

**Act on Granting Priority to Renewable Energy Sources
(Renewable Energy Sources Act)**

Section 1

Purpose

The purpose of this Act is to facilitate a sustainable development of energy supply in the interest of managing global warming and protecting the environment and to achieve a substantial increase in the percentage contribution made by renewable energy sources to power supply in order at least to double the share of renewable energy sources in total energy consumption by the year 2010, in keeping with the objectives defined by the European Union and by the Federal Republic of Germany.

Section 2

Scope of Application

- (1) This Act deals with the purchase of, and the compensation to be paid for, electricity generated exclusively from hydrodynamic power, wind energy, solar radiation energy, geothermal energy, gas from sanitary landfills, sewage treatment plants, mines, or biomass within the territorial scope of this Act or within Germany's exclusive economic zone, by utility companies which operate grids for public power supply (grid operators). The Federal Ministry of the Environment, Nature Conservation and Nuclear Safety shall be authorised to lay down rules— in agreement with the Federal Ministry of Food, Agriculture and Forestry as well as the Federal Ministry of Economics and Technology – by adopting an ordinance, which shall be subject to approval by the German Bundestag. Said ordinance shall specify what substances and technical processes used in connection with biomass fall within the scope of application of this Act; in addition, the ordinance shall lay down the relevant environmental standards.
- (2) This Act shall not apply to electricity
 1. produced by hydro-electric power plants and installations fuelled by gas from landfills or sewage treatment plants with an installed electrical capacity of over 5 megawatts, or by installations in which electricity is generated from biomass, with an installed electrical capacity of over 20 megawatts, and
 2. produced by installations of which over 25 per cent is owned by the Federal Republic of Germany or one of Germany's federal states, and
 3. produced by installations for the generation of electricity from solar radiation energy, with an installed electrical capacity of over five megawatts. In the case of installations for the generation of electricity from solar radiation energy which are not attached to or built on structures which are primarily used for purposes other than the generation of electricity from solar radiation energy, the upper capacity limit specified in the first sentence above shall be 100 kilowatts.
- (3) New installations shall be installations which were commissioned after [add: date of entry into force of this Act]. Reactivated or modernised installations shall be considered as new

installations if major components of the installations were replaced. Modernisation work shall be deemed to be major if the modernisation costs amount to at least 50 per cent of the investment cost required to build a completely new installation. Existing installations shall be installations which were commissioned prior to [add: date of entry into force of this Act].

Section 3

Obligation to Purchase and Pay Compensation

- (1) Grid operators shall be obliged to connect to their grids electricity generation installations as defined in Section 2 above, to purchase electricity available from these installations as a priority, and to compensate the suppliers of this electricity in accordance with the provisions in Sections 4 to 8 below. This obligation shall apply to the grid operator whose grid is closest to the location of the electricity generation installation, providing that the grid is technically suitable to feed in this electricity. A grid shall be considered to be technically suitable even if – notwithstanding the priority to be granted pursuant to the first sentence above – a grid operator needs to upgrade its grid at reasonable economic expense to feed in the electricity; in this case, the grid operator shall be obliged to upgrade its grid without delay if this is requested by a party interested in feeding in electricity. Grid data and data of the electricity generation installation shall be disclosed where this is necessary for the grid operator and the party interested in feeding in electricity to do their planning and to determine the technical suitability of a grid.
- (2) Pursuant to Sections 4 to 8 below, the upstream transmission grid operator shall be obliged to purchase, and pay compensation for, the amount of energy purchased by the grid operator in accordance with clause (1) above. If there is no domestic transmission grid in the area serviced by the grid operator entitled to sell electricity, the next closest domestic transmission grid operator shall be obliged to purchase and pay compensation for this electricity as specified in the first sentence above.

Section 4

Compensation to be Paid for Electricity Generated from Hydrodynamic Power, Gas from Landfills, Mines, and Sewage Treatment Plants

The compensation to be paid for electricity generated from hydrodynamic power and gas from landfills, mines and sewage treatment plants shall amount to at least 15 pfennigs per kilowatt-hour. In the case of electricity generation installations with an electrical capacity of over 500 kilowatts, this shall apply only to that part of the total amount of electricity fed in during a given accounting year which corresponds to the ratio of 500 kilowatts to the total capacity of the installation in kilowatts; the capacity shall be calculated as the annual average of the mean effective electrical capacity measured in the various months of the year. The price to be paid for other electricity shall be at least 13 pfennigs per kilowatt-hour.

Section 5

Compensation to be Paid for Electricity Generated from Biomass

- (1) The following compensation shall be paid for electricity generated from biomass:

1. At least 20 pfennigs per kilowatt-hour in the case of installations with an installed electrical capacity of up to 500 kilowatts.
2. At least 18 pfennigs per kilowatt-hour in the case of installations with an installed electrical capacity of up to 5 megawatts.
3. At least 17 pfennigs per kilowatt-hour in the case of installations with an installed effective electrical capacity of over 5 megawatts; however, this provision shall not be effective before the date of the entry into force of the ordinance specified in the second sentence of Section 2(1).

The first clause of the second sentence in Section 4 above shall apply mutatis mutandis.

- (2) As of 1 January 2002, the minimum compensation amounts specified in (1) above shall be reduced by one per cent annually for new installations commissioned as of this date; the amounts payable shall be rounded to one decimal.

Section 6

Compensation to be Paid for Electricity Generated from Geothermal Energy

The following compensation shall be paid for electricity generated from geothermal energy:

1. At least 17.5 pfennigs per kilowatt-hour if the installation involved has an installed electrical capacity of up to 20 megawatts, and
2. At least 14 pfennigs per kilowatt-hour if the installation involved has an installed electrical capacity of over 20 megawatts.

The first clause of the second sentence in Section 4 above shall apply mutatis mutandis.

Section 7

Compensation to be Paid for Electricity Generated from Wind Energy

- (1) The compensation to be paid for electricity generated from wind energy shall be at least 17.8 pfennigs per kilowatt-hour for a period of five years starting from the date of commissioning. Hence, the compensation to be paid for installations which, during this period of time, achieve 150 per cent of the reference yield calculated for the reference installation as described in the Annex to this Act shall be at least 12.1 pfennigs per kilowatt-hour. For other installations, the period mentioned in the first sentence above shall be prolonged by two months for every 0.75 per cent which their yield stays below 150 per cent of the reference yield. If the electricity is generated by installations which are located at least three nautical miles seawards from the baselines used to demarcate territorial waters and if these installations are commissioned no later than 31 December 2006, the periods specified in the first sentence and in the second sentence above shall be nine years.
- (2) For existing installations, the date of commissioning as defined in the first sentence of (1) above shall be [add: the date of the entry into force of this Act]. For these installations, the period defined in the first 3 sentences of (1) above shall be reduced by half of the operating life of an installation as of [add: the date of the entry into force of this Act]; in any case, however, this period shall not be less than four years starting from [add: the date of the entry into force of this Act]. If P-V curves are not available for such installations, an authorised institution as defined in the Annex may perform the necessary calculations on

the basis of the design documents of the type of installation concerned.

- (3) As of 1 January 2002, the minimum compensation amounts specified in (1) above shall be reduced by 1.5 per cent annually for new installations commissioned as of this date; the amounts payable shall be rounded to one decimal.
- (4) For the implementation of the provisions in (1) above, the Federal Ministry of Economics and Technology shall be authorised to adopt an ordinance laying down rules for the calculation of the reference yield.

Section 8

Compensation to be Paid for Electricity Generated from Solar Radiation Energy

- (1) The compensation to be paid for electricity generated from solar radiation energy shall be at least 99 pfennigs per kilowatt-hour. As of 1 January 2002, the minimum compensation paid shall be reduced by 5 per cent annually for new electricity generation installations commissioned as of this date; the amounts payable shall be rounded to one decimal.
- (2) The obligation to pay compensation as specified in (1) above shall not apply to photovoltaic installations which are commissioned after 31 December of the year following the year in which photovoltaic installations which are eligible for compensation under this Act reach a total installed capacity of 350 megawatts. Prior to the discontinuation of the obligation to pay compensation as specified in (1) above, the German Bundestag shall adopt a follow-up compensation scheme which shall enable installation operators to manage their installations cost-effectively, taking into consideration the decline of marginal unit cost achieved by then in the field of system engineering.

Section 9

Common Provisions

- (1) The minimum compensation amounts specified in Sections 4 to 8 shall be payable for newly commissioned installations for a period of 20 years after the year of commissioning, except for installations which generate electricity from hydrodynamic power. For installations which were commissioned prior to the entry into force of this Act, the year 2000 shall be considered to be the year of commissioning.
- (2) If electricity generated from various installations is billed via a common metering device, the calculation of the amounts of the different rates of compensation payable shall be based on the maximum effective capacity of each individual installation. If electricity is generated from several wind energy converters, the calculation of the compensation shall – notwithstanding the first sentence above – be based on the cumulative values of these installations.

Section 10 Grid Costs

- (1) The costs associated with connecting installations as specified in Section 2 above to the technically and economically most suitable grid connecting point shall be borne by the installation operators. The implementation of this connection must comply with the grid operator's technical requirements in a given case and with the provisions laid down in Section 16 of the *Energiewirtschaftsgesetz* (Energy Management Act) of 24 April 1998 (Federal Law Gazette I, p. 730). The installation operator shall be entitled to have the connection implemented either by the grid operator or by a qualified third party.
- (2) The costs associated with upgrading the grid exclusively in order to connect new installations in accordance with Section 2 for accepting and transmitting energy fed into the grid for public power supply shall be borne by the grid operator whose grid will have to be upgraded. The grid operator shall specify the concrete investment required by presenting the costs in detail. The grid operators shall be entitled to add the costs borne by them when determining the charges for the use of the grid.
- (3) Any disputes shall be settled by a clearing centre which shall be established within the Federal Ministry of Economics and Technology, with the involvement of the parties concerned.

Section 11 Nation-wide Equalisation Scheme

- (1) Transmission grid operators shall be obliged to record any differences in the amount of energy purchased and compensation payments made under Section 3 above and to equalise such differences amongst themselves as specified in (2) below.
- (2) By 31 March of each year, the transmission grid operators shall determine the amount of energy purchased in accordance with Section 3 above and the percentage share which this amount represents relative to the overall amount of energy delivered to final consumers either directly by the operator or indirectly via downstream grids. If transmission grid operators have purchased amounts of energy that are greater than this average share, they shall be entitled to sell energy to, and receive compensation from, the other transmission grid operators in accordance with Sections 3 to 8 above, until these other grid operators have purchased a volume of energy which is equal to the average share mentioned above.
- (3) Monthly instalments shall be paid in accordance with the equalisation amounts and payments to be expected.
- (4) Utility companies which deliver electricity to final consumers shall be obliged to purchase and pay compensation for that part of the electricity which their regular transmission grid operator purchased in accordance with the provisions of (2) above. The first sentence shall not apply to utility companies if, relative to the total amount of electricity they deliver, at least 50 per cent of the electricity delivered is electricity as defined in Section 2 (1) in conjunction with (2) above. The part of the electricity to be purchased by a utility company in accordance with the first sentence shall be related to the amount of electricity delivered by the utility company concerned and shall be determined in such a way that each utility company will receive a relatively equal share. The compulsory amount to be

purchased (part) shall be calculated as the ratio of the total amount of electricity fed into the grid under Section 3 to the total amount of electricity sold to final consumers; furthermore, it is necessary to deduct from this sum the amount of electricity delivered by utility companies in accordance with the second sentence above. The compensation as specified in the first sentence above shall be calculated as the average compensation per kilowatt-hour paid by all grid operators two quarters earlier in accordance with Section 3. Electricity purchased in accordance with the first sentence shall not be sold at the compensation paid in accordance with the fifth sentence, if that electricity is marketed as electricity pursuant to Section 2 or as comparable electricity.

- (5) Each grid operator shall be obliged to make available in good time to the other grid operators the data required to perform the calculations referred to in (1) and (2) above. Each grid operator shall be entitled to request that the other grid operators have their data audited by a chartered accountant or a sworn auditor appointed by mutual agreement. If no agreement can be reached, the chartered accountant or sworn auditor shall be appointed by the President of the Higher Regional Court which has jurisdiction at the seat of the grid operator eligible to receive equalisation payments.

Section 12 **Progress Report**

By 30 June, every two years after the entry into force of this Act, the Federal Ministry of Economics and Technology shall submit a report – drafted in consultation with the Federal Ministry of the Environment, Nature Conservation and Nuclear Safety as well as the Federal Ministry of Food, Agriculture and Forestry – on the progress achieved in terms of the market introduction and the cost development of power generation installations as specified in Section 2; and by 1 January, every two years after the year of entry into force of this Act, the Ministry shall, where necessary, propose adjustments of the compensation amounts specified in Sections 4 to 8 and of their reduction rates, in keeping with technological progress and market developments with regard to new installations; furthermore, the Ministry shall propose a prolongation of the period for calculating the yield of a wind energy converter as specified in the Annex, based on the experience made with the period defined in this Act.

Annex

1. The reference installation shall be a wind energy converter of a specific type for which a yield at the level of the reference yield can be calculated on the basis of P-V curve (power-wind speed curve) measured by an authorised institution at the reference site.
2. The reference yield shall be the amount of electricity which each specific type of wind energy converter, including the respective hub heights, would yield during five years of operation – calculated on the basis of measured P-V curves – if it were built at the reference site.
3. The type of a wind energy converter shall be defined by the model designation, the swept rotor area, the rated power output and the hub height as specified by the manufacturer.

4. The reference site shall be a site determined by means of a Rayleigh distribution with a mean annual wind speed of 5.5 metres per second at a height of 30 metres, a logarithmic wind shear profile and a roughness length of 0.1 metres.
5. The P-V curve shall be the correlation between wind speed and power output (irrespective of hub height) determined for each type of wind energy converter. P-V curves shall be determined in accordance with the standard procedure defined in the *Technische Richtlinien für Windenergieanlagen* (Technical Guidelines for Wind Energy Converters), rev. 13, as of 1 January 2000, published by *Fördergesellschaft Windenergie e.V.* (FGW), Hamburg, or in the Power Performance Measurement Procedure, version 1, published in September 1997 by the Network of European Measuring Institutes (MEASNET), Brussels/Belgium,. P-V curves which were determined by means of a comparable procedure prior to 1 January 2000 can also be used instead of P-V curves as specified in the second sentence, providing that the construction of wind energy converters of the type to which they apply is not initiated within the territorial scope of this Act after 31 December 2001.
6. Measurements of the P-V curves and calculations of the reference yields of different types of wind energy converters at reference sites shall be carried out for the purposes of this Act by institutions which are accredited for the measurement of P-V curves as defined in (5) above in accordance with the General Criteria for the Operation of Test Laboratories (DIN EN 45001) of May 1990. The names of these institutions shall be published in the Federal Official Gazette by the Federal Ministry of Economics and Technology for the information of interested parties.

Explanatory Memorandum

A. General Provisions

For the sake of protecting the environment and managing global warming as well as guaranteeing a reliable energy supply, the German Federal Government and the German Bundestag – in agreement with the European Union – have set themselves the objective of at least doubling the percentage share of renewable energy sources in total energy supply by the year 2010. This objective is related to the envisaged commitment on the part of the Federal Republic of Germany to reduce greenhouse gas emissions by 21 per cent by the year 2010 in the framework of the European Union's burden sharing as laid down in the Kyoto Protocol to the Framework Climate Convention of the United Nations; and this objective is linked to the German Federal Government's objective to reduce carbon dioxide emissions by 25 per cent by the year 2005, relative to 1990.

In order to attain this objective, it is necessary to mobilise the so-called new renewable energy sources. Traditional hydrodynamic power from large dams accounts for the overwhelming share of the renewable energy sources used today. For geographical reasons, the utilisation potential of hydrodynamic power is largely exhausted. For this reason, it is necessary additionally to generate electricity from wind energy, solar radiation energy, biomass, and hydrodynamic power of rivers in order to attain the objective set for Europe as a whole by the year 2010. To this end, the currently used potential of these energy sources will have to grow fivefold.

In order to translate this objective into reality, the European Commission has proposed a number of energy policy measures in its communication entitled "The Energy Policy Dimension of Climate Change", in which renewable energy sources play a key role. The purpose of the Act on Granting Priority to Renewable Energy Sources (Renewable Energy Sources Act) is intended to help attain these objectives and to implement the European Union's "Campaign for a Breakthrough of Renewable Energy Sources". In view of growing meteorological evidence of a warming of the Earth's atmosphere and the increase in the frequency of natural disasters world-wide, prompt action by the legislator is indispensable in the interest of protecting the environment and managing global warming.

Currently, renewables are unevenly and insufficiently used, although many renewable energy sources are available in large quantities. Despite their considerable economic potential, they account for an extremely low share of the total, statistically identified gross domestic energy consumption. If we fail to cover a much larger share of our energy requirements by means of renewable energy sources, there will be two consequences: not only will we find it more and more difficult to meet our obligations in the fields of environmental protection and global warming management, at both European and international level, but we will also miss out on major economic development opportunities. Renewables are domestic energy sources which can help to reduce our dependence on energy imports, thereby making our energy supply more reliable. Currently, the EU depends on energy imports to cover approximately 50 per cent of its energy consumption; and there is a risk that this figure will rise to 60 per cent by the year 2010 and 70 per cent by the year 2020 if we do not tap the potential of renewable energy sources.

Greater use of renewable energy sources will create jobs, especially in the sector of small and medium-sized enterprises, which play a crucial role in the economic structure of the Federal Republic of Germany. Small and medium-sized enterprises are not only an important factor in crafts and trades; they also provide an impetus for a variety of industries, including the metal industry, electrical engineering, mechanical engineering, engine and equipment engineering, as well as the building materials industry. The stimulation of the use of biomass for electricity generation associated with the adoption of this Act will also provide a major impetus for an economic recovery of the agricultural sector. Furthermore, the production and use of renewable energy sources will promote sustainable regional development, which will help to improve the social and economic cohesion within the Community and to harmonise living conditions within the Federal Republic of Germany.

In three European countries – Germany, Denmark and Spain – national legislation has been adopted to introduce minimum prices for feeding into grids electricity generated from renewable energy sources. It is owing exclusively to the national legislation of these three countries that the European Union witnessed the emergence of a wind turbine manufacturing industry which offers cutting-edge technology in the world market today. This also proved that it was wrong to assume that the introduction of minimum price systems would hamper productivity, because in all the three countries mentioned above the introduction of wind energy converters was based on minimum prices guaranteed by law. This has stimulated a market development – initially in the wind energy sector – which led to an efficient industry with considerable export opportunities, which has created jobs for over 20,000 people in Germany alone. As a result of the associated economies of scale and the global competition initiated among manufacturers of wind energy converters, production costs as well as the compensation paid in real terms have been successfully reduced by 50 per cent since 1991. Owing to technological progress, there is growing demand in the world market; in the next ten years, demand for wind energy converters alone may amount to over 100,000 megawatts. Against this background, the market introduction of renewable energy sources should not be underestimated in terms of its importance for industrial policy, not least because it can be safely assumed in view of global climate problems that there will be rapidly growing demand world-wide. It can be expected that the impact which the Renewable Energy Sources Act will have on other sectors in which renewable energy sources are used will be similar to the effects which it will have on the wind energy sector.

In the past, the *Stromeinspeisungsgesetz für Erneuerbare Energien* (Act on Feeding into the Grid Electricity Generated from Renewable Energy Sources), which entered into force on 1 January 1991, has mainly provided an impetus for the wind energy sector because the compensation rates laid down in the Act made this possible. By the end of 1999, i.e. nine years after the entry into force of the Act, as much as approximately 4,400 megawatts had been installed within the territorial scope of the Act, accounting for about one-third of the capacity installed world-wide. For hydro-electric power plants below the capacity limit of five megawatts laid down in this Act, the compensation rates specified have been more or less sufficient to permit cost-effective operation. Nevertheless, the Act has not brought about a level of utilisation of the existing potential that would be comparable to the use of wind energy because there are still many licensing obstacles that are beyond the scope of this Act; at least the Act has helped to stabilise the potential of hydro-electric power plants which was partially jeopardised before the entry into force of this Act. However, the compensation rates have not been sufficient to stimulate a large-scale market introduction of electricity generated from other sources, especially photovoltaic cells and biomass. For this reason, the compensation rates have been modified in the Renewable Energy Sources Act, which replaces

the Electricity Feed Act, in order to promote large-scale generation of electricity from all kinds of renewable energy sources.

However, the adoption of the Renewable Energy Sources Act has also become necessary for other reasons:

- The coupling of the current compensation rates to the development of the power rates can no longer be maintained without risking a disruption in the use of renewable energy sources. The non-simultaneity of liberalisation in the various national electricity markets of the European Union without any practicable reciprocity clauses between markets that are already fully liberalised and others which are still protected; the abundance of capacity which was created without risk during the days of territorial monopolies and which has been largely written off; the fact that the “unbundling” of electricity generation, transmission and distribution is far from being implemented; the competitive advantages enjoyed by the German utility corporations due to the fact that they can use their tax-free nuclear provisions (which by now amount to over DM 70 billion) at their discretion for investments: for all of these reasons, it is not likely that a price will settle down in the electricity market which will reflect the actual medium-term and long-term costs of electrical power supply. For this reason, it is initially necessary to set fixed prices for renewable energy sources in order to safeguard a continuous increase in the use of renewable energy sources, which is undeniably necessary.
- The Electricity Feed Act currently in force has led to an unequal distribution of burdens among the utility companies which are obliged to pay compensation. The percentage “capping” of the amount of electricity that can be fed into the grid, which was introduced with the second amendment of 1998, needs adjusting because this upper limit brings the utilisation of wind energy in the northern German region already close to the point of market introduction. The purpose of the Renewable Energy Sources Act is therefore to abolish this upper limit, while at the same time introducing a non-bureaucratic mechanism that will evenly distribute extra cost among all utility companies.
- Since the previous Electricity Feed Act was aimed at utility companies which could act as producers, regional grid operators and distributors at the same time, it is now necessary because of the new energy management legislation to redefine both the addressee of electricity to be fed into the grid and the company obliged to pay compensation.

The compensation scheme defined in the Renewable Energy Sources Act is based on the systematic approach introduced in the Electricity Feed Act and guided by the recommendations presented by the European Commission in its White Paper on “Energy for the Future: Renewable Sources of Energy” as well as the relevant resolutions adopted by the European Parliament. The compensation rates specified in the Renewable Energy Sources Act have been determined by means of scientific studies, subject to the proviso that the rates identified should make it possible for an installation – when managed efficiently – to be operated cost-effectively, based on the use of state-of-the-art technology and depending on the renewable energy sources naturally available in a given geographical environment. However, there is no guarantee that the cost of a given installation will be covered.

In some cases, the cost of the production of renewable energy sources is still much higher than the production cost of conventional energy sources. This is largely due to the fact that the overwhelming share of the external costs associated with the generation of electricity from conventional energy sources is not reflected in the price; instead, these costs are borne by the

general public and by future generations. In addition, conventional energy sources still benefit from substantial governmental subsidies which keep their price artificially low. Another reason for the higher costs is the structural discrimination of new technologies. Their lower market share does not allow economies of scale to become effective. Lower production volumes lead to higher unit cost and thus reduce competitiveness, which in turn prevents higher production volumes, like in a vicious circle.

For this reason, the purpose of this Act is not only to protect the operation of existing installations but also to break this vicious circle and to stimulate a dynamic development in all fields of electricity generation from renewable energy sources. In combination with measures aimed at internalising external costs, the purpose of this pricing regime is to bring renewable energy sources closer to conventional energy sources in terms of their competitiveness. In order to continue to facilitate major improvements in technological efficiency, the compensation rates specified in the Renewable Energy Sources Act vary, depending on the energy sources, the sites and the installation sizes involved; furthermore, they will decline over time and will remain in effect for a limited period of time. The fact that the rates will be reviewed every two years guarantees that they will be updated continuously and at short intervals to reflect market and cost trends.

The German Bundestag and the German Federal Government feel – in line with the established practice of the European Court of Justice – that the Renewable Energy Sources Act does not constitute aid granted by a Member State or through state resources as defined in Article 87 of the Treaty Establishing the European Community (ECT).

In accordance with the wording of Article 87 ECT, the European Court of Justice has consistently ruled that the only benefits which can be regarded as state aid as defined in the Treaty are benefits which are granted – directly or indirectly – from state resources. This obviously does not apply to the Renewable Energy Sources Act. It does not imply any benefits in cash or kind to be made available – either directly or indirectly or subsequently – by public authorities, nor does it imply any renunciation of tax revenues or other payments in cash or in kind owed to the public sector. Instead, the compensation payments made are straightforward financial transfers which, in accordance with the ‘polluter pays’ principle laid down in Community law, are used directly to cover electricity production costs. In a case involving a similar pricing regime, the European Court of Justice therefore stated quite clearly that a measure which is characterised by the fact that minimum prices are set with the objective of benefiting the seller of a product exclusively at the expense of the consumer did not constitute state aid.

In addition, compensation paid under this Act cannot be state aid from a terminological perspective because operators of installations for the generation of electricity from renewable energy sources are not granted any benefits; instead, the Act compensates disadvantages which such operators have in comparison with conventional electricity producers. After all, most of the social and ecological follow-up costs associated with conventional electricity generation are currently not borne by the operators of such installations but by the general public, the taxpayers and future generations. The Renewable Energy Sources Act merely reduces this competitive advantage which conventional electricity generators have vis-à-vis operators generating electricity from renewable energy sources which cause only limited external costs.

In no other field is the introduction of a pricing regime at the expense of polluters more legitimate and more justifiable than in the field of energy supply because of the ecological

damage associated with conventional electricity generation. The Renewable Energy Sources Act, which is designed to promote the market introduction of emission-free and sustainable energy sources to substitute for conventional energy sources, provides for strictly consistent, equal burden sharing among all power suppliers. This is in keeping with the 'polluter pays' principle established in environmental protection. This principle is part and parcel of the primary law laid down in the EC Treaty, which in its Article 6 stipulates compliance with ecological interests.

The Renewable Energy Sources for which the Act provides compensation payments cannot be obtained anywhere at lower prices. For this reason, the pricing scheme specified in the Act is not an instrument for artificially supporting the "commodity" kilowatt-hour of electricity generated from renewable energy sources; instead, the prices specified in the Act will permit operators to manage their installations cost-effectively in the first place.

The key regulatory element contained in the Renewable Energy Sources Act is the obligation to purchase electricity generated from renewable energy sources, based on the amount of electricity generated during a calendar year, calculated as a ratio of the total amount of electricity sold. Such obligations are usually imposed when the movement of goods poses serious risks to external interests and when those who are responsible for such risks are not expected to take any voluntary action or sufficient action to prevent such risks. The consumption of electricity in the free market poses such risks to the climate and to the environment. Hence, the Renewable Energy Sources Act can be characterised as a protective standard. Such standards are quite commonly used without this constituting state aid: The fact that it is prohibited to sell alcoholic beverages to adolescents, for instance, does not constitute state aid for non-alcoholic beverages. And systematically reducing the price of lead-free petrol despite higher production costs does not constitute state aid; instead, it is a buying and investing incentive based on the 'polluter pays' principle.

The provisions of the Renewable Energy Sources Act are based on Directive 96/92/EC of the European Parliament and the Council of 19 December 1996 concerning common rules for the internal market in electricity, in particular Articles 3 (2), 7 (5), 8 (3) and (4), as well as Art. 11 (3); furthermore, these provisions are designed to implement Article 20a of the German Constitution, which stipulates that, as a responsibility vis-à-vis future generations, natural resources must be protected because they are the very basis of human survival; and finally, the provisions are aimed at implementing the environmental protection objectives laid down in Articles 2, 6, and 10 of the Treaty Establishing the European Community.

B. Special Provisions

Section 1

Paragraph 1

Paragraph 1 specifies the purpose of this Act. The Act is designed to achieve sustainable energy supply in the interest of protecting the environment and managing global warming. Hence, it is an instrument for the implementation of the objectives agreed in the United Nations Framework Climate Convention and for the implementation of the climate strategies pursued by the European Union and the Federal Republic of Germany.

Paragraph 2

The objective of doubling the percentage share of renewable energy sources in total energy supply was already stipulated in the European Commission's White Paper on "Energy for the Future: Renewable Sources of Energy", and it has been confirmed by the Council of Ministers. The German Federal Government has also endorsed this objective. And the Renewable Energy Sources Act is evidence of the German Bundestag's explicit support of this objective.

In the next few decades, renewable energy sources will have to make relevant contributions to energy supply and thus to global warming management. Hence, in the interest of sustainable energy supply, it will be necessary in the next decade to double or triple the contribution made by renewable energy sources to electricity generation. The European Commission feels that renewable energy sources should account for 23.5 per cent of total European power supply by the year 2010. Germany – where renewable energy sources currently account for approximately six per cent of the national power supply – is far below the European average.

Section 2

Paragraph 1

Paragraph 1 provides a positive list of the renewable energy sources to which this Act applies. Like the Electricity Feed Act, it covers hydrodynamic power, wind energy, landfill gas, gas from sewage treatment plants, and biomass.

The term "solar energy", which was still used in the Electricity Feed Act, has been replaced by "solar radiation energy", which is correct in terms of physics. The installations which this term refers to include in particular photovoltaic installations and installations for solar thermal electricity generation.

Geothermal energy, which had not been covered by the Electricity Feed Act, has been added to the scope of application of this Act in order to render the vast potential of geothermal energy accessible for use.

The use of mine gas for electricity generation will improve the carbon dioxide and methane balance, relative to the release of these substances into the atmosphere without utilising them. For this reason, mine gas was included in the scope of application of this Act.

In this Act – like in the Electricity Feed Act – hydrodynamic power means the use of original, renewable hydrodynamic power in run-of-river and storage power stations fed exclusively from natural water resources.

The term "biomass" has not been conclusively defined. However, with a view to the purpose of this Act as specified in Section 1, it certainly does not include fossil fuels such as oil, coal and gas which will not be renewed within reasonable periods of time. The term "biomass" comprises solid, liquid and gaseous fuels which originate in recently harvested crops including timber and harvest residues, as well as waste wood and organic waste from food production and animal husbandry.

This Act maintains the principle of exclusive use introduced in the Electricity Feed Act. According to this principle, privileges under the Act will be granted only to those forms of electricity generation which are based exclusively on the use of the energy sources specified, unless the generation of electricity from renewable energy sources is only possible in the presence of priming or supporting fuels. As a general rule, it is not in keeping with the principle of exclusive use if materials such as harbour sludge, surface-treated railway sleepers, particle boards with synthetic components or other types of contaminated waste wood are used for the generation of electricity. In accordance with the purpose of this Act as specified in Section 1, the key criterion is that the electricity generation process used should not compromise the environment or the climate. In order not to rule out from the very beginning processes which make ecological and economic sense but which are still under development, and in order to correct misguided developments where necessary, the Federal Ministry of the Environment, Nature Conservation and Nuclear Safety will be in charge of monitoring and reviewing developments; and the Ministry is authorised to adopt provisions which will specify what substances and technical processes in the biomass segment fall into the scope of application of the Act, and what environmental standards will have to be observed. What is important for the legislator in the final analysis is that the various processes used should make sure that the harmful substances contained in the biomass will, as far as possible, be accumulated in the residues instead of being released to the environment via the atmosphere or water.

In all other respects, the provisions of the *Gesetz zum Schutz vor schädlichen Umwelteinwirkungen durch Luftverunreinigungen, Geräusche, Erschütterungen und ähnliche Vorgänge (Bundesimmissionsschutzgesetz – Act for the Protection against Harmful Environmental Effects Caused by Air Pollution, Noise, Vibration and Similar Factors – Federal Ambient Pollution Control Act)* as well as the relevant implementing regulations will apply. In addition, an implementing regulation for the *Kreislaufwirtschafts- und Abfallgesetz (Recycling and Waste Management Act)*, which will deal with the treatment of waste wood, is in the process of being prepared.

The scope of application of the Act also covers biogas which is generated elsewhere and fed into the gas network when such biogas is used for electricity generation, providing that proof is furnished of the origin of this gas and providing that there are calculations which prove that the energy content of the gas quantity used is equal to the energy content of the biogas quantity fed into the network.

The scope of application of the Act is extended to include the exclusive economic area located outside the 12-mile zone in order to facilitate the implementation of offshore wind projects in this area.

The term “grid operator” is used as defined in the *Gesetz über die Elektrizitäts- und Gasversorgung (Electricity and Gas Supply Act)*. It should be emphasised that only operators of public supply grids are obliged to purchase and pay compensation for electricity fed into their grids.

Paragraph 2

Paragraph 2 specifies electricity generation installations which are excluded from the scope of application of this Act. Like the Electricity Feed Act, the present Act does not cover large-scale hydro-electric power plants, as well as large installations generating electricity from

landfill gas and gas from sewage treatment plants. On the one hand, this is because it can be assumed that large-scale installations can be operated cost-effectively even without being included in the scope of application of this Act; and on the other hand, it is intended that especially decentralised smaller installations should become the pillar of future energy supply.

As far as electricity generation from biomass is concerned, this Act covers a wider range of installations than previous legislation. The scope of application covers biomass installations with a capacity of up to 20 megawatts in order to tap additional potential and mobilise efficiency reserves.

In addition, physically separate installations will be treated separately in terms of the scope of application, even if they use a common line to feed in electricity.

In the interest of equal treatment, the scope of application now also covers installations operated by electricity producers which had been excluded in the past. The “unbundling” of the activities of producers, regional grid operators and distributors, which the new energy legislation calls for, legally puts producers of electricity from renewable energy sources on an equal footing with conventional electricity producers. As a result, all producers will be motivated to invest in renewable energy sources.

In addition, there is a limitation for installations used for the generation of electricity from solar radiation energy. The purpose of this limitation is to prevent a continuation of the sealing of open spaces. The building structures specified in the Act which are covered by the rules on compensation include roofs, facades, noise protection walls and in some cases also embankments not exclusively designed for the purpose of electricity generation from solar radiation energy.

Paragraph 3

Paragraph 3 defines the terms “existing installations” and “new installations” as used in this Act. These definitions are particularly relevant for wind energy converters. Hence, the yardstick for determining the investment cost associated with the construction of a new installation is only the cost incurred above the foundation level.

Section 3

Paragraph 1

The obligation to connect electricity generators, purchase their electricity and pay compensation for the electricity purchased is now incumbent upon the grid operator whose grid is geographically closest to the electricity generator. This makes more economic sense than the reference to supply areas found in the provisions of the Electricity Feed Act.

The grid operators still are the right addressees for the obligation to connect electricity generators, purchase electricity, and pay compensation for, the electricity purchased because they own a natural monopoly which in practice is not jeopardised by the deglomeration of utility companies and the liberalisation of the electricity market.

It is clearly stated that the obligation to purchase, and pay compensation for, electricity is not limited to “excess electricity”; instead, this obligation applies to the entire amount of electricity offered to the grid operator.

In line with the European Union’s Internal Market for Electricity Directive, the Act stipulates that renewable energy sources should be granted priority when purchasing and paying compensation for electricity. Consequently, grid operators cannot refuse to purchase and pay compensation for electricity generated from renewable energy sources by stating that the power supply requirements of their grids are already fully met by means of conventionally generated electricity. For the same reason, it will only be necessary to expand the grid if the grid’s power supply requirements are already fully met by means of electricity generated from renewable energy sources. This will tend to be the exception to the rule. For this reason, it is justified that the grid operator in this rare case will be obliged to upgrade the grid if an eligible electricity generator, as defined in this Act, wants to feed in electricity. In keeping with the principle of proportionality, this obligation on the part of the grid operators is limited by what is economically no longer reasonable.

Since both grid operators and electricity generators interested in feeding in electricity have to carry out complex planning processes and take decisions affecting the use of their assets, both are obliged to provide to the other the data required.

Paragraph 2

The transmission grid operator which is upstream from the grid operator as defined in paragraph 2 is obliged to accept the electricity purchased by the grid operator under this Act, and to pay compensation for this electricity as specified in Sections 4 to 8.

Sections 4 to 8

The compensation scheme laid down for all renewable energy sources which are within the scope of application of this Act is guided by the principle that operators of optimised installations for the generation of electricity from renewable energy sources should generally be enabled to run these installations cost-effectively when these are managed efficiently. The most important factors included in the calculation of the compensation rates are the investment cost, the operating cost, the metering cost and the cost of capital for a specific type of installation relative to the service life, as well as the market return on capital employed.

In order to limit the administrative effort required— especially for the parties feeding electricity into the grid from small decentralised installations, but also for grid operators and governmental authorities – the Act upholds the principle of applying a uniform compensation rate nation-wide because this dispenses with the need for examining the cost or controlling the economic efficiency of electricity generating installations on a case-by-case basis. Such a lump-sum approach cannot and will not guarantee that a profitable compensation will be paid in every single case. For this reason, the compensation rates specified in this Act are minimum amounts; hence, higher compensation rates can be paid as a means of systematically promoting specific technologies. In this way, it is possible to attain the objectives pursued by this Act more effectively than by exclusively applying the lump-sum provisions contained in this Act.

It is up to the Federal Ministry of Economics and Technology – in agreement with the Federal Ministry of the Environment, Nature Conservation and Nuclear Safety and the Federal Ministry of Food, Agriculture and Forestry – to monitor developments in this field and, where necessary, to propose differentiated adjustments of the compensation rates to be paid for new installations in accordance with Section 12 of this Act.

In order to allow for technological progress and the expected reduction of costs, the compensation rates will be subject to nominal degressive annual reductions as of the year 2002; these reductions – which will apply across the board to all electricity generating installations built in the same year – will amount to 1 per cent for biomass, 1.5 per cent for wind energy, and 5 per cent for photovoltaic energy. As far as installations for the generation of electricity from hydrodynamic power, landfill gas, mine gas and gas from sewage treatment plants are concerned, on the other hand, their cost reduction potential has already largely been exhausted. The remaining cost-cutting potential will be adequately covered by the inflation rate. Currently, there is no need to introduce specific provisions for geothermal electricity generating installations because it will take some years before such systems will be operational.

With the exception of wind energy converters, existing and newly built installations will be treated alike. This general rule does not apply to wind energy converters because under the former Electricity Feed Act, the latter have already benefited from compensation payments which have permitted a cost-effective operation of such installations at suitable sites. For this reason, the period of time during which the higher initial compensation rate applies is reduced from five to four years for existing wind energy converters. This should be sufficient to safeguard existing installations.

Section 4

The provisions contained in the Electricity Feed Act with regard to electricity generation from hydrodynamic power, landfill gas and gas from sewage treatment plants have essentially been maintained because they have proven to be effective in the past; the scope of these provisions was extended to include installations generating electricity from mine gas.

Section 5

The use of biomass for the purpose of electricity generation represents a hitherto inadequately used potential to supply energy in a way which does not lead to an adverse impact on the climate. At the same time, biomass provides additional perspectives for the domestic agriculture and forestry. The compensation rates have to be increased substantially above the rates laid down in the Electricity Feed Act in order to enable operators of biomass installations to operate their installations cost-effectively, thereby initiating a dynamic development. Compensation rates differ in accordance with the electrical capacity of installations in order to give due account to the fact that the power production costs of smaller decentralised installations are higher.

The provision to the effect that compensation will not be paid before the entry into force of the ordinance applies only to electricity generating installations with a capacity of over five megawatts. Compensation for electricity from installations with a capacity less than 5 megawatts will be paid after the entry into force of this Act.

Section 6

The use of geothermal energy for the purpose of electricity generation depends on the presence of a reliable legal setting for investors; the purpose of the provisions in Section 6 is to create such a setting.

Section 7

The previous provisions applying in the field of wind energy systems did not give due account to the differences prevailing between various sites. In the amended version of the relevant provisions, different compensation rates are specified; irrespective of the type of technology used, the rates vary as a function of site profitability. Compared to the previous provisions, the new provisions – when applied to electricity generating installations over a service life of twenty years – on balance lead to the following results: at very good sites, compensation rates will be reduced to 13.5 pfennigs per kilowatt-hour; at sites with average wind conditions, the rates will be stabilised at 16.4 pfennigs per kilowatt-hour, and at inland sites, the rates will be moderately increased to 17.3 pfennigs per kilowatt-hour. The purpose of these new provisions is to avoid payment of compensation rates that are higher than what is required for a cost-effective operation of such installations, and to create an incentive for installing wind energy converters at inland sites. Compensation rates differ because of the different periods of time during which the initial compensation rates will be paid. In addition, the higher initial compensation rate will facilitate the financing of wind energy converters which was increasingly being questioned by credit institutions when the previous provisions were in force.

The period during which the higher initial compensation rate will be paid is calculated by means of a comparison with a reference installation. This calculation is based on the P-V curve of the reference installation, determined either in accordance with the technical guidelines for wind energy converters published by *Fördergesellschaft Windenergie* (FGW – Association for the Promotion of Wind Energy) or in accordance with the Power Performance Measurement Procedure defined by the Network of European Measuring Institutes (MEASNET), which was funded by the European Commission. The purpose of the provisions concerning the key features to be used to determine identical installation models is first of all to prevent manipulation by turbine manufacturers or operators; and secondly, the provisions are designed to clarify that it will not be necessary to repeat the calculation every time the installation is modified.

The following example may help to illustrate how to calculate the prolongation of the period during which the higher initial compensation rate will be paid: A site with a reference yield of 144 is six percentage points below the reference level of 150. Divided by 0.75 per cent of the reference yield, as specified in the provisions of Section 7 (1), these six percentage points give 8, which must then be multiplied by 2 months, again as specified in the provisions. The

result is 16 months, which must be added to the basic period of five years. Hence, the higher compensation rate will be paid for a period of 6 years and 4 months.

The electricity production costs of offshore wind energy converters are expected to decrease substantially in the future. At present, however, the investment cost is much higher than the cost of onshore installations due to the lack of experience, higher expenses for new converter models, complicated foundation work and the lack of economies of scale. The purpose of the special provisions for offshore installations, which will be in effect for a limited period of time, is to make up for this shortcoming and to create incentives for investments. The relevant provisions apply to wind energy converters which are located at least three nautical miles seawards from the baselines. However, the resulting line is not completely identical with the seaward demarcation line of the former three-mile zone.

Section 8

Paragraph 1

In the long term, the use of solar radiation energy holds the greatest potential for providing energy supply which does not have an adverse impact on the climate. This energy source both requires sophisticated technology and will attain considerable economic importance in the future. The relatively high compensation rate is due to the fact that, because of insufficient demand, these electricity generating installations are currently not yet produced in sufficient quantities.

As soon as this Act has created sufficient demand, the large production volumes which will result can be expected to lead to a substantial reduction in manufacturing cost, and hence, in electricity production cost, so that the compensation rates can be allowed to decrease rapidly. In addition to the real reduction of compensation payments due to inflation, the development described above is anticipated in this Act by stipulating degressive compensation rates. For electricity generating installations which will become operational after 1 January 2003 and in subsequent years, the compensation rates – for newly commissioned installations only – will once again be reduced degressively by five percent.

In combination with the “100,000 Roofs Programme”, the provisions in Section 8 (1) lead to compensation payments which for the first time make electricity generation from solar radiation energy an attractive option for private investors; however, in many cases, the compensation specified does not permit a profitable operation of such installations at all times. The level of compensation has also been influenced by the compensation rates currently paid in Spain. In this context, it should be borne in mind that solar radiation intensity is much greater in Spain than in Germany.

Paragraph 2

For electricity generated from solar radiation energy, the obligation to pay the compensation rates specified in Section 8 (2) will end as of 31 December of the year following the year in which the total installed capacity of photovoltaic installations which are eligible to receive compensation under the present Act surpasses the limit of 350 megawatts. The waiting period of twelve months has been introduced in order not to create any uncertainty in the market and

to enable market players to prepare for a smooth transition. The limit of 350 megawatts was calculated by adding the 300-megawatt target of the “100,000 Roofs Programme” to the capacity of the currently installed base.

In the framework of the present Act, the German Bundestag will introduce provisions for compensation payments to be made during the follow-up period to ensure that cost-effective operation of photovoltaic installations will be possible – giving due account of the decline in the marginal unit cost achieved by then – and to ensure that the photovoltaic sector will grow at an increasing pace.

Section 9

Paragraph 1

The fact that compensation payments are limited to a period of 20 years is in keeping with calculation formulas and amortisation cycles commonly used in the energy sector. Only in the case of hydroelectric power is this period usually not sufficient to safeguard the profitability of the installations.

The fact that the period during which compensation will be paid for electricity generated from already existing installations is calculated as of 1 January 2000 is designed to protect the installed base of operators of such existing installations.

Paragraph 2

If electricity supplied from several wind energy converters is billed on the basis of a single metering device, these electricity generating installations will be treated as a single entity for the purpose of determining the level of the compensation to be paid.

Section 10

Paragraph 1

The provisions concerning the connection charges are designed to avoid legal disputes, and hence, to provide transparency and legal certainty.

If another grid, which is not used for public power supply, is located between an electricity generating installation and a grid whose operator is obliged to purchase electricity under the provisions of this Act, the electricity generating installation can be connected to this other grid if this is technically feasible. This will help to avoid cost which would not make any economic sense.

Paragraph 2

In line with the rules introduced in Denmark in 1997 with the approval of the European Commission, the cost associated with upgrading the grid – which also involves the necessary grid expansion – will have to be borne by the grid operator. For the sake of transparency, the grid operators will be obliged to present detailed calculations of the investments required because these expenses can be included by grid operators when calculating their service charges.

Paragraph 3

A clearing centre, which will be attached to the Federal Ministry of Economics and Technology, will be established for the settlement of disputes. The parties concerned include in particular the associations of grid operators and of operators of electricity generating installations as defined in Section 2 of this Act.

Section 11

Section 11 must be seen in close connection with Section 3. The provisions laid down in both sections, taken together, constitute a multi-level equalising system for electricity purchases and compensation payments.

Level 1, which is dealt with in Section 3(1), provides for the connection of an electricity generating installation to the next closest suitable grid. This grid will usually be a local low-voltage grid. However, if the installation to be connected is a large wind farm, the grid may also be a higher voltage grid, or even a transmission grid. The operator of the grid concerned will be obliged to purchase, and pay compensation for, the electricity delivered.

Level 2, which is dealt with in Section 3(2), provides for the purchase of, and compensation payments to be made for, electricity by the upstream transmission grid operator. If the grid to which an installation is connected is already a transmission grid, there will be no upstream transmission grid. In that case, level 2 will not apply.

Level 3, which is dealt with in Section 11 (1) to (3), provides for fair nation-wide equalisation among transmission grid operators in terms of electricity volumes purchased and compensation payments made. This provision is designed to remedy a shortcoming in the former Electricity Feed Act, as a result of which the electricity purchases to be made under the Electricity Feed Act in some regions were far above average. The equalisation provision in the present Act is aimed at the operators of transmission grids because this is a small group with a limited number of players which will easily be able to handle the transactions associated with the equalisation scheme and which will also be able to monitor each other. After the implementation of the equalisation procedure, each transmission grid operator will carry the same percentage share of electricity (fed in under this Act), relative to the total amount of electricity transmitted via the grid of the operator concerned.

Level 4, which is dealt with in Section 11(4), provides for another step to be taken. Pursuant to the provisions in this paragraph, transmission grid operators will evenly distribute the electricity purchased under this Act among electricity distributors operating within their sales

territory, and the latter will be obliged to pay the same compensation rates for this electricity nation-wide. The result of this provision is that each utility company which supplies electricity will have to purchase the same percentage share of electricity and pay the same percentage share of the compensation due. Level 4 ideally complements the principle of deglomeration for utility companies insofar as that it imposes a similar obligation on electricity distributors which are responsible for energy production methods that jeopardise the climate and the environment.

The obligation to purchase, and pay compensation for, electricity as specified in Section 11(4) will not apply to utility companies if over half of the electricity they deliver is generated from renewables because – again in accordance with the ‘polluter pays’ principle – such companies have already done enough to protect the environment and manage global warming.

Electricity purchased at the compensation rates specified in Sections 4 to 8 must not be marketed as electricity from renewable energy sources at prices which are below the average compensation rates. In other words, when electricity which was fed into the grid under the provisions of this Act is marketed, the compensation rates paid will be regarded as the electricity generation costs to which other cost items (e.g. grid operating charges, licence fees, ecotax and value-added tax) have to be added in order to obtain the market price. The purpose of this provision is to combat price dumping in the renewables electricity market. There is a risk of price dumping because the overwhelming share of the electricity to be purchased under this Act will be purchased by the large utility companies which still have a dominant position in the market. The reference period for calculating the average compensation rate will be the period two quarters earlier. During the first quarter after the entry into force of the Renewable Energy Sources Act, the compensation payments made under the Electricity Feed Act can be used mutatis mutandis.

The purpose of the provisions in Section 11(5) is to ensure transparency with regard to electricity purchases and compensation payments by grid operators which are obliged under this Act to connect electricity generators to their grids; and to equalise among transmission grid operators the amounts of electricity purchased and the compensation payments made.

Section 12

These provisions are designed to monitor the market penetration achieved and the technological progress made by installations for the generation of electricity from renewable energy sources and, where necessary, to adjust the level of the compensation rates.

Adjustments of compensation rates will have to be announced early enough prior to their introduction. However, such adjustments can only apply to new installations; otherwise, there would be no reliable basis for operators of installations to make their investments, and it would be impossible for credit institutions involved in financing such installations to estimate the cost of such investments.