



# RENEWABLE ENERGIES

The way forward



Federal Ministry for the  
Environment, Nature Conservation  
and Nuclear Safety

**Imprint**

**Publisher:** Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)  
Public Relations Division · D - 11055 Berlin

**E-mail:** [service@bmu.bund.de](mailto:service@bmu.bund.de)

**Internet:** [www.bmu.de](http://www.bmu.de) and [www.erneuerbare-energien.de](http://www.erneuerbare-energien.de)

**Editors:** Dipl.-Ing. (FH) Dieter Böhme, Dr. Wolfhart Dürrschmidt, Dr. Harald Kohl,  
BMU, Division Z III 1 (General and Fundamental Aspects of Renewable  
Energies), Alexandra Liebing, BMU, Division Z II 3 (T) (Public Relations)

**Design:** design\_idee, büro\_für\_gestaltung, Erfurt

**Photos:** dpa, nordphoto, artis.foto

**Date:** March 2004

**First print:** 10,000 copies



WE ARE SWITCHING TO RENEWABLE ENERGIES.

## CONTENTS

<b>New direction in energy policy - from fossil-nuclear fuels to the age of solar efficiency .....</b>	<b>4</b>
<b>What are renewable energies? Germany sailing ahead .....</b>	<b>6</b>
<b>Climate protection, jobs, sustainable energy supply .....</b>	<b>9</b>
<b>Key tasks for the 21<sup>st</sup> century - potential and objectives .....</b>	<b>10</b>
<b>The proper instruments - how the Federal Government supports renewable energies .....</b>	<b>12</b>
<b>Research and development .....</b>	<b>13</b>
<b>Wind power sailing ahead .....</b>	<b>14</b>
<b>Biomass - the oldest form of energy utilisation .....</b>	<b>16</b>
<b>Solar energy for heat and electricity .....</b>	<b>17</b>
<b>Hydropower - the mature energy source .....</b>	<b>18</b>
<b>Geothermal energy - energy from the Earth's interior .....</b>	<b>19</b>
<b>Renewable energies in Europe and worldwide .....</b>	<b>20</b>
<b>International Conference for Renewable Energies - renewables 2004 .....</b>	<b>23</b>



## NEW DIRECTION IN ENERGY POLICY - FROM FOSSIL-NUCLEAR FUELS TO THE AGE OF SOLAR EFFICIENCY

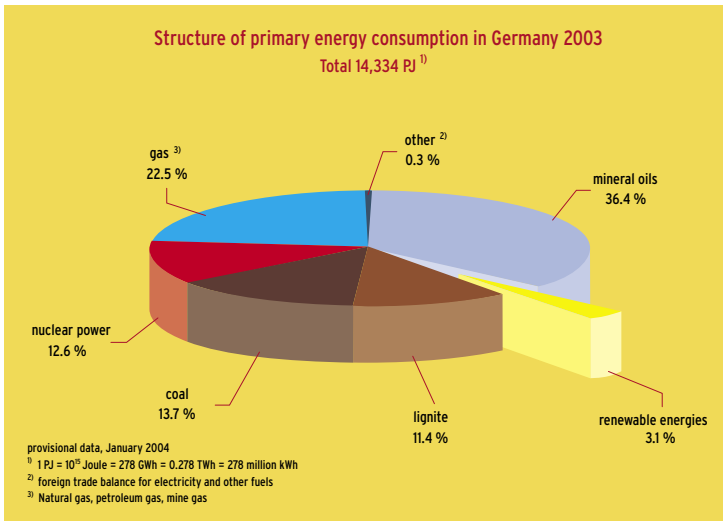
Protecting the global climate, saving valuable resources and establishing worldwide sustainable development – these are the major challenges facing us in the 21st century. A key prerequisite for handling them is a new direction in energy policy. The old methods can no longer secure our heat, electricity and fuel supplies. Renewable energies in Germany have developed rapidly, involving a large number of committed and forward-looking players. Wind, water, solar radiation, biomass and geothermal energy all hold vast potential for jobs, climate protection, the conservation of natural resources and the development of a sustainable energy supply in general. Over the past years, the Federal Government has initiated the new direction in energy policy. Our task now is to consistently further this development.

At present the Renewable Energy Sources Act (EEG) is being amended. This Act is the cornerstone of success for regenerative energy sources and will enter into force by summer 2004. Financial incentives are also provided by the market introduction programme which promotes renewable energies. This programme entered into force at the beginning of 2004 with new conditions of funding. Other funding programmes and measures on exploring, developing and demonstrating future-oriented technologies round off the Federal Government's range of support measures.

The Federal Government has adopted the goal of raising the share of renewable energies in the electricity supply to at least 12.5 % by 2010. After 2010, if we lay the proper foundation in the present decade, development of renewable energies can finally begin in earnest. The Government's medium term goal, by 2020, is to increase the share of renewable energies in electricity generation to at least 20 %. In the long term, i.e. by the middle of this century, economies obtaining at least half of their energy supply from renewables will reap advantages.

The Federal Government has therefore, in the framework of its sustainability strategy, adopted the goal of covering at least half of our energy requirements from renewables by the middle of this century. A study undertaken on behalf of the Federal Environment Ministry on ecologically optimising the increased use of renewables has found that this can be done to both ecological and economic advantage ("Ökologisch optimierter Ausbau der erneuerbaren Energien", cf [www.erneuerbare-energien.de](http://www.erneuerbare-energien.de)).

Reserves of oil, natural gas, coal and uranium are limited and their utilisation is associated with dangers for people and the environment. Nuclear power entails unacceptably high safety and waste management risks. In June 2000 the Federal Government and



the electricity utility companies therefore agreed on the structured phase-out of nuclear power: In around 2020 the last nuclear power plant in Germany will be switched off. The Act on the Phase-out of Nuclear Power entered into force in 2002.

# WHAT ARE RENEWABLE ENERGIES?

## GERMANY SAILING AHEAD

Renewable energies are energy sources which continuously regenerate through natural processes and which by human standards are infinitely available. Renewable energies have three prime sources:

- ▶ solar radiation
- ▶ tidal power
- ▶ heat from the Earth's interior (geothermal energy)

Sun, moon and earth provide these inexhaustable and environmentally sound energies. They can be used both directly (e.g. through solar collectors and geothermal utilisation) and indirectly (e.g. in the form of biomass, wind and hydropower). Renewable energies can be converted into electricity and heat, but can also be stored (e.g. in fuels).

Considerable progress has been made in Germany in recent years. The share of renewables in the total electricity supply was raised from around 4.7 % in 1998 and 6.7 % in 2000 to around 7.9 % in 2003. Clear increases were also achieved in the heat supply, for example through utilisation of solar thermal energy and biomass. In all, in 2003 the regenerative share in the total final energy utilisation for heating amounted to around 4.1 %. The biogenic share in relation to total fuel consumption stood at around 0.9 %.





**Contribution of renewable energies to electricity generation in Germany  
1990 - 2003 in GWh <sup>1)</sup>**

	hydropower	wind power	biomass <sup>2)</sup>	photovoltaics	total electricity generation
1990	17,000	40	1,422	1	18,463
1991	15,900	140	1,450	2	17,492
1992	18,600	230	1,545	3	20,378
1993	19,000	670	1,570	6	21,246
1994	20,200	940	1,870	8	23,018
1995	21,600	1,800	2,020	11	25,431
1996	18,800	2,200	2,203	16	23,219
1997	19,000	3,000	2,479	26	24,505
1998	19,000	4,489	2,800	32	26,321
1999	21,300	5,528	3,020	42	29,890
2000	24,936	9,500	4,129	64	38,629
2001	23,383	10,456	5,065	116	39,020
2002	23,824	15,856	6,412	188	46,280
<b>2003 <sup>3)</sup></b>	<b>20,350</b>	<b>18,500</b>	<b>7,085</b>	<b>323</b>	<b>46,258</b>

<sup>1)</sup> 1 GWh = 1 million kWh

<sup>2)</sup> this includes the 50 % biogenic share of the wastes

<sup>3)</sup> provisional data, January 2004





## CLIMATE PROTECTION, JOBS, SUSTAINABLE ENERGY SUPPLY

Renewable energies have many advantages over conventional fuels. They not only conserve resources and are climate-friendly, they also create jobs and offer prospects for trade and industry.

### Renewable energies

- ▶ are environmentally sound given the appropriate ecological structure, and play a particularly important role in climate protection;
- ▶ are low risk and can be easily reversed if safety questions arise;
- ▶ create new jobs in major future-oriented branches, especially in structurally weak regions;
- ▶ have a high export potential on the global market;
- ▶ provide incentives for investments in modern technology;
- ▶ are suitable for developing sustainable energy supply in industrial and developing countries;
- ▶ are a prerequisite for the development of a sustainable energy supply at a global level.

The increased use of renewable energies avoids the release of greenhouse gases which are harmful to the climate. In 2003 around 53 million tonnes of carbon dioxide emissions were avoided in Germany – about 23 million tonnes of these through the EEG alone. Air quality also benefits from the boom in regenerative energy sources, since the pollutants nitrogen oxide, sulphur dioxide, hydrocarbons and particulates, which arise from the combustion of fossil fuel, are not emitted or emitted only in small quantities when renewable energies are used.

Renewable energies create jobs. In 2002, around 120,000 jobs could be directly or indirectly attributed to the utilisation of regenerative energies – over 50,000 in wind power utilisation and about 30,000 in biomass utilisation. The development of renewables also means a boost for trade and industry: In 2003 companies in the sector recorded a turnover of approximately 10 billion euros.

# KEY TASKS FOR THE 21<sup>ST</sup> CENTURY - POTENTIAL AND OBJECTIVES

Only a small percentage of the vast potential of renewable energies is currently exploited in Germany. As a comparison, in 2003, gross electricity consumption in Germany stood at 589 TWh, the final energy consumption for heat supply was about 1,500 TWh while fuel supply totalled around 740 TWh.

Possible long-term utilisation potential of renewable energies for electricity heat and fuel supply in Germany, excluding imports (final energy)			
	electricity supply	heat supply	fuel supply
	TWh/year <sup>1)</sup>		
hydropower	24	-	-
wind power	165	-	-
biomass	60	200	60
photovoltaics	105	-	-
geothermal energy	200	330	-
solar thermal energy	-	290	-
<b>total</b>	<b>554</b>	<b>820</b>	<b>60</b>

<sup>1)</sup> 1 TWh = 1.000 GWh = 1 billion kWh

At present classic branches still dominate the regenerative energy supply in Germany. In 2003 around half the renewables' share in the final energy supply came from biogenic fuels (especially wood for heat generation) and around one fifth from hydropower.

In 2003, renewable energies contributed around 7.9 % to electricity supply, around 4.1 % to heat supply and about 0.9 % to cover fuel requirements.

Share of renewable energies in final energy consumption 2003 in per cent			
	electricity	heat	fuel
hydropower	3.5	-	-
wind power	3.1	-	-
biogenic solid fuels <sup>1)</sup>	0.6	3.7	-
biogenic liquid fuels	0.01	0.01	0.9
biogas	0.2	0.1	-
sewage gas	0.1		-
landfill gas	0.3	-	-
photovoltaics	0.1	-	-
solar thermal energy	-	0.2	-
geothermal energy	-	0.1	-
<b>total <sup>2)</sup></b>	<b>7.9</b>	<b>4.1</b>	<b>0.9</b>

<sup>1)</sup> this includes the 50 % biogenic share of the wastes  
<sup>2)</sup> provisional data, January 2004

On the road towards a future-oriented energy supply, the Federal Government has set itself important objectives and milestones. For renewable energies this means that from 2000 to 2010 their share in the energy supply will be raised to at least 12.5 % in the electricity sector and to at least 4.2 % of primary energy use. The Federal Government has furthermore set itself a mid-term interim objective: by 2020 at least 20 % of electricity should be supplied from renewables. The Federal Government's long-term goal is to cover at least half the total energy requirements in Germany with renewable energies in 2050.

# THE PROPER INSTRUMENTS - HOW THE FEDERAL GOVERNMENT SUPPORTS RENEWABLE ENERGIES

Up until recently a large number of obstacles slowed the growth of renewable energies. For a long time, renewables were held back by over-capacities in the conventional energy supply, an intentional undervaluing of the possible contributions of renewable energies and by a lack of incentive structures.

This has changed. The Federal Government has now created a number of framework conditions and instruments which support the development of renewable energies and assist them in becoming mature and economically viable technologies. This specifically includes:

- ▶ **Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz, EEG):** guarantees priority purchase and a minimum compensation for electricity from renewables fed into the grid
- ▶ **Biomass Ordinance:** in the framework of the EEG, this regulates which substances are classified as biomass and defines technical procedures and environmental requirements
- ▶ **Compensation for solar power:** following the successful conclusion of the 100,000 roofs solar power programme, on 1 January 2004 improved conditions for the compensation of solar power was introduced in the “2nd act amending the EEG”.
- ▶ **Market Introduction Programme** for renewable energies: grants and loans at favourable rates for renewable energies installations, focusing on thermal energy and financed from the revenues of the ecological tax reform
- ▶ **Additional Funding Programmes:** favourable loans, fiscal incentives
- ▶ **Research, Development and Demonstration**



## RESEARCH AND DEVELOPMENT

The Federal Government has extensively supported research and development of renewable energy technologies since the first oil price crisis of the seventies. In three decades the Federal Government has invested a total of 1.74 billion euros for this purpose.

Heading the list are the fascinating but scientifically and technically ambitious photovoltaic technologies. 770 million euros have already been invested in this sector. Technology on wind energy utilisation, which is now well advanced and close to traditional energy sources with regard to specific costs, received funding of 330 million euros. The clear goal is to tap, develop and promote renewable energies on the market for their economically viable and environmentally sound use.

The Federal Government also promotes the exploration, development and demonstration of future-oriented energy forms in the framework of the future investment programme ZIP (Zukunfts-Investitions-Programm). For the period 2000 to 2004 an additional 160 million euros have been made available from the programme. Federal Environment Ministry funding focuses on the branches geothermal electricity generation, solar thermal power plants and ecological research in the fields of offshore wind parks, biomass and fuel cells.



## WIND POWER SAILING AHEAD

Germany leads the world in wind power utilisation. With around 14,600 megawatts of installed capacity in 2003 about one third of electricity generated from wind power worldwide comes from Germany. In 2003 alone around 2,600 MW were installed. In 2003, wind power in Germany contributed around 3.1 % to electricity generation with approximately 18.5 TWh.

The continuous development of wind parks will further advance this branch of renewable energies in the coming years. Even though onshore locations with high wind volumes are becoming fewer, more potential will be tapped by developing good inland sites and by replacing older, smaller wind farms with new higher capacity parks (so-called repowering). Today, wind turbines with an output of over 1.5 MW can generate 10 times more electricity at the same site than smaller, older plants, which can gradually be replaced.

There will be a limit to wind energy utilisation on land. But the strong breeze out to sea holds further development potential. In January 2002, the Federal Government submitted a strategy on the utilisation of wind energy at sea. The strategy identifies potentially suitable areas and expected size for offshore wind parks in Germany's Exclusive Economic Zone in the North and Baltic Seas.

The prospects: under current conditions an output of 500 MW can be established in an initial phase up to 2006, with around 2,000 to 3,000 MW possible by 2010.

If investors in offshore wind parks and the electricity utility companies create the conditions for the utilisation of electricity generated at sea, in about 25 years an installed capacity of up to 25,000 MW will be possible. Altogether, on land and at sea, wind power could then account for a quarter of the total electricity supply in Germany.





## BIOMASS – THE OLDEST FORM OF ENERGY UTILISATION

In primeval times mankind discovered fire and thus by burning wood and other regenerative products first created the opportunity to harness energy to his needs. Today the energy use of biomass is being rediscovered – with the most modern technology. The dynamics in the bioenergy sector matches the situation ten years ago in wind power utilisation. The EEG, the Biomass Ordinance, market introduction programmes for renewable energies and research and development all promote investments and lead to a noticeable development of bioenergies.

Energy use of wood, biowastes, slurry and other substances of plant and animal origin holds great potential for heat and electricity supply in Germany. Biomass currently contributes to final energy consumption with around 3.8 % to the heat supply and around 1.2 % to electricity production. By the end of 2003, around 80 biomass (heat) power plants were in operation in Germany, with an electrical output of about 400 MW. Around 1,700 biogas plants with approx. 175 MW electrical capacity and about 130 block-type thermal power stations using liquid biofuels with an electric capacity of around 11 MW were also generating electricity at the end of 2003.

Biogenic substances can ultimately give a stimulus to regenerative energies on the market. Since 1997 more and more so-called biodiesel (rapeseed oil methyl ester) has filled the fuel tanks of road vehicles. It currently has a 0.9 % share in final energy consumption. Since biodiesel is now a mature fuel, many automobile manufacturers have made it an option for their vehicles, with the result that there are now around 1,800 filling stations in Germany which sell biodiesel.



## SOLAR ENERGY FOR HEAT AND ELECTRICITY

Wind and weather are driven by solar radiation, plants use sunlight to live and grow. Thus, hydropower wind and bioenergy are indirect forms of solar energy. But the energy which shines onto earth from our sun can also be used directly in a variety of ways:

- ▶ solar thermal heat utilisation through collectors
- ▶ solar thermal electricity generation in solar power plants
- ▶ electricity generation using photovoltaic systems
- ▶ passive solar use in buildings through special components and architectural planning

Even if Germany is not blessed with quite as much sun as countries in southern latitudes, solar collectors can obtain enough thermal energy to heat water for daily use, or to heat buildings. The collector branch is consequently also hotting up, recording on average double figure growth rates for several years. At present, around 5.6 million square metres of solar collector area are in operation in Germany – equivalent to over 750 football fields.

Germany has also developed quickly in the area of photovoltaics. Semi-conductor materials can directly convert light into electricity – although the costs are currently still high. Therefore support is needed. Research and development, the 100,000 roofs solar power programme and the EEG have brought about a steep increase in growth. By the end of 2003 approx. 400 MW were installed in Germany. In the 100,000 roofs solar power programme a total capacity of around 350 MW was installed on more than 60,000 roofs in Germany. At present, photovoltaics contributes about 0.1 % to Germany's electricity supply, with around 323 million kilowatt hours. Based on the existing framework conditions, the solar energy sector anticipates an annual market growth for photovoltaics of about 25 % over the coming years. Thus, photovoltaics can also develop into a major export industry, given the fact that there are numerous future markets for solar power in the Earth's hot zones or 'sun belt'.



## HYDROPOWER – THE MATURE ENERGY SOURCE

It is a known fact that water is the source of life, not just as a fresh drink. Run-of-river plants can generate electricity from rivers, while water reservoirs and mountain lakes can be used to store energy. In this way, hydropower plays a role in covering both the electrical base load and the peak hour supply.

Hydroelectric power plants for electricity generation have been operating for about a century. Depending on water supply they provide half of the electricity from renewables. But hydropower only has limited potential in Germany, with over three quarters of its potential already being used.

Nevertheless hydropower also has potential for the future which the Renewable Energy Sources Act is helping to tap. The bulk of the remaining potential lies in modernising, expanding or replacing large and small plants, some of which are up to 100 years old. A modernisation drive can not only help increase power yield, it can also improve the ecological status of water bodies.

## GEOTHERMAL ENERGY - ENERGY FROM THE EARTH'S INTERIOR

Hot springs are relatively rare in Germany. However, the heat in the Earth's interior can be tapped from deeper layers of earth and rock. In central Europe, temperature increases by 3 degrees Celsius on average for every 100 metres of depth below ground. At a depth of 2 to 4 kilometres, either hot thermal water can be found that can be used directly, or water is injected into hot dry rock, thus bringing its energy to the surface. In a few regions such as the valley of the upper Rhine, the Northern Alpine Molasse Basin and the North German Lowlands, conditions are particularly favourable. The Federal Environment Ministry funds several projects for geothermal power generation at selected model sites.

There are currently 34 major geothermal plants used for heat generation in Germany, with an annual output of approx. 1.5 TWh of thermal energy. In November 2003, the first plant transforming deep earth heat into electricity went into operation in Neustadt-Glewe, Mecklenburg-Western Pommern. Other sites must now be developed in order to expand geothermal electricity generation in Germany. Although there still needs to be a great deal of research and development, demonstration and market introduction, geothermal energy can turn out to be one of the most important renewable energy sources. Geothermal heat is available around the clock and can at any time be controlled as required. Studies have shown that in Germany there is a long-term utilisation potential of about 200 TWh electricity and around 330 TWh heat per year. In other words, if this branch of renewable energies can gain a foothold, geothermal energy could become an important integral part of a future energy system that is increasingly built on renewable energy sources.

## RENEWABLE ENERGIES IN EUROPE AND WORLDWIDE

Renewable energy sources are important not just for Germany. Climate protection is a global task: industrialised and developing countries alike must all make an effort to reduce greenhouse gas emissions. Within the European Union, important first steps have been taken. With the European Climate Protection Strategy of March 2000, the EU indicates how it will achieve its greenhouse gas reduction commitments laid down in the Kyoto Protocol. Improving energy efficiency and the development of renewable energies are key aspects of this.

Utilisation of renewable energies in the EU in 2002					
	biomass	hydropower	wind power	geothermal energy	total
	Final energy [TWh]				
Belgium	5.4	0.4	0.05	0.06	5.9
Denmark	9.3	0.03	5.9	0.02	15.3
Germany	61.8	23.0	19.4	0.51	104.7
Finland	64.5	10.7	0.1	0.10	75.4
France	120.9	60.5	0.3	1.59	183.2
Greece	10.9	2.7	0.7	0.14	14.4
United Kingdom	11.6	4.8	1.5	0.01	17.9
Ireland	1.9	0.9	0.3	0.002	3.1
Italy	66.5	40.1	1.5	6.00	114.1
Luxembourg	0.2	0.1	0.03	n.d.a.	0.4
Netherlands	6.0	0.1	1.2	0.03	7.3
Austria	29.2	35.6	0.3	0.57	65.6
Portugal	21.4	7.7	0.3	0.13	29.6
Sweden	61.5	66.0	0.6	2.29	130.4
Spain	42.0	22.8	7.7	n.d.a.	72.5
<b>EU-15</b>	<b>513.2</b>	<b>275.3</b>	<b>39.7</b>	<b>11.45</b>	<sup>1)</sup> <b>845.7</b>

in comparison: final energy [PJ]					
<b>EU-15</b>	<b>1,846.1</b>	<b>990.3</b>	<b>142.9</b>	<b>41.2</b>	<sup>1)</sup> <b>3,041.9</b>

<sup>1)</sup> total includes 5.7 TWh (20.54 PJ) from solar thermal energy and 0.26 TWh (0.9 PJ) from photovoltaic systems  
(Refer to table on page 21)

In October 2001, the Directive on the promotion of electricity from renewable energy sources in the European internal electricity market entered into force. The goal of the EU is to increase the contribution of renewable energy sources to electricity production from 14 % in 1997 to 22 % in 2010.

This European target thus goes beyond Germany's national target, a fact which can be attributed to the considerably higher share of hydropower in some other EU Member States. Individual Member States therefore have to achieve different targets in increasing the share of renewables, in accordance with their starting situation. For Germany, a target of 12.5 % by 2010 is proposed. This is compatible with the Federal Government's national objective.

<b>Utilisation of solar energy in the EU in 2002</b>		
	<b>solar thermal energy <sup>1)</sup></b>	<b>photovoltaics</b>
	<b>area [1,000 m<sup>2</sup>]</b>	<b>installed capacity [kW<sub>p</sub>]</b>
Belgium	41.3	n.d.a.
Denmark	290.3	1,590
Germany	4,715.1	277,300
Finland	43.3	3,052
France	670.0	17,241
Greece	2,850.2	n.d.a.
United Kingdom	203.4	4,136
Ireland	4.2	n.d.a.
Italy	408.5	22,000
Luxembourg	n.d.a.	n.d.a.
Netherlands	395.2	26,326
Austria	2,542.0	9,000
Portugal	199.9	1,668
Sweden	199.3	3,297
Spain	282.4	16,000
<b>EU-15</b>	<b>12,844.9</b>	<b>381,610</b>

<sup>1)</sup> glazed and unglazed collectors

**Electricity generation from hydropower in the EU 1990 - 2002 in TWh  
(excluding generation from pumped storage reservoirs)**

	1990	1991	1993	1995	1997	1999	2001	2002 <sup>1)</sup>
Sweden	71.8	62.6	73.9	67.4	68.4	71.0	78.4	66.0
France	52.8	56.3	63.1	70.6	61.6	71.6	73.7	60.5
Italy	31.3	41.8	41.0	37.4	41.2	44.9	46.3	40.1
Austria	31.2	31.1	36.3	36.7	35.6	40.1	41.4	35.6
Spain	25.2	27.0	24.1	22.9	34.4	22.6	40.6	22.8
Germany	17.2	14.7	17.7	21.6	17.2	19.5	20.3	23.0
other EU countries <sup>2)</sup>	27.9	30.8	29.5	30.6	34.2	31.1	34.4	27.4
<b>total</b>	<b>257.3</b>	<b>264.4</b>	<b>285.6</b>	<b>287.2</b>	<b>292.6</b>	<b>300.8</b>	<b>335.1</b>	<b>275.3</b>

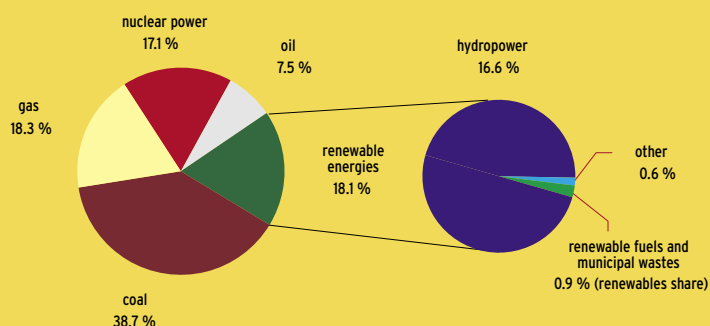
<sup>1)</sup> estimate

<sup>2)</sup> generation each < 15 TWh/a

Source: Energy Information Administration (EIA)

At present, global utilisation of renewable energies is largely still based on classic forms of use: traditional heat provision from wood and electricity generation from hydropower. Global electricity generation breaks down as follows (2001): coal 38.7 %, gas 18.3 %, renewable energies 18.1 %, nuclear power 17.1 %, oil 7.5 %. Electricity generation from renewables is thus dominated by hydropower, which alone generates 16.6 % of total electricity generation worldwide.

**Electricity generation from renewable energies 2001 (worldwide)**



# INTERNATIONAL CONFERENCE FOR RENEWABLE ENERGIES - RENEWABLES 2004



Internationale Konferenz  
für Erneuerbare Energien, Bonn  
International Conference  
for Renewable Energies, Bonn

The International Conference for Renewable Energies, *renewables 2004*, organised by the Federal Government, will take place from 1 to 4 June 2004 in Bonn. Chancellor Gerhard Schröder issued an invitation to the event during the September 2002

World Summit on Sustainable Development in Johannesburg. Its aim is to give further impetus to the dynamic process initiated in Johannesburg for the global increased use of renewable energies.

*Renewables 2004* will adopt, on a voluntary basis and in a process involving individual governments, national and regional goals and timetables for the increased use of renewable energies.

An international action plan and a follow-up process will be adopted to act as an important policy guideline and positive signal to investors.

Important topics will be the various advantages of the utilisation of renewables and their potential, strengthening financial support, the improvement of political framework conditions, research and development as well as education and training in the field of renewable energies. As preparation for *renewables 2004*, the Federal Government convened a National Advisory Committee and an International Steering Committee with members from government and non-government institutions, which has met several times prior to the Conference. Moreover, a number of regional preparatory meetings have taken place i.a. in Latin America (Brazil), Africa (Kenya), Europe (Germany, Berlin), Asia (Thailand) and in the Arab region (Yemen).

Statistics on renewable energies are from the brochure "Erneuerbare Energien in Zahlen - nationale und internationale Entwicklung" in the BMU environmental policy series, and from other BMU publications. These contain relevant lists of sources. Publications can be ordered from the BMU or downloaded from the websites [www.bmu.de](http://www.bmu.de) or [www.erneuerbare-energien.de](http://www.erneuerbare-energien.de). Some data published here are only provisional. Figures may deviate from those published previously, pending publication of final data.

**Contact:**

**Federal Ministry for the Environment, Nature Conservation and Nuclear Safety**

**Public Relations Division**

**D - 11055 Berlin**

**Fax: +49 (1888) 3 05 - 20 44**

**Internet: [www.bmu.de](http://www.bmu.de)**

**E-mail: [service@bmu.bund.de](mailto:service@bmu.bund.de)**

**This brochure is part of the public relations work of the German Federal Government.**

**It is distributed free of charge and is not intended for sale.**

**Printed on 100 % recycled paper.**

