

**Consolidated version of the reasoning behind the Act on the Promotion of Renewable Energies
in the Heat Sector (Erneuerbare-Energien-Wärmegesetz - EEWärmeG)**

of 7 August 2008

Federal Law Gazette (BGBl.) 2008, Part I, no. 36 of 18 August 2008, page 1658

Preamble:

Consolidation refers to a process whereby the legislator's reasoning and related amendments and corrections are combined into a single, unofficial document. This document is for information purposes only; the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety will not accept any responsibility for its content.

This consolidated version of the reasoning is based on the following:

1. The reasoning behind the Government draft dated 5 December 2007 (*Bundesrat* (Upper House of Parliament) publication 9/08)
2. The German Government's response to the *Bundesrat*'s opinion dated 15 February 2008 (*Bundestag* (Lower House of Parliament) publication 16/8395)
3. The recommended resolution and report by the Committee for the Environment, Nature Conservation and Nuclear Safety (*Bundestag* (Lower House of Parliament) publication 16/9476).

Preface

A. Problem and objective

Climate change poses new challenges for society. The situation is further exacerbated by the rising global demand for energy. In order to be able to ensure a sustainable and reliable supply of energy at affordable prices in future, we need to pave the way for an integrated energy and

climate policy. As part of this overall concept, the Act on the Promotion of Renewable Energies in the Heat Sector (EEWärmeG, or “Heat Act”) aims to significantly increase the proportion of buildings’ energy requirements that are met from renewable energy sources. By using renewable energies, we can save fossil fuels and substantially reduce emissions of harmful greenhouse gases.

B. Solution

The Act introduces the obligation for new buildings to use renewable energies for heat supply. This obligation is accompanied by extended financial support, particularly for the socially sound renovation of old buildings, together with a provision allowing municipalities and local authority associations to stipulate compulsory connection to a heating supply grid for climate protection reasons.

C. Alternatives

None.

D. Financial impacts on public budgets

The Federal Government, *Länder* and local authorities will face investment costs in order to meet their obligation to use renewable energies in public buildings.

The Federal Government will make additional funding available from the proceeds from the sale of CO₂ certificates in order to promote renewable energies in the heating market. The costs to the Federal Government (including additional personnel costs) will, with the exception of the additional funding associated with providing financial support for renewable energies, be met by the competent departments within the context of their individual budgets.

Additionally, the enforcement of the Act by the *Länder* will incur legal costs.

E. Other costs

The total investment volume associated with the obligation to use renewable energies and the financial support available under the Heat Act which will be borne by the owners of buildings has been estimated at 43.9 billion euros by the year 2020. Of this, 35.1 billion euros relates to private households and 8.8 billion euros to industry.

Forecasters have predicted that the Act will have a net cost effect of 12 billion euros, since it will also facilitate savings of 31 billion euros.

Depending on the energy source used, the time required to amortise the costs will vary. If used appropriately, a system for the use of renewable energies will operate cost-efficiently in far less than 20 years. If the recent development in fossil fuel prices is extrapolated, renewable energy equipment is likely to be amortised even faster.

Regarding the impacts on individual prices, forecasters anticipate a slightly increased influence on both general price levels and consumer prices.

F. Bureaucracy costs

This draft Act will enable the German Government to meet its aim of significantly reducing bureaucracy costs. Only three statutory reporting requirements are stipulated by the Act. Firstly, costs will be incurred in order to meet the obligation to use renewable energies. Secondly, the owners of buildings wishing to be exempted from their obligation to use renewable energies will bear the costs of the exemption procedure. Thirdly, the progress report presented to the *Bundestag* (Lower House of Parliament) by the Federal Government will also incur minimal administrative costs.

Reasoning

A. General part

I. Aims of and need for the Heat Act

The Heat Act is required in order to meet the central political objectives of the United Nations, the European Union and the Federal Republic of Germany, and is designed to help improve climate protection as well as ensure a sustainable, reliable energy supply. As fossil resources grow ever scarcer, the ever-expanding global demand for energy calls for a significant improvement in energy efficiency, as well as alternatives to conventional energy sources. Only renewable energies can be considered inexhaustible by human yardsticks; this also applies to biomass, since it is a renewable raw material, albeit subject to certain natural limitations. We owe it to future generations to conserve existing resources and use regenerative energies.

Against this background, on 8/9 March 2007 the European Council resolved to increase the proportion of renewable energies among primary energy consumption to 20 percent by the year 2020. Prior to this, the Kyoto Protocol, as the outcome of the Framework Convention on Climate Change, formulated the target of increasing the proportion of renewable energies in order to minimise emissions of greenhouse gases. Finally, the G8 nations have repeatedly reaffirmed their commitment to the more widespread use of renewable energy sources in the interests of a sustainable development of energy supply.

Accordingly, on 24 August 2007, the German Government adopted an integrated energy and climate programme in Meseberg, designed to further reduce emissions of greenhouse gases in Germany. Renewable energies play a decisive role in this respect by substituting fossil fuels and thus helping to reduce greenhouse gas emissions. The German Government is aiming to significantly increase the share of primary energy consumption in Germany that is derived from renewables by the year 2020. This will necessitate an increase in the proportion of heating and cooling supply from renewables from the current level of 6 percent to 14 percent. The Heat Act contains a target to this effect.

Although the heating sector offers great potential, it has thus far been lacking an equivalent mechanism to the successful Renewable Energy Sources Act (EEG) in the electricity sector in order to prompt a dynamic expansion in renewable energies. Given the sharp rise in fossil fuel prices, and thanks to support schemes such as the market incentive programme, the proportion of renewable energies has risen overall, but further measures are required if we are to meet these ambitious targets and deadlines. The Heat Act represents a central component in a raft of measures. It aims to increase the use of renewable energies, while also pursuing ecological objectives, and helping to significantly improve supply reliability in Germany. In particular, by promoting domestic energy sources, we can reduce our dependency on oil and gas imports, which often originate from geopolitically unstable regions.

The Act is also important for Germany's attractiveness as an industrial location. The manufacturing and servicing of the equipment needed in order to increase the use of renewable energies in the heating market will trigger investments which will improve value-added within Germany, as well as creating jobs. In the renewable energies sector as a whole, forecasters predict an increase in the employment numbers from currently around 235,000 to more than 300,000 by the year 2020.¹ Small and medium-sized enterprises in structurally weak rural regions are particularly well-placed to contribute to regional development in this way. At the same time, the Heat Act is significant for industrial policy. It selectively promotes technological innovations which will strengthen the German energy industry's leading position among global competitors.

Renewable energies are a growth market. The global investment volume is expected to have increased sixfold by the year 2020. By then, some 250 billion euros will have been spent on technologies for the extraction and use of renewable energies. In recent years, Germany has expanded its leading position as a developer of innovative technologies for the use of renewable energies. In the light of this pioneering role, Germany is expected to serve a significant portion of the global market in future, particularly in the area of high-tech products with short innovation cycles. In this way, the Heat Act will contribute to economic growth.

II. Legislative competency of the German Government

The German Government's legislative powers in this connection are derived from Article 74, paragraph (1), no. 24 of the German Basic Law (GG), since these provisions fall under the area of air pollution control. The main purpose of the Act determines its legislative competency in the face of concurrent legislation. The main purpose of the Act on the Promotion of Renewable Energies in the Heat Sector, being a central component of the Government's integrated energy and climate programme adopted in Meseberg on 24 August 2007, is to reduce emissions of greenhouse gases and therefore protect the climate. The obligation incumbent upon the owners of buildings to obtain a proportion of their heating energy demand from renewable sources provides the starting-point for achieving the desired goal of climate protection. The other purposes and aims cited in Article 1 of conserving fossil resources, reducing dependency on energy imports and promoting the further development of technologies complement the higher goal of climate protection.

Within the meaning of Article 74, para. (1), no. 24 of the Basic Law, a measure is considered to serve the purpose of air pollution control if it limits or reduces the volume of pollutants and therefore conserves the natural composition of the air. Emissions of climate-damaging greenhouse gases impair the atmosphere, which is a component of the environmental medium "air". The obligation to use renewable energies helps to achieve the volume target pursuant to Article 1, para. (2), since this obligation leads to the substitution of fossil fuels, the reduction of CO₂ emissions, and hence helps to ensure air pollution control.

With the exception of Article 3, para. (2), Article 15, para. (5) and number I.1 letter a, second clause, the German Government has made conclusive use of its legislative powers with the Act on the Promotion of Renewable Energies in the Heat Sector. As such, the *Länder* are only permitted to adopt provisions regarding the inclusion of existing buildings, i.e. buildings constructed prior to 1 January 2009, in the obligation to use renewables, the granting of more extensive financial support, and the specification of larger minimum collector areas for the use of solar thermal systems in new buildings. The *Länder* also regulate the competence of the authorities (Article 12) and may regulate alternative provisions on enforcement, since the wording of the enforcement provisions contained in the Act, particularly Article 11 is flexible in this regard (Article 84, para. (1), sentences 2 and 5 of the Basic Law (GG)).

¹Erneuerbare Energien: Arbeitsplatzeffekte: Wirkungen des Ausbaus erneuerbarer Energien auf den deutschen Arbeitsmarkt, July 2006; Erneuerbare Energien: Bruttobeschäftigung 2006, Teilbericht zum Abschlussbericht des Vorhabens "Wirkungen des Ausbaus der erneuerbaren Energien auf den deutschen Arbeitsmarkt – Follow up", September 2007, available for downloading on the Internet at: <http://www.erneuerbare-energien.de>.

III. Principal content

On the one hand, this Act creates the necessary competition to allow the cheapest solutions to become established, and on the other, it also promotes innovative technologies. In this way, the Act grants the greatest possible decision-making scope to obligated parties, is open to all forms of technology, and ensures the effective expansion of renewable energies. The Act also makes a pivotal differentiation between new and existing buildings. Overall, the Act unites three priority areas:

Firstl

y, it obligates the owners of buildings to meet a proportion of their heating energy demand from renewable energies. The obligation is confined to new buildings because the use of renewable energies is technically easier, more cost-efficient and more socially acceptable to achieve in new buildings than in existing buildings. Solid biomass, geothermal energy, solar thermal energy and environmental heat, as well as biogas and sustainably produced vegetable oil, may all be used for this purpose. Based on its objective of reducing the use of fossil energies in heat supply, minimising the associated emissions of greenhouse gases and thereby promoting climate protection, the Act also supports other climate-friendly measures. For example, the owners of buildings may also utilise waste heat or heat from highly efficient CHP installations or employ more extensive energy-saving measures as an alternative to using renewable energies; significant greenhouse gas emissions can also be saved in this way, thereby contributing to climate protection.

Secondly, the obligation to use renewables is accompanied by a significant increase in the funding available. This creates additional incentives for the use of innovative technologies in particular. The support of renewable energy use in existing buildings is another particular priority area: Measures to modernise existing heating systems are very cost-intensive. The high cost of renovation is one of the main reasons behind the current modernisation backlog in existing buildings. In order to make these financial pressures more socially acceptable and create effective investment incentives, the volume of funding will be increased to a maximum of 500 million euros per annum in the years 2009 to 2012, subject to more detailed specifications in the respective budgets.

Thirdly, on the basis of their existing legislative powers under *Land* law, the Act allows municipalities and local authority associations to establish compulsory connection and use regarding a public local or district heating supply grid for climate policy reasons.

IV. Alternatives

In 2006, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety investigated all the available mechanisms for increasing the use of renewable energies in the heating market, and subsequently discussed these with associations and companies. This consultation process over a period of several months revealed that existing support mechanisms and other national or regional regulations were not capable of achieving the objectives of the Heat Act anywhere near as well as the combined solution presented here, which unites the compulsory usage model for new buildings with a topped-up market incentive programme for both new buildings and – in particular – old buildings. It is hoped that the Act will also accommodate the specific requirements and (often) significantly higher costs and greater technical challenges associated with older buildings.

In addition to the combination model outlined in the Heat Act, the parties also discussed the possibility of introducing a so-called bonus model with a nationwide equalisation mechanism, or a quotas model, or the option of reverting solely to a topped-up market incentive programme (fiscal model), as possible alternatives.

Factors opposing the bonus model include the high transaction costs linked to the development of a nationwide compensation system, for which there are no precedents. Factors opposing the quotas model include the experiences of similar models in other European countries, particularly in the electricity sector, which has shown that prescribed production volumes do not aid dynamic market expansion.

The fiscal model is based on providing financial support for the expansion of renewable energies in the form of grants – in other words, continuing the approach already begun with the market incentive programme. Admittedly, this model allows the Government to pursue technology-specific control plans, and as a result, the market incentive programme is also very successful. However, in recent years, it has emerged that fiscal means alone are insufficient to achieve the desired expansion of

renewable energies in the heating market. Another disadvantage of this model is the huge public cost of financial support. Against this background, the fiscal model is not capable of single-handedly achieving the German Government's targets. Its steering effect is best developed as an accompanying model operating alongside another solution, particularly the obligation to use renewables as presented here. The combination of these two models achieves the greatest steering effect and is the option most capable of responding to the differing specific requirements of new and existing buildings. Proportionately low costs and a limited administrative input offer an effective way of mobilising the existing CO₂ savings potential over the long term, while sustainability criteria guarantee minimum pressures on the environment.

Similarly, the German Government's targets cannot be met with the existing funding mechanisms or other possible future provisions at *Länder* level. On the contrary, in the absence of a national law, there is a real possibility that the *Länder* will fail to provide any funding at all, or only isolated pockets of funding, and any financial support provided would undoubtedly be non-standardised, which would be detrimental to investment certainty on the part of industry.

V. Consequences

1. Intentional and unintentional effects

a) Overview

The Act introduces an obligation for the owners of new buildings to use a proportionate share of renewable energies. It is estimated that some 175,000 new buildings are constructed in Germany each year, all of which would fall under the obligation to use renewable energies pursuant to Article 3, para. (1). It is estimated that of these, around 150,000 are residential buildings, and 25,000 non-residential buildings. Of the 175,000 owners, forecasters estimate that around 140,000 are private individuals (80 percent) and 35,000 are companies (20 percent).

Owners who voluntarily use renewable energies are eligible for financial support in accordance with Article 13. This applies in particular to the use of renewable energies in existing buildings. We have assumed that the take-up of financial support would be in an approximate ratio of 80 percent (private owners) to 20 percent (companies). This ratio also reflects the take-up of the market incentive programme to date.

Building owners who use renewable energies, either because they are obliged to do so pursuant to Article 3, para. (1) or who do so voluntarily (incentivised by the financial support), will inevitably be faced with investment costs. However, this aspect will be offset by medium and long-term benefits. Renewable energies used for heat generation will become increasingly competitive, particularly as a result of improved technologies, scale effects, and continuing price rises for conventional energy carriers. Depending on future developments in the cost of renewable energies and oil and gas prices, cost efficiency will vary for different forms of renewable energy. Owners will not suffer any financial disadvantages, provided the investments are amortised within the heating system's usual service life. The required investment costs and cost efficiency are outlined below (see 3. and 4.). Positive price effects on systems technology are likewise anticipated (see section b) below).

These investments will also trigger a positive impetus on employment (see section c) below), which will benefit systems manufacturing and related supplier industries. Despite reduced expenditure on conventional equipment, on balance, we anticipate a positive effect. In particular, the emphasis on shifting energy use and transformation into the domestic market will lead to an overall increase in value-added for the national economy.

b) Price effects

The Heat Act will reinforce the expansion of renewable energies in heat supply. This will lead to increased demand for systems that produce heat from renewable energies, and to the development of additional production capacity among system manufacturers. Technological progress, coupled with the scale effects associated with rising production figures, will tend to lower the cost of individual renewable energy systems.

As the Act is essentially open to all forms of technology, all technologies for the generation of heat from renewable energies will be able to compete with one another. The owners of buildings will select the most favourable variant to meet their obligations. This competition between different renewable energies will likewise lead to falling equipment prices.

Finally, increasing the proportion of heat generated from renewable energies will reduce our dependency on imports of fossil energies, particularly oil and gas, and overall, demand for these forms of energy will be reduced. This could potentially have a limited dampening effect on further price rises for fossil fuels.

c) Employment impetus

Some 235,000 people in Germany are currently employed in the renewable energies sector as a whole, comprising the fields of electricity, heat and fuels (see A. I. above). This dynamically expanding sector is characterised in particular by small and medium-sized enterprises. Germany is already considered the most attractive location for companies in the renewable energies industry. By the year 2010, the headcounts of these companies could be increased by up to 50 percent. If

the sector continues to expand at its current pace, we can expect employment figures to rise to a maximum of 300,000 jobs. A precise breakdown into the sectors electricity, heat and fuel is not currently available.

A precise forecast on employment market effects is dependent upon a large number of factors. Political framework conditions also play a decisive role. Nevertheless, it is true to say that the investments associated with expanding the use of renewable energies will initially exert a positive impetus on employment, leading to an increased headcount among equipment manufacturing sectors. Demand for upstream supplies will also increase, leading to a significant increase in employment figures among supplier industries. By contrast, expenditure on conventional systems will decrease (substitution effect). The expansion of renewable energies will help to improve value-added in Germany, while reduced energy imports will help to reduce the pressure on GDP. In order to achieve this, the additional expenditure required in order to expand renewable energies will need to be financed, leading in turn to reduced budgets for consumers or individual consumer groups (budget effect). As well as balancing these effects against one another, it is also necessary to compare their respective impacts against the reference development. Only in this way is it possible to measure the employment effects associated with the expansion of renewable energies in the heating sector under the Heat Act versus the situation without this support. Ultimately, the gross increase in employment resulting from increased investments in manufacturing, operation and exports compared to the reference will be offset against the reduced employment resulting from higher expenditure on such systems and reduced expenditure on conventional plants compared with the reference scenario. The result is the net employment effect. It is estimated that by the year 2010, this effect will total approximately 24,900 employees² in the heating market for renewable energies.

² Estimate by Ragwitz/Nast/Bürger/Klinski/Leprich, "Eckpunkte für die Entwicklung und Einführung budgetunabhängiger Instrumente zur Marktdurchdringung erneuerbarer Energien im Wärmemarkt", December 2006, for achievement of the 14 percent target.

2. Cost to public budgets

Based on the average rate of new construction, researchers have estimated that the obligation to use a proportion of renewable energies for heat generation, which also applies to public entities, will cost an anticipated total of 55 million euros (maximum) per annum³ which will need to be factored into the budgets of the Federal Government, Länder and local authorities; of this, around 4 percent is attributable to the Federal Government, 10 percent to the Länder, 76 percent to local authorities, and 10 percent to indirect institutions⁴. Overall, however, these costs are largely compensated by the investments saved and by savings on fossil fuel expenditure. It is estimated that the aforementioned investments will save around 3.9 million euros per annum on fossil fuels over the term of 20 years.

Enforcement of the obligation will entail further costs. The Act has been carefully designed to minimise the administrative input for authorities: In addition to the proof requirements for affected building owners (see section 5. below), the authorities are only required to undertake spot checks (Article 11, para. 1). According to initial estimates by researchers, the enforcement costs for the *Länder* are expected to total around 1.2 million euros, equating to 17 full-time jobs nationwide⁵. This estimate was based primarily on the cost of spot checks pursuant to Article 11, para. 1 calculated at a rate of 2 percent, plus the cost of handling applications for exemptions pursuant to Article 9, no. 2 and the cost of punishing regulatory offences pursuant to Article 17.

The increased volume of funding available to support renewable energies means that up to 500 million euros could be payable per annum in the years 2009 to 2012, depending on requirements. This considerable increase compared with current budgets will be financed from the Federal budget via the anticipated proceeds from selling emission certificates.

³Nast/Ragwitz, “Mehr- und Minderkosten der öffentlichen Hand durch das EEWärmeG“, Stuttgart, November 2007.

⁴Derived from total public construction according to Ragwitz/Nast/Bürger/Klinski/Leprich: “Investitionsbedarf einer Nutzungspflicht für erneuerbare Energien in öffentlichen Gebäuden”, Karlsruhe, February 2006.

⁵Bürger, “Abschätzung der Kosten für den Vollzug des EEWärmeG”, Freiburg, November 2007 (converted into a total number of obligated parties of 175,000).

The increased volume of funding will necessitate increased expenditure on enforcement by the competent Federal authorities.

The costs to the Federal Government (including additional personnel costs) will be met by the competent departments within the context of their individual budgets, with the exception of the additional financial support for renewable energies.

3. Costs to private individuals

a) Overview

Owners of buildings will face costs in conjunction with the compulsory or voluntary use of renewable energies. Depending on the type of renewable energy and level of usage, such costs may include investment costs, the cost of maintaining and servicing the heating system, and where applicable, additional costs for the energy carriers themselves (see sections b – c below). These costs will be offset by savings. The cost of installing and maintaining a system for the use of fossil fuel will be avoided, as will the cost of purchasing conventional fuels. As the prices of oil and gas continue to rise, renewable energies are likely to become ever cheaper compared with conventional fuels in future. In the medium term, depending on the type of renewable energy used, the initial investment costs will be amortised within the standard service life of a system, and the use of renewable energies will then become profitable (see section d below). Additionally, it may be necessary to appoint experts in some cases, at additional cost (see section e below).

b) Investment costs⁶

Owners will be liable for the cost of purchasing a system in order to utilise renewable energies for heat supply.

⁶ All figures according to Nast, "Mehrkosten und wirtschaftliche Bilanz von EE-Anlagen", Stuttgart, October 2007. Figures refer solely to the cost for new buildings, since only new buildings are subject to the obligation to use renewables pursuant to Article 3.

The investment costs for a solar thermal system for a detached house are in the region of 2,600 euros. For a block of eight apartments, the costs are around 11,200 euros, corresponding to an investment outlay of around 1,400 euros per unit.

If the owner of the building opts to use solid biomass in the form of wood pellets, the investment costs for a pellet boiler will be in the region of 15,500 euros for a detached house.

The investment costs for a heat pump vary, depending on the energy source and type of heat pump used. In order to meet the heat demand of a detached house, the investment costs for a heat pump will be in the region of 17,000 euros.

The use of biogas that has been upgraded to natural gas quality does not generally require any additional investments. The cost of purchasing biogas that has been upgraded to natural gas quality is estimated at around 10 cents/kWh.

Special boilers are needed in order to use liquid biomass. The additional investment required compared with a conventional boiler is estimated at approximately 100 – 200 euros. Additionally, the cost of purchasing liquid biomass is currently around 9 cents per kWh.

c) Investment volume

It is currently impossible to quantify the total investment volume triggered by the Heat Act as a result of the obligation to use renewables pursuant to Article 3, para. (1) and the financial support available pursuant to Article 13. In order to be able to calculate costs, it would be necessary to predict how many obligated owners will opt for which types of renewable energy, and the extent to which they will make use of alternatives, as well as how many owners will opt to voluntarily use renewable energies in view of the financial support available. It is currently impossible to predict future developments in this regard. In particular, the obligation to use renewables pursuant to Article 3, para. 1 is essentially open to all types of technology, and owners will be able to choose between a variety of renewable energy sources with varying levels of investment outlay. As this is a new obligation in law, there is no existing data available which could be extrapolated to the future.

Using as a basis the publication “Leitstudie 2007: Ausbaustrategie Erneuerbare Energien” by Nitsch⁷ the Fraunhofer Institute for Systems and Innovation Research (ISI) in collaboration with the Institute for Applied Ecology (*Öko-Institut*) and Jülich Research Center (*Forschungszentrum Jülich*), programme group STE, have calculated that in order to achieve the target cited in Article 1 of obtaining 14 percent of final energy consumption for heat from renewable energies, a total fictitious investment volume of 43.9 billion euros by the year 2020 will be needed, contrasting with a saving of 1527.6 PJ heat from conventional energies over the same period. This translates into a total cost of 31.3 billion euros for fossil fuels. In conclusion, therefore, based on this calculation, the Heat Act would produce total differential costs of 12.6 billion euros⁸ by the year 2020. The same study estimates the difference in generation costs between renewable generation technologies and conventional reference technologies at around 970 million euros (average) over the years 2008 to 2020. The discounted total of these differential costs is 7.1 billion euros for the period 2008 to 2020.

Assuming that 80 percent of owners covered by the Heat Act are private owners (see 1.a. above), for the period up until 2020 this would translate into a total fictitious investment volume for private individuals of 35.12 billion euros and differential costs of 10.08 billion euros.

d) Amortisation

The investment, capital and maintenance costs of such systems are offset by significant savings, since the use of renewable energies saves fossil fuels, and fuel costs are therefore reduced. Owners also save on the investment, maintenance and capital costs for a conventional boiler. The following total cost calculations are based on a period of 20 years, an increase in the purchase price for fossil fuels to 8.8 Ct/kWh_{H_u} by the year 2020 according to the “Leitstudie 2007” study by Nitsch⁹, and a discount rate of 4 percent.

⁷Nitsch, “Leitstudie 2007: Ausbaustrategie Erneuerbare Energien, Aktualisierung und Neubewertung bis zu den Jahren 2020 und 2030 mit Ausblick bis 2050”, study commissioned by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Stuttgart, February 2007, available for downloading from the Internet at: <http://www.erneuerbareenergien.de>.

⁸Fraunhofer Institut für System- und Innovationsforschung (ISI)/ Öko-Institut/ Forschungszentrum Jülich, Programmgruppe STE, “Wirtschaftliche Bewertung von Maßnahmen des Integrierten Energie- und Klimaprogramms

(IEKP)“, Karlsruhe/Berlin/Jülich, 29 October 2007.

The calculations for solar thermal systems are based on typified parameters: For detached houses, we have assumed an average living area of 120 m², and for multiple dwellings, an average living area of 75 m² per unit. Accordingly, for detached homes, with a collector surface area of 0.04 m²_{opening} / m²_{living area}, this produces additional annual expenditure of approximately 49 euros. The block of 8 apartments used in our example will incur annual costs of approximately 168 euros for the same percentile collector area. This figure may also be significantly cheaper, particularly if using the prescribed statutory collector area of 0.03 m²_{opening} / m²_{living area} is used as a basis when calculating multiple dwelling units, or if system prices are reduced as a result of the anticipated expansion in production.

The use of a heat pump is viable, depending on the parameters used as a basis. Despite high investment costs, this option also offers the greatest potential savings. The calculation of total annual costs produces a figure of up to 189 euros.

When using solid biomass in the form of wood pellets, the annual fuel savings total approximately 1,235 euros. Hence, after 20 years, the remaining extra cost is around 193 euros per annum.

e) Cost of providing proof

Additionally, owners falling under the obligation to use renewables pursuant to Article 3, para. (1), may face the cost of providing proof, where especially where the appointment of an expert is required in accordance with Article 10. The average cost of providing such proof is estimated at 26 euros per case.¹⁰ Based on the number of private owners affected each year (140,000), the total cost to private individuals is around 3.6 million euros.

⁹Nitsch, "Leitstudie 2007" (see footnote 7 above).

¹⁰Bürger, "Abschätzung der Kosten für den Vollzug des EEWärmeG" (see footnote 5 above).

4. Cost to industry

The cost to industry is calculated in the same way as the cost to private owners; we would therefore refer you to the comments under 3.c) above. Accordingly, given that industry accounts for 20 percent of owners affected by the obligation to use renewables and those eligible for financial support (see 1.a above) over the period up until 2020, industry could face an estimated total fictitious investment volume of 8.78 billion euros and differential costs of 2.52 billion euros. Added to this is the cost of appointing experts (see 3.e above), which may be estimated at 910,000 euros for non-residential buildings, based on the average figure of 26 euros per case.

5. Bureaucracy costs

a) Overview

Articles 9 and 10 of the Heat Act contain two new reporting requirements for the private and commercial owners of buildings. However, these reporting requirements are designed in such a way that each building owner is only affected by one of these two requirements (see b) – d) below). Additionally, a reporting requirement is being introduced for the administrative authorities regarding the submission of a progress report (see e) below).

A reporting requirement already exists for building owners who apply for funding under the market incentive programme. This reporting requirement is being incorporated into the Heat Act (Articles 13 to 15) together with the market incentive programme; however, this has no effect on the existing reporting requirement.

Special proof requirements may be regulated under the Sustainability Ordinance, to which reference is made in number II.2, letter b of the Annex to the Heat Act in connection with sustainability requirements pertaining to the production of biomass for use as liquid biomass under the Heat Act. If the Sustainability Ordinance is adopted and a further new reporting requirement is created, the effects will need to be investigated when the Ordinance is adopted.

b) Reporting requirement pursuant to Articles 9 and 10

The new reporting requirements apply to the owners of buildings fall under the obligation to use renewables pursuant to Article 3, para. (1). Depending on whether the owner meets or is exempt from this obligation, either Article 9 or Article 10 will determine the reporting requirements.

Owners who are exempt from the obligation to use renewables are subject to the reporting requirements pursuant to Article 9, no. 2. They must undergo an official exemption process to prove that meeting the obligation and implementing alternative measures would lead to an unreasonable hardship resulting from special circumstances arising from disproportionate costs or other causes. The authority will only issue a decision upon application by the owner of the building. The reporting requirement associated with the application process is aimed at all building owners who believe that they are exempt from the obligation to use renewables for the reasons cited in the Act. Hence, this reporting requirement is aimed at securing preferential treatment in the form of an exemption. The reporting requirement addresses private owners of buildings, as well as commercial and industrial owners. Under the Act, exemptions from the obligation are subject to stringent requirements. Firstly, such exemptions will only be considered in exceptional cases. Secondly, the decision is left to the discretion of the competent authority. This ensures that the target group remains manageable.

The application requirements have also been reduced to the bare minimum required for enforcement. In cases where the obligation to use renewables may be waived by force of law and hence without an official enforcement act, limited reporting requirements are envisaged. According to Article 9, no. 1, the obligation to use renewable energy shall not apply if meeting the obligation and implementing alternative measures would contravene obligations under public law (letter a) or is technically not possible in a specific case (letter b). This must be proven to the authority in accordance with Article 10, para. 1, sentence 1, no. 3 in conjunction with para. 4. The legislators did examine the option of extending this simplification to include the case cited in Article 9, no. 2 but rejected it. The case cited in Article 9, no. 2 necessitates a discretionary decision on the part of the authorities, which should embrace financial and – in particular – social considerations as well as technical factors.

Conversely, owners who meet their obligation to use renewable energies must submit evidence of their compliance to the competent authorities. Such owners are therefore subject to reporting requirements in accordance with Article 10. In particular, they are required to prove that selected requirements pertaining to the use of renewable energies, e.g. certain quality standards or ecological

criteria, are met. The obligation to furnish proof is differentiated according to the various requirements and has been reduced to a bare minimum in order to make it easier for owners to select an appropriate and cost-effective variant. Depending on the type of renewable energy, therefore, certification from an expert, system manufacturer, installation technician or fuel supplier, or an energy requirement certificate, must be submitted. Where justified, various different forms of proof will be considered admissible and of equal value in order to ensure that the obligated party has freedom of choice and is able to select the cheapest form of proof. Another concession has been provided in cases where there are several obligated parties, whereby proof need only be submitted by one of the obligated parties (Article 10, para. 1, sentence 2).

c) Investigation of alternatives

These reporting requirements have been discussed at length and examined for possible alternatives. They are considered indispensable, but the legislators have chosen the least stringent measures possible and combined this with a strengthening of the enforcement provisions pursuant to Article 11. Under Article 11, the competent authorities must monitor compliance with the obligation contained in Article 3 (1) and the correctness of the proofs pursuant to Article 10 by at least conducting appropriate spot checks. This combination of the requirement to submit proof plus official monitoring is the most appropriate means of ensuring that the Heat Act is a success. The German Government's targets of increasing the use of renewable energies in heat supply can only be achieved by ensuring that the obligation to use renewable energies is fulfilled. Given the overarching public interest in the success of this law, national guidelines on enforcement are advisable in this exceptional case. Consultation with the *Länder* and associations on this draft Act revealed that clear national guidelines on enforcement are both essential and desirable.

Against this background, the Act provides for a differentiation between authorities and private individuals. Neither the authorities nor the owners will bear sole responsibility for the costs and burdens associated with ensuring enforcement. Such one-sidedness is to be avoided. Instead, the obligations should be distributed in such a way that they are met by the party for whom compliance is least expensive. However, it remains the case that the competent authorities must monitor compliance with the obligation to use renewable energies (i.e. "whether"). As comprehensive monitoring is unrealistic to achieve, the authorities must instead perform appropriate spot checks. Experience in other areas of law, such as taxation law, has shown that targeted spot checks ensure the achievement of statutory targets. Additionally, this allows enforcement input to be reduced to a

minimum.

Regarding the question of how the obligation to use renewables is met, comprehensive monitoring by the authorities is neither necessary nor expedient, since this would incur excessively high economic costs. This is where the requirement to submit proof pursuant to Article 10 of the submitted Act comes into play: Affected owners of buildings are required to submit proof to the authority showing whether the requirements regarding the use of certain renewable energies, e.g. specified quality standards for solar thermal installations or requirements governing sustainable generation for biomass use, have been observed. Compliance with these requirements can generally be achieved more easily, quickly and inexpensively by means of owner-supplied proof than with an official monitoring system. As certification from the system manufacturers, installation technicians or fuel suppliers is admissible, the required time input on the part of the owner should be minimal. In many cases, Article 10 in conjunction with the relevant provisions in the Annex provides owners with freedom of choice between a number of types of proof, all of which are equally ranked. In this way, owners can opt for the cheapest or most time-saving option among several, equally suitable forms of proof. The authority's work is limited to checking the proof and its accuracy by means of suitable spot checks (Article 11, para. 1); to this end, authorities have been granted interventionary powers pursuant to Article 11, para. 2.

This balanced interaction between official duties and the obligations of owners to provide proof is one solution that ensures compliance with the obligation to use renewable energies at the lowest possible cost. Admittedly, other measures to reduce bureaucracy costs still further could be conceivable. For example, either the obligation of the building owners to provide proof or the enforcement requirements of the authorities could be reduced. However, the consequence of this would be that the Act would come to nothing and the German Government would fall short of its target to increase the use of renewable energies in heat supply.

d) Cost of reporting requirements pursuant to Articles 9 and 10

It is not possible to fully assess the costs associated with the requirement to submit an application pursuant to Article 9, no. 2 and the requirements to provide proof pursuant to Article 10. To date, no reliable figures are available, particularly for the individual types of proof. As a result, the following calculations are based on assumptions. In order to rectify this information deficit in future, the progress report on this Act should explicitly investigate enforcement experiences (Article 18, sentence 2, no. 4) and therefore provide a greater insight into the bureaucracy costs incurred.

Against the background of the application requirements outlined in Article 9, no. 2, an ex ante estimate of the bureaucracy costs was based on the assumption that an average of 5 percent of the 175,000 citizens and companies in total per annum who were eligible under the Heat Act (see 1.a above) would apply for exemption and would therefore be required to submit information pursuant to Article 9, no. 2. This translates into a maximum of 8,750 applications (average) per annum. The time needed up to follow up these reporting requirements may fluctuate widely depending on the circumstances of the individual case; in particular, longer periods may be needed if experts are consulted to assess financial viability, but the average time taken should not exceed two hours in total.

These bureaucracy costs, based on the assumption of 35,000 obligated parties per annum (see 1.a above), will impact the economy. Assuming an exemption application rate of 5 percent, therefore, some 1,750 companies will be affected by the reporting requirements pursuant to Article 9, no. 2. With a time input of two hours and an average wage of 30.20 euros per hour (average rate for the economy as a whole), this produces a total cost to the economy of 105,700 euros per annum for the requirement pursuant to Article 9, no. 2 to submit applications for exemption.

For those owners who opt not to apply for exemption from compulsory usage, the cost of providing proof pursuant to Article 10 will depend on the extent of the proof to be submitted. The proof required will vary according to the different renewable energies. Where Article 10 in conjunction with the respective provisions in the Annex to this Act requires certification, e.g. from the equipment manufacturer, this is unlikely to require a significant time input from either the owner of the building or the equipment manufacturer. There are no qualified requirements placed on such certification; standardised declarations from the equipment manufacturers will generally be sufficient, and therefore already exist in many cases. The situation regarding expert proof pursuant to Article 10 is rather different. Appointing an expert will generally take time on the part of the obligated party for the handling process (appointing an expert, facilitating an inspection, invoicing, forwarding of the proof to the authorities). However, it should be borne in mind that the reporting requirements only apply to new buildings, where comprehensive planning processes will already have been undergone and experts consulted. Even today, similar certificates are already being requested and issued. As such, experts estimate that the new reporting requirements pursuant to Article 10 will incur very little additional time, and in some cases may already be available. The additional time associated with these requirements can therefore be estimated at around 30 minutes in total. Based on the average wage of 30.20 euros, the 33,250 obligated parties in industry who opt

not to apply for exemption pursuant to Article 9, no. 2 will face bureaucracy costs of 502,000 euros per annum.

Overall, this produces bureaucracy costs to industry totalling some 607,700 euros per annum.

e) Other costs

Minimal additional costs will also be incurred to the Federal budget in conjunction with preparing the progress report pursuant to Article 18. However, these costs are more than offset by economic savings of a significantly greater magnitude, since the progress report facilitates an expedient review and update of the law.

Otherwise, no bureaucracy costs within the meaning of Article 2, para. (1) of the Act on the Establishment of a National Regulatory Control Council will be incurred.

f) Review

Enforcement of the Heat Act is the subject of the progress report pursuant to Article 18, so that as early as 2011 the bureaucracy costs can be evaluated, and where applicable, suggested enforcement improvements submitted.

VI. Time validity

There is no question of putting a time limit on the Act. Its unlimited validity guarantees the necessary level of investment certainty and creates the requirements for the envisaged long-term increase in the share of heat generated from renewables. There are plans to periodically evaluate the Act (Article 18).

VII. Compatibility with European Union law

The provisions of this Act are compatible with European Union (EU) law. In particular, it does not appear to infringe any of the basic freedoms guaranteed by the Treaty establishing the European Community (ECT).

Any indirect impacts on the freedom of movement of goods are justified by overarching objectives. Article 2 of the ECT states that the Community is committed to a high degree of environmental protection and to improving environmental quality.

In applying the provisions on financial support, the provisions relating to subsidies, particularly Articles 87 to 89 of the ECT and the provisions adopted for their enforcement, were taken into account.

VIII. Compatibility with higher national law

The Act is compatible with the requirements of the financial constitution. No payment obligations towards the State or special charges will be levied.

The infringement of basic rights associated with the obligation to use a proportion of renewable energies pursuant to Article 3, paragraph 1 are justified by the higher-ranking objectives of the public good: Insofar as the owners of buildings are obliged to meet a proportion of their heating requirements from renewable energies, this constitutes a content and limit provision pursuant to Article 14, paragraph 1, sentence 2 of Germany's Basic Law (GG), which abstractly extends the range of obligations incumbent the owners of buildings. Such an infringement is justified. The Heat Act pursues a legitimate goal by expanding renewable energies in the heat sector in the interests of climate protection. It promotes climate protection in a situation where no less stringent but equally effective alternatives are apparent (for an investigation of the alternatives, see IV above). An assessment of the conflicting interests between the basic rights of building owners and the objective of climate protection pursued by the Act is influenced to a large extent by Article 14, paragraph 2 of the Basic Law, which states that property entails obligations, and its use shall also serve the public good, together with Article 20a of the Basic Law, which states that the state shall protect the natural bases of life. The Heat Act aims to increase the proportion of renewable energies; as a result, conventional fuels and resources will be saved, and the emission of climate-damaging gases will be reduced. Hence, the Act serves to protect the climate and protect the natural bases of life. Given the longevity of greenhouse gases and the long-term impacts of climate change, it is also an expression of responsibility for future generations. In this connection, climate protection assumes outstanding importance. In order to exclude disproportionality in the obligation to use renewables, the law makes provision for exemptions in cases of hardship cases (Article 9, no. 2), Moreover, Article 4

exempts buildings where the German Government believes that the use of renewable energies would not be financially viable.

The provision on compulsory connection and use (Article 16) does not represent an infringement of the rights protected by Article 14 of the Basic Law. It is merely an extension of the existing powers of the *Länder* and would not disproportionately restrict the basic right to freedom of ownership.

Finally, paragraph 2 of Article 11 allows authorised individuals to enter the premises of obligated parties in order to verify compliance with the obligation to use renewables by means of the basis of spot checks. This is an infringement of the inviolability of the home as defined in Article 13, para. 1 of the Basic Law. This infringement is justified. According to Article 13, paragraph (7) of the Basic Law, interferences and restrictions are permissible on the basis of a formal act, provided this is adequately defined and makes reference to the basic law principle that has been restricted. Here too, the Act preserves the principle of proportionality. The option of entering the homes of obligated parties in order to carry out spot checks is justified by the higher-ranking objective of the public good, because this provision is necessary in order to monitor the obligation to use renewable energies. In the absence of monitoring, there is a risk that the obligation to use renewable energies would not be met, and the Act would fail to reach its specified objective.

The provision of Article 11, para. (2) as outlined here is identical to the official access rights found and upheld in many *Länder* construction codes. Finally, as well as being limited to spot checks, it should be noted that the premises concerned are usually outdoor facilities or cellar rooms, so that the need for constitutional justification is less pronounced.

IX. Amendments to the valid legal situation

Under this Act, the promotion of measures for the use of renewable energies, which is currently only anchored in budget legislation within the context of medium-term financial planning and concretised in Guidelines by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, has been placed on a broader statutory basis.

X. Effects on equality policy

In its proposed wording, the Act has no impact on the equality of men and women. It is aimed directly at the owners of buildings and at legal entities under public and private law. The effects take place irrespective of the gender of the affected parties. There are no anticipated effects on the differing life situations of men and women.