – according to the German government huge – potential for efficiency gains in the existing building stock, fair application of the proportionality principle would probably allow a greater burden to be placed on owners.[45]

In view of the fact that the new EnEV – in line with the EU directive – is targeted on the total (primary) energy demand of a building, it is only consistent for the EnEV to include requirements for heating, ventilation, air-conditioning and hot water heating systems (Section 13 ff. EnEV).[46] Very generous transitional periods are allowed with regard to the retrofitting of heating systems in existing buildings (Section 10 EnEV).

In conformity with the European Energy Performance of Buildings Directive, the EnEV provides an important information instrument in the form of energy performance certificates (Section 16 ff. EnEV). When erecting a building, and on selling, renting or leasing, the owner, tenant or lessor must present, or at least be able to present, an energy performance certificate showing the building's energy performance. The certificate can be made out on the basis of calculated energy demand or measured energy consumption. For new buildings, the certificate must contain the calculated energy demand; on structural modifications and for existing buildings, the figures can be partly based on the less informative energy consumption figures.[47] The certificate must also include a wide range of other information on building energy efficiency, including recommendations for cost-efficient improvements to the building's energy performance (see Section 17 (4) EnEV together with Annexes 6 to 9). It is expected that energy performance certificates will in future help to make the energy performance of a building an important decision criterion when properties are bought, rented or leased.[48]

44 See Keyhanian (2008:397ff.).
45 Fischer & Klinski (2007:11).
46 See Keyhanian (2008:400).
47 For further detail see Schmidt (2008); Schlarmann & Marold (2009).
48 Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings, OJ L 153, 18 June 2010, 13, recital 27 of the Directive.

July 2010 brought the entry into force of a new EU Directive on the Energy Performance of Buildings.[49] As before, it remains the sole responsibility of member states to set minimum requirements for the energy performance of buildings.[50] This is scarcely likely to spur joint effort by member states to the extent needed. At least the harmonisation of calculation and testing methods will bring more transparency regarding member state efforts (see in particular Article 3 of the Directive together with Annex I). It is to be welcomed that existing buildings are now included in the efficiency requirements under Article 7. However, member states are left considerable leeway in this regard: the overall requirements legislated by member states must only be complied with in "major renovations". The Directive does not specify whether the requirements have to be applied to the renovated building as a whole or to the renovated building elements only. On the other hand, it introduces various environmental improvements. Among other things, member states are required to ensure that "by 31 December 2020, all new buildings are nearly zero-energy buildings" (Article 9 (1) a).[51]

Another point to consider is that both EU law and German law contain other regulatory regimes that affect building energy efficiency, raising difficulties in some respects when it comes to streamlining and harmonising the diversity of rules and regulations. Examples include –

- the recently revised Ordinance on Small Combustion Installations (Kleinfeuerungsanlagen-Verordnung) with limits for flue losses that have an impact on efficiency[52]
- the Heating Costs Ordinance (Heizkosten-Verordnung), also revised, that promotes energy economy by requiring consumption-based allocation of heating costs among residential units[53]
- local government powers under the municipal code (Gemeindeordnung) in each of the German Länder to decree – now on the basis of climate change policy objectives – mandatory connection to and use of a district

49 (ibid.:13).
50 See in particular recital 10 of the Directive.
51 The reasons for enacting the directive are instructive in this regard, notable recital 17 of the Directive.
52 1. BImSchV [First Ordinance on the Implementation of the Federal Immission Control Act] of 26 January 2010, BGBl I 2010, 38.
53 Verordnung über die verbrauchsabhängige Abrechnung der Heiz- und Warmwasserkosten (Verordnung über Heizkostenabrechnung-HeizkostenV) [Heating Costs Ordinance] of 5 October 2009, BGBl I 2009, 3250; see Wall (2009).

heating network linked to a CHP plant,[54] some approaches adopted in Länder building codes[55]
- *Länder* climate change legislation that – for example in Hamburg – at least for a time laid down stricter thermal insulation requirements for buildings than the then EnEV,[56] and
- municipal land-use planning law, which in its objectives is now expressly geared to "general climate protection"[57] and which, in laying down what can be stipulated in a land-use plan and in urban development contracts,[58] provides a wide range of approaches for promoting energy efficiency and energy economy in buildings.

It should be borne in mind when contemplating this mass of legislation that under Section 1 (3) EnEG, the provisions of the EnEG apply without prejudice to other stipulations of law that lay down stricter requirements for thermal insulation.

All in all, a complex body of energy efficiency law has been developed, including many constructive approaches and also increasingly strict requirements, even if these are limited to new buildings. Given the substantial share of greenhouse gas emissions accounted for by existing buildings and the great scope for energy efficiency and economic gains, again most of all in existing buildings, any grandfathering arrangements in this regard must be scaled back in future to the constitutionally necessary minimum.[59] While the German government's Energy Concept of September 2010 in its analysis of potential energy savings and of energy savings needed in the existing building stock accords with the line of argument developed here, and also formulates truly ambitious targets, the choice of policy instruments so far looks inadequate to the task. The government aims for "a building stock which is almost climate-neutral" in the long term, i.e. by 2050, and acknowledges

54 BVerwGE 125, 68. It is now laid down in national law, in Section 16 EEWärmeG, that if there is a *Länder* law stipulation empowering local governments to decree mandatory connection to and use of a public district heating network, then they may now additionally make use of those powers to further climate change policy objectives.

55 See Kahl (2010a:400ff.); Kahl (2010b).

56 HmbKlimSchG read in conjunction with HmbKliSchVO of 11 December 2007, HmbGVBl 2008, 1; noted as early as 2008 in SRU (2008a:para. 139); Braun (2008).

57 Koch & Hendler (2009:§ 14 para. 39 (with further references); BVerwGE 118, 33, 41; BVerwGE 125, 68, 73; BGHZ 151, 274, 285.

58 See in particular Section 11 (1) 4 BauGB.

59 Emphatically concurring on this point, SRU (2008a:163 para 143 ff.).

that existing instruments will not suffice to meet these targets. At the same time, the government emphasises that experience shows there to be "limits to the economic strain that owners can be expected to bear". It therefore concludes that a new strategic approach is needed with the focus on incentives.[60]

III. Efficiency Requirements for Energy-related Appliances and Equipment

Mainstream environment policy was developed as an accompaniment to advancing industrialisation and, as a body of law regulating industrial facilities, aimed to protect human health and the environment from air pollution, noise, water pollution, etc. With the spread of mass-produced goods from industrial manufacture, the environmental impacts of the products themselves increasingly became a focus of environment policy attention. In time, noise and air pollution, particularly from construction machinery, motor vehicles, aircraft, rolling stock, etc., were recognised as major hazards and became regulated. Product-related environment policies of this kind gained increasingly clear recognition as a separate environment policy responsibility and have been put forward by the European Commission as part of what is referred to as integrated product policy.[61] Integrated product policy aims to take into consideration and adequately regulate the environmental impacts of products over their entire life cycle, from the mining of raw materials to production, distribution, use and waste management.[62]

A central instrument of integrated product policy is the Ecodesign Directive of 2005,[63] which underwent substantial additions in 2009.[64] The

60 BMWi & BMU (2010:22ff.).
61 EU Commission (2001), EU Commission (2003).
62 For further detail see EU Commission (2001:5).
63 Directive 2005/32/EC of the European Parliament and of the Council of 6 July 2005 establishing a framework for the setting of ecodesign requirements for energy-using products and amending Council Directive 92/42/EEC and Directives 96/57/EC and 2000/55/EC of the European Parliament and of the Council, OJ L 121, 22 July 2005, 29.
64 Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products, OJ L 285, 31 October 2009, 10; for a detailed treatment of the onward development of the Ecodesign Directive see Schomerus & Spengler (2010); Lustermann (2007).

Ecodesign Directive provides the powers and legal framework for the Commission implementing regulations laying down environmental requirements for "energy-using products". An energy-using product is one which "once placed on the market and/or put into service, is dependent on energy input … to work as intended" (see Article 2 indent 1 of the Ecodesign Directive). The 2009 recast extends the scope of the Directive to all "energy-related products". These are defined in Article 2 indent 1 of the Directive as any good that "has an impact on energy consumption during use". This broad definition of energy-related products – as will be discussed below – results in various difficulties of legal systematics and hence also practical difficulties.

The focus on energy-related projects in the Ecodesign Directive stems from the EU's ambitious climate change policy, whose demanding targets require exploitation of all significant potential for energy efficiency gains. The potential energy savings through efficiency improvements on energy-related products – excluding means of transport for persons or goods (see Article 1 (3) of the Directive) – are estimated at 190 TWh per year.[65] The Ecodesign Directive also creates powers to lay down comprehensive environmental impact requirements for products (see Article 15 (2) c). For the time being, however, the priority is laid on energy efficiency for climate change policy purposes.[66]

To date, the Commission has enacted implementing measures in regulations on the following product groups: set-top boxes,[67] non-directional household lamps,[68] fluorescent lamps and high-intensity discharge lamps,[69] external power supplies,[70] electric motors,[71] glandless circula-

65 Commission press release of 22 July 2009, IP/09/1179.
66 See recital 14 of the Ecodesign Directive.
67 Commission Regulation (EC) No 107/2009 of 4 February 2009, OJ L 36, 5 February 2009, 8.
68 Commission Regulation (EC) No 244/2009 of 18 March 2009, OJ L 36, 24 March 2009, 3; amended by Commission Regulation (EC) No 859/2009 of 18 September 2009, OJ L 247, 19 September 2009, 3.
69 Commission Regulation (EC) No 245/2009 of 18 March 2009, OJ L 76, 24 March 2009, 17.
70 Commission Regulation (EC) No 278/2009 of 6 April 2009, OJ L 93, 7 April 2009, 3.
71 Commission Regulation (EC) No 640/2009 of 22 July 2009, OJ L 191, 23 July 2009, 26.

tors,[72] televisions,[73] and household refrigerating appliances.[74] To these is added the previously issued, non-product-specific Standby Regulation governing the electric power consumption of household and office equipment.[75] The Standby Regulation alone enjoys considerable practical importance by virtue of the fact that the power consumption of devices on standby is estimated at some 3.5% of total consumption in the EU. A major stir was caused by the Household Lamps Regulation, which imposed a de facto ban on incandescent light bulbs, as it is impossible for these to meet the efficiency requirements laid down for them.[76] According to the Commission's working plan, implementing regulations are soon to be expected for washing machines, dishwashers and fans.[77]

Germany has transposed the Ecodesign Directive into German law in the Energy Using Products Act (EBPG);[78] transposition of the recast Ecodesign Directive was required by 20 November 2010 (Article 23 (1) of the Ecodesign Directive, first sentence). Like the Ecodesign Directive, the EBPG does not lay down binding ecodesign requirements. In this regard, Section 2 (3) 1 of the EBPG explicitly refers to the implementing measures already enacted or still to be enacted by the Commission as European Community law of direct effect. Under Section 3 of the EBPG, the German government additionally has powers to enact secondary legislation, allowing detailed rules to be laid down promoting the implementation of the EU Commission's implementing measures. The German government has evidently so far had no occasion to issue rules of this kind supplementing the implementing measures enacted by the Commission.

The main legislative substance of the EBPG consists of provisions to ensure that the ecodesign requirements laid down by the Commission are ac-

72 Commission Regulation (EC) No 641/2009 of 22 July 2009, OJ L 191, 23 July 2009, 35.
73 Commission Regulation (EC) No 642/2009 of 22 July 2009, OJ L 191, 23 July 2009, 42.
74 Commission Regulation (EC) No 643/2009 of 22 July 2009, OJ L 191, 23 July 2009, 53.
75 Commission Regulation (EC) No 1278/2008 of 18 December 2008, OJ L 339, 18 December 2008, 45.
76 See Wegener (2009); Brenncke (2009).
77 See EU Commission (2008a).
78 Gesetz über die umweltgerechte Gestaltung energiebetriebener Produkte [Act on the Ecodesign of Energy-Using Products] of 27 February 2008, BGBl I 2008, 258; on this see Nusser (2010).

tually complied with in Germany. Under Section 4 EBPG, an affected product may only be placed on the market if –

- it meets the requirements in the implementing legislation
- it is labelled with a CE mark in accordance with Section 6 EBPG, and
- a declaration of conformity has been issued for the product in which the manufacturer warrants that all requirements of the applicable implementing legislation are complied with.

Also of considerable importance are the market surveillance measures provided for under Section 7 EBPG to ensure compliance by producers and vendors. Section 7 (1) EBPG requires the competent authorities to compile a surveillance plan. Section 7 (3) to (5) provides for a wide range of surveillance measures, including sample taking, (temporary) prohibition from placing a product on the market, and product recall or withdrawal orders.

The broader scope of the recast Ecodesign Directive raises difficult issues of where to draw the line. As the Directive now applies not only to "energy using products" but to "any good that has an impact on energy consumption during use", it will probably become necessary to define the boundary with other regulatory regimes. Recital 4 of the Directive, for example, also applies to products used in construction such as windows and insulation materials, and shower heads and taps. Construction materials – as discussed at length above – are already subject to energy-related requirements under the regime established by the EU Energy Performance of Buildings Directive and the EnEV. Additionally, considering that Article 21 requires the Commission to assess the appropriateness of extending the scope of the Directive to non-energy-related products, the Ecodesign Directive could – as *S*chomerus put it – develop to become an "environment super-directive". But that is going beyond the subject of climate change policy.

IV. Promotion of Energy Efficiency in Industrial Facilities, Aviation and Shipping through Emissions Trading

Transposition of the Intergovernmental Panel on Climate Change Directive into German law made energy efficiency a basic requirement for installations subject to licensing under the Federal Immission Control Act (BImSchG). Section 5 (1) 4 of the earlier BImSchG was prevented from gaining

widespread application,[79] however, notably owing to a lack of supporting detail rules at a subordinate legislative level. With the introduction of emissions trading, the energy efficiency requirement in the first sentence of Section 5 (1) 4 BImSchG was overruled in that "the objective of compliance with the obligation to ensure efficient energy use must not lead to requirements related to carbon dioxide emissions based on combustion or other processes in the installation that go beyond the requirements laid down in the Greenhouse Gas Emissions Trading Act" (Section 5 (1) BImSchG, fourth sentence).[80] The decisive factor for energy efficiency improvements under law relating to industrial facilities is thus the greenhouse gas mitigating efficiency of emissions trading as the "central instrument" of European climate change policy.

The emissions trading system enshrined in international law in the Kyoto Protocol has been one of the most important policy instruments in the EU for the reduction of CO_2 emissions and for the combating of climate change since the enactment of the Emissions Trading Directive of 13 October 2003.[81] It is a key part of the European climate change policy package of 2008[82] and of the German government's Integrated Energy and Climate Programme (IEKP) of 2007.[83] Emissions trading was introduced into national law mainly through the Greenhouse Gas Emissions Trading Act (TEHG) of 8 July 2004,[84] the 2007 Allocation Act (Zuteilungsgesetz) of 26 August 2004[85] and the national Allocation Plan I of 31 March 2004.[86]

A first trial trading phase from 2005 to 2007 was negotiated with bureaucratic efforts but achieved little or nothing in terms of climate change mitigation. This was due to an over-elaborate allocation plan that was not only influenced both by German government industrial policy objectives and by

79 See Koch (1998); Rebentisch (2001:430ff.).
80 The aim being allow extensive scope for emissions trading for reasons of cost-efficiency: see e.g. Rehbinder & Schmalholz (2002); for a critical view: Koch & Wieneke (2001).
81 Directive 2003/87/EC of 13 October 2003, OJ L 275, 25 October 2003, 32; amended by Directive 2008/101/EC of 19 November 2008, OJ L 8, 13 January 2009, 3 and Directive 2009/29/EC of 23 April 2009, OJ L 140, 05 June 2009, 63.
82 EU Commission (2008b).
83 BMU (2007a.).
84 BGBl I 2004, 1578, last amended on 16 July 2009, BGBl I 2009, 1954.
85 BGBl I 2004, 2211; last amended on 22 December 2004, BGBl I 2004, 3704.
86 BMU (2004).

industry (and notably coal industry) lobbying,[87] but also led to companies being allocated too many emission allowances.[88] Neither any impact on emission reductions nor an efficient reduction trajectory could be expected to be attained in this way. That individual studies should nonetheless have arrived at analysis models giving a positive assessment of the first trading phase is hard to comprehend.[89]

In the meantime, on the basis of the Allocation Act 2012 of 7 August 2007[90] and National Allocation Plan II of 28 June 2007,[91] emissions trading has entered the Kyoto Phase (2008 to 2012). The allocation plan has been simplified with regard to allocation criteria, giving the efficiency of emissions trading a greater chance of coming into its own.[92] Over-allocation of emission allowances seems to have been avoided this time under pressure from the European Commission.[93]

The European Commission rightly identified weaknesses in emissions trading in the form in which it was initially institutionalised, and responded to the criticism. Following thorough consultation,[94] Directive 2009/29/EC[95] brought substantial adjustments to the emissions trading scheme that support expectations that emissions trading will be made more effective in future.

Three points should be noted in this revision of the Emissions Trading Directive:[96]

- Firstly, the preamble sets down the EU's climate policy objectives in the form of the 2°C target and a voluntary commitment by the EU to reduce emissions by 20% and under certain circumstances by 30% by 2010.[97]

87 (ibid.:123:ff.).
88 For a detailed treatment of the critique see SRU (2006:11); SRU (2008a:para. 164).
89 Concerning these studies see DEHSt (2009:129ff.).
90 BGBl I 2007, 1788.
91 BMU (2006).
92 SRU (2008a:para 173ff.).
93 See EU Commission (2006b); on this see SRU (2008a:173f.).
94 EU Commission (2006c), and even earlier EU Commission (2005a).
95 Directive 2009/29/EC amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community, OJ L 140, 5 June 2009, 63.
96 For further detail see SRU (2008a:para. 184ff.).
97 OJ L 140, 5 June 2009, 63.

- Secondly, allocation of allowances is essentially to be prescribed at EU level in future by setting a maximum quantity of allowances with allocation schedules for member states.[98]
- Finally, the Directive codifies in law one of the central demands made by the Sachverständigenrat für Umweltfragen (SRU): a fundamental obligation on member states to auction the available quantity of allowances instead of allocating them free of charge as in the first trading period (see Article 10). This is the only way to prevent over-allocation of allowances and to ensure an efficient emission trading system.[99] For this very reason, however, the revised Emissions Trading Directive is to be criticised for incorporating transitional arrangements in Articles 10a, 10b and 10c that mean full auctioning is not required until 2027, and even then with exemptions allowed for certain industries that are subject to international competition.

The emissions trading system was substantially extended by an amending directive, 2008/101/EC.[100] Under this directive, all aircraft operators whose aircraft take off or land in EU member states are generally included in the emissions trading system (Article 3a read in conjunction with Annex I (b)).[101] From 1 January 2010, operators must report CO_2 emissions from their flights (Article 14 (3)). From 2012, allowances must be surrendered for flight emissions (Article 3c (1)). The legal foundation for data collection in Germany has the power to issue secondary legislation in Section 27 of the Greenhouse Gas Emissions Trading Act (TEHG) – inserted by the First Act

98 See Article 9; Erling & Waggershauser (2008:176); Wegener (2009:285); Peine (2008:106).

99 See also SRU (2006:para. 36); SRU (2008a:para. 190).

100 OJ L 8, 13.1.2009, p. 3; the directive was transposed into German law with regard to the data collection required from 2010 in the Erstes Gesetz zur Änderung des Treibhausgas-Emissionshandelsgesetz [First Act Amending the Greenhouse Gas Emissions Trading Act] of 16 July 2009, BGBl I 2009, 1954, and the Datenerhebungsverordnung 2020 [Data Collection Ordinance 2020] of 22 July 2009, BGBl I 2009, 2118.

101 A list of 'administering member states' was established in Regulation (EC) No 748/2009 of 5 August 2009, OJ L 219, 22 August 2009, 1. This assigns aircraft operators to the EU member states responsible for them; Annex I (c) excludes from the emissions trading system, inter alia, flights transporting heads of state and government on official mission, military flights, rescue flights, humanitarian flights, scientific research flights, round flights, flights by aircraft with a maximum take-off mass of less than 5,700 kg, and flights by a commercial air transport operator with total annual emissions lower than 10,000 tonnes per year.

Amending the TEHG (1. TEHGÄndG) of 16 July 2009[102] – and, issued under that power, the Data Collection Ordinance 2020 (DEV 2010) of 22 July 2009.[103] The ruling is that 15% of allowances must be auctioned. This percentage can be increased from 1 January 2013 as part of the general review of the Directive (Article 3d (1) and (2)).

The extension of the emissions trading system to aviation – a change not yet incorporated in the Kyoto Protocol – is to be welcomed. While aviation only causes about 3% of global greenhouse gas emissions,[104] the rapid growth in air traffic[105] and the greater climate impact of greenhouse gas emissions at flight altitudes[106] make aviation one of the sectors where climate change policy must apply. The inclusion of aviation in emissions trading is criticised from various quarters. The SRU is in favour of including aviation in emissions trading in principle, but considers the setting of the emissions budget on the basis of average aviation emissions in the period 2004 to 2006 to be too undemanding (see Article 3 c (1) read in conjunction with Article 1 (1) s).[107] Other parties, with regard to Europe going its own way, fear competitive disadvantages for European, including German, aviation and raise doubts about the regime's compatibility with international aviation law.[108]

The European Union has now put the inclusion of shipping in emission trading on the agenda. Global CO_2 emissions from shipping are considerable:[109] European maritime trade accounts for about 32% of global greenhouse gas emissions from maritime transport.[110] The International Maritime Organization has come out against including shipping in the emissions trading system, however, and instead proposes the setting of technical standards

102 BGBl I 2009, 1954.
103 BGBl I 2009, 2118.
104 EU Commission (2005:2).
105 On developments in Germany see Koch (2010:277f. with further references); see also SRU (2008a:para. 195); with a view to the increase in greenhouse gas emissions from aviation, the EU Commission notes: "If the growth continues as up to now, emissions from international flights from EU airports will by 2012 have increased by 150 % since 1990." EU Commission (2005:2).
106 IPCC (1999).
107 SRU (2008a:para. 197).
108 Pegatzky & Nixdorf (2009:1399); Erling (2009:349 ff.).
109 European Economic and Social Committee (2009:22, section 5.2); EU Commission (2009c).
110 UBA (2010:2).

on CO_2 reduction to secure faster adoption of new low-emissions and more energy-efficient technologies.[111] Because consensus was not reached by 31 December 2011, the Commission plans to propose a corresponding revision of the Emissions Trading Directive.[112]

How the EU emissions trading regime will develop is also very much of an open question, given the lack of progress in international negotiations on a continuation of the Kyoto Protocol or a new global climate regime post-2012. The Copenhagen Conference in December 2009 regrettably delivered no more than a half-hearted, non-binding acknowledgement of the 2°C target.[113] At least the 2°C target was bindingly adopted at the Cancún Conference.

V. Increasing Energy Efficiency in Motor Vehicles

The German motor vehicle fleet accounts for about 12% of national CO_2 emissions.[114] Technically there are numerous options for reducing vehicle greenhouse gas emissions. These include different forms of motive power[115] (hybrid vehicles, electric vehicles and biofuel admixtures) and also efficiency improvements to conventional power trains. As CO_2 emissions correlate one-to-one with fossil fuel consumption, efficiency requirements can be laid down in law with the aid of CO_2 emission limits. The regulatory toolbox includes command-and-control instruments such as CO_2 emission limits with fines if exceeded, duties, and inclusion of road transport in emissions trading.[116]

The European Commission's initial goal was a significant reduction in CO_2 emissions from road transport by way of a voluntary commitment by the European automotive industry, consisting of a reduction in average fuel consumption in the new car fleet to 140 g CO_2/km by 2008; this target was not attained.[117] 'Soft' regulation and support for voluntary action not backed

111 See IMO, Prevention of air pollution from ships, second IMO GHG study 2009, MEPC/59/4/7 Annex, p. 6, available at http://www.imo.org/includes/blastDataOnly.asp/data_id%3D26046/4-7.pdf, last accessed 2 October 2012.
112 European Economic and Social Committee (2009).
113 Copenhagen Accord of 18 December 2009, FCCC/CP/2009/L.7, 1.
114 BMU (2009b).
115 For a comprehensive discussion see SRU (2005:para. 301ff.).
116 See the brief overview in SRU (2008a:para. 155ff.).
117 SRU (2008a:para. 152).

by sanctions thus failed. Based on the Commission proposal of 19 December 2007,[118] Regulation (EC) No 443/2009 of 27 April 2009[119] laid down binding requirements for annual reductions in CO_2 emissions from the new vehicle fleet with noncompliance sanctioned with fines (Article 9). The European Commission aims to attain a reduction in average CO_2 emissions to 95 g/kg by 2020.[120] To attain this target of the European Community, Article 4 of the Regulation provides for phased, obligatory CO_2 reductions, by means of improvements in engine technology, to 130 g/km for the entire new car fleet by 2015. This is to be achieved in stages by requiring the 130 g/km target to be met by 65% of each manufacturer's new passenger cars registered in 2012, 75% in 2013 and 80% in 2014 (see Table 1 below). A further reduction of 10 g CO_2/km or equivalent is to be achieved by technical improvements and increased use of biofuels.[121]

Table 1: Average CO_2 Emissions of the German New Car Fleet (g/km)

	1995	2006	2008	EU targets			
				2012	2013	2015	2020
Diesel	194	173	166	65% 130	75% 130	100% 120 or 130	100% 95
Petrol		172	164				

Source: SRU (2008b:para. 152); EU Commission (2007a).

From a model-based impact assessment, it is assumed that the stipulated fleet emission limits will attain a reduction in CO_2 emissions, relative to the trend with no action taken, of 17.9% by 2020 and 38% by 2030. In absolute figures this is equivalent to 32 million t by 2030.[122]

The SRU has already shown in a 2005 special report that greater efficiency improvements are indeed possible.[123] This would require a trend reversal in car manufacturing, however, because past efficiency gains have been partly wiped out by a continuous increase in vehicle weight, engine power and

118 EU Commission (2007a).
119 OJ L 140, 5.6.2009, p. 1.
120 EU Commission (2007b:3).
121 (ibid.).
122 See BMU (2009b).
123 See SRU (2005:para. 301ff.).

engine capacity.[124] Road transport is a policy area where the limits of the efficiency paradigm are particularly in evidence. Efficient use of energy will have to be supplemented by energy saving. What effect is to be had from the use of other power trains and particularly from the (limited) use of biofuels is something that – for cars as for other energy-using products – will have to be determined in a life-cycle analysis and by taking primary energy requirements into account.

The European Commission has meanwhile presented proposals for fleet emission limits in respect of light commercial vehicles.[125] The phased approach is shown in Table 2 below.

Table 2: CO_2 Emission Limits for Light Commercial Vehicles < 3.5 t

2020 target	135 g CO_2/km
2014 to 2016	Phased reduction to 175 g CO_2/km
2014	Target applies for 75% of vehicles
2015	Target applies for 80% of vehicles
Beginning in 2016	175 g CO_2/km limit applies for all vehicles

Consensus has not yet been reached.[126] Germany and France have rejected the proposals.

Alongside the central, command-and-control instrument of fleet CO_2 emission limits, there are a number of further policy instruments for the improvement of efficiency in motor vehicles. Ancillary incentives for buyers are the aim of Germany's revised Energy Consumption Labelling Ordinance (Pkw-En-VKV) of 2009.[127] A 2009 road tax reform[128] makes CO_2 emissions

124 See SRU (2008a:para. 153).

125 EU Commission (2009d).

126 Council Conclusions on clean and energy-efficient vehicles for a competitive automotive industry and decarbonised road transport as adopted by the Competitiveness Council on 25 May 2010, 10151/10.

127 Verordnung über Verbraucherinformationen zu Kraftstoffverbrauch und CO_2-Emissionen neuer Personenkraftwagen [Ordinance on Consumer Information Regarding Fuel Consumption and CO_2 Emissions of New Passenger Vehicles] (Pkw-Energieverbrauchskennzeichnungsverordnung – Pkw-EnVKV) of 28 May 2004, BGBl I 2004, 1037, last amended by Article 400 of the Ordinance of 31 October 2006, BGBl I 2006, 2307.

128 Kraftfahrzeugsteuergesetz [Road Tax Act] of 26 September 2002, BGBl I 2002, 3818; last amended on 27 May 2010.

a determinant of the amount of road tax payable for new vehicles, with €2 added for each g CO_2/km in excess of 120 g/km, plus €2 for each 100 cc engine size or part thereof. This first phase of what is referred to as a CO_2-based road tax will scarcely have an impact on purchase decisions.[129]

VI. The Energy Services Directive and the Energy Services Act

With the Energy Services Directive of 2006,[130] the EU selected a cross-sectoral approach with the objective of creating a market for energy services of such a kind that competition would emerge for the best services for the improvement of end-use energy efficiency. As an interim objective of these efforts, Article 4 of the Energy Services Directive sets member states an overall national indicative energy savings target of 9% by 2016 to be reached by way of energy services and other energy efficiency improvement measures. Under Article 14 (2) of the Directive, member states must submit national energy efficiency action plans by 30 June 2007, 2011 and 2014, describing the energy efficiency improvement measures planned to reach the interim targets and the final target. The directive demands not only energy efficiency improvements, but an absolute energy saving as a result.

Annex 3 of the Directive contains an indicative list of energy efficiency improvement measures relating, among other things, to heating, building insulation and the use of CHP plants. This presents a problem of legal systematics, and hence a practical problem of this cross-sectoral directive in the form of a potential collision with the sector-specific energy efficiency requirements discussed earlier. With a view to the intensive development of sectoral energy efficiency requirements in secondary legislation, the Directive should be supplemented with clarifying provisions.

The regulatory programme under the Energy Services Directive must also be distinguished from the energy-efficiency-related provisions in the internal market in energy legislation. Self-evidently, environment protection, being a cross-sectoral policy area (see also Article 11 TFEU), creates a need for added stipulations alongside and in some cases within energy law. More and more environment-related provisions have thus found their way into the

129 For numerous details, see Gawel (2010).

130 Directive 2006/32/EC on energy end-use efficiency and energy services, OJ L 114, 27 April 200, 64; for further detail see SRU (2008a:para. 123 ff.); further Keyhanian (2008:143ff.).

internal market in energy legislation. More still were added in the third internal market package.[131] The original Internal Market in Electricity Directive already contained provisions requiring efficiency improvements and its successor added to them. The requirements mainly relate to energy efficiency in generation and conversion and to energy transmission, whereas the Energy Services Directive targets end-use energy efficiency and related energy services.

There are, however, questionable overlaps, for example regarding the energy management services that energy undertakings are expected to provide for energy users under Article 3 (11) of the Internal Market in Electricity Directive. The Energy Services Directive makes similar stipulations, but far more emphatically, for example with the indicative energy savings targets for member states, including the obligation to submit national energy efficiency action plans. In other respects, too, the energy-efficiency-related provisions in the internal market in energy legislation tend to be mostly programmatic, and most of all they are not backed up with adequate instruments – for which reason they are not discussed in greater depth here.

The Energy Services Directive was meant to be transposed into national law by 17 May 2008, and in parts earlier (see Article 18 (1)). Germany's first attempt – a proposal for an Energy Efficiency Improvement Act (EnEfG-E) of 30 January 2009 – failed at the interdepartmental consultation stage.[132] The Act on Energy Services and other Energy Efficiency Measures (EDL-G) of 4 November 2010[133] has since entered into force. This short act with 13 sections is a one-to-one transposition of the Directive. In the explanatory notes, reference is made to the many sector-specific regulatory regimes on energy efficiency and the new act is described as a "Stammgesetz", the principal act on the policy area. Notable points are the creation of a Federal Agency for Energy Efficiency at the Federal Office of Economics and Export Control (Section 9), together with an advisory council (Section 10). In many cases, details are left to be laid down in secondary legislation (Sections 4, 5, 7 and 11 EDL-G).

The Federal Ministry of Economics and Technology (BMWi) presented a National Energy Efficiency Action Plan and submitted it to the European Commission at the end of 2007.[134] This describes how the 9% indicative

131 Instructive on numerous details, Britz (2010).
132 See Kachel (2009); Pielow (2010:122).
133 BGBl I 2010, 1483.
134 BMWi (2007) for further detail see SRU (2008a:para. 127ff.).

energy savings target is to be attained by 2016. The key sectors of buildings, energy-using products and transportation covered in this section are likewise major areas of focus in the Nationaler Energieeffizienz-Aktionsplan (EEAP). Some of the action plan has already been put into effect, such as the CO_2-based road tax and the tightening of requirements in the EnEV. In its assessment, the Commission was critical of some parts of the plan.[135]

VII. Interim Assessment of Energy Efficiency Law

As a positive overall outcome, a remarkably complex body of energy efficiency law relating to climate change has been developed at the level of the European Community with national additions on transposition into national law. The degree of complexity is generally appropriate, given the challenges to be dealt with. Under the climate change objectives pursued by the Community and by Germany, it is to be welcomed that a body of energy efficiency law has been created for all key sectors where it is possible and imperative to reap energy efficiency gains – buildings, appliances and equipment, industry, and transportation – with constructive regulatory strategies, innovative regulatory structures and, in many cases, demanding requirements. One striking aspect is the renaissance of command-and-control regulation. This applies to the buildings sector, product-related law and now motor vehicles. Whether it is still possible to speak of emissions trading as the "central instrument" of climate change policy appears highly questionable.

This brings us to the conspicuous shortcomings of energy efficiency law as a means of addressing climate change. The revised EU Emissions Trading Directive raises hopes for improvement, however. The effectiveness of emissions trading has yet to be tested in the aviation sector; it is even more of an unknown with regard to the shipping sector, where it may never be adopted for shipping at all.

In the particularly important building sector, certainly too little has been done with regard to existing buildings. The German government's latest Energy Concept is disappointing on precisely this issue. The much-vaunted constitutional limit to the burden that can reasonably be placed on building owners has not yet been reached by far and does not stand in the way of

135 EU Commission (2008c); for another critical appraisal see SRU (2008a:para. 127ff.).

scaling back grandfathering arrangements in the way that would be desirable on climate policy grounds. The command-and-control rules on vehicle CO_2 emissions are too complicated for it to be possible to predict their effectiveness.

As a rule, when evaluating any climate efficiency strategy, consideration must be given to the fact that such strategies are countered by growing energy demand. Thus, alongside the efficiency 'revolution', efforts must also be made to achieve energy savings. The energy savings target in the Energy Services Directive must consequently be developed further and be backed up with suitably sophisticated policy instruments at national level. For road transport, for example, a simple CO_2 reduction strategy based on command-and-control requirements on vehicle emissions is not enough. What is needed instead is an integrated regulatory strategy that operates at source – in planning and traffic management – under the banner of "more mobility with less traffic"[136] Consideration must also be given to the second central precondition for successful climate change policy – that of substituting fossil fuels with renewable energy. This is discussed in the following section.

D. Legal Framework for the Promotion of Renewable Energy

Substitution of carbon-based fossil fuels coal, mineral oil and gas through the use of renewable energy is of fundamental importance in climate change mitigation.[137] Renewable energy sources include wind, hydropower, solar power, biomass, tidal energy and geothermal energy. These primary energy sources have the basic advantage that no CO_2 emissions occur in their use, or, in the case of biomass, that its use is at least carbon neutral. Renewable energy resources are also seen as infinite This must, however, be seen from different perspectives. In particular, it must be remembered that the production of biomass often conflicts with other uses of agricultural land and that,

136 See SRU (2005:para. 134ff.); see also Groß (2010).

137 For a recent discussion see BMU (2009a); Bundesregierung (2009b); see the economic critique by Wackerbauer (2009:176), according to which the EEG only has a "very limited environment policy function" following the introduction of emissions trading. The National Action Plan on Renewable Energy is unable to dispel this criticism.

in the interest of preserving nature and the landscape, its production must take account of nature conservation provisions.[138]

I. The Renewable Energy Sources Act

Germany has long played a pioneering role in the promotion of renewable energy, particularly wind energy. With the Electricity Feed-In Act (Stromeinspeisungsgesetz) of 7 December 1990 (see II above), Germany adopted a successful promotion strategy, which received a positive evaluation from the EU Commission,[139] was confirmed by the Federal Court of Justice[140] and the EU Court of Justice[141] as being compliant with the German constitution and EU law, and has been emulated by many EU member states. The Electricity Feed-In Act has since undergone a number of major revisions. The resulting body of law in force today is contained in the Renewable Energy Sources Act (EEG) of 25 October 2008.[142] Under Section 1 (2), the aim of the new Act is to generate 30% of electricity supply from renewable energy resources by 2020.

The instrumental core of the former Electricity Feed-in Act has been retained: grid operators must feed renewables-generated electricity on a priority basis into the grid and charge a state-specified price for it. The initial, fundamental debate whether the requirement for grid operators to pay for renewables-generated electricity represented an unlawful levy under constitutional fiscal rules and/or unlawful state aid under Community law is largely over.[143] In particular, it has been clarified in European law that the

138 Emphatically on this point SRU (2007:para. 69ff.).

139 See Directive 2009/28/EC of the European Parliament and the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, OJ L 140/16 (particularly Article 16); EU Commission (2005b:4).

140 BGH, NVwZ 2003, 1143, decision of 11 June 2003.

141 EU Court of Justice, decision of 13 March 2001 – C 379/98, 2001, I – 2099.

142 Renewable Energy Sources Act (EEG) of 25 October 2008, BGBl I 2008, 2074; last amended on 11 August 2010, BGBl I 2010, 1170; see also the instructive work by Oschmann (2009); and Weißenborn (2009).

143 On these controversies, see Koch & Schütte (1998).

definition of state aid is only satisfied if there is direct funding from state resources,[144] which is not the case with a feed-in tariff.

In the Renewable Energy Directive of 23 April 2009,[145] the Community now has an elaborate legal framework for the promotion of renewable energy sources.[146] Unlike its 2001 predecessor, the new Renewable Energy Directive covers all major uses of renewable energy; alongside electricity generation, it thus also includes heating, refrigeration and – following on from the former Biofuels Directive – the production of fuels from renewable energy sources. As a target, Article 3 (1) of the Renewable Energy Directive lays down that renewable energy sources are to account for at least a 20% share of the Community's gross final energy consumption by 2020. The individual member states are each assigned national targets, the target for Germany being 18%. The German government's current Reference Scenario 2009 projects that renewables will account for 20% of final energy consumption by 2020.[147] In the transportation sector, Article 3 (4) of the Renewable Energy Directive requires all member states to attain a 10% renewables share by 2020. Apart from this, member states are left to decide the contribution to be made by each sector towards the overall target.

Member states are thus essentially left to decide by which means they will attain the target. They are able to apply a broad range of "support schemes" (Article 3 (3) of the Renewable Energy Directive). Under the legal definition in Article 2 (k) of the Directive, these include investment aid, tax exemptions, feed-in tariffs, premium payments and green certificates. The Community thus does not make a choice between the two competing systems with regard to electricity generation – the quota approach and the German feed-in approach.[148] Under the quota approach, the state specifies what percentage of electricity consumption, as measured at the supplier or the end consumer, must come from renewables. The feed-in approach combines a

144 EU Court of Justice, decision of 13 March 2001 – C 379/98, 2001, I – 2099; the dispute regarding compatibility with free movement of goods under the TFEU has flared up again, however, see Cremer, (2009:130ff. with further references).

145 Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources, OJ L 140, 5 June 2009, 16.

146 For further detail see Müller (2009); Lehnert & Vollprecht (2009); instructively on the genesis of the Directive: Cremer (2009) and Prall & Ewer (2013:§ 9 para. 30ff.); Ringel & Bitsch (2009).

147 See BMU (2009: Zusammenfassung, para. 4).

148 See the instructive presentation in Lauber & Schenner (2009).

requirement for grid operators to accept renewables-generated electricity with the obligation to pay a state-specified tariff. Both modelling-based analyses and practice-based efficiency analyses show advantages in favour of the feed-in approach.[149]

Regardless of what promotional instrument they use, member states must ensure that grid operators provide priority access for renewables-generated electricity (Article 16 (2) (a) and (b) of the Renewable Energy Directive). Ensuring this in practice requires corresponding grid capacity. It is thus only consistent that Article 16 (1) of the Directive establishes an obligation to develop adequate infrastructure. Finally, under Article 4 (1) of the Directive, member states each had to submit to the Commission a national renewable energy action plan by no later than 30 June 2009. These had to set out overall national targets for the share of energy from renewable sources consumed in transport, electricity and heating and cooling, together with adequate measures to be taken to achieve those targets.[150]

The requirements of the Renewable Energy Directive concerning heating and the sustainable production of biofuels are discussed in the next two sections (2 and 3).

The revised EEG already corresponds in substantial parts with the requirements of the Renewable Energy Directive; indeed, when it comes to stipulating the feed-in approach, it now has greater endorsement in European law than before. The following may be regarded as the most important onward developments in national law:[151]

1. The connection of renewable energy facilities required to purchase, transmit and distribute the electricity must occur "immediately" and "as a priority" (Section 5 (1) and the first sentence of Section 8 (1) EEG).
2. If grid capacity is inadequate despite consistent priority access for green power, the grid system operator has "upon the request of those interested in feeding in electricity" to improve, boost and if necessary expand their grid infrastructure to guarantee the purchase, transmission and distribution of the electricity (Section 9 (1) EEG). For the transitional period until supply shortages have been remedied, detailed "feed-in management" arrangements must be met (Sections 11 and 12 EEG).

149 EU Commission (2005b).
150 See German Government (2009b).
151 For details see Oschmann (2009:264ff.); and Weißenborn (2009); further Prall & Ewer (2013:para. 104ff.).

3. With regard to who pays the feed-in tariff, the mechanisms of vertical and horizontal compensation between grid system operators and electricity supply companies have been enhanced into a finely balanced system that levels out regional differences in the feed-in tariff burden faced by grid operators across the country. Important detail is added in the Equalisation Scheme Ordinance (AusglMechV).
4. The ever-controversial provisions on tariff levels have likewise been revised in favour of wind energy and biomass, although there are various problems with the latter. Separately from this, the feed-in tariff for solar power has recently been reduced owing to "over-subsidisation".[152]
5. Where electricity is generated from biomass, a premium for biomass within the meaning of Section 27 and Annex 2 EEG is paid, provided that sustainability requirements laid down in the Biomass Electricity Sustainability Ordinance are met.[153]

Transposition of the Renewable Energy Directive into national law is not fully complete, however.[154] Specifically, this applies to the following elements of the Directive:

- Article 16 (5) of the Renewable Energy Directive creates a detailed obligation requiring grid operators to provide information for new producers of energy from renewable sources. The less precise Section 5 (1) EEG could well benefit from clarification.
- With regard to the guarantees of origin under Section 55 EEG, the mechanisms to ensure that guarantees of origin are issued electronically (Article 15 (5) of the Renewable Energy Directive) need to be established and included.

The German government has now adopted an act amending German renewable energy legislation in line with European law. This includes:

- amendments to the EEG relating to the requirement of grid operators to provide information as just mentioned, guarantees of origin, and the powers of enactment with regard to the Biomass Sustainability Ordinance (BioNachV), and

152 Act dated 11 August 2010, BGBl I 2010, 1170; for an instructive efficiency analysis of the various feed-in tariffs see also Schröer & Zierahn (2010).
153 On the complex details see Weißenborn (2009); further Vollprecht (2010).
154 For further detail see Ringel & Bitsch (2009).

- amendments to the EEWärmeG, notably with regard to the example-setting role of the public sector in adding thermal insulation to public buildings.[155]

II. The Renewable Energies Heat Act

In line with the Meseberg Integrated Energy and Climate Programme, new instruments were introduced under the Renewable Energies Heat Act (EEWärmG) of 7 August 2008,[156] which was designed to foster and enforce the use of renewable energy for heat supply.[157] This is of particular importance in climate policy because around half of the energy used in Germany goes to supplying heat and for refrigeration.[158] The aim is thus not only to reduce energy consumption by improving energy efficiency, with, among other things, the aid of the EnEV, but also to switch the unavoidable portion of energy consumption over to renewable energy. It is hoped that the share of renewables in heat supply will be increased from the current 6.6% to 14% in 2020 (see Section 1 (2) EEWärmeG).

The regulatory core of the Renewable Energies Heat Act (EEWärmG) comprises a statutory obligation to cover a percentage of heat demand from renewable energy sources. The percentage involved depends on the type of energy used and ranges from 15% for solar energy (Section 15 (1) EEWärmeG) to 50% for biofuels (Section 5 (3) No. 1 EEWärmeG). The obligation to meet heat demand using renewables may be replaced by other measures, however. This applies, for example, if at least 50% of heat demand is met from high-performance CHP plants (Section 7 (1) b EEWärmeG). Also, it is permissible to substitute the use of renewable energy by meeting a greater percentage than that prescribed with high energy efficiency in buildings. This means that building owners must exceed the EnEV require-

155 German Government, Gesetz zur Umsetzung der Richtlinie 2009/28/EG zur Förderung der Nutzung von Energie aus erneuerbaren Quellen, BGBl I 2011, S. 619 vom 15.04. 2011 [Draft Act Transposing Directive 2009/28/EC on the promotion of the use of energy from renewable sources] (EAG EE) of 28 September 2010.

156 BGBl I 2008, 1658; last amended on 15 July 2009, BGBl I 2009, 1804.

157 For greater detail see Wustlich (2008a and b).

158 BMU (2007a:44); Legislative justification for the EEWärmeG, BT-Drs. 16/9476 of 04 June 2008.

ments by 15%.[159] The aim of these and other provisions is to keep the financial burden arising from the various climate-change instruments at a reasonable level. There are doubts, however, regarding the conformity of these substitution rules with the Renewable Energy Directive, in which the third paragraph of Article 13 (4) stipulates that "minimum levels" of energy from renewable sources must be used in all new buildings and also in existing buildings subject to major renovation by no later than 31 December 2014.[160]

Alongside the command-and-control requirement to use renewable energy, the first sentence of Section 1 EEWärmeG provides for €500 million a year in grant funding up to 2012 primarily for modifications to existing buildings. This addresses a central point of building-related climate change regulation with regard to both energy efficiency and renewable energy sources: namely, without substantial improvements in existing buildings, the effects of legislative provisions on climate change will remain very unsatisfactory.

The statutory obligation to make use of renewable energy sources and the grant funding for modifications to existing buildings are supplemented by promotion of district heating networks under Section 16 EEWärmeG as the third pillar of the act. As mentioned earlier, this adds climate change policy to the grounds for which local governments are allowed to exercise powers under Länder law to impose an obligation to connect and utilise district heat.

III. Biofuels for Motor Vehicles

In view of the considerable contribution – approximately 12%[161] – made by road traffic to greenhouse gas emissions, the European Union and also Germany have adopted targets for the use of biofuel – which were initially highly ambitious, although they have been lowered since.[162] The Meseberg Integrated Energy and Climate Programme included a 17% target for biofuels for use in motor vehicles by 2020. The German Advisory Council on the Environment (SRU) found this target to be far too high, because no consideration had been given when setting the biofuel quota to land use conflicts

159 For greater detail see Wustlich (2008a:1044ff.).
160 For further detail see Ringel & Bitsch (2009:811).
161 See BMU (2009b).
162 For more see SRU (2007:para. 149ff.).

and adequate nature conservation standards, let alone climate efficiency.[163] Arguing from a climate change standpoint, the Council favours biomass use in stationary CHP plants.[164] It is thus to be welcomed that the European Union in Article 3 (4) of the Renewable Energy Directive[165] prescribes a renewables share of 'only' 10% for the transport sector as a whole.

The German government aims to attain the national target under the Renewable Energy Directive of an 18% renewable energy share of final energy consumption by 2020 with 30% of renewable energy in electricity generation, 14% in heating and 12% in transportation.[166] As a result of the Biofuels Quota Act of 2007 as revised in 2009,[167] the statutory provision for a biofuels quota is now to be found in Section 37a-f BImSchG. This lays down an overall biofuels quota for petrol and diesel of 6.25% for the years 2010 to 2014 (section 37a (3) of the revised BImSchG). The quota requirement applies to business enterprises that place fuels on the market. The quota can be met both by admixing biofuels and by placing pure biofuels on the market.[168]

The quota requirement introduced, in 2007 brought in a command-and-control measure that took the place of the previous tax incentives for biofuels. Doubts raised under German constitutional law and European law under the heading of the protection of legitimate expectations were dismissed by the Federal Constitutional Court[169] and the European Court of Justice[170]

Given the prevailing conflicts regarding its use – with food production in particular – and the environmental risks involved, biomass production re-

163 SRU (2007:para. 105ff., 150).
164 See also SRU (2008a:para. 146).
165 See Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, OJ L 140, 16.
166 German Government (2009b:12).
167 Biokraftstoffquotengesetz [Biofuels Quota Act] of 18 December 2006, BGBl I 2006, 3180; most recently amended by Gesetz zur Änderung der Förderung von Biokraftstoffen [Act Amending the Support for Biofuels] of 15 July 2009, BGBl I 2009, 1804; for further detail see BMU, Roadmap Biokraftstoffe – Gemeinsame Strategie vom 14 November 2007; on the legislation as initially enacted in 2006 see Jarass (2007).
168 For an instructive discussion with numerous details see Brinktrine (2010).
169 BVerfG-K NVwZ 2007, 1168.
170 EuGH Rs. C- 201/08, decision of 7 September 2009, ZUR 2009, 604; EU Court of Justice, decision of 7 September 2009 – C 201/08, 2001, I – 2099.

quires effective regulation. Hence it is to be especially welcomed that, in the Renewables Energy Directive already mentioned on several occasions, the European Union has introduced sustainability requirements for the production of biomass. Article 17 of the Renewable Energy Directive requires that:[171]

- adequate greenhouse gas emission savings be achieved for biofuels, i.e. a 35% reduction in such emissions
- land of recognised high biodiversity value, which is specified in detail, should not be used for biomass production
- biomass must not be made from crops grown on land with high carbon stocks, and
- cross-compliance requirements be observed.

Article 18 of the Renewables Directive contains monitoring provisions whose focal point comprises a compliance verification system.

The decisive provision for practical enforcement of the sustainability requirements is the first sentence of Article 17 (1) of the Renewable Energy Directive, under which biofuels can only be taken into account when measuring compliance with the national renewable energy targets if the sustainability criteria set out in Article 17 (2) to (6) of the Directive are met. These criteria are transposed into German law in more specific form in the Biofuels Sustainability Ordinance (Biokraft-NachV) of 30 September 2009.[172]

Attainment of the German national target is backed up by sanction in Section 37c (2) BImSchG, which requires business enterprises to pay a levy if they fail to meet their biofuel quota. Overall, the conclusion may be permitted that overblown expectations have given way here to a realistic assessment where, under EU influence, the sustainability requirements have been recognised for what they are capable of achieving.[173]

171 For more see Ludwig (2009); and also Nitsch & Osterburg (2007); BfN (2009).

172 Verordnung über Anforderungen an eine nachhaltige Herstellung von Biokraftstoffen (Biokraftstoff-Nachhaltigkeitsverordnung) [Ordinance on Requirements for Sustainable Production of Biofuels], BGBl I 2009, 3182; last amended on 22 June 2010, BGBl I 2010, 814; see Franken (2010).

173 Very helpful for details: Ludwig (2009).

IV. Use of Biogas

A key component in the promotion of renewable energy involves greater use of biogas. Accordingly, the German government has introduced a package of rules which simplify the procedure for feeding biogas into the gas grid. The package includes a revised Gas Network Access Ordinance (GasNZV) and the Gas Network Charges Ordinance (GasNEV).[174]

V. Interim Assessment of Renewable Energy Law

With the original Electricity Feed-in Act, Germany embarked on a path towards promoting renewable energy sources that has since become a Europe-wide success story. With the major revision of the EEG in 2009, the revision of the EEWärmeG likewise in 2009 and the Biofuels Quota Act of 30 September 2009, Germany is aiming to achieve widespread use of renewable energy sources. With the revised Renewable Energy Directive of 23 April 2009, the EU, too, has created a comprehensive legal framework to promote the use of renewable energy, with clear quantified targets for member states. Germany, for its part, is to meet 18% of gross primary energy consumption from renewable energy sources by 2020 and plans to accomplish this with a 30% renewables share in electricity generation, 14% in heating and 12% in transportation.

These are ambitious goals overall and appear to be backed up with a promising set of policy instruments. Whether the legal framework for sustainable biofuel production proves able to avoid mistakes in the long term is something that will have to be carefully watched.

The medium-term substitution strategy with 30% renewables by 2030, 45% by 2040 and 60% by 2050 also requires further assessment to determine if additional legal instruments are needed.

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174 Verordnung über den Zugang zu Gasversorgungsnetzen (Gasnetzzugangsverordnung) [Ordinance on Access to Gas Supply Grids (Gas Grid Access Ordinance) of 25 July 2005, BGBl I 2005, 2210, last amended on 17 October 2008, BGBl I 2008, 2006; Verordnung über die Entgelte für den Zugang zu Gasversorgungsnetzen (Gasnetzentgeltverordnung) [Ordinance on Fees for Access to Gas Supply Grids (Gas Grid Fee Ordinance] of 25 July 2005, BGBl I 2005, 2197, last amended by the Verordnung zum Erlass von Regelungen über Messeinrichtungen im Strom- und Gasbereich [Ordinance Regulating Access to Metering Points in the Electricity and Gas Sectors] on 17 October 2008, BGB1 I 2008, 2006.

E. Outlook

Overall, in the relatively short period of 20 years since the Rio Summit of 1992, a remarkably complex body of climate change law has been created at international level and notably also at European and EU member state level. This legal framework features a diverse range of instruments, encompassing not only the great experiment of emissions trading, but also highly controversial command-and-control regulation in certain areas of energy efficiency law and renewable energy law. Particularly noteworthy is that the regulatory regimes now generally feature explicitly formulated targets. This encourages transparent and rational debate on the necessary onward development of the legal framework.

The Federal Government of Germany decided, after the catastrophic accident in the nuclear energy plants in Fukushima (2011), to phase out the use of nuclear energy for power generation. A big package of alterations of statutes were passed by the legislative bodies (Bundestag and Bundesrat), including the phasing out of nuclear energy and the introduction of regulations to reinforce renewable energy and energy efficiency, as well as statutes providing electricity from renewable energies.[175] This agenda includes the necessity of planning and constructing about 3,000 km of high-voltage power lines.[176]

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175 Alternation of: AtG, BGBl I 2011, S. 1704; EEG, BGBl I 2011, S. 1634; EnWGÄndG, BGBl I 2011, S. 1554; new regulations: NABEG, BGBl I 2011, S. 1690; EKFG, BGBl I 2011, S. 1702; Gesetz zur Stärkung der klimagerechten Entwicklung in den Städten und Gemeinden, BGBl I 2011, S. 1509; see the instructive overviews by Sellner & Fellenberg (2011); Scholtka & Hermes (2011); Attendorn (2012); Prall & Ewer (2013).

176 Prall & Ewer (2013) Rn. 137.

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