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**INTERNATIONAL ENERGY AGENCY
AGENCE INTERNATIONALE DE L'ENERGIE**



RENEWABLES INFORMATION 2002



OECD 

with 2000 data



FOREWORD

Support for increasing renewable energy's role in electricity generation has never been greater. There is growing acknowledgement of the potential for renewables to contribute to economic benefits from greater energy sector diversification, as well as the benefits of environmentally clean generation. To accelerate deployment, many OECD (and non-OECD countries) have put in place a range of policies to remove barriers and reduce costs, many of which are based on numerical targets. However, to understand by how much generation is increasing, it is first necessary to understand the current level of the market, and trends over recent years. Energy statistics are at the heart of these questions.

Renewables Information 2002 is the first comprehensive report on the level of renewable markets in OECD countries. These statistics have been brought together from diverse sources, and respond to the growing need for accurate data on how renewable energy markets are developing in response to policy supports. In producing the report, many gaps and deficiencies in previous compilations have been addressed. However, several obstacles remain to providing a full set of statistics. Future editions of the report will address these remaining inadequacies. Nevertheless, the report provides the best data so far available on renewable energy markets, and an important picture of the trends.

Different bodies use different definitions of renewable energy. The Renewable Energy Working Party (REWP) of the International Energy Agency set down the following broad definition:

“Renewable Energy is energy that is derived from natural processes that are replenished constantly. In its various forms, it derives directly or indirectly from the sun, or from heat generated deep within the earth. Included in the definition is energy generated from solar, wind, biomass, geothermal, hydropower and ocean resources, and biofuels and hydrogen derived from renewable resources.”

However, other agencies suggest different definitions, and may include or exclude specific renewables technologies, based on their particular situation. For example, large hydro, geothermal and municipal waste are sometimes not included in the definition of renewables, while peat is sometimes included. At the same time, some studies do not include non-commercial biomass in developing countries, while others do. For the purposes of this study, the statistics collected include large (and small) hydro and geothermal, but not peat. Non-commercial biomass is included in our definition, but data are not always complete, thus leading to possible underestimations.

Another on-going issue concerns the process of collecting the data. In the past, records have been kept by a variety of bodies, but no single agency has attempted to bring them all together. Four years ago, recognising the need for a complete and coherent set of renewable energy statistics, the International Energy Agency (IEA), the Statistical Division of the Economic Commission for Europe of the United Nations, and Eurostat, the Statistical Office of the European Commission, combined their effort to produce a uniform questionnaire. Following extensive consultations, this Renewables and Waste Questionnaire was first completed by national bodies in the year 2000. After resolving some expected bedding-down issues in close co-ordination with Eurostat for European Union member countries, the IEA is now publishing the data from the second year of the questionnaire as a complete single volume.

The collection of the data presents national governments with some unique challenges. Renewable energy systems tend to be smaller than conventional systems, and harder to track. Operators tend to be more diverse and a much larger population. Many systems are connected to the grid at the distribution utility level, rather than the transmission level, and so do not require interconnection permits. National governments are now seeking to improve data collection methods to reflect the particular nature of renewable energies.

For the moment, therefore, this report is work-in-progress. As can be seen from some of the historic information, more detail is provided for the most recent years. There remain areas that will undoubtedly be re-visited in the future, as information from additional sources is brought in. For example, the focus of this report is on grid-connected renewable energy data with off-grid renewable production not included. Such areas will be incorporated in the future as renewable energy technologies and markets mature, and as our data collection methods improve.

This publication, therefore, represents the IEA's first unique grouping of renewable energy statistics. It has been produced to better inform the many stakeholders involved in the energy sector, and to assist policy makers to decide on strategies and measures to guide renewable energy markets.

This report is published under my responsibility as Executive Director of the IEA and does not necessarily reflect the views of IEA member countries.

Robert Priddle
Executive Director

TABLE OF CONTENTS

| | |
|---------------------------|------------|
| INTRODUCTION | vii |
|---------------------------|------------|

DEVELOPMENT OF RENEWABLES AND WASTE SOURCES IN THE OECD

| | |
|-------------------------------------|---|
| Primary Energy Supply | 1 |
| Electricity Production | 2 |
| Installed Generating Capacity | 5 |

PRINCIPLES AND DEFINITIONS

| | |
|------------------------------------|----|
| I. General Notes | 7 |
| II. Structure of the Book | 8 |
| III. Notes on Energy Sources | 9 |
| IV. Country Notes | 11 |
| V. Geographical Coverage | 14 |
| VI. Conversions | 15 |

OECD RENEWABLES AND WASTE GRAPHS AND DATA

| | |
|---|-----|
| Share of TPES from Renewables Sources, by Country | 17 |
| Share of Electricity Production from Renewables Sources, by Country | 18 |
| Share of Electricity Production from Renewables Sources Excluding Hydro, by Country | 19 |
| Graphs - Electricity Production by Renewable Energy Source (GWh) | 20 |
| OECD Total | 26 |
| OECD North America | 30 |
| OECD/IEA Pacific | 34 |
| OECD Europe | 38 |
| IEA Total | 42 |
| IEA North America | 46 |
| IEA Europe | 50 |
| European Union | 54 |
| Australia | 58 |
| Austria | 61 |
| Belgium | 65 |
| Canada | 69 |
| Czech Republic | 72 |
| Denmark | 76 |
| Finland | 80 |
| France | 84 |
| Germany | 88 |
| Greece | 92 |
| Hungary | 95 |
| Iceland | 99 |
| Ireland | 103 |
| Italy | 106 |

| | |
|-----------------------|-----|
| Japan | 109 |
| Korea | 113 |
| Luxembourg | 117 |
| Mexico..... | 121 |
| Netherlands..... | 124 |
| New Zealand..... | 128 |
| Norway | 131 |
| Poland..... | 134 |
| Portugal..... | 139 |
| Slovak Republic | 142 |
| Spain..... | 145 |
| Sweden | 149 |
| Switzerland | 153 |
| Turkey | 157 |
| United Kingdom | 160 |
| United States | 163 |

Units and Technical Abbreviations

| | | |
|-------|---|--|
| Mega | : | = M = 10 ⁶ |
| Giga | : | = G = 10 ⁹ |
| Tera | : | = T = 10 ¹² |
| Peta | : | = P = 10 ¹⁵ |
| GW | : | Gigawatt |
| GWh | : | Gigawatt hour |
| 1 GWh | : | = 3.6 Terajoules |
| MW | : | Megawatt (electric) |
| MWh | : | Megawatt hour |
| kW | : | kilowatt |
| kWh | : | kilowatt hour |
| t | : | metric ton = tonne |
| .. | : | not available |
| e | : | estimated data |
| c | : | confidential data |
| x | : | not applicable |
| RES | : | Renewable Energy Sources |
| 1 toe | : | tonne of oil equivalent = 41.868 GJ = 10 ⁷ kCal |
| TJ | : | Terajoule (10 ¹² joules) |
| TPES | : | Total Primary Energy Supply |



INTRODUCTION

The IEA *Renewables Information 2002* is a new publication that will be produced annually to provide reliable statistics on renewables energy in OECD Member countries to a global audience of energy experts and organisations in the field. It is a comprehensive volume of basic statistics compiled by the IEA on electricity and heat production, supply and final consumption, and installed capacity of renewables and waste sources.

The data shown in this publication are mainly based on information provided in the Renewables and Waste Questionnaire. This questionnaire is completed by the national administrations of the OECD member countries and provides such figures as electricity and heat production, primary supply, transformation sector, end-consumption, and installed capacity of energy from renewable sources. The Renewables and Waste Questionnaire was implemented in August 2000 and is a joint questionnaire between the IEA, Eurostat, the statistical body of the EU, and the Statistical Division of the Economic Commission for Europe of the United Nations.

In general, the dispersion of renewables and waste production, specifically that of the off-grid production (such as domestic solar collectors), creates transparency and measurement problems for national administrations. Thus, the nature and structure of the renewable energy market impedes renewables statistics from achieving the same level of data quality and reliability as those of the traditional fossil fuels, which are mainly produced in grid-connected plants.

In order to improve the quality of renewables and waste statistics and to ensure data compatibility, the IEA initiated a project in 2002 with the objective to compare and harmonise historical IEA data with those of national administrations and/or Eurostat,

where applicable. Due to the unavailability or inaccuracy of renewables and waste statistics before 1990, emphasis was put on the reconciliation of data after 1990. Thus, 1990 is the first year reported in this publication. However, discrepancies between the different data-collecting bodies remain in the early years of our analysis because renewable energy classification systems were not then well established and co-ordinated between the member countries. Where possible, these discrepancies have been resolved and the following pages incorporate the results of the reconciliation process. Deviations from national statistics or Eurostat remain in places where different definitions of renewable energy are applied or where our analysis suggested that IEA data more accurately reflect reality.

Statistics in this publication should be used with caution, since definitional issues and regional deficiencies prevent us from providing a full set of homogenous data. Breaks in time series occur especially in the first years of our analysis. Country notes and individual country data should be consulted when using regional aggregates. Our analysis suggests that data are likely to be more accurate for electricity and heat generation, as well as capacity, than for supply and final consumption of renewable and waste energy.

This publication includes data for the Slovak Republic, which joined the OECD on 14 December 2000. There may be some breaks in the series until the national administration has had a chance to review the time series currently included in the IEA databases.

The OECD has 30 member countries. Energy data for all member countries are presented in this publication and included in all OECD totals or regional aggregates.

The IEA has 26 member countries; Iceland, Mexico, Poland and the Slovak Republic are members of the OECD but not of the IEA.

Footnotes on individual tables and the notes in *Principles and Definitions* provide more information on Secretariat estimates and IEA statistical methods and procedures. All units are metric, unless specified.

All tables are available on the Internet in the IEA web site (<http://www.iea.org>).

Further information on reporting methodologies is also available on the IEA web site.

Energy data on OECD are collected from OECD member countries by the team in the Energy Statistics Division (ESD) of the IEA Secretariat,

headed by Mr. Jean-Yves Garnier. OECD renewables and waste statistics in ESD are the responsibility of Ms. Christine Kellner and Mr. Marco Baroni. Mr. Lawrence Metzroth has overall editorial responsibility. Secretarial support from Mrs. Sharon Michel and Ms. Susan Stolarow is also gratefully acknowledged.

Also in the IEA Secretariat, thanks are due to Mr. Mark Hammonds and Mr. Rick Sellers (IEA Renewables Energy Unit) for their contribution to the publication and their useful suggestions and comments.

Thanks are due to Mr. Nikolas Roubanis, in Eurostat, for his contribution to the data on European Union member countries.

This is the inaugural publication of *Renewables Information*, and it is provided free of charge to reach an audience as wide as possible. The IEA Energy Statistics Division recognises this first issue as an effort to refine sometimes inconsistent and preliminary data, and evolving definitions and methodology into the same world standard statistics reports that are issued by the division on other energy forms. In that spirit enquiries, comments and suggestions are welcome and should be addressed to:

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DEVELOPMENT OF RENEWABLE AND WASTE SOURCES IN THE OECD

Primary Energy Supply

Summary

In 2000, renewable and waste sources accounted for 13.8% of World Total Primary Energy Supply (TPES)¹. Combustible renewables and waste (97% of which is biomass) represented almost 80% of total renewable energy, followed by hydro (16.7%). The share of the OECD member countries in global renewables supply was approximately 24%, but widely varied among the different renewables categories. For instance, OECD only accounted for 16% of global combustible renewables and waste, while hydro accounted for 50% and “other” (which includes geothermal, wind and solar energy) for 70%.

In the OECD, TPES from renewable sources (excluding industrial waste, non-renewable municipal waste, non-specified combustible renewables and waste, and the amount of electricity generated from hydro pumped storage) increased from 266.6 Mtoe in 1990 to 317.7 Mtoe in 2000, yielding an average annual growth of 1.8%. The renewables' share of total TPES increased from 5.9% to 6.0% over the same period. By contrast with electricity generation, the share of renewable energy sources to TPES has increased in the past ten years, which means that primary renewable sources have been able to keep pace with the growth of traditional energy sources in the OECD. This suggests that most of the growth of renewable energy

consumption has taken place in the final consumption sector (industry, transport and other sectors) rather than in the transformation sector. However, one should add that although the share of total renewable electricity production has experienced an annual decrease of 0.9% between 1990 to 2000, other renewables than hydro have experienced a 2.3% increase of their share over the same period.

The largest proportion of primary renewable energy supply in the OECD is solid biomass (see definition on page 10), representing 45.4% of the total. The major solid biomass producing country is the United States, with a 41.8% share. Hydro plants represent the second largest source, producing 35.6% of renewables primary supply. The largest producer is Canada, followed by the United States and Norway. Solid biomass and hydropower combined represent 81.0% of the total renewable energy supply. With a 9.3% share, geothermal energy is the third largest renewable source. The major producer is again the United States, with a 44.4% share. The second and third largest producers are Mexico and Italy. The remaining 10% of primary renewable energy supply are produced from renewable municipal solid waste, gas from biomass, liquid biomass, solar thermal, wind and solar photovoltaics (in the respective order). The largest producer of renewable municipal solid waste is the United States, with a 45.8% share. Other major producers are France, Korea and Germany. The United States is also the largest producer of energy from gas from biomass and liquid biomass. Solar thermal energy supply is mainly concentrated in the United States, Japan and Turkey. The largest windpower producers are Germany, the United States, Spain and Denmark (in

¹ See *Energy Balances of OECD Countries and Energy Balances of Non-OECD Countries*

the respective order). Solar photovoltaics production occurs in many countries, with Germany and Korea being the largest producers.

In 2000, the United States produced 34.7% of the total primary energy supply from renewable sources in the OECD, followed by Canada with a 13.2% share. However, the countries with the largest proportion of renewables supply to total energy supply were Iceland (72.6%), Norway (52.8%), Sweden (31.7%) and New Zealand (31.3%).

Electricity Production

Summary

Between 1990 and 2000, OECD gross electricity production from renewable sources (excluding industrial waste, non-renewable municipal waste, non-specified combustible renewables and waste, and electricity production from hydro pumped storage) increased from 1 291.8 TWh to 1 505.7 TWh, indicating an average annual growth rate of 1.5%. However, while in 1990 electricity from renewable sources accounted for 17.1% of the overall electricity production in the OECD, this share declined to 15.6% in 2000.

The decrease of the share of electricity generated from renewable sources is related to two factors. Firstly, many countries have not been able to attain the same growth rate for renewable electricity as for electricity produced from traditional fossil fuels. This applies particularly to emerging economies with very high growth rates of electricity consumption, such as Korea, Mexico or Turkey, where production more than doubled between 1990 and 2000. In general, rising demand for electricity is met by increasing electricity production from traditional fossil fuels rather than renewable sources, due to the costs and availability of renewables in most OECD countries. Secondly, stagnation of development of hydropower, which accounts for over 85% of renewable electricity generation, has played a major role in the decline of the share of electricity production from renewable sources. Because hydroelectric capacity is mature in most OECD member states, it is difficult to locate suitable, environmentally acceptable sites to expand this energy form. As a result, hydroelectric capacity expansion has been stagnant for the past decade,

rather than growing to meet electricity demand. Also, hydropower is dependent on climatic conditions, and lower precipitation levels in some major hydropower producing countries, like the United States and Japan, have caused a decline of the total OECD hydroelectric production in the late 1990's.

The rate of renewable electricity production to total electricity production declined in both the OECD Pacific and OECD North America, due to the aforementioned reasons. In OECD Europe, on the other hand, the contribution of renewable sources to total electricity production increased from 17.7% to 19.1% between 1990 and 2000. OECD Europe is now producing 40.5% of the OECD renewable electricity generation, up from 36% in 1990. This increase is the result of the implementation of strong supporting policies in European Union member countries in the past few years. Policy instruments like feed-in tariffs and tax incentives make electricity generation with renewable sources competitive in many European Union member countries today.

2.0% of total OECD electricity was produced with renewable sources other than hydroelectricity, up from 1.6% in 1990.

A more detailed analysis of the individual renewable and waste products and their development in the electricity market follows.

Hydro²

Even though hydropower is by far the largest source of renewable electricity generation and represents the third largest provider of total electricity production, little new growth is projected for this sector. As mentioned above, hydropower has reached its potential capacity limit in most OECD countries. Between 1990 and 2000, electricity generated from hydro plants (excluding generation from pumped storage plants) increased from 1 173.1 TWh to 1 315.4 TWh in the OECD. However, while in 1990, 90.8% of electricity produced from renewable sources came from hydro

² Please note that hydro electricity generation is expressed in TWh due to its magnitude. The unit used for electricity generation from all other renewable products is GWh.

plants, this share decreased to 87.4% in 2000 due to the rapid growth of generation from other renewable sources and the stagnant development of hydropower capacity. The share of hydropower in the overall electricity production declined from 15.6% to 13.7% during this time span. In 2000, the largest hydropower generating countries (net of pumped storage) were Canada (358.3 TWh), the United States (248.4 TWh) and Norway (141.6 TWh).

Solid Biomass

Electricity generation from solid biomass grew from 64 789 GWh to 83 244 GWh, yielding a 2.5% average annual growth in the OECD. The second largest renewable electricity source after hydropower, solid biomass accounted for 5.5% of the renewable electricity generation in 2000. 50% of the electricity from solid biomass is generated in the United States (41 616 GWh), where it makes up 12.5% of renewable electricity production. The second largest producer of electricity from solid biomass is Japan (11 309 GWh), generating 10.5% of the renewable electricity. The third largest producer in the OECD, and the largest producer in OECD Europe, is Finland (8 476 GWh), where solid biomass has, with 36.4%, the highest share of renewable electricity production.

Geothermal

Like hydropower, geothermal electricity production has not experienced significant growth between 1990 to 2000 in the OECD. It achieved an average annual growth rate of 1.2%, increasing from 29 189 GWh to 32 878 GWh. Geothermal energy is the third largest contributor to renewable electricity production. Geothermal electricity production actually declined by 0.5% per annum in OECD North America, although the region remains the largest producer, with 62.6% of the share in 2000. The decrease in OECD North America is due to a decline in geothermal electricity generation in the United States, the largest individual producer of geothermal electricity. The United States produced 14 678 GWh in 2000 (down from 16 525 GWh in 1990), contributing 44.6% of the OECD production. The second largest producer is Mexico, reporting 5 901 GWh in 2000. With an output of 4 705 GWh,

Italy represents the third largest producer in the world and the largest producer in OECD Europe. The highest growth rate was experienced in Iceland, where geothermal electricity generation increased by 16.7% annually from 283 GWh to 1 323 GWh. Lacklustre growth is projected for the next few years because there are few development schemes in countries with geothermal potential.

Renewable Municipal Solid Waste

Renewable municipal solid waste represented 2.1% of the renewable electricity generation in 2000. It is thus the fourth biggest source of renewable electricity. However, it should be noted at this point that data on non-renewable and renewable municipal solid waste have been collected as distinct products only since 1999. Before this, all municipal solid waste is classified as renewable (unless revisions were submitted by individual countries). After 1999, data are often estimates rather than observations because the energy classification systems of many countries do not permit the exact separation of renewable and non-renewable municipal solid waste. IEA analysis suggests that a major part of the production reported under renewable municipal solid waste in fact belongs in non-renewable municipal solid waste.

31 554 GWh of electricity were produced from renewable solid municipal waste in the OECD in 2000. By far the biggest producer of electricity from renewable solid municipal waste is the United States, generating 15 653 GWh in 2000 (49.6% of OECD production). The second largest producer is Japan, with a production of 5 209 GWh. With 2 028 GWh, Germany represents the third largest producer. The remaining electricity production from renewable municipal solid waste is spread among smaller producers in OECD Europe. Denmark has experienced the highest growth rate, increasing its production with an annual growth rate of 35.8% from 47 GWh in 1990 to 1 000 GWh in 2000.

Wind

Between 1990 and 2000, windpower increased from 3 838 GWh to 28 897 GWh, achieving an average annual growth of 22.4%. This represented the second largest growth rate, after solar photovoltaics.

In 2000, wind turbines provided 1.9% of the renewable electricity consumed in the OECD. Most of the growth occurred in the European Union, where wind energy is heavily subsidised by governments. As a consequence, growth in absolute terms was largest in Germany, Spain and Denmark (adding 9 281, 4 941 and 3 831 GWh of production, respectively). The United States experienced the largest increase outside the European Union, increasing its production by 2 579 GWh. The United States, having installed most of its wind capacity before 1990, represents the second largest producer after Germany.

Gas from Biomass³

Please note that complete biogas statistics are not available until 1992. Electricity production from gas from biomass grew from an estimated 5 000 GWh in 1990 to 12 048 GWh in 2000. While in the early 1990's, nearly the entire amount of biogas electricity was produced in the United States, the largest proportion of this production has moved to OECD Europe, which today contributes 54.5% of biogas electricity. While OECD Europe, as a whole, is the largest production region, most biogas production is in the European Union member countries. Further, the driving force in the European Union is the United Kingdom, which provided 2 556 GWh of biogas electricity in 2000 – the second largest amount in the OECD. While the United States, with 4 984 GWh, remains the largest individual producer, its growth of 6.4% per annum has been much slower than that of many European Union countries. Germany has an average annual growth rate of 23.4% (reaching 1 683 GWh in 2000), Italy of 60.3% (566 GWh) and France of 14.4% (346 GWh). Major growth is expected to take place in the European member countries in the near future.

Solar Photovoltaics

Among all renewable products, solar photovoltaics experienced the largest growth rate. While being small in absolute terms, it increased from 17 GWh in 1990 to 215 GWh in 2000, achieving a 28.9%

growth rate. Growth was strongest in the European Union countries. Germany, with its high feed-in tariffs for solar photovoltaic electricity generation, achieved the highest average annual growth rate of 50.6% (increasing production from 1 GWh in 1990 to 60 GWh in 2000). Outside the European Union, Korea experienced strong growth, raising its production from 15 GWh in 1991 (1990 data are not available) to 62 GWh in 2000. However, since solar photovoltaics output is very difficult to capture due to its frequent off-grid use, this information should be used with caution. Information on solar collectors surface (Table 2) provides more reliable statistics on this product, especially for the European Union countries.

Solar Thermal

Solar thermal electricity production increased from 664 GWh in 1990 to 913 GWh in 2000, demonstrating an average annual growth rate of 3.2%. Production takes place almost exclusively in the United States, where 880 GWh were generated in 2000 (96.4% of the OECD total). Besides the United States, Australia and Canada have reported minor amounts of solar thermal electricity production.

Tide/Wave/Ocean

605 GWh of electricity were generated in 2000 from tide, wave or ocean motion. An average annual growth rate of 0.1% from 1990 to 2000 indicates that not much growth is taking place in this segment. The main producer of electricity production from water motion is France, generating 573 GWh in 2000 (with a plant capturing electricity from tidal movements). The second, much smaller, contributor is Canada, producing 32 GWh.

Non-Renewable Municipal Solid Wastes and Industrial Waste

Industrial waste and non-renewable municipal solid waste represent a controversial issue in the renewable energy context. While some of the OECD member countries acknowledge these products as renewable energy sources and include them in their national statistics, many countries exclude them on the grounds that they are not biodegradable. Based

³ Due to unavailability of data, all growth rates in this paragraph were calculated taking 1992 as base year instead of 1990.

on IEA (and European Union) methodology, industrial waste and non-renewable municipal solid waste are excluded from the definition of renewable energy sources. However, these data are collected from our member countries and included in this publication in order to account for the full range of statistics collected in the Annual Renewables and Waste Questionnaire. As mentioned under *Renewable Municipal Solid Waste*, a division into renewable and non-renewable municipal solid waste exists only from 1999 and is not very accurate. Similarly, industrial waste statistics do not reach the same quality level as those of other products, because data collection systems were not in place in many countries in the early 1990's. As a consequence, data and analysis of the development of electricity from non-renewable waste may not reflect the entire situation and should be used with caution.

The data strongly suggest that both industrial waste and non-renewable solid waste have experienced an increase between 1990 and 2000. In 2000, industrial waste and non-renewable municipal solid waste generated 1.2% of the OECD renewable electricity (here production from non-renewable waste is exceptionally included in the definition of renewable electricity). Most of the 13 589 GWh of industrial waste electricity production takes place in two countries. The largest provider is the United States with 6 552 GWh (48.2% of total), followed by Germany with 3 946 GWh (29.0% of total). The Netherlands represents the third largest producer, with 935 GWh in 2000. The OECD Pacific does not report any production of electricity from industrial waste. In 2000, 4 826 GWh of electricity were generated from non-renewable municipal solid

waste. Almost the entire amount was produced by the following four countries: Germany (1 660 GWh), Netherlands (1 398 GWh), Switzerland (717 GWh) and the United Kingdom (409 GWh). However, please note that this information might be distorted because many countries, including the main municipal solid waste producers, the United States and Japan, do not report renewable and non-renewable municipal solid waste as distinct products.

Installed Generating Capacity

In 2000, the OECD countries reported 381.3 GW of installed capacity fuelled by renewable sources (excluding hydro pumped storage and industrial waste, but including non-renewable municipal solid waste capacity). In 2000, around 18-19% of the reported total installed capacity in the OECD was based on renewable energy sources. 332.9 GW of plants were hydroelectric (excluding pumped storage), 13.6 GW solid biomass, 16.1 GW wind, 6.8 GW municipal solid waste, 5.6 GW geothermal, 2.6 GW gas from biomass, 0.4 GW solar photovoltaics, 0.4 GW solar thermal, and 0.3 GW tide, wave, and ocean power. 2.7 GW of capacity was reported as non-specified combustible renewables and wastes. 1.7 GW of plants were fired by industrial waste. Pumped storage capacity represented 82.5 GW. As the developments of production for the different renewable energy sources in *Electricity Production* suggest, growth of capacity has been strongest in the wind and solar power sectors.



PRINCIPLES AND DEFINITIONS

I General Notes

This publication is, as already mentioned, the first effort of the Energy Statistics Division of the IEA to provide a comprehensive set of statistics on renewable and waste products. Various data sets on renewables and waste have already been published in other IEA publications, but never with such detail and with such a comprehensive structure.

It is important to highlight once again that the published time series often have breaks due to lack of information (especially in the early years of the series). There are also some difficulties in the collection process of data for renewables from some OECD member countries.

One major problem is represented by the breakdown between renewable municipal solid waste and non-renewable municipal solid waste, which is available for most countries only for the last two years of the time series (i.e. 1999 and 2000).

Before 1999, the IEA did not ask for this distinction and thus data were rarely collected separately. The breakdown into the two sub-products is nonetheless important because most countries include the renewable (biodegradable) part of municipal solid waste in renewables while they exclude the other part. Furthermore, the non-renewable component is counted when calculating CO₂-emissions.

Increased attention to the separate renewable and non-renewable collection of municipal solid waste and to recycling also makes it difficult to estimate the breakdown throughout the time series since the relative percentage can vary significantly from one year to the next.

This publication is the result of several years of work on the collection and verification of the data and of harmonisation between the IEA and the Eurostat databases, national publications and other ad-hoc studies.

This harmonisation process was completed during the six months preceding the release of this publication and therefore includes new data and revisions that are not included in other IEA publications for 2000. This leads to differences from the TPES as it was calculated in June 2002 in the *'Energy Balances of OECD Countries'* publication.

In Table 1 of *Renewables Information 2002*, the new data are presented in the second row (in Mtoe) and in the third row (as percentage of the total). At the bottom of the table there are also two memo items, with the renewable share of TPES as it was calculated in June 2002 for reference.

It should be noted that the overall differences are not significant for most countries, but they are significant in the detail of each time series, each type of plant and each product.

Special attention should also be given to the percentage of renewables over the total TPES in countries where net exports of electricity are large, and in particular if they represent a significant percentage of the total TPES. In these cases, the high net exports of electricity can heavily influence the percentage of renewables TPES, especially if the electricity exported has been produced mostly from renewable sources (e.g. from hydro).

The first three tables that are presented in this publication are a summary of the renewables' share of TPES and the renewables' share of electricity

production, first including and then excluding hydro from the total renewable products. The large differences among countries and differences between the tables for the same country should be noted. These tables assume importance when targets on renewables' share have to be decided, although the list of elements that are considered as renewables can vary from country to country.

According to IEA definitions, the renewable products are: hydro (with no differentiation of large, medium or small), geothermal, solar photovoltaics, solar thermal, tide, wave, ocean, wind, solid biomass, gases from biomass, liquid biofuels, and renewable municipal solid waste. Total renewables does not include industrial waste, non-renewable municipal solid waste, non-specified combustible renewables and waste, waste heat, net heat 'created' due to heat pumps, and the amount of electricity generated with hydro pumped storage.

Electricity from fuel cells using hydrogen from renewable sources as well as non-renewables fuel cells is not included in this publication due to lack of reliable information.

The lack of reliability of statistics prevents forming a complete picture of renewable energy supply and consumption.

Off-grids renewables and renewable sources connected to the local distribution networks are often omitted from national data collection schemes.

The evolution of new technologies exploiting renewable sources is also not covered here. These will be some of the important features for future improvements of IEA's renewables publications.

II Structure of the Book

Renewables Information 2002 contains detailed statistical information on renewable and waste products for the 30 member countries of the OECD and for regional aggregates (OECD Total, IEA Total, OECD North America, IEA North America, OECD Europe, IEA Europe, OECD/IEA Pacific and European Union).

The tables of regional aggregates are presented before the country tables, which are set out in alphabetical order.

The book consists of:

- three summary tables showing percentage of renewables in TPES and in electricity generation for all OECD countries (both including and excluding hydro from the total renewables),
- a set of graphs showing the electricity production by type of renewable source for each OECD country,
- a set of five tables for each OECD member country and for each of the eight regional aggregates.

The list of the five tables is described below. It should be noted that Table 4 is not available for all countries.

Table 1: Energy Supply, GDP and Population.

Table 2: Net Generating Capacity of Renewables and Waste Products

Table 3: Gross Electricity Generation from Renewable Sources

Table 4: Gross Heat Production from Renewable Sources

Table 5: Primary Energy Supply, Transformation and Final Consumption of Renewable Products

Table 1 provides a full set of main indicators for each OECD member country such as TPES, percentage of renewables, GDP, population, electricity generation and the share produced from renewables products.

Table 2 shows a comprehensive status of net electrical capacity by type of fuel, as well as solar collectors surface.

Table 3 and Table 4 present respectively electricity and heat production from each of the renewable and waste sources as well as the breakdown according to the type of plant (electricity only, CHP or heat only plants).

In Table 5, a short balance for eight different products is shown. The products are: geothermal and solar thermal direct use, industrial waste, renewable and non-renewable municipal solid waste, solid biomass, gases from biomass and liquid biofuels. Due to the lack of reliable statistics for some of the sub-sectors, the balance consists only of

the following five flows: production, net imports, miscellaneous to balance, transformation sector and final energy consumption. In the case of geothermal and solar thermal, only heat directly used in the final consumption sector is shown. Transformation sector data for these products are not collected from the member countries but estimated based on IEA methodology.

III Notes on Energy Sources

A. Capacity

Net Maximum Capacity at Peak Period

The IEA has adopted UNIPEDA definitions 2.1.3.5 and 2.2.5.1 for Net Maximum Capacity at Peak Period.

Net maximum capacity is defined as the sum of net maximum capacities of all stations taken individually at a given period of operation. It is the maximum power assumed to be solely active power that can be supplied, continuously, with all plants running, at the point of outlet to the network. It is assumed that all equipment is in full working order, that the power produced can be disposed of without any restrictions and that optimum conditions prevail as regards primary sources (i.e. flow and head in the case of hydro plants; grades and quantity of fuel in hand and water supply, temperature and purity, in the case of combustible fuel-fired plants and assuming that the output and method of production in CHP plants are those which lend to maximum electricity production). The period of operation assumed for present purposes is continuous running; in practice 15 hours or more per day.

The capacity is *net* in the sense that it is the output capacity measured at the station busbars, i.e. after deducting the power consumed by station auxiliaries and losses in station transformers.

B. Electricity and Heat

Gross Electricity Production

Gross electricity production is measured at the terminals of all alternator sets in a station; it therefore includes the energy taken by station auxiliaries and losses in transformers that are considered integral parts of the station.

Hydro stations' production includes production from pumped storage plants unless stated differently.

Fuel consumption in combustible fuel-fired power plants are split into three types of plants (electricity, CHP and heat). These are defined as follows:

Types of Plants

Electricity Plants refers to plants, which are designed to produce electricity only.

Combined Heat and Power Plants (CHP) refers to plants, which are *designed* to produce both heat and electricity simultaneously. UNIPEDA refers to these as co-generation power stations. Where possible, fuel inputs and electricity/heat outputs are reported on a unit basis rather than on a plant basis.

Heat Plants refers to plants, which are designed to produce heat only.

Heat delivered from CHP or Heat plants may be used for process or space heating purposes in any sector of economic activity including the residential sector.

It should be noted that the reporting of data on fuel use and electricity and heat production according to plant type is normally conducted at the level of the *plant*, assuming that if a plant comprises at least one CHP *unit* then the entire plant is considered a CHP plant.

Gross Heat Production

Data collected on heat has been expanded to obtain more disaggregated data on inputs and outputs of 'combined heat and power plants' and on 'heat only plants'. Data on heat become available in different years for different countries and thus aggregated country data should be used with caution.

C. Supply, Transformation and Consumption

Primary Production

Production is the production of primary energy, i.e. combustible renewables and wastes, geothermal or solar thermal. Production is calculated after removal of impurities.

Net Imports

Net imports are the sum of total imports minus total exports.

Miscellaneous to Balance

Miscellaneous to balance includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Transformation Sector

The transformation sector comprises the conversion of primary forms of energy to secondary forms as well as further transformation processes.

Final Energy Consumption

Total final consumption (TFC) is the sum of consumption by the different end-use sectors (industry, transport and other).

D. Products***Hydro***

Hydro refers to potential and kinetic energy of water converted into electricity in hydroelectric plants. Hydro includes output from pumped storage plants.

Geothermal

Energy available as heat emitted from within the earth's crust, usually in the form of hot water or steam. It is used for electricity generation or directly as heat in its primary form.

Electricity Output: For electricity generation, unless the actual efficiency of the geothermal process is known, the quantity of geothermal energy input for electricity generation is inferred from the electricity production at geothermal plants assuming an average thermal efficiency of 10 per cent.

Primary Production/Consumption: Directly used as heat for district heating, agriculture or greenhouses.

Solar Photovoltaics (PV)

Solar radiation exploited for electricity generation by photovoltaic cells.

Note: Passive solar energy for direct heating, cooling or lighting of dwellings or other buildings is not included.

Solar Thermal

Solar radiation exploited for hot water production and/or electricity generation by flat plate collectors or solar thermal-electric plants.

Note: Passive solar energy for direct heating, cooling or lighting of dwellings or other buildings is not included.

Tide

Mechanical energy derived from tidal movement or wave motion and exploited for electricity generation.

Wind

Kinetic energy of wind exploited for electricity generation in wind turbines.

Industrial Waste

Industrial waste consists of solid and liquid products (e.g. tyres) combusted directly, usually in specialised plants, to produce heat and/or power and that are not reported in the category solid biomass.

Renewable Municipal Waste

Renewable municipal solid waste consists of the biodegradable part of municipal waste products that are combusted directly to produce heat and/or power and comprises wastes produced by the residential, commercial and public services sectors that are collected by local authorities for disposal in a central location. Hospital waste is included in this category.

Non-Renewable Municipal Waste

Non-renewable municipal solid waste consists of the non-biodegradable part of municipal waste products that are combusted directly to produce heat and/or power and comprises wastes produced by the residential, commercial and public services sectors that are collected by local authorities for disposal in a central location. Hospital waste is included in this category.

Solid Biomass

Biomass is defined as any plant matter used directly as fuel or converted into other forms before combustion. Included are wood, vegetal waste (including wood waste and crops used for energy production), animal materials/wastes, sulphite lyes, also known as "black liquor" (an alkaline spent liquor from the digesters in the production of sulphate or soda pulp during the manufacture of paper where the energy content derives from the lignin removed from the wood pulp) and other solid biomass.

Charcoal produced is also included here. Since charcoal is a secondary product, its treatment is slightly different than that of the other primary biomass. Production of charcoal (an output in the transformation process) is offset by the inputs of primary biomass into the charcoal production process. The losses from this process are included in the transformation sector. Other supply (e.g. trade and stock changes) as well as consumption are aggregated directly with the primary biomass. In some countries, only primary biomass is reported.

Gas from Biomass

Biogas is derived principally from the anaerobic fermentation of biomass and solid wastes and combusted to produce heat and/or power. Included in this category are landfill gas and sludge gas (sewage gas and gas from animal slurries) and other biogas.

Liquid Biomass

Liquid biomass includes bio-additives such as bioethanol, biodiesel, biomethanol, biodimethyl-ether and biooil.

Non-Specified Combustible Renewables and Wastes

Non-specified combustible renewables and wastes is associated with one or more of the following four products: industrial waste, municipal waste, solid biomass or biogas.

Energy sources are reported as non-specified when national administrations are not able to break down the data into the different products (especially in earlier years of the time series) or when data are confidential.

IV COUNTRY NOTES

Data for all countries and years shown in this publication have been subject to revisions during a reconciliation process of IEA data with Eurostat and/or national publications in 2002.

Australia

Biogas production at sewage treatment works is unavailable.

Capacity refers to net maximum capacity at 30 June.

The production of solar electricity is available from 1995.

Austria

Output of electricity from CHP plants is included in electricity plants prior to 1993.

Inputs to public electricity plants include inputs to public CHP plants prior to 1992.

Canada

For autoproducer plants that generate electricity with process steam produced from combustible renewables and waste, the energy required to produce the initial steam is not taken into account by the Canadian Administration. As a result, efficiencies for these plants are overstated.

Czech Republic

In 1999 and 2000, the Czech electricity market was restructured and various big enterprises were divided, sold and merged. This causes breaks in series for these years.

A new survey system causes breaks in final consumption in 1999.

Data from 1993 onwards have been officially submitted by the Czech Administration. This may lead to breaks in series between 1992 and 1993.

Electricity production in CHP plants is included in electricity plants prior to 1993.

Combustible renewables data are available as of 1992.

Denmark

Prior to 1994, the electricity and heat production are estimated based on fuel inputs data.

Finland

A new survey system and a reclassification of the data lead to breaks in series for most products and sectors between 1999 and 2000.

Data for biogas and industrial waste are available from 1996.

Prior to 1992, outputs from the use of combustible renewables and waste to generate electricity and/or

heat were included in coal and cannot be reported individually here.

Before 1993, all wood electricity production is allocated to CHP plants.

Germany

Electricity production in electricity plants includes production from CHP plants.

All heat production has been included in CHP plants.

Electricity generating capacity data for unified Germany is not available prior to 1991. This leads to a break in series between 1991 and 1992.

Greece

Data for biogas end-use are available from 1998.

New information on solid biomass end-use is available from 1996 and leads to breaks in series between 1995 and 1996.

Data on combustible renewables and waste are available from 1992.

Hungary

Geothermal direct use is available from 1999.

Data on municipal waste are available from 1998.

Iceland

In 1998, 60 MW of generating capacity was installed in the geothermal CHP plant at *Nesjavellir*. Since the plant was inoperable for four months, production of geothermal heat decreased compared to 1997. The extra electricity capacity caused electricity production from geothermal to almost double over the same period.

Heat production from municipal wastes is available from 1993.

Electricity production from geothermal sources in CHP plants is available from 1992.

Ireland

From 1993 to 1995, end-use consumption of gas from biomass is included in the transformation sector.

Data on solid biomass are available from 1992 and biogas from 1993.

Japan

Data refer to the fiscal year (April to March).

Heat production from geothermal and solar thermal sources in Japan is not reported by the Japanese Administration.

Production of electricity from solar PV may be underestimated as production from roof top devices may not be included. Production of electricity from wind may also be understated.

Direct use of geothermal and solar thermal become available in 1994 and 1998, respectively.

Until 1997, the electricity produced using TRT technology (Top pressure Recovery Turbines) was included with electricity generated from solid biomass. Now it is included with electricity generated from coal gases and as a consequence is no longer reflected in the data for recent years.

A change in methodology leads to a break in series between 1997 and 1998.

Korea

Data on renewable energy sources have been estimated by the Secretariat using information provided by the Korean Administration.

Heat data are available starting in 1991.

Pumped storage in electricity plants is available from 1991.

Luxembourg

Most of the hydro production shown for Luxembourg is from the Vianden pumped storage plant and is exported directly to Germany.

Data on solid biomass are available from 1992.

Electricity and Heat production from gas from biomass are available from 1999.

Mexico

Data on biogas are available from 1998.

Direct use of solar thermal and electricity production is available from 1998.

Starting in 1998, CRE (Comisión Reguladora de Energía) has published new data for electricity

generation by autoproducers. This may lead to breaks in the time series between 1997 and 1998.

Netherlands

All electricity produced from combustible renewable and wastes is included in CHP plants.

A new survey leads to breaks in series in the end-use consumption for solid biomass and biogas between 1998 and 1999.

Data for biogas are available starting in 1992.

New Zealand

Prior to 1994, data refer to fiscal year (April to March).

Norway

Heat production from biogas is available from 1995.

Data for industrial waste and gases from biomass and waste are available from 1991.

Poland

Because the Polish energy classification system is not yet well established, high statistical variations occur in certain consumption sectors.

Data for gases from biomass refer only to the gas from fermentation of biomass.

Before 2000, industrial wastes were used interchangeably with light fuel oil in some plants, which might result in breaks in the time series.

Some changes in the data collection process lead to breaks in series between 1996 and 1997.

The Polish Administration adopted new methodologies to estimate the production of heat sold in heat plants (1993) and in CHP plants (1995). This causes breaks in series between 1992 and 1993 and 1994 and 1995 for heat production and fuel inputs in these plants

Due to changes in data availability, there is a large increase in solid biomass between 1992 and 1993.

Portugal

Data on municipal wastes are available from 1999.

Data on direct use of geothermal heat are available from 1994.

Data on biogas are available from 1994.

Slovak Republic

Solid biomass supply and consumption data for 2000 are estimated by the Secretariat.

Electricity statistics have been estimated by the Secretariat. From 1993, IEA estimates are based on direct submissions from the Statistical Office of the Slovak Republic and the Power Research Institute (EGU) of Bratislava. This may lead to breaks in series between 1992 and 1993.

Spain

Data on direct use of solar and geothermal heat are available from 1994.

Sweden

Autoproducer inputs to waste-heat production that is sold are reported in the respective end-use sectors and not in the transformation sector.

Transformation data for industrial waste are not available prior to 1999.

Prior to 1992, electricity production from gas from biomass is included with solid biomass.

Data for gases from biomass and waste begin in 1992.

Switzerland

Geothermal direct use is overstated as it refers to heat production by geothermal heat pumps, which include inputs from electricity and/or gas in the transformation process.

Electricity production from pumped storage by autoproducers is available from 1996.

Solid biomass transformation data are available from 1993.

Turkey

The Turkish Administration surveys renewables and wastes used for power and heat intermittently. Due to this fact, some breaks may appear in the combustible renewables and waste series.

Data for the transformation sector are estimated for industrial waste, municipal solid waste and biogas for the years 1999 and 2000.

Electricity production from wind is available starting in 1998.

In 1995, the Turkish Administration reclassified autoproducer plants by type and source to be consistent with IEA definitions. This causes breaks between 1994 and 1995 for electricity production

Data on electricity generated from combustible renewables and waste are available from 1991.

United Kingdom

Before 1998, municipal solid waste, solid biomass and gas from biomass are classified as non-specified combustible renewables and waste due to confidentiality reasons (from 1992 to 1997) and unavailability of detailed data (before 1992). The corresponding inputs into the transformation sector are included in statistical difference for the respective products.

United States

Data for heat plants are available only as of 1999.

A reclassification of data from the industry sector to the transformation sector for industrial wastes and solid biomass leads to a break in series between 1998 and 1999.

There are breaks in series concerning the total production of electricity and heat in the United States. Comprehensive data on electricity and heat production and consumption in electricity, CHP and heat plants are only available from 1992.

Data for combustible renewables and waste are available from 1992.

V GEOGRAPHICAL COVERAGE

Denmark excludes Greenland and the Danish Faroes, except prior to 1990, where data on oil for Greenland were included with the Danish statistics. The Administration is planning to revise the series back to 1974 to exclude these amounts.

France includes Monaco and excludes overseas departments (Martinique, Guadeloupe, French Polynesia and Réunion).

Germany includes the new federal states of Germany from 1970 onwards.

Italy includes San Marino and the Vatican.

Japan includes Okinawa.

The **Netherlands** excludes Surinam and the Netherlands Antilles.

Portugal includes the Azores and Madeira.

Spain includes the Canary Islands.

United States includes Puerto Rico, Guam, the Virgin Islands and the Hawaiian Free Trade Zone.

The **European Union (EU)** includes Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and the United Kingdom.

The **International Energy Agency (IEA)** includes Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.

The **Organisation for Economic Co-Operation and Development (OECD)** includes Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, *Iceland*, Ireland, Italy, Japan, Korea, Luxembourg, *Mexico*, the Netherlands, New Zealand, Norway, *Poland*, Portugal, the *Slovak Republic*, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.

OECD North America includes Canada, *Mexico*, and the United States.

OECD Pacific includes Australia, Japan, Korea and New Zealand.

OECD Europe includes Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, *Iceland*, Ireland, Italy, Luxembourg, the Netherlands, Norway, *Poland*, Portugal, the *Slovak Republic*, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

IEA and regional totals include only IEA Member countries; non-IEA Members are shown in italics above.

VI CONVERSIONS

General Conversion Factors for Energy

| <i>To:</i> | TJ | Gcal | Mtoe | MBtu | GWh |
|--------------|-------------------------|-------------|------------------------|---------------------|------------------------|
| <i>From:</i> | multiply by: | | | | |
| TJ | 1 | 238.8 | 2.388×10^{-5} | 947.8 | 0.2778 |
| Gcal | 4.1868×10^{-3} | 1 | 10^{-7} | 3.968 | 1.163×10^{-3} |
| Mtoe | 4.1868×10^4 | 10^7 | 1 | 3.968×10^7 | 11630 |
| MBtu | 1.0551×10^{-3} | 0.252 | 2.52×10^{-8} | 1 | 2.931×10^{-4} |
| GWh | 3.6 | 860 | 8.6×10^{-5} | 3412 | 1 |

Conversion Factors for Mass

| <i>To:</i> | kg | T | lt | st | lb |
|------------------------|--------------|-----------------------|-----------------------|------------------------|-----------|
| <i>From:</i> | multiply by: | | | | |
| kilogramme (kg) | 1 | 0.001 | 9.84×10^{-4} | 1.102×10^{-3} | 2.2046 |
| tonne (t) | 1000 | 1 | 0.984 | 1.1023 | 2204.6 |
| long ton (lt) | 1016 | 1.016 | 1 | 1.120 | 2240.0 |
| short ton (st) | 907.2 | 0.9072 | 0.893 | 1 | 2000.0 |
| pound (lb) | 0.454 | 4.54×10^{-4} | 4.46×10^{-4} | 5.0×10^{-4} | 1 |

Conversion Factors for Volume

| <i>To:</i> | gal U.S. | gal U.K. | bbl | ft³ | l | m³ |
|------------------------------------|-----------------|-----------------|-------------|-----------------------|----------|----------------------|
| <i>From:</i> | multiply by: | | | | | |
| U.S. gallon (gal) | 1 | 0.8327 | 0.02381 | 0.1337 | 3.785 | 0.0038 |
| U.K. gallon (gal) | 1.201 | 1 | 0.02859 | 0.1605 | 4.546 | 0.0045 |
| Barrel (bbl) | 42.0 | 34.97 | 1 | 5.615 | 159.0 | 0.159 |
| Cubic foot (ft³) | 7.48 | 6.229 | 0.1781 | 1 | 28.3 | 0.0283 |
| Litre (l) | 0.2642 | 0.220 | 0.0063 | 0.0353 | 1 | 0.001 |
| Cubic metre (m³) | 264.2 | 220.0 | 6.289 | 35.3147 | 1000.0 | 1 |

Decimal Prefixes

| | | | |
|------------------|-----------|-------------------|-----------|
| 10 ¹ | deca (da) | 10 ⁻¹ | deci (d) |
| 10 ² | hecto (h) | 10 ⁻² | centi (c) |
| 10 ³ | kilo (k) | 10 ⁻³ | milli (m) |
| 10 ⁶ | mega (M) | 10 ⁻⁶ | micro (μ) |
| 10 ⁹ | giga (G) | 10 ⁻⁹ | nano (n) |
| 10 ¹² | tera (T) | 10 ⁻¹² | pico (p) |
| 10 ¹⁵ | peta (P) | 10 ⁻¹⁵ | femto (f) |
| 10 ¹⁸ | exa (E) | 10 ⁻¹⁸ | atto (a) |

SHARE OF TPES FROM RENEWABLES SOURCES*, BY COUNTRY

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---------------------------|------|------|------|------|------|------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| <i>OECD Total</i> | 5.9 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 0.1 |
| <i>OECD North America</i> | 6.6 | 6.6 | 6.7 | 6.6 | 6.4 | 6.4 | 6.2 | -0.5 |
| <i>OECD/IEA Pacific**</i> | 4.2 | 3.8 | 3.8 | 3.9 | 3.9 | 3.7 | 3.7 | -1.1 |
| <i>OECD Europe</i> | 5.7 | 6.2 | 6.0 | 6.3 | 6.4 | 6.4 | 6.7 | 1.6 |
| <i>IEA Total</i> | 5.9 | 5.9 | 5.9 | 5.9 | 5.9 | 5.9 | 5.8 | -0.0 |
| <i>IEA North America</i> | 6.3 | 6.3 | 6.5 | 6.3 | 6.2 | 6.2 | 6.0 | -0.5 |
| <i>IEA Europe</i> | 5.9 | 6.4 | 6.2 | 6.4 | 6.5 | 6.5 | 6.7 | 1.2 |
| <i>European Union</i> | 4.8 | 5.2 | 5.2 | 5.4 | 5.5 | 5.4 | 5.7 | 1.6 |
| Australia | 5.8 | 5.9 | 6.1 | 6.3 | 6.0 | 5.9 | 6.1 | 0.5 |
| Austria | 21.6 | 23.6 | 22.3 | 22.3 | 22.3 | 23.1 | 22.9 | 0.6 |
| Belgium | 1.3 | 1.3 | 1.2 | 1.2 | 1.2 | 1.3 | 0.9 | -3.5 |
| Canada | 16.1 | 16.7 | 17.0 | 16.7 | 16.3 | 16.9 | 16.8 | 0.4 |
| Czech Republic | 0.3 | 1.4 | 1.3 | 1.5 | 1.6 | 1.8 | 1.4 | 18.0 |
| Denmark | 8.8 | 7.8 | 6.9 | 7.8 | 8.3 | 9.0 | 10.1 | 1.4 |
| Finland | 19.1 | 21.0 | 19.2 | 20.4 | 21.7 | 21.8 | 23.5 | 2.1 |
| France | 6.9 | 7.5 | 7.1 | 6.8 | 6.7 | 6.9 | 6.8 | -0.2 |
| Germany | 1.6 | 1.9 | 1.9 | 2.2 | 2.4 | 2.3 | 2.6 | 4.9 |
| Greece | 5.1 | 5.6 | 5.7 | 5.4 | 5.0 | 5.3 | 5.0 | -0.1 |
| Hungary | 1.3 | 1.9 | 1.4 | 1.5 | 1.4 | 1.5 | 1.6 | 2.1 |
| Iceland | 62.5 | 64.4 | 61.8 | 63.6 | 66.3 | 71.7 | 72.6 | 1.5 |
| Ireland | 1.6 | 2.0 | 1.6 | 1.6 | 2.0 | 1.8 | 1.8 | 1.0 |
| Italy | 3.7 | 4.3 | 4.6 | 4.7 | 4.8 | 5.1 | 5.2 | 3.5 |
| Japan | 3.6 | 3.4 | 3.4 | 3.6 | 3.4 | 3.3 | 3.2 | -1.1 |
| Korea | 0.6 | 0.6 | 0.7 | 0.8 | 1.0 | 1.0 | 1.1 | 6.2 |
| Luxembourg | 0.9 | 1.4 | 1.1 | 1.4 | 1.5 | 1.3 | 1.5 | 6.0 |
| Mexico | 11.1 | 11.4 | 11.3 | 10.6 | 10.3 | 10.5 | 10.4 | -0.6 |
| Netherlands | 1.2 | 1.2 | 1.6 | 1.9 | 2.0 | 1.3 | 1.4 | 2.0 |
| New Zealand | 35.1 | 32.5 | 30.5 | 28.7 | 31.1 | 32.0 | 31.3 | -1.1 |
| Norway | 53.4 | 49.3 | 43.7 | 43.9 | 44.1 | 44.9 | 52.8 | -0.1 |
| Poland | 1.6 | 3.9 | 3.6 | 3.7 | 4.0 | 4.0 | 4.2 | 10.3 |
| Portugal | 15.7 | 13.0 | 15.9 | 14.6 | 13.4 | 10.9 | 12.7 | -2.1 |
| Slovak Republic | 1.5 | 2.8 | 2.5 | 2.4 | 2.5 | 2.6 | 2.8 | 6.4 |
| Spain | 6.9 | 5.4 | 7.0 | 6.3 | 6.1 | 5.2 | 5.6 | -2.0 |
| Sweden | 25.2 | 26.3 | 23.9 | 27.9 | 28.3 | 28.0 | 31.7 | 2.3 |
| Switzerland | 13.0 | 15.9 | 13.6 | 14.8 | 14.7 | 16.7 | 15.9 | 2.0 |
| Turkey | 17.9 | 17.1 | 16.3 | 15.4 | 15.4 | 14.5 | 12.5 | -3.5 |
| United Kingdom | 0.5 | 0.8 | 0.8 | 0.9 | 0.9 | 1.0 | 1.1 | 7.6 |
| United States | 5.2 | 5.2 | 5.3 | 5.2 | 5.1 | 5.0 | 4.8 | -0.9 |

* Renewable sources include hydro, geothermal, solar thermal, solar pv, tide, wind, renewable municipal solid waste, solid biomass and gases from biomass

** Geographic coverage of OECD and IEA Pacific is the same

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

SHARE OF ELECTRICITY PRODUCTION FROM RENEWABLES SOURCES, BY COUNTRY

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---------------------------|------|------|------|------|------|------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| <i>OECD Total</i> | 17.1 | 17.1 | 17.1 | 17.3 | 16.5 | 16.0 | 15.6 | -0.9 |
| <i>OECD North America</i> | 17.7 | 17.9 | 18.9 | 18.8 | 17.0 | 16.5 | 15.3 | -1.5 |
| <i>OECD/IEA Pacific**</i> | 13.5 | 11.1 | 10.6 | 10.9 | 10.6 | 10.0 | 9.8 | -3.2 |
| <i>OECD Europe</i> | 17.7 | 18.7 | 17.6 | 18.2 | 18.5 | 18.4 | 19.1 | 0.8 |
| <i>IEA Total</i> | 17.3 | 17.2 | 17.2 | 17.4 | 16.6 | 16.1 | 15.7 | -0.9 |
| <i>IEA North America</i> | 17.5 | 17.8 | 18.8 | 18.8 | 17.0 | 16.3 | 15.1 | -1.5 |
| <i>IEA Europe</i> | 18.6 | 19.4 | 18.2 | 18.9 | 19.2 | 19.0 | 19.8 | 0.6 |
| <i>European Union</i> | 13.1 | 14.0 | 13.6 | 14.1 | 14.3 | 14.1 | 14.9 | 1.2 |
| Australia | 9.6 | 9.6 | 9.5 | 9.8 | 8.7 | 8.8 | 8.9 | -0.7 |
| Austria | 66.0 | 70.5 | 66.9 | 67.8 | 69.6 | 71.1 | 72.3 | 0.9 |
| Belgium | 1.1 | 1.3 | 1.1 | 1.1 | 1.3 | 1.4 | 1.2 | 1.2 |
| Canada | 62.4 | 61.0 | 63.1 | 62.2 | 60.3 | 61.0 | 60.5 | -0.3 |
| Czech Republic | 2.3 | 4.0 | 3.5 | 3.4 | 3.1 | 3.7 | 3.1 | 3.1 |
| Denmark | 3.2 | 5.5 | 4.2 | 7.1 | 10.1 | 12.0 | 16.8 | 18.0 |
| Finland | 28.6 | 30.6 | 25.6 | 29.1 | 34.8 | 30.5 | 33.3 | 1.5 |
| France | 13.3 | 15.4 | 13.4 | 13.4 | 12.9 | 14.6 | 13.2 | -0.1 |
| Germany | 3.7 | 5.1 | 5.1 | 4.5 | 4.8 | 5.2 | 6.3 | 5.3 |
| Greece | 5.1 | 8.6 | 10.3 | 9.1 | 8.2 | 9.6 | 7.8 | 4.3 |
| Hungary | 0.6 | 0.5 | 0.6 | 0.6 | 0.7 | 0.8 | 0.8 | 2.7 |
| Iceland | 99.5 | 99.8 | 99.9 | 99.9 | 99.9 | 99.9 | 99.9 | 0.0 |
| Ireland | 4.9 | 4.1 | 4.0 | 4.1 | 5.6 | 5.2 | 5.0 | 0.2 |
| Italy | 16.4 | 17.5 | 19.4 | 18.8 | 18.4 | 19.9 | 18.9 | 1.5 |
| Japan | 12.7 | 10.7 | 10.4 | 11.2 | 10.7 | 10.0 | 9.9 | -2.4 |
| Korea | 5.9 | 1.5 | 1.3 | 1.3 | 2.0 | 1.8 | 1.5 | -12.7 |
| Luxembourg | 16.7 | 29.0 | 23.2 | 32.5 | 47.5 | 43.0 | 46.9 | 10.9 |
| Mexico | 23.3 | 21.8 | 22.9 | 18.2 | 16.8 | 20.3 | 19.3 | -1.9 |
| Netherlands | 1.5 | 2.4 | 3.1 | 4.1 | 4.3 | 2.5 | 3.1 | 7.7 |
| New Zealand | 80.5 | 84.4 | 78.5 | 71.7 | 72.7 | 71.4 | 72.0 | -1.1 |
| Norway | 99.8 | 99.7 | 99.5 | 99.6 | 99.6 | 99.6 | 99.7 | -0.0 |
| Poland | 1.1 | 1.4 | 1.5 | 1.5 | 1.8 | 1.7 | 1.6 | 4.0 |
| Portugal | 34.7 | 28.3 | 45.9 | 41.7 | 36.4 | 20.3 | 30.3 | -1.4 |
| Slovak Republic | 8.0 | 18.7 | 16.9 | 16.5 | 16.9 | 16.3 | 15.2 | 6.6 |
| Spain | 17.2 | 14.9 | 23.9 | 19.7 | 19.3 | 13.5 | 16.1 | -0.7 |
| Sweden | 50.9 | 47.6 | 38.5 | 48.3 | 49.1 | 48.1 | 57.1 | 1.1 |
| Switzerland | 55.2 | 57.4 | 52.5 | 56.3 | 55.3 | 59.6 | 57.2 | 0.4 |
| Turkey | 40.4 | 41.6 | 42.9 | 38.9 | 38.3 | 30.0 | 24.9 | -4.7 |
| United Kingdom | 2.1 | 2.4 | 1.7 | 2.1 | 2.4 | 2.7 | 2.7 | 2.6 |
| United States | 10.8 | 11.0 | 11.8 | 12.0 | 10.6 | 9.7 | 8.3 | -2.6 |

* Renewable sources include hydro, geothermal, solar thermal, solar pv, tide, wind, renewable municipal solid waste, solid biomass and gases from biomass

** Geographic coverage of OECD and IEA Pacific is the same

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

SHARE OF ELECTRICITY PRODUCTION FROM RENEWABLES SOURCES EXCLUDING HYDRO, BY COUNTRY

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---------------------------|------|------|------|------|------|------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| <i>OECD Total</i> | 1.6 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 2.0 | 2.3 |
| <i>OECD North America</i> | 2.0 | 2.1 | 2.1 | 2.0 | 2.0 | 2.1 | 2.0 | 0.3 |
| <i>OECD/IEA Pacific**</i> | 1.9 | 1.9 | 1.9 | 2.0 | 1.5 | 1.6 | 1.6 | -1.8 |
| <i>OECD Europe</i> | 0.9 | 1.2 | 1.2 | 1.5 | 1.7 | 1.8 | 2.1 | 9.5 |
| <i>IEA Total</i> | 1.6 | 1.8 | 1.8 | 1.9 | 1.8 | 1.9 | 2.0 | 2.4 |
| <i>IEA North America</i> | 1.9 | 2.0 | 2.0 | 2.0 | 1.9 | 2.0 | 2.0 | 0.4 |
| <i>IEA Europe</i> | 0.9 | 1.3 | 1.3 | 1.6 | 1.8 | 1.8 | 2.2 | 9.3 |
| <i>European Union</i> | 1.0 | 1.4 | 1.4 | 1.7 | 2.0 | 2.0 | 2.5 | 9.5 |
| Australia | 0.4 | 0.4 | 0.6 | 0.6 | 0.6 | 0.5 | 0.9 | 8.3 |
| Austria | 2.3 | 3.3 | 2.9 | 3.0 | 3.0 | 2.8 | 2.7 | 1.9 |
| Belgium | 0.7 | 0.8 | 0.8 | 0.7 | 0.8 | 1.0 | 0.7 | -0.6 |
| Canada | 0.8 | 1.0 | 1.0 | 1.1 | 1.2 | 1.3 | 1.3 | 4.6 |
| Czech Republic | - | 0.7 | 0.5 | 0.8 | 0.9 | 1.1 | 0.7 | - |
| Denmark | 3.1 | 5.4 | 4.2 | 7.1 | 10.0 | 11.9 | 16.7 | 18.4 |
| Finland | 8.6 | 10.4 | 8.5 | 11.4 | 13.3 | 12.1 | 12.3 | 3.7 |
| France | 0.5 | 0.6 | 0.6 | 0.7 | 0.7 | 0.7 | 0.7 | 3.1 |
| Germany | 0.6 | 1.0 | 1.1 | 1.3 | 1.7 | 1.7 | 2.5 | 16.0 |
| Greece | 0.0 | 0.1 | 0.1 | 0.1 | 0.2 | 0.3 | 0.8 | 64.7 |
| Hungary | - | - | - | - | 0.3 | 0.3 | 0.3 | - |
| Iceland | 6.3 | 5.8 | 6.8 | 6.7 | 10.4 | 15.8 | 17.2 | 10.6 |
| Ireland | - | 0.1 | 0.2 | 0.7 | 1.2 | 1.3 | 1.4 | - |
| Italy | 1.6 | 1.6 | 1.8 | 1.9 | 2.2 | 2.4 | 2.5 | 5.1 |
| Japan | 2.2 | 2.3 | 2.4 | 2.5 | 1.8 | 1.9 | 1.8 | -1.6 |
| Korea | - | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | - |
| Luxembourg | 5.4 | 10.9 | 9.5 | 12.1 | 15.6 | 19.3 | 19.2 | 13.4 |
| Mexico | 4.2 | 3.7 | 3.5 | 3.1 | 3.3 | 3.2 | 3.1 | -2.9 |
| Netherlands | 1.4 | 2.3 | 3.0 | 4.0 | 4.1 | 2.4 | 3.0 | 8.1 |
| New Zealand | 8.1 | 7.3 | 7.4 | 7.3 | 8.1 | 9.1 | 8.9 | 0.9 |
| Norway | 0.2 | 0.3 | 0.3 | 0.2 | 0.3 | 0.3 | 0.3 | 2.5 |
| Poland | 0.0 | 0.0 | 0.1 | 0.1 | 0.2 | 0.1 | 0.2 | 14.4 |
| Portugal | 2.5 | 3.2 | 3.0 | 3.3 | 3.0 | 3.4 | 4.2 | 5.4 |
| Slovak Republic | - | - | - | - | - | - | - | - |
| Spain | 0.4 | 0.9 | 1.0 | 1.4 | 1.7 | 2.4 | 3.3 | 22.7 |
| Sweden | 1.3 | 1.7 | 1.7 | 2.0 | 1.9 | 1.9 | 3.0 | 8.7 |
| Switzerland | 0.7 | 0.9 | 1.2 | 1.1 | 1.1 | 1.2 | 1.4 | 7.4 |
| Turkey | 0.1 | 0.4 | 0.3 | 0.4 | 0.3 | 0.2 | 0.2 | 4.7 |
| United Kingdom | 0.4 | 0.9 | 0.8 | 0.9 | 1.0 | 1.2 | 1.3 | 11.6 |
| United States | 2.1 | 2.2 | 2.2 | 2.1 | 2.0 | 2.1 | 2.1 | 0.1 |

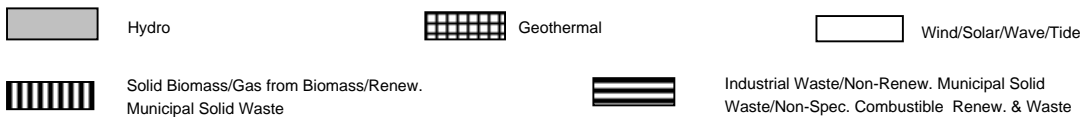
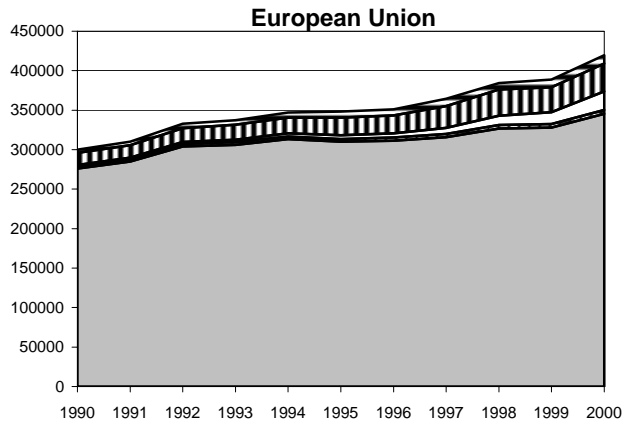
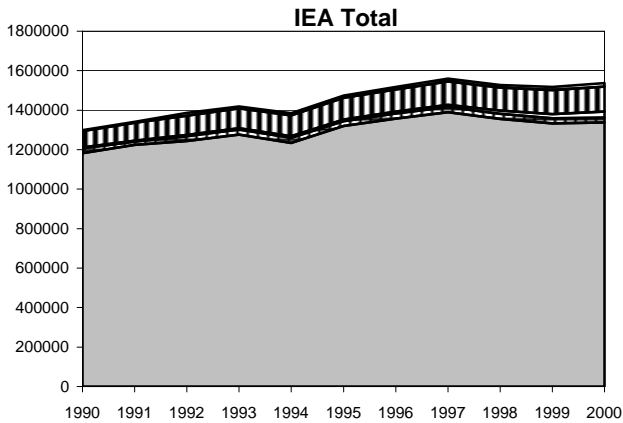
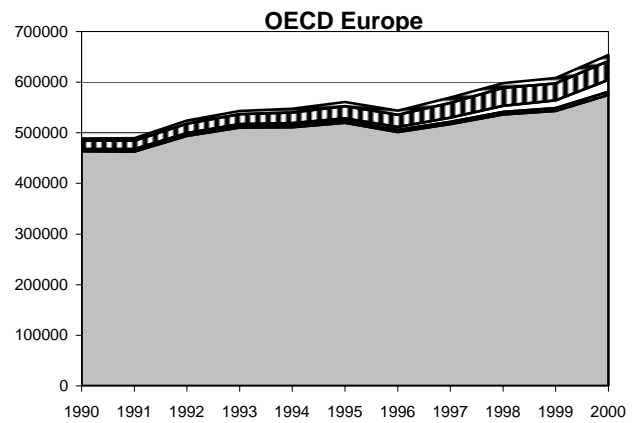
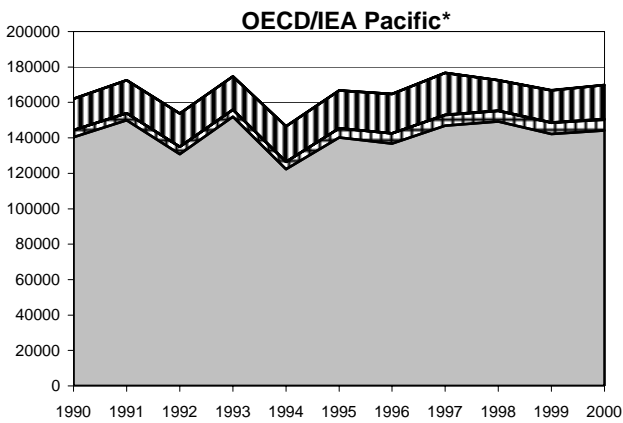
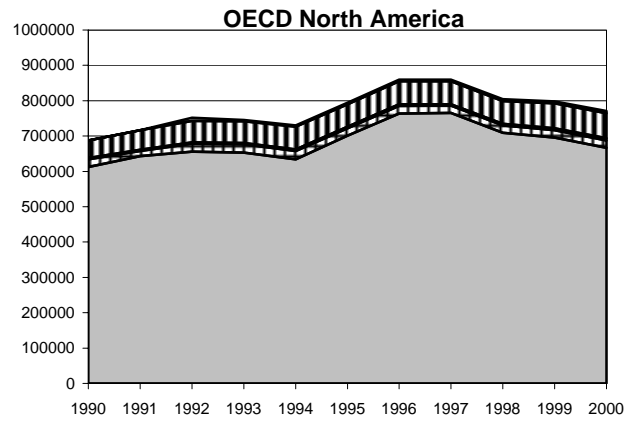
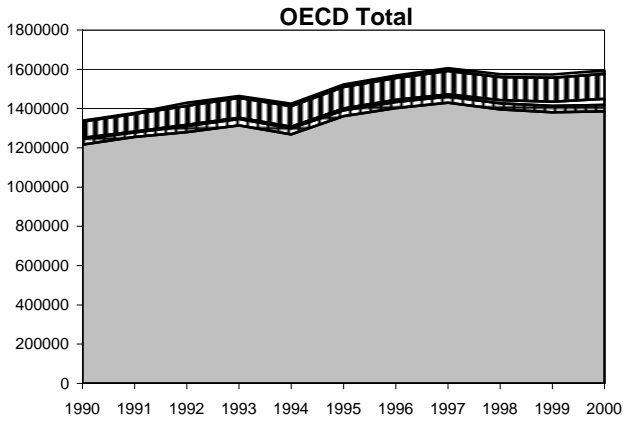
* Renewable sources include hydro, geothermal, solar thermal, solar pv, tide, wind, renewable municipal solid waste, solid biomass and gases from biomass. In this table, production from hydro plants is excluded.

** Geographic coverage of OECD and IEA Pacific is the same

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

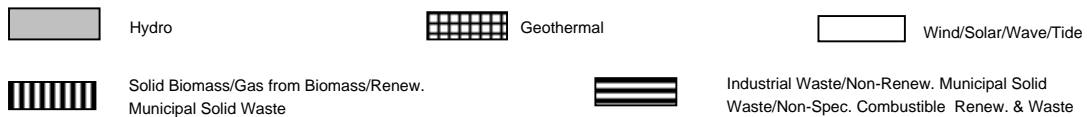
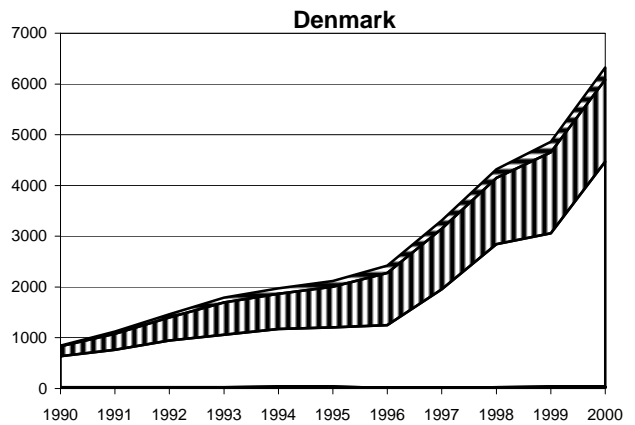
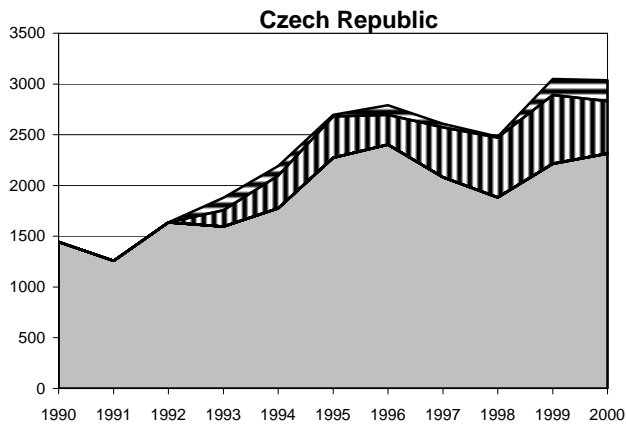
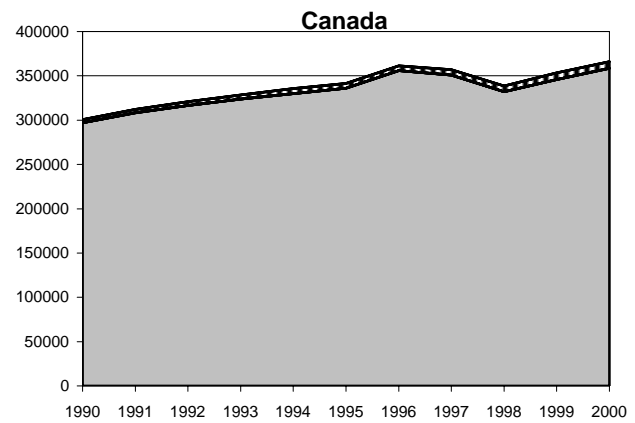
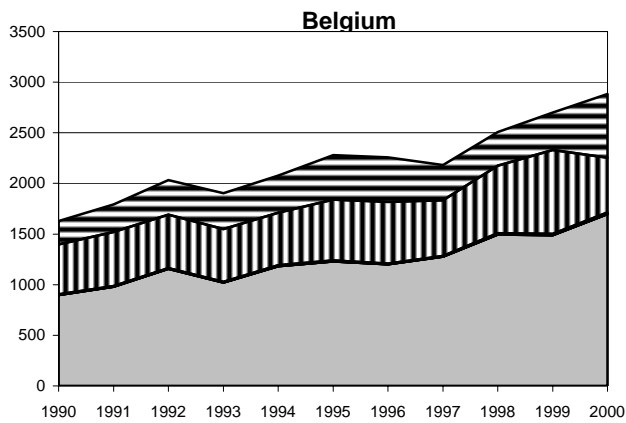
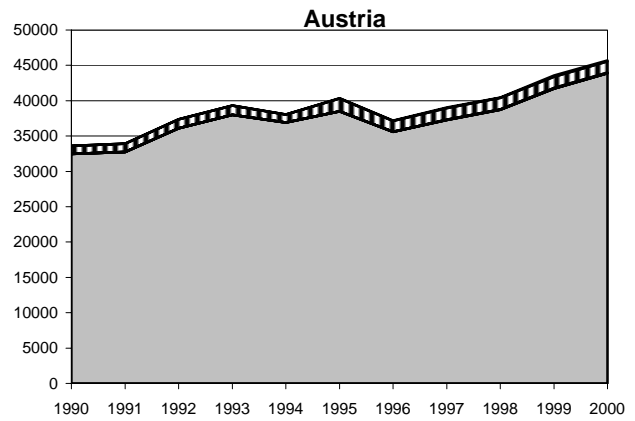
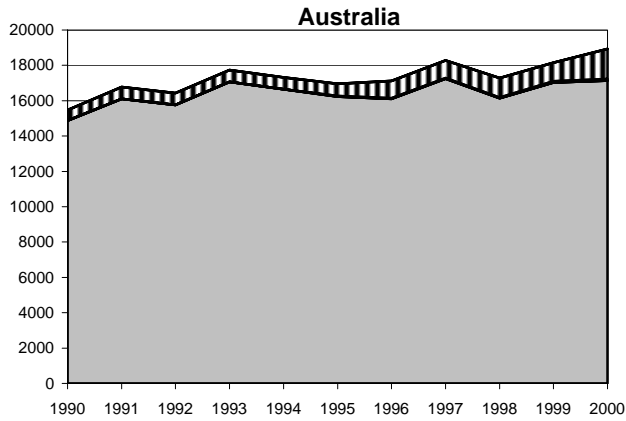
Electricity Production by Renewable Energy Source (GWh)



Source: IEA/OECD Renewables Statistics.

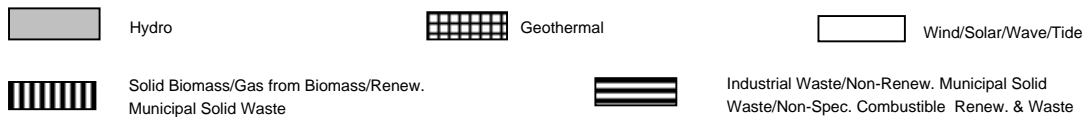
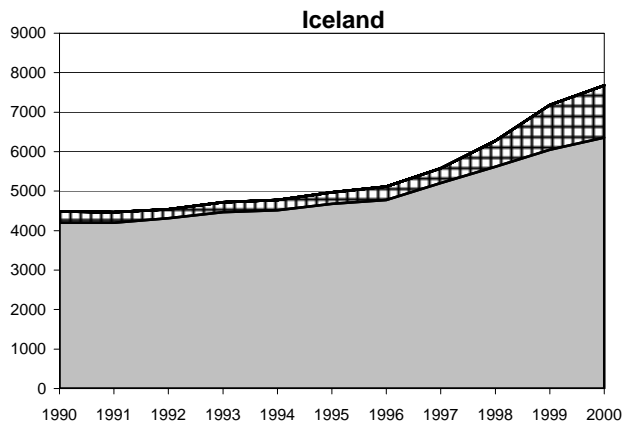
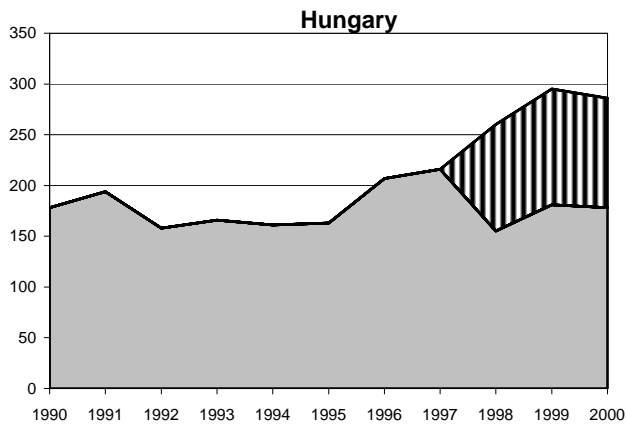
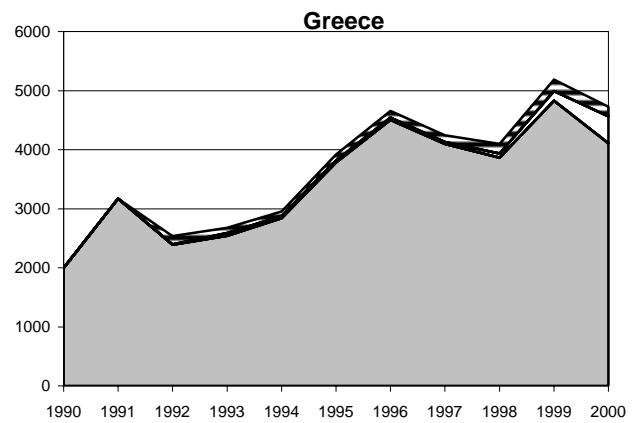
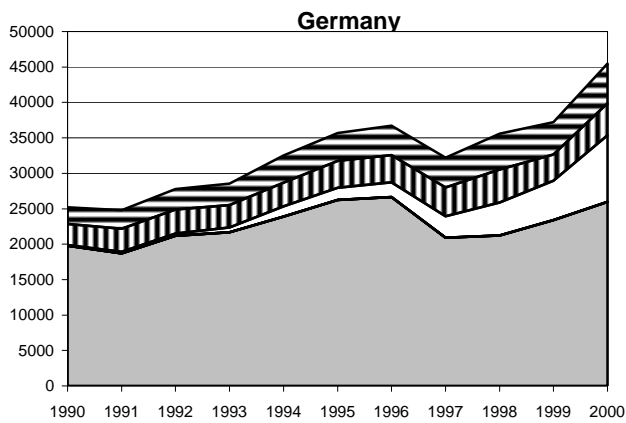
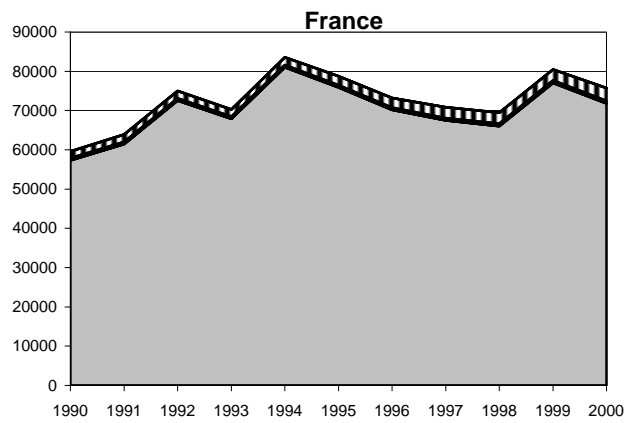
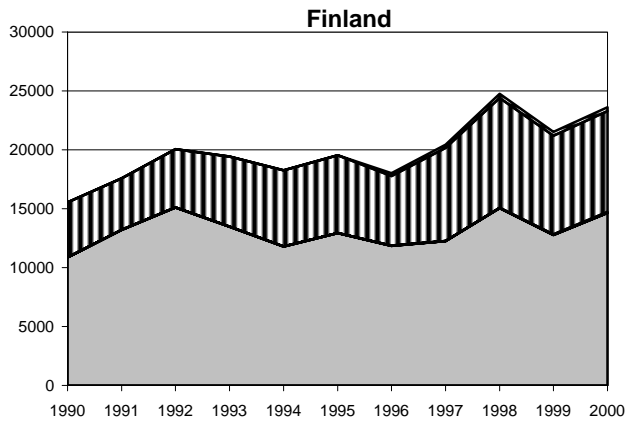
* Geographic coverage of OECD and IEA Pacific is the same.

Electricity Production by Renewable Energy Source (GWh)



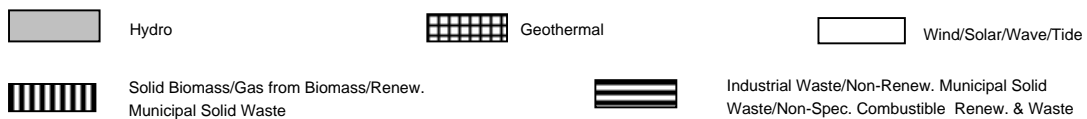
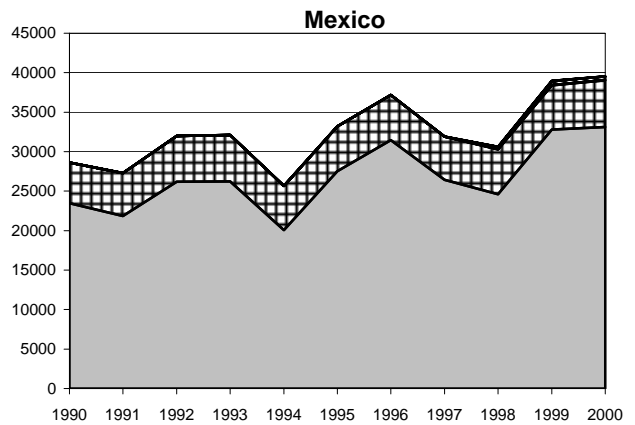
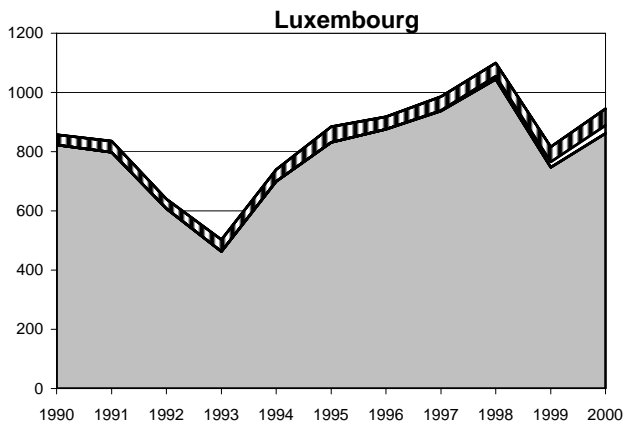
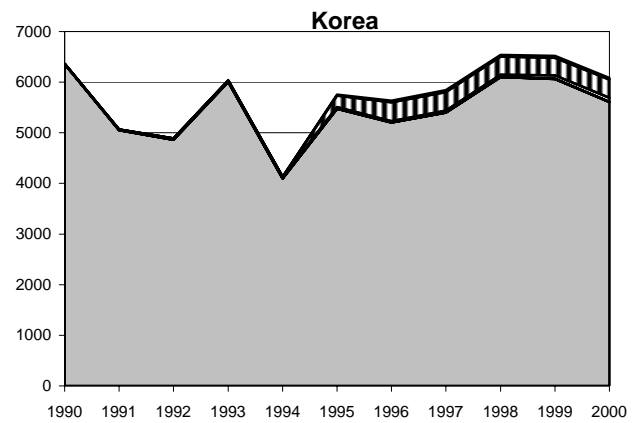
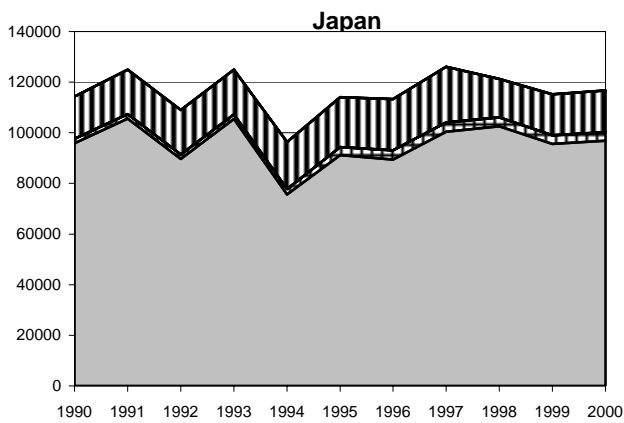
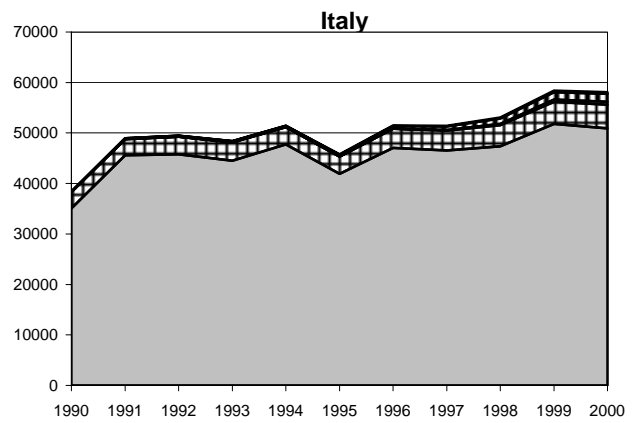
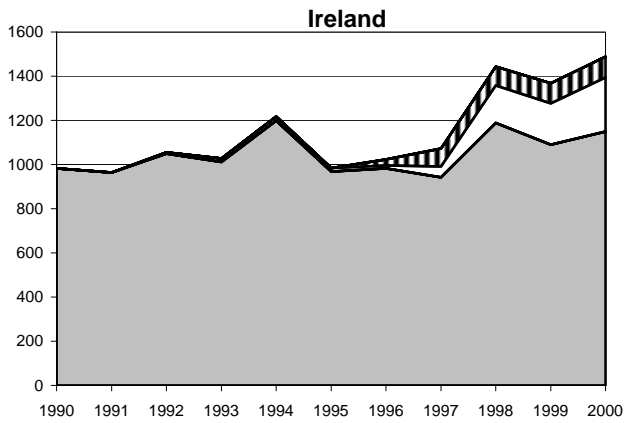
Source: IEA/OECD Renewables Statistics.

Electricity Production by Renewable Energy Source (GWh)



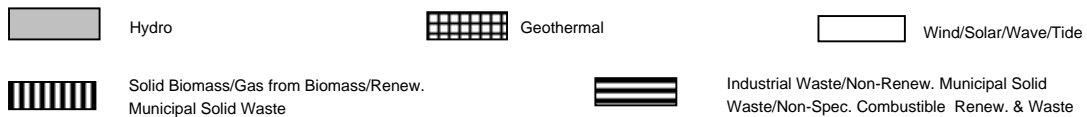
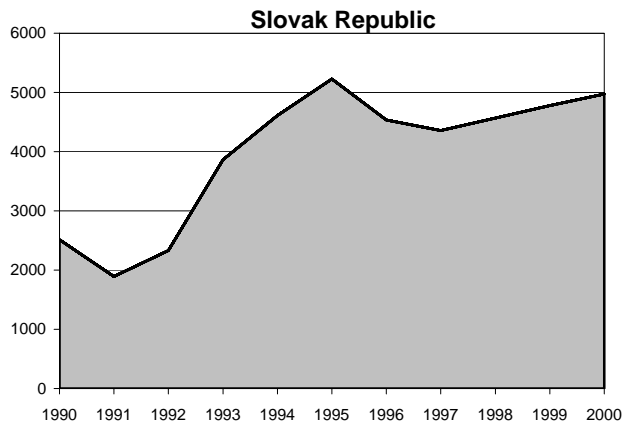
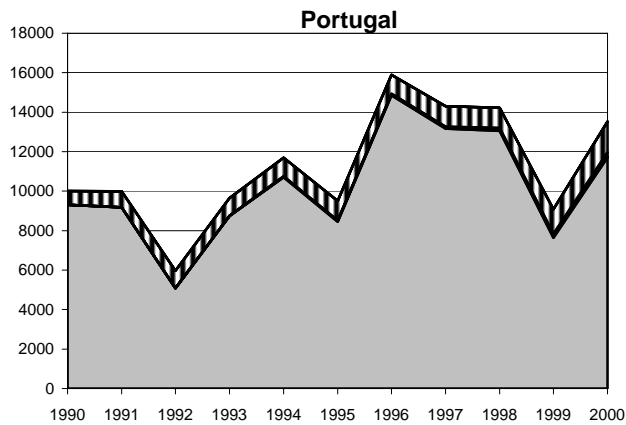
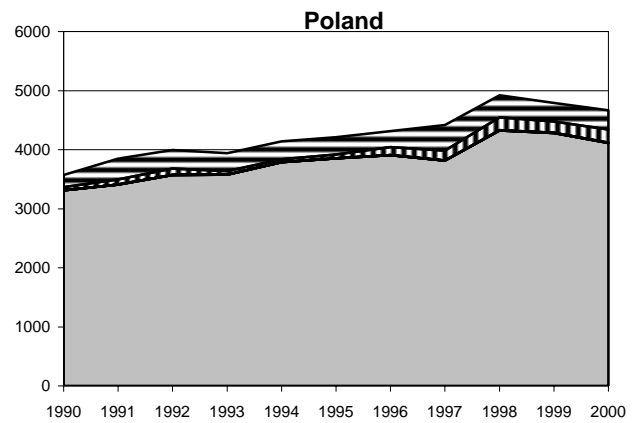
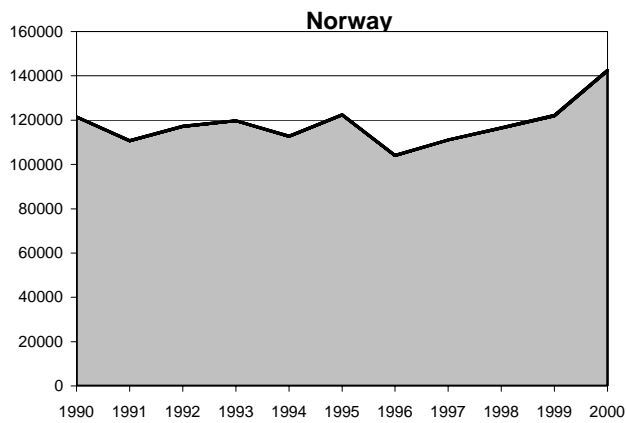
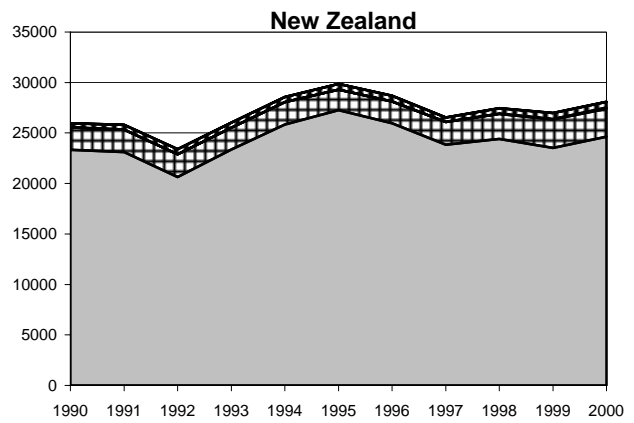
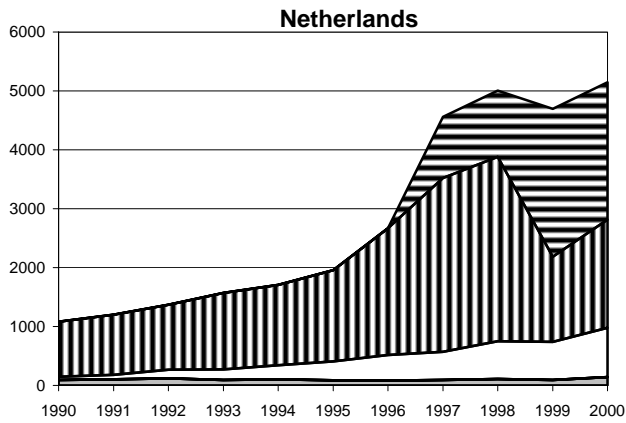
Source: IEA/OECD Renewables Statistics.

Electricity Production by Renewable Energy Source (GWh)



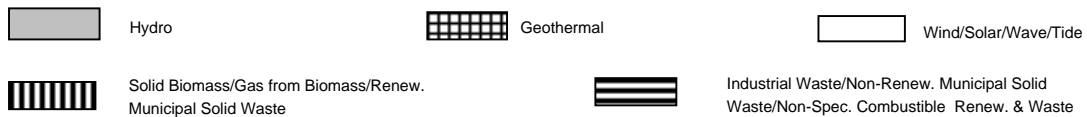
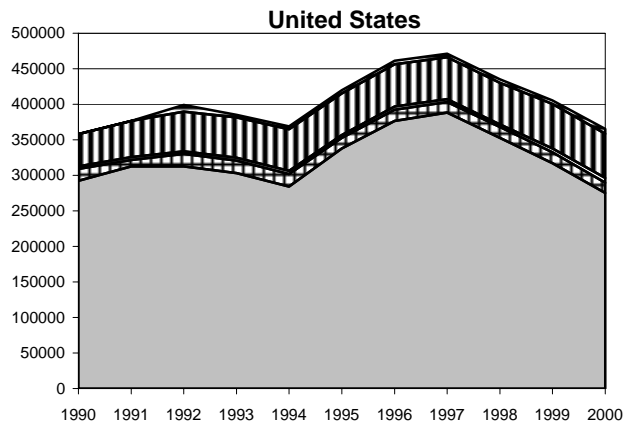
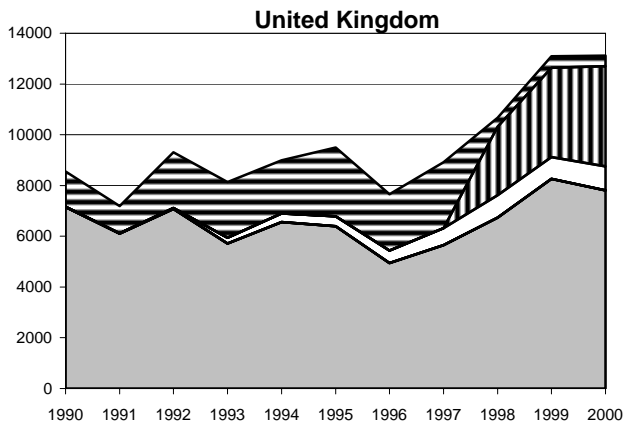
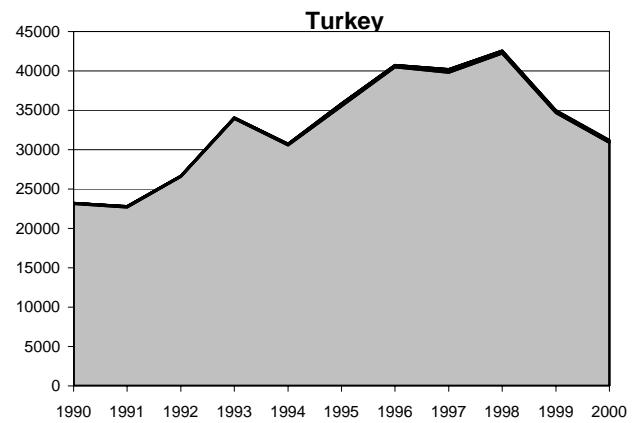
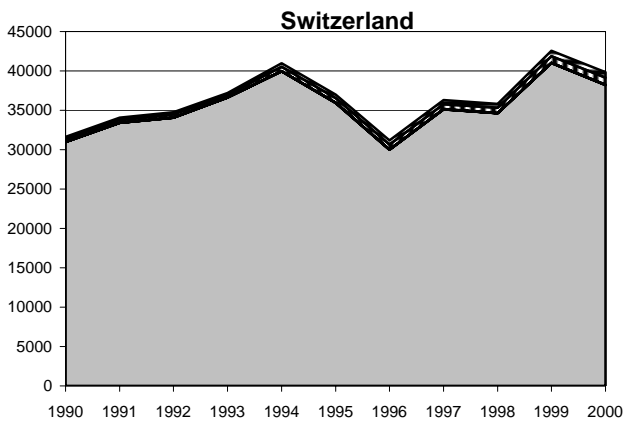
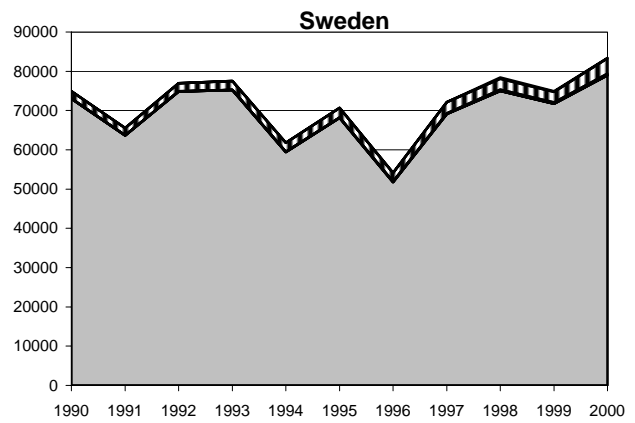
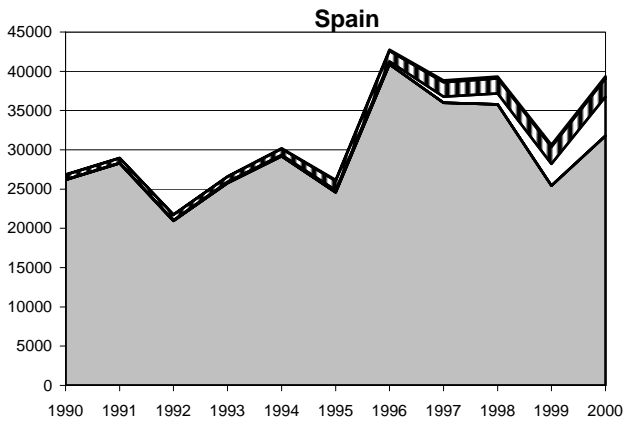
Source: IEA/OECD Renewables Statistics.

Electricity Production by Renewable Energy Source (GWh)



Source: IEA/OECD Renewables Statistics.

Electricity Production by Renewable Energy Source (GWh)



Source: IEA/OECD Renewables Statistics.

OECD Total

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------------------------------|
| TPES (Mtoe) ⁽¹⁾ | 4514.72 | 4884.46 | 5042.77 | 5088.97 | 5111.35 | 5213.43 | 5316.93 | 1.6 |
| of which: Renewables (Mtoe) ⁽²⁾ | 266.62 e | 294.85 e | 303.81 e | 307.05 e | 307.80 e | 313.54 e | 317.71 e | 1.8 |
| Renewables/TPES(%) | 5.9 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 0.1 |
| GDP (1995 bil. US\$) | 21801.45 | 23908.22 | 24598.45 | 25384.64 | 25979.26 | 26727.21 | 27685.45 | 2.4 |
| TPES/GDP ⁽³⁾ | 0.21 | 0.20 | 0.21 | 0.20 | 0.20 | 0.20 | 0.19 | -0.8 |
| TPES/GDP (1973 = 100) | 74 | 73 | 73 | 71 | 70 | 70 | 68 | -0.8 |
| Population (millions) | 1043.63 | 1086.85 | 1094.30 | 1101.82 | 1109.03 | 1116.50 | 1122.18 | 0.7 |
| TPES/population ⁽⁴⁾ | 4.33 | 4.49 | 4.61 | 4.62 | 4.61 | 4.67 | 4.74 | 0.9 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 7560.0 | 8507.8 | 8744.4 | 8871.0 | 9090.9 | 9310.8 | 9629.3 | 2.4 |
| of which: Renewables (TWh) ⁽²⁾ | 1291.80 e | 1453.51 e | 1494.39 e | 1531.17 e | 1495.75 e | 1493.19 e | 1505.70 e | 1.5 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 17.1 | 17.1 | 17.1 | 17.3 | 16.5 | 16.0 | 15.6 | -0.9 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 199.34 e | 290.36 e | 299.18 e | 299.18 e | 299.97 e | 314.85 e | 319.25 e | 4.8 |
| Renewable/TPES (%) | 4.4 e | 5.9 e | 5.9 e | 5.9 e | 5.9 e | 6.0 e | 6.0 e | 3.1 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

(1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.

(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.

(3) In units of toe/1995 thousand US\$.

(4) In units of toe/per capita.

(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants

(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------------|
| Total Capacity | 393497 e | 435089 e | 438511 e | 443050 e | 445324 e | 455491 e | 465480 e | 1.7 |
| Hydro | 369431 | 404335 | 405615 | 408643 | 409168 | 412550 e | 415376 e | 1.2 |
| of which: Pumped Storage | .. | 81227 | 82811 | 80566 e | 84554 e | 84194 e | 82500 e | .. |
| Geothermal | 4463 | 5049 | 4989 | 5098 | 5255 | 5442 e | 5644 e | 2.4 |
| Solar Photovoltaic | .. | .. | .. | .. | .. | 279 | 352 e | .. |
| Solar Thermal | 348 | 349 | 349 | 350 | 375 | 425 | 425 | 2.0 |
| Tide, Wave, Ocean | 260 | 260 | 260 | 260 e | 260 e | 260 e | 258 e | -0.1 |
| Wind | 2386 | 4237 | 5126 | 6230 e | 8006 e | 11396 e | 16110 e | 21.0 |
| Industrial Waste | .. | .. | .. | .. | .. | 1188 | 1742 | .. |
| Municipal Solid Waste | .. | .. | .. | .. | .. | 5855 e | 6757 e | .. |
| Solid Biomass | .. | .. | .. | .. | .. | 13728 e | 13611 e | .. |
| Gas from Biomass | .. | .. | .. | .. | .. | 1656 | 2562 e | .. |
| Comb. Renewables Non-Specified | .. | .. | .. | .. | .. | 2712 e | 2643 e | .. |
| Solar Collectors Surface (1000 m ²) | .. | .. | .. | .. | .. | .. | .. | .. |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

OECD Total

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|---------|------------------|------------------|------------------|------------------|------------------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | .. | 1522025 e | 1568801 e | 1606134 e | 1574701 e | 1573023 e | 1594451 e | .. |
| Hydro | 1216377 | 1361583 | 1402273 | 1429525 e | 1394878 e | 1380741 | 1385682 e | 1.3 |
| of which: Pumped Storage | 43280 | 58633 | 63262 | 62291 | 64655 e | 64041 e | 70332 e | 5.0 |
| Geothermal | 29189 | 29686 | 31530 | 31073 | 32040 | 33018 | 32878 | 1.2 |
| Solar Photovoltaics | 17 | 74 e | 81 e | 98 e | 154 e | 167 e | 215 e | 28.9 |
| Solar Thermal | 664 | 850 | 932 | 926 e | 920 e | 903 e | 913 | 3.2 |
| Tide, Wave, Ocean | 597 | 601 | 579 | 602 | 622 | 612 | 605 | 0.1 |
| Wind | 3838 | 7353 e | 8389 e | 10722 e | 14442 e | 19130 e | 28897 e | 22.4 |
| Industrial Waste | .. | 9291 | 10459 e | 11983 e | 13221 e | 11432 e | 13589 e | .. |
| Municipal Solid Waste Renew. | .. | 25048 | 27814 | 29652 | 32581 e | 31364 e | 31554 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 591 | 693 | 689 | 1072 e | 4364 e | 4826 e | .. |
| Solid Biomass | 64789 e | 79118 | 77812 | 81513 | 75876 e | 81581 e | 83244 e | 2.5 |
| Gas from Biomass | .. | 5116 | 6020 | 6760 | 8895 e | 9711 | 12048 | .. |
| Comb. Renewables Non-Specified | 1384 | 2714 | 2219 | 2591 | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | .. | 1463456 e | 1513881 e | 1545626 e | 1512031 e | 1504254 e | 1520430 e | .. |
| Hydro | 1216377 | 1361583 | 1402273 | 1429525 e | 1394878 e | 1380741 | 1385682 e | 1.3 |
| of which: Pumped Storage | 43280 | 58633 | 63262 | 62291 | 64655 e | 64041 e | 70332 e | 5.0 |
| Geothermal | 29189 | 29525 | 31359 | 30894 | 31759 | 31913 | 30135 | 0.3 |
| Solar Photovoltaics | 17 | 74 e | 81 e | 98 e | 154 e | 167 e | 215 e | 28.9 |
| Solar Thermal | 664 | 850 | 932 | 926 e | 920 e | 903 e | 913 | 3.2 |
| Tide, Wave, Ocean | 597 | 601 | 579 | 602 | 622 | 612 | 605 | 0.1 |
| Wind | 3838 | 7353 e | 8389 e | 10722 e | 14442 e | 19130 e | 28897 e | 22.4 |
| Industrial Waste | .. | 4913 | 5164 e | 5232 e | 6128 e | 4542 e | 5353 | .. |
| Municipal Solid Waste Renew. | .. | 19941 | 21359 | 22416 | 24364 | 23745 | 23720 | .. |
| Municipal Solid Waste Non-Renew. | .. | c | c | c | 318 | 2015 | 2387 | .. |
| Solid Biomass | 29958 e | 33567 | 37474 | 37977 | 31242 | 32816 e | 33116 e | 1.0 |
| Gas from Biomass | .. | 4206 | 5003 | 5573 | 7204 e | 7670 | 9407 | .. |
| Comb. Renewables Non-Specified | 1384 | 843 | 1268 | 1661 | - | - | - | - |
| CHP Plants | .. | 58569 e | 54920 e | 60508 e | 62670 e | 68769 e | 74021 e | .. |
| Geothermal | - | 161 | 171 | 179 | 281 | 1105 | 2743 | - |
| Industrial Waste | .. | 4378 | 5295 e | 6751 e | 7093 e | 6890 e | 8236 e | .. |
| Municipal Solid Waste Renew. | .. | 5107 | 6455 | 7236 | 8217 e | 7619 e | 7834 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 591 | 693 | 689 | 754 e | 2349 e | 2439 e | .. |
| Solid Biomass | 34831 e | 45551 e | 40338 e | 43536 e | 44634 e | 48765 e | 50128 | 3.7 |
| Gas from Biomass | .. | 910 | 1017 | 1187 | 1691 | 2041 | 2641 | .. |
| Comb. Renewables Non-Specified | - | 1871 | 951 | 930 | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

OECD Total

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|----------------------------------|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---|
| Total Heat | .. | 253925 e | 329037 e | 333348 e | 353389 e | 884580 e | 886143 e | .. |
| Geothermal | .. | 7468 | 7000 | 7516 | 6257 | 8272 | 7805 | .. |
| Solar Thermal | .. | 6 | 188 | 239 | 277 | 336 | 371 | .. |
| Industrial Waste | .. | 9784 e | 14294 e | 17388 e | 19288 e | 36594 e | 45167 e | .. |
| Municipal Solid Waste Renew. | .. | 110174 e | 116282 e | 120794 e | 133350 e | 147378 e | 158615 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 8981 e | 9778 e | 10170 e | 10640 e | 24623 e | 23234 e | .. |
| Solid Biomass | .. | 95174 | 157921 e | 154834 e | 157046 e | 586581 e | 565008 e | .. |
| Gas from Biomass | .. | 3428 e | 4116 e | 5159 e | 4699 e | 58478 e | 62900 e | .. |
| Waste Heat and Heat Pumps | .. | 18910 e | 19458 e | 17248 e | 21832 e | 22318 e | 23043 e | .. |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | .. | 150388 e | 211103 e | 210512 e | 216113 e | 224996 e | 215258 e | .. |
| Geothermal | .. | 7103 | 6630 | 7148 | 5885 | 7556 | 6967 | .. |
| Solar Thermal | .. | - | - | - | - | - | - | .. |
| Industrial Waste | .. | 4370 | 7068 | 8434 | 8167 | 12200 e | 12912 | .. |
| Municipal Solid Waste Renew. | .. | 70680 e | 72417 e | 71151 e | 77788 e | 65998 e | 67989 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 7038 e | 8128 e | 8191 e | 8438 e | 21402 e | 19554 e | .. |
| Solid Biomass | .. | 56532 | 112102 e | 109830 e | 109709 | 111845 | 101647 e | .. |
| Gas from Biomass | .. | 2231 | 2559 | 3312 | 3238 | 2960 | 2711 | .. |
| Waste Heat and Heat Pumps | .. | 2434 | 2199 | 2446 | 2888 | 3035 | 3478 | .. |
| Heat Only Plants | .. | 103537 e | 117934 e | 122836 e | 137276 e | 659585 e | 670885 e | .. |
| Geothermal | .. | 365 | 370 | 368 | 372 | 716 | 838 | .. |
| Solar Thermal | .. | 6 | 188 | 239 | 277 | 336 | 371 | .. |
| Industrial Waste | .. | 5414 e | 7226 e | 8954 e | 11121 e | 24394 e | 32255 e | .. |
| Municipal Solid Waste Renew. | .. | 39494 e | 43865 e | 49643 e | 55562 e | 81380 e | 90626 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 1943 e | 1650 e | 1979 e | 2202 e | 3221 e | 3680 e | .. |
| Solid Biomass | .. | 38642 | 45819 | 45004 e | 47337 e | 474736 e | 463361 e | .. |
| Gas from Biomass | .. | 1197 e | 1557 e | 1847 e | 1461 e | 55518 e | 60189 e | .. |
| Waste Heat and Heat Pumps | .. | 16476 e | 17259 e | 14802 e | 18944 e | 19284 e | 19565 e | .. |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

OECD Total

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00** |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 76814 e | 91259 e | 92973 e | 94556 e | 95520 e | 100702 | 103680 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | -7713 | -8850 | -9040 | -9056 | -9142 | -9135 | -9387 | .. |
| Final Energy Consumption | 69101 | 82409 e | 83933 e | 85500 e | 86378 | 91567 | 94293 | .. |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 10300 | 21190 | 23680 | 26170 | 66474 e | 127658 | 128315 e | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Final Energy Consumption | 10300 | 21190 | 23680 | 26170 | 66474 e | 127658 e | 128315 e | .. |
| Industrial Waste | | | | | | | | |
| Production | 82896 e | 252734 e | 248707 e | 275852 e | 272715 e | 281258 e | 329984 e | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | -5222 | -2690 | -22641 | -301 | -589 | -247 | -250 | .. |
| Transformation Sector | 30001 e | 185060 e | 168389 e | 211310 e | 208933 e | 220386 e | 266698 e | .. |
| Final Energy Consumption | 47673 e | 64984 e | 57677 e | 64241 e | 63193 e | 60625 e | 63036 e | .. |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 362522 e | 551649 e | 598760 e | 616720 e | 645570 e | 644646 e | 650576 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | -6368 | -15479 | -15754 | -20507 | -7097 | -9754 | -70 | .. |
| Transformation Sector | 345936 e | 525402 | 565432 | 575872 | 614254 e | 619159 e | 627607 | .. |
| Final Energy Consumption | 10218 | 10768 | 17574 | 20341 | 24219 | 15733 | 22899 | .. |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | 12026 | 18813 e | 19454 e | 19658 e | 27198 e | 87889 e | 95822 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | -9 | -19 | .. |
| Transformation Sector | 11803 | 18557 e | 19221 e | 19433 e | 26801 e | 76214 e | 82274 | .. |
| Final Energy Consumption | 223 | 256 | 233 | 225 | 397 | 11666 | 13529 | .. |
| Solid Biomass | | | | | | | | |
| Production | 5389441 e | 5680573 e | 5828559 e | 5813035 e | 5842007 e | 5930847 e | 6013833 e | .. |
| Net Imports ⁽¹⁾ | 5684 e | 14790 | 16876 | 19610 | 20479 | 18642 | 24062 | .. |
| Miscellaneous to Balance ⁽²⁾ | 5607 | -3340 | -1037 | -2425 | 4351 | 2343 | 2854 | .. |
| Transformation Sector | 1788720 e | 1673935 | 1797796 | 1790832 | 1717760 e | 2448917 e | 2482676 e | .. |
| Final Energy Consumption | 3612012 e | 4018088 e | 4046602 e | 4039388 e | 4149077 e | 3502915 e | 3558073 e | .. |
| Gas from Biomass | | | | | | | | |
| Production | 30921 | 100228 e | 115094 e | 124993 e | 134490 e | 213347 e | 244901 e | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | -8247 | -10960 | -12925 | -16520 | -737 | -46 | 106 | .. |
| Transformation Sector | 8836 e | 73524 | 84496 | 90011 | 114236 e | 193471 e | 225318 e | .. |
| Final Energy Consumption | 13838 | 15744 e | 17673 e | 18462 e | 19517 e | 19830 e | 19689 e | .. |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | 744 | 4540 | 3320 | 4287 | 4592 | 4956 | 5687 | .. |
| Net Imports ⁽¹⁾ | - | 49 | 34 | 9 | 17 | 17 | 21 | .. |
| Miscellaneous to Balance ⁽²⁾ | - | 34 | 15 | -65 | -7 | -96 | 46 | .. |
| Transformation Sector | 744 | 1391 | 1465 | 1501 | 1490 | 1757 | 1975 | .. |
| Final Energy Consumption | - | 3232 | 1904 | 2730 | 3112 | 3120 | 3779 | .. |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

**Growth rates have not been calculated for aggregates due to unavailability of data for some countries which causes breaks in series.

OECD North America

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|----------|---------|----------|----------|----------|---------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 2260.36 | 2452.58 | 2514.47 | 2544.60 | 2566.84 | 2640.73 | 2704.15 | 1.8 |
| of which: Renewables (Mtoe) ⁽²⁾ | 148.31 e | 161.87 | 169.43 | 167.26 | 165.07 | 170.07 | 168.44 | 1.3 |
| Renewables/TPES(%) | 6.6 | 6.6 | 6.7 | 6.6 | 6.4 | 6.4 | 6.2 | -0.5 |
| GDP (1995 bil. US\$) | 7321.96 | 8207.71 | 8496.13 | 8882.00 | 9265.22 | 9651.65 | 10066.14 | 3.2 |
| TPES/GDP ⁽³⁾ | 0.31 | 0.30 | 0.30 | 0.29 | 0.28 | 0.27 | 0.27 | -1.4 |
| TPES/GDP (1973 = 100) | 71 | 68 | 68 | 66 | 63 | 63 | 61 | -1.4 |
| Population (millions) | 359.43 | 383.33 | 387.63 | 392.06 | 396.33 | 400.92 | 403.39 | 1.2 |
| TPES/population ⁽⁴⁾ | 6.29 | 6.40 | 6.49 | 6.49 | 6.48 | 6.59 | 6.70 | 0.6 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 3786.2 | 4270.8 | 4386.6 | 4420.9 | 4547.8 | 4660.7 | 4813.0 | 2.4 |
| of which: Renewables (TWh) ⁽²⁾ | 671.42 e | 766.42 | 829.27 e | 829.32 e | 773.14 e | 768.82 | 737.25 | 0.9 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 17.7 | 17.9 | 18.9 | 18.8 | 17.0 | 16.5 | 15.3 | -1.5 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 84.92 | 161.46 | 169.02 | 164.08 | 162.01 | 170.07 | 168.44 | 7.1 |
| Renewable/TPES (%) | 3.8 | 6.6 | 6.7 | 6.5 | 6.3 | 6.4 | 6.2 | 5.2 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

(1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.

(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.

(3) In units of toe/1995 thousand US\$.

(4) In units of toe/per capita.

(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants

(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|--------|---------------|---------------|---------------|---------------|-----------------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | .. | 191244 | 190652 | 192933 | 192625 | 194769 e | 194631 e | .. |
| Hydro | 159621 | 174139 | 173352 | 175689 | 175218 | 175816 e | 174880 e | 0.9 |
| of which: Pumped Storage | .. | 21564 | 21287 | 19487 e | 19075 e | 19122 e | 18197 e | .. |
| Geothermal | 3369 | 3721 | 3637 | 3603 | 3667 | 3751 | 3838 | 1.3 |
| Solar Photovoltaic | .. | .. | .. | .. | .. | 169 | 190 | .. |
| Solar Thermal | 340 | 335 | 335 | 336 | 362 | 412 | 412 | 1.9 |
| Tide, Wave, Ocean | 20 | 20 | 20 | 20 e | 20 e | 20 e | 20 e | - |
| Wind | 1912 | 1755 | 1703 | 1604 e | 1724 e | 2332 e | 2446 e | 2.5 |
| Industrial Waste | .. | .. | .. | .. | .. | 739 | 1158 | .. |
| Municipal Solid Waste | .. | .. | .. | .. | .. | 2579 | 2806 | .. |
| Solid Biomass | .. | .. | .. | .. | .. | 7185 | 6870 | .. |
| Gas from Biomass | .. | .. | .. | .. | .. | 628 | 873 | .. |
| Comb. Renewables Non-Specified | .. | .. | .. | .. | .. | 1138 e | 1138 e | .. |
| Solar Collectors Surface (1000 m ²) | .. | .. | .. | .. | .. | .. | .. | .. |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

OECD North America

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|---------|---------------|-----------------|-----------------|-----------------|---------------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | .. | 794535 | 859985 e | 859968 e | 804191 e | 797707 | 770699 | .. |
| Hydro | 612727 | 701418 | 763902 | 765336 | 709175 | 695411 | 666686 | 0.8 |
| of which: Pumped Storage | 15919 | 23851 | 25889 | 25619 | 26096 | 23991 | 26893 | 5.4 |
| Geothermal | 21649 | 20610 | 21475 | 20645 | 21026 | 21061 | 20579 | -0.5 |
| Solar Photovoltaics | .. | 4 | 3 | 4 | 29 | 31 | 32 | .. |
| Solar Thermal | 663 | 827 | 906 | 896 | 890 | 873 | 883 | 2.9 |
| Tide, Wave, Ocean | 26 | 33 | 32 | 32 | 32 | 32 | 32 | 2.1 |
| Wind | 3066 | 3261 | 3477 | 3320 | 3091 | 4747 | 5861 | 6.7 |
| Industrial Waste | .. | 4268 | 4826 e | 5032 e | 4952 e | 4897 | 6552 | .. |
| Municipal Solid Waste Renew. | 10613 e | 14773 | 15646 | 15448 | 16021 | 16547 | 15653 | 4.0 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 38590 e | 46052 | 46133 | 45453 | 44828 | 50018 | 49428 | 2.5 |
| Gas from Biomass | .. | 3289 | 3585 | 3802 | 4147 | 4090 | 4993 | .. |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | .. | 757455 | 825882 e | 825710 e | 770071 e | 757830 | 727464 | .. |
| Hydro | 612727 | 701418 | 763902 | 765336 | 709175 | 695411 | 666686 | 0.8 |
| of which: Pumped Storage | 15919 | 23851 | 25889 | 25619 | 26096 | 23991 | 26893 | 5.4 |
| Geothermal | 21649 | 20610 | 21475 | 20645 | 21026 | 20646 | 18724 | -1.4 |
| Solar Photovoltaics | .. | 4 | 3 | 4 | 29 | 31 | 32 | .. |
| Solar Thermal | 663 | 827 | 906 | 896 | 890 | 873 | 883 | 2.9 |
| Tide, Wave, Ocean | 26 | 33 | 32 | 32 | 32 | 32 | 32 | 2.1 |
| Wind | 3066 | 3261 | 3477 | 3320 | 3091 | 4747 | 5861 | 6.7 |
| Industrial Waste | .. | 440 | 421 e | 405 e | 425 e | 659 | 566 | .. |
| Municipal Solid Waste Renew. | 9693 e | 13432 | 14084 | 13892 | 14072 | 14023 | 13451 | 3.3 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 13560 e | 14352 | 18227 | 17621 | 17571 | 18008 | 17577 | 2.6 |
| Gas from Biomass | .. | 3078 | 3355 | 3559 | 3760 | 3400 | 3652 | .. |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | .. | 37080 | 34103 e | 34258 e | 34120 e | 39877 | 43235 | .. |
| Geothermal | - | - | - | - | - | 415 | 1855 | - |
| Industrial Waste | .. | 3828 | 4405 e | 4627 e | 4527 e | 4238 | 5986 | .. |
| Municipal Solid Waste Renew. | 920 e | 1341 | 1562 | 1556 | 1949 | 2524 | 2202 | 9.1 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 25030 e | 31700 | 27906 | 27832 | 27257 | 32010 | 31851 | 2.4 |
| Gas from Biomass | .. | 211 | 230 | 243 | 387 | 690 | 1341 | .. |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

OECD North America

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|------|--------------|--------------|--------------|--------------|---------------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | .. | 28539 | 65900 | 66711 | 68905 | 565437 | 562596 | .. |
| Geothermal | .. | - | - | - | - | - | - | .. |
| Solar Thermal | .. | - | - | - | - | - | - | .. |
| Industrial Waste | .. | 1993 | 4248 | 5768 | 4609 | 17310 | 17040 | .. |
| Municipal Solid Waste Renew. | .. | 7270 | 3344 | 3420 | 9703 | 27849 | 31070 | .. |
| Municipal Solid Waste Non-Renew. | .. | - | - | - | - | - | - | .. |
| Solid Biomass | .. | 19276 | 58134 | 57300 | 54243 | 466450 | 456607 | .. |
| Gas from Biomass | .. | - | 174 | 223 | 350 | 53828 | 57879 | .. |
| Waste Heat and Heat Pumps | .. | - | - | - | - | - | - | .. |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | .. | 28539 | 65900 | 66711 | 68905 | 52842 | 50751 | .. |
| Geothermal | .. | - | - | - | - | - | - | .. |
| Solar Thermal | .. | - | - | - | - | - | - | .. |
| Industrial Waste | .. | 1993 | 4248 | 5768 | 4609 | 5756 | 4826 | .. |
| Municipal Solid Waste Renew. | .. | 7270 | 3344 | 3420 | 9703 | 5208 | 7463 | .. |
| Municipal Solid Waste Non-Renew. | .. | - | - | - | - | - | - | .. |
| Solid Biomass | .. | 19276 | 58134 | 57300 | 54243 | 41805 | 38462 | .. |
| Gas from Biomass | .. | - | 174 | 223 | 350 | 73 | - | .. |
| Waste Heat and Heat Pumps | .. | - | - | - | - | - | - | .. |
| Heat Only Plants | .. | - | - | - | - | 512595 | 511845 | .. |
| Geothermal | .. | - | - | - | - | - | - | .. |
| Solar Thermal | .. | - | - | - | - | - | - | .. |
| Industrial Waste | .. | - | - | - | - | 11554 | 12214 | .. |
| Municipal Solid Waste Renew. | .. | - | - | - | - | 22641 | 23607 | .. |
| Municipal Solid Waste Non-Renew. | .. | - | - | - | - | - | - | .. |
| Solid Biomass | .. | - | - | - | - | 424645 | 418145 | .. |
| Gas from Biomass | .. | - | - | - | - | 53755 | 57879 | .. |
| Waste Heat and Heat Pumps | .. | - | - | - | - | - | - | .. |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

OECD North America

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00** |
|---|-----------|---------|---------|----------|-----------|---------|---------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 14069 | 17000 | 17293 | 17879 | 18465 | 20363 | 21735 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Final Energy Consumption | 14069 | 17000 | 17293 | 17879 | 18465 | 20363 | 21735 | .. |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | - | - | - | - | 1270 | 64735 | 62157 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Final Energy Consumption | - | - | - | - | 1270 | 64735 | 62157 | .. |
| Industrial Waste | | | | | | | | |
| Production | - | 128432 | 123426 | 129139 e | 111828 | 128803 | 159946 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | -22133 | - | - | - | - | .. |
| Transformation Sector | - | 125190 | 98177 | 125874 | 107368 | 128803 | 159946 | .. |
| Final Energy Consumption | - | 3242 | 3116 e | 3265 e | 4460 e | - | - | .. |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 173829 e | 270237 | 286440 | 281394 | 286702 | 313018 | 297650 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Transformation Sector | 173829 e | 270237 | 286440 | 281394 | 286702 | 313018 | 297650 | .. |
| Final Energy Consumption | - | - | - | - | - | - | - | .. |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Transformation Sector | - | - | - | - | - | - | - | .. |
| Final Energy Consumption | - | - | - | - | - | - | - | .. |
| Solid Biomass | | | | | | | | |
| Production | 3080224 e | 3137047 | 3217388 | 3133252 | 3211547 | 3287508 | 3329190 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | 1697 | - | - | - | - | .. |
| Transformation Sector | 1501822 e | 1302595 | 1412118 | 1393893 | 1350769 | 2053693 | 2073847 | .. |
| Final Energy Consumption | 1578402 | 1834452 | 1806967 | 1739359 | 1860778 e | 1233815 | 1255343 | .. |
| Gas from Biomass | | | | | | | | |
| Production | - | 42788 | 46558 | 46808 | 49777 | 121490 | 138356 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Transformation Sector | - | 42788 | 46558 | 46808 | 49777 | 121490 | 138356 | .. |
| Final Energy Consumption | - | - | - | - | - | - | - | .. |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | 4063 | 2920 | 3820 | 4160 | 4409 | 4897 | .. |
| Net Imports ⁽¹⁾ | - | 49 | 39 | 11 | 8 | 11 | 15 | .. |
| Miscellaneous to Balance ⁽²⁾ | - | 34 | 15 | -65 | -7 | -98 | 46 | .. |
| Transformation Sector | - | 1140 | 1405 | 1487 | 1476 | 1730 | 1923 | .. |
| Final Energy Consumption | - | 3006 | 1569 | 2279 | 2685 | 2592 | 3035 | .. |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

**Growth rates have not been calculated for aggregates due to unavailability of data for some countries which causes breaks in series.

OECD/IEA Pacific*

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|--|---------|----------|----------|----------|----------|----------|----------|-------------------------------------|
| TPES (Mtoe) ⁽¹⁾ | 632.98 | 758.85 | 793.85 | 817.06 | 797.42 | 822.58 | 847.15 | 3.0 |
| of which: Renewables (Mtoe) ⁽²⁾ | 26.44 | 28.61 e | 29.80 e | 31.51 e | 30.73 e | 30.77 e | 31.63 e | 1.8 |
| Renewables/TPES(%) | 4.2 | 3.8 | 3.8 | 3.9 | 3.9 | 3.7 | 3.7 | -1.1 |
| GDP (1995 bil. US\$) | 5647.71 | 6214.55 | 6446.74 | 6589.86 | 6513.41 | 6627.17 | 6818.40 | 1.9 |
| TPES/GDP ⁽³⁾ | 0.11 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 1.0 |
| TPES/GDP (1973 = 100) | 80 | 88 | 88 | 89 | 88 | 89 | 89 | 1.0 |
| Population (millions) | 186.86 | 192.39 | 193.43 | 194.44 | 195.44 | 196.29 | 197.18 | 0.5 |
| TPES/population ⁽⁴⁾ | 3.39 | 3.94 | 4.10 | 4.20 | 4.08 | 4.19 | 4.30 | 2.4 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 1145.0 | 1390.3 | 1438.3 | 1491.5 | 1506.5 | 1558.2 | 1621.5 | 3.5 |
| of which: Renewables (TWh) ⁽²⁾ | 154.89 | 154.51 e | 152.69 e | 163.16 e | 160.30 e | 155.41 e | 158.34 e | 0.2 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 13.5 | 11.1 | 10.6 | 10.9 | 10.6 | 10.0 | 9.8 | -3.2 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 26.44 | 28.60 e | 29.78 e | 31.48 e | 30.70 e | 30.80 e | 31.63 e | 1.8 |
| Renewable/TPES (%) | 4.2 | 3.8 e | 3.8 e | 3.9 e | 3.9 e | 3.7 e | 3.7 e | -1.1 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

(1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.

(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.

(3) In units of toe/1995 thousand US\$.

(4) In units of toe/per capita.

(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants

(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|----------------|--------------|----------------|----------------|----------------|----------------|----------------|-------------------------------------|
| Total Capacity | 55103 e | 63534 | 64475 e | 64855 e | 64966 e | 66558 e | 68157 e | 2.1 |
| Hydro | 52170 | 59394 | 60165 | 60236 | 61163 | 62007 | 62328 | 1.8 |
| of which: Pumped Storage | 18005 | 24385 | 25285 | 25285 | 26995 | 27395 | 27395 | 4.3 |
| Geothermal | 531 | 779 | 788 | 858 | 871 | 896 | 1006 | 6.6 |
| Solar Photovoltaic | 1 | 3 | 3 | 4 | 4 | 5 | 5 | 17.5 |
| Solar Thermal | 8 | 14 | 14 | 14 | 13 | 13 | 13 | 5.0 |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 8 | 8 | 12 | 59 | 127 e | 251 | - |
| Industrial Waste | - | - | - | - | - | 249 | 249 | - |
| Municipal Solid Waste | - | - | - | - | - | 850 | 1322 | - |
| Solid Biomass | - | - | - | - | 80 | 1966 e | 2023 e | - |
| Gas from Biomass | - | - | - | - | - | 23 | 481 | - |
| Comb. Renewables Non-Specified | 2393 e | 3336 e | 3497 e | 3731 e | 2776 e | 422 | 479 e | x |
| Solar Collectors Surface (1000 m ²) | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

* Geographic coverage of OECD and IEA Pacific is the same.

OECD/IEA Pacific*

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|--------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | .. | 166701 e | 164737 e | 176737 e | 172581 e | 166873 e | 169902 e | .. |
| Hydro | 140416 | 140192 | 136704 | 146844 e | 149237 e | 142216 | 144184 | 0.3 |
| of which: Pumped Storage | .. | 12170 | 12014 | 13545 | 12244 | 11428 | 11524 | .. |
| Geothermal | 3951 | 5222 | 5814 | 6014 | 6002 | 6257 | 6115 | 4.5 |
| Solar Photovoltaics | .. | 27 e | 31 e | 37 e | 45 e | 53 e | 63 e | .. |
| Solar Thermal | 1 | 23 | 26 | 30 e | 30 e | 30 e | 30 | 40.5 |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 10 e | 18 e | 24 e | 40 e | 120 e | 305 e | - |
| Industrial Waste | - | - | - | - | - | .. | - | - |
| Municipal Solid Waste Renew. | .. | 3291 e | 4026 e | 4750 e | 5329 e | 5629 e | 5570 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 19 e | 34 e | 34 e | 34 e | 34 e | 35 e | .. |
| Solid Biomass | .. | 17683 e | 17467 e | 18459 e | 11289 e | 12033 e | 13109 | .. |
| Gas from Biomass | .. | 234 | 617 | 545 | 575 | 501 | 491 | .. |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | .. | 165333 e | 163280 e | 175309 e | 170984 e | 165245 e | 167633 e | .. |
| Hydro | 140416 | 140192 | 136704 | 146844 e | 149237 e | 142216 | 144184 | 0.3 |
| of which: Pumped Storage | .. | 12170 | 12014 | 13545 | 12244 | 11428 | 11524 | .. |
| Geothermal | 3951 | 5168 | 5757 | 5957 | 5945 | 6201 | 6076 | 4.4 |
| Solar Photovoltaics | .. | 27 e | 31 e | 37 e | 45 e | 53 e | 63 e | .. |
| Solar Thermal | 1 | 23 | 26 | 30 e | 30 e | 30 e | 30 | 40.5 |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 10 e | 18 e | 24 e | 40 e | 120 e | 305 e | - |
| Industrial Waste | - | - | - | - | - | .. | - | - |
| Municipal Solid Waste Renew. | .. | 3060 | 3657 | 4384 | 4972 | 5281 | 5209 | .. |
| Municipal Solid Waste Non-Renew. | .. | - | - | - | - | - | - | .. |
| Solid Biomass | .. | 16677 | 16537 | 17562 | 10210 | 10888 | 11309 | .. |
| Gas from Biomass | .. | 176 | 550 | 471 | 505 | 456 | 457 | .. |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | .. | 1368 e | 1457 e | 1428 e | 1597 e | 1628 e | 2269 e | .. |
| Geothermal | - | 54 | 57 | 57 | 57 | 56 | 39 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | .. | 231 e | 369 e | 366 e | 357 e | 348 e | 361 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 19 e | 34 e | 34 e | 34 e | 34 e | 35 e | .. |
| Solid Biomass | .. | 1006 e | 930 e | 897 e | 1079 e | 1145 e | 1800 | .. |
| Gas from Biomass | .. | 58 | 67 | 74 | 70 | 45 | 34 | .. |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

* Geographic coverage of OECD and IEA Pacific is the same.

OECD/IEA Pacific*

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|------|----------------|----------------|----------------|----------------|----------------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | .. | 25966 e | 32919 e | 41744 e | 51386 e | 57471 e | 68146 e | .. |
| Geothermal | .. | - | - | - | - | - | - | .. |
| Solar Thermal | .. | - | - | - | - | - | - | .. |
| Industrial Waste | .. | 4407 e | 5823 e | 7502 e | 9207 e | 10311 e | 12209 e | .. |
| Municipal Solid Waste Renew. | .. | 17341 e | 22766 e | 27998 e | 34828 e | 39202 e | 47194 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 457 e | 519 e | 747 e | 1051 e | 1255 e | 1444 e | .. |
| Solid Biomass | .. | - | - | 1406 e | 1740 e | 1955 e | 2210 e | .. |
| Gas from Biomass | .. | 663 e | 665 e | 738 e | 901 e | 903 e | 1298 e | .. |
| Waste Heat and Heat Pumps | .. | 3098 e | 3146 e | 3353 e | 3659 e | 3845 e | 3791 e | .. |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | .. | 936 e | 1238 e | 1459 e | 1659 e | 1702 e | 2906 e | .. |
| Geothermal | .. | - | - | - | - | - | - | .. |
| Solar Thermal | .. | - | - | - | - | - | - | .. |
| Industrial Waste | .. | - | - | - | - | - | - | .. |
| Municipal Solid Waste Renew. | .. | 723 e | 956 e | 1126 e | 1281 e | 1314 e | 2243 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 213 e | 282 e | 333 e | 378 e | 388 e | 663 e | .. |
| Solid Biomass | .. | - | - | - | - | - | - | .. |
| Gas from Biomass | .. | - | - | - | - | - | - | .. |
| Waste Heat and Heat Pumps | .. | - | - | - | - | - | - | .. |
| Heat Only Plants | .. | 25030 e | 31681 e | 40285 e | 49727 e | 55769 e | 65240 e | .. |
| Geothermal | .. | - | - | - | - | - | - | .. |
| Solar Thermal | .. | - | - | - | - | - | - | .. |
| Industrial Waste | .. | 4407 e | 5823 e | 7502 e | 9207 e | 10311 e | 12209 e | .. |
| Municipal Solid Waste Renew. | .. | 16618 e | 21810 e | 26872 e | 33547 e | 37888 e | 44951 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 244 e | 237 e | 414 e | 673 e | 867 e | 781 e | .. |
| Solid Biomass | .. | - | - | 1406 e | 1740 e | 1955 e | 2210 e | .. |
| Gas from Biomass | .. | 663 e | 665 e | 738 e | 901 e | 903 e | 1298 e | .. |
| Waste Heat and Heat Pumps | .. | 3098 e | 3146 e | 3353 e | 3659 e | 3845 e | 3791 e | .. |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

* Geographic coverage of OECD and IEA Pacific is the same.

OECD/IEA Pacific*

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00** |
|---|----------|----------|----------|----------|----------|----------|----------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 17387 | 27347 e | 29167 e | 29917 e | 29218 | 30068 | 29159 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | -5987 | -5987 | -5987 | -5987 | -5987 | -6000 | -6000 | .. |
| Final Energy Consumption | 11400 | 21360 e | 23180 e | 23930 e | 23231 | 24068 | 23159 | .. |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 3521 | 4333 | 4868 | 5525 | 42039 | 38672 | 39345 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Final Energy Consumption | 3521 | 4333 | 4868 | 5525 | 42039 | 38672 | 39345 | .. |
| Industrial Waste | | | | | | | | |
| Production | 11037 e | 17549 e | 18664 e | 25111 e | 30905 e | 34505 e | 37734 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Transformation Sector | - | 5686 e | 7466 e | 9477 e | 11561 e | 12875 e | 15174 | .. |
| Final Energy Consumption | 11037 | 11863 | 11198 | 15634 | 19344 | 21630 | 22560 | .. |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 14614 | 46480 e | 58741 e | 70609 e | 87924 e | 95810 e | 104603 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | -1 | - | -1 | - | - | 1 | .. |
| Transformation Sector | 14614 | 46479 e | 58741 e | 70608 e | 87924 e | 95810 e | 104604 | .. |
| Final Energy Consumption | - | - | - | - | - | - | - | .. |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | 1121 e | 1472 e | 1786 e | 2197 e | 2452 e | 2901 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Transformation Sector | - | 1121 e | 1472 e | 1786 e | 2197 e | 2452 e | 2901 | .. |
| Final Energy Consumption | - | - | - | - | - | - | - | .. |
| Solid Biomass | | | | | | | | |
| Production | 449016 | 467269 e | 489852 e | 509630 e | 409896 e | 418474 e | 443417 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | 2863 | 2002 | 3498 | .. |
| Transformation Sector | 144570 e | 152175 e | 151729 e | 159879 e | 118062 e | 119249 e | 132788 | .. |
| Final Energy Consumption | 304446 e | 315094 e | 338123 e | 349751 e | 294697 e | 301227 e | 314127 e | .. |
| Gas from Biomass | | | | | | | | |
| Production | 947 | 3422 e | 6587 e | 6829 e | 7843 e | 8446 e | 8642 e | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | 720 | 854 | 285 | 39 | -40 | 123 | .. |
| Transformation Sector | 905 | 4101 e | 7387 e | 7050 e | 7820 e | 8266 e | 8625 e | .. |
| Final Energy Consumption | 42 | 41 | 54 | 64 | 62 | 140 | 140 | .. |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Transformation Sector | - | - | - | - | - | - | - | .. |
| Final Energy Consumption | - | - | - | - | - | - | - | .. |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

* Geographic coverage of OECD and IEA Pacific is the same.

**Growth rates have not been calculated for aggregates due to unavailability of data for some countries which causes breaks in series.

OECD Europe

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|--|----------|----------|----------|----------|----------|----------|----------|-------------------------------------|
| TPES (Mtoe) ⁽¹⁾ | 1621.38 | 1673.04 | 1734.44 | 1727.32 | 1747.09 | 1750.11 | 1765.64 | 0.9 |
| of which: Renewables (Mtoe) ⁽²⁾ | 91.87 e | 104.37 e | 104.58 e | 108.28 e | 112.00 e | 112.71 e | 117.63 e | 2.5 |
| Renewables/TPES(%) | 5.7 | 6.2 | 6.0 | 6.3 | 6.4 | 6.4 | 6.7 | 1.6 |
| GDP (1995 bil. US\$) | 8831.78 | 9485.96 | 9655.58 | 9912.78 | 10200.64 | 10448.39 | 10800.91 | 2.0 |
| TPES/GDP ⁽³⁾ | 0.18 | 0.18 | 0.18 | 0.17 | 0.17 | 0.17 | 0.16 | -1.2 |
| TPES/GDP (1973 = 100) | 79 | 76 | 77 | 75 | 73 | 72 | 70 | -1.2 |
| Population (millions) | 497.35 | 511.13 | 513.24 | 515.31 | 517.26 | 519.29 | 521.61 | 0.5 |
| TPES/population ⁽⁴⁾ | 3.26 | 3.27 | 3.38 | 3.35 | 3.38 | 3.37 | 3.39 | 0.4 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 2628.8 | 2846.7 | 2919.5 | 2958.5 | 3036.5 | 3091.9 | 3194.8 | 2.0 |
| of which: Renewables (TWh) ⁽²⁾ | 465.49 e | 532.58 e | 512.43 e | 538.70 e | 562.31 e | 568.96 e | 610.11 e | 2.7 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 17.7 | 18.7 | 17.6 | 18.2 | 18.5 | 18.4 | 19.1 | 0.8 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 87.98 e | 100.30 e | 100.39 e | 103.62 e | 107.26 e | 113.99 e | 119.18 e | 3.1 |
| Renewable/TPES (%) | 5.4 e | 6.0 e | 5.8 e | 6.0 e | 6.1 e | 6.5 e | 6.8 e | 2.2 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

(1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.

(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.

(3) In units of toe/1995 thousand US\$.

(4) In units of toe/per capita.

(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants

(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|---------------|-----------------|---------------|---------------|-----------------|-----------------|-----------------|-------------------------------------|
| Total Capacity | 163393 | 180311 e | 183384 | 185262 | 187733 e | 194164 e | 202692 e | 2.2 |
| Hydro | 157640 | 170802 | 172098 | 172718 | 172787 | 174727 e | 178168 e | 1.2 |
| of which: Pumped Storage | 25906 | 35278 | 36239 | 35794 | 38484 e | 37677 e | 36908 e | 3.6 |
| Geothermal | 563 | 549 | 564 | 637 | 717 | 795 e | 800 e | 3.6 |
| Solar Photovoltaic | 8 | 47 | 58 | 72 | 103 | 105 | 157 e | 34.7 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | 240 | 240 | 240 | 240 | 240 | 240 | 238 | -0.1 |
| Wind | 474 | 2474 | 3415 | 4614 | 6223 | 8937 | 13413 | 39.7 |
| Industrial Waste | - | - | - | - | - | 200 | 335 | - |
| Municipal Solid Waste | 962 | 1560 | 2008 | 2021 | 2198 e | 2426 e | 2629 e | 10.6 |
| Solid Biomass | 2742 | 3203 e | 3532 | 3427 | 3687 | 4577 e | 4718 e | 5.6 |
| Gas from Biomass | 384 | 475 | 597 | 647 | 734 | 1005 | 1208 e | 12.1 |
| Comb. Renewables Non-Specified | 380 | 961 | 872 | 886 | 1044 | 1152 | 1026 e | 10.4 |
| Solar Collectors Surface (1000 m ²) | 4059 | 7579 | 8430 | 9047 | 10229 | 10358 e | 11625 e | 11.1 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

OECD Europe

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|---------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | .. | 560789 e | 544079 e | 569429 e | 597929 e | 608443 e | 653850 e | .. |
| Hydro | 463234 | 519973 | 501667 | 517345 | 536466 | 543114 | 574812 e | 2.2 |
| of which: Pumped Storage | 20099 | 22612 | 25359 | 23127 | 26315 e | 28622 e | 31915 e | 4.7 |
| Geothermal | 3589 | 3854 | 4241 | 4414 | 5012 | 5700 | 6184 | 5.6 |
| Solar Photovoltaics | 14 | 43 | 47 | 57 | 80 | 83 e | 120 e | 24.0 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | 571 | 568 | 547 | 570 | 590 | 580 | 573 | 0.0 |
| Wind | 772 | 4082 | 4894 | 7378 | 11311 | 14263 | 22731 | 40.2 |
| Industrial Waste | .. | 5023 | 5633 | 6951 | 8269 | 6535 e | 7037 e | .. |
| Municipal Solid Waste Renew. | .. | 6984 | 8142 | 9454 | 11231 | 9188 | 10331 | .. |
| Municipal Solid Waste Non-Renew. | .. | 572 | 659 | 655 | 1038 | 4330 | 4791 | .. |
| Solid Biomass | 10452 e | 15383 | 14212 | 17601 | 19759 | 19530 e | 20707 e | 7.1 |
| Gas from Biomass | .. | 1593 | 1818 | 2413 | 4173 e | 5120 | 6564 | .. |
| Comb. Renewables Non-Specified | 1384 | 2714 | 2219 | 2591 | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | .. | 540668 e | 524719 e | 544607 e | 570976 e | 581179 e | 625333 e | .. |
| Hydro | 463234 | 519973 | 501667 | 517345 | 536466 | 543114 | 574812 e | 2.2 |
| of which: Pumped Storage | 20099 | 22612 | 25359 | 23127 | 26315 e | 28622 e | 31915 e | 4.7 |
| Geothermal | 3589 | 3747 | 4127 | 4292 | 4788 | 5066 | 5335 | 4.0 |
| Solar Photovoltaics | 14 | 43 | 47 | 57 | 80 | 83 e | 120 e | 24.0 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | 571 | 568 | 547 | 570 | 590 | 580 | 573 | 0.0 |
| Wind | 772 | 4082 | 4894 | 7378 | 11311 | 14263 | 22731 | 40.2 |
| Industrial Waste | .. | 4473 | 4743 | 4827 | 5703 | 3883 e | 4787 | .. |
| Municipal Solid Waste Renew. | .. | 3449 | 3618 | 4140 | 5320 | 4441 | 5060 | .. |
| Municipal Solid Waste Non-Renew. | .. | c | c | c | 318 | 2015 | 2387 | .. |
| Solid Biomass | 1581 e | 2538 | 2710 | 2794 | 3461 | 3920 e | 4230 e | 10.3 |
| Gas from Biomass | .. | 952 | 1098 | 1543 | 2939 e | 3814 | 5298 | .. |
| Comb. Renewables Non-Specified | 1384 | 843 | 1268 | 1661 | - | - | - | - |
| CHP Plants | .. | 20121 e | 19360 e | 24822 | 26953 | 27264 e | 28517 e | .. |
| Geothermal | - | 107 | 114 | 122 | 224 | 634 | 849 | - |
| Industrial Waste | .. | 550 | 890 | 2124 | 2566 | 2652 e | 2250 e | .. |
| Municipal Solid Waste Renew. | .. | 3535 | 4524 | 5314 | 5911 | 4747 | 5271 | .. |
| Municipal Solid Waste Non-Renew. | .. | 572 | 659 | 655 | 720 | 2315 | 2404 | .. |
| Solid Biomass | 8871 e | 12845 e | 11502 e | 14807 | 16298 | 15610 e | 16477 | 6.4 |
| Gas from Biomass | .. | 641 | 720 | 870 | 1234 | 1306 | 1266 | .. |
| Comb. Renewables Non-Specified | - | 1871 | 951 | 930 | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

OECD Europe

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|----------------------------------|------|-----------------|-----------------|-----------------|---------------|-----------------|-----------------|---|
| Total Heat | .. | 199420 e | 230218 e | 224893 e | 233098 | 261672 e | 255401 e | .. |
| Geothermal | .. | 7468 | 7000 | 7516 | 6257 | 8272 | 7805 | .. |
| Solar Thermal | .. | 6 | 188 | 239 | 277 | 336 | 371 | .. |
| Industrial Waste | .. | 3384 | 4223 | 4118 | 5472 | 8973 e | 15918 | .. |
| Municipal Solid Waste Renew. | .. | 85563 e | 90172 e | 89376 e | 88819 | 80327 e | 80351 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 8524 e | 9259 e | 9423 | 9589 | 23368 | 21790 | .. |
| Solid Biomass | .. | 75898 | 99787 e | 96128 e | 101063 | 118176 | 106191 e | .. |
| Gas from Biomass | .. | 2765 | 3277 | 4198 | 3448 | 3747 | 3723 | .. |
| Waste Heat and Heat Pumps | .. | 15812 | 16312 | 13895 | 18173 | 18473 | 19252 | .. |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | .. | 120913 e | 143965 e | 142342 e | 145549 | 170452 | 161601 e | .. |
| Geothermal | .. | 7103 | 6630 | 7148 | 5885 | 7556 | 6967 | .. |
| Solar Thermal | .. | - | - | - | - | - | - | .. |
| Industrial Waste | .. | 2377 | 2820 | 2666 | 3558 | 6444 e | 8086 | .. |
| Municipal Solid Waste Renew. | .. | 62687 e | 68117 e | 66605 e | 66804 | 59476 | 58283 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 6825 e | 7846 e | 7858 | 8060 | 21014 | 18891 | .. |
| Solid Biomass | .. | 37256 | 53968 e | 52530 e | 55466 | 70040 | 63185 e | .. |
| Gas from Biomass | .. | 2231 | 2385 | 3089 | 2888 | 2887 | 2711 | .. |
| Waste Heat and Heat Pumps | .. | 2434 | 2199 | 2446 | 2888 | 3035 | 3478 | .. |
| Heat Only Plants | .. | 78507 | 86253 | 82551 e | 87549 | 91221 e | 93800 | .. |
| Geothermal | .. | 365 | 370 | 368 | 372 | 716 | 838 | .. |
| Solar Thermal | .. | 6 | 188 | 239 | 277 | 336 | 371 | .. |
| Industrial Waste | .. | 1007 | 1403 | 1452 | 1914 | 2529 | 7832 | .. |
| Municipal Solid Waste Renew. | .. | 22876 | 22055 | 22771 e | 22015 | 20851 e | 22068 | .. |
| Municipal Solid Waste Non-Renew. | .. | 1699 | 1413 | 1565 | 1529 | 2354 | 2899 | .. |
| Solid Biomass | .. | 38642 | 45819 | 43598 | 45597 | 48136 | 43006 | .. |
| Gas from Biomass | .. | 534 | 892 | 1109 | 560 | 860 | 1012 | .. |
| Waste Heat and Heat Pumps | .. | 13378 | 14113 | 11449 | 15285 | 15439 | 15774 | .. |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

OECD Europe

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00** |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 45358 e | 46912 e | 46513 e | 46760 e | 47837 e | 50271 | 52786 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | -1726 | -2863 | -3053 | -3069 | -3155 | -3135 | -3387 | .. |
| Final Energy Consumption | 43632 | 44049 | 43460 | 43691 | 44682 | 47136 | 49399 | .. |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 6779 | 16857 | 18812 | 20645 | 23165 e | 24251 | 26813 e | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Final Energy Consumption | 6779 | 16857 | 18812 | 20645 | 23165 e | 24251 e | 26813 e | .. |
| Industrial Waste | | | | | | | | |
| Production | 71859 e | 106753 e | 106617 e | 121602 e | 129982 e | 117950 e | 132304 e | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | -5222 | -2690 | -508 | -301 | -589 | -247 | -250 | .. |
| Transformation Sector | 30001 e | 54184 e | 62746 e | 75959 e | 90004 e | 78708 e | 91578 e | .. |
| Final Energy Consumption | 36636 e | 49879 e | 43363 e | 45342 e | 39389 e | 38995 e | 40476 e | .. |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 174079 e | 234932 e | 253579 e | 264717 e | 270944 e | 235818 e | 248323 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | -6368 | -15478 | -15754 | -20506 | -7097 | -9754 | -71 | .. |
| Transformation Sector | 157493 e | 208686 | 220251 | 223870 | 239628 e | 210331 e | 225353 | .. |
| Final Energy Consumption | 10218 | 10768 | 17574 | 20341 | 24219 | 15733 | 22899 | .. |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | 12026 | 17692 | 17982 | 17872 | 25001 | 85437 | 92921 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | -9 | -19 | .. |
| Transformation Sector | 11803 | 17436 | 17749 | 17647 | 24604 | 73762 | 79373 | .. |
| Final Energy Consumption | 223 | 256 | 233 | 225 | 397 | 11666 | 13529 | .. |
| Solid Biomass | | | | | | | | |
| Production | 1860201 e | 2076257 e | 2121319 e | 2170153 e | 2220564 e | 2224865 e | 2241226 e | .. |
| Net Imports ⁽¹⁾ | 5684 e | 14790 | 16876 | 19610 | 20479 | 18642 | 24062 | .. |
| Miscellaneous to Balance ⁽²⁾ | 5607 | -3340 | -2734 | -2425 | 1488 | 341 | -644 | .. |
| Transformation Sector | 142328 e | 219165 | 233949 | 237060 | 248929 e | 275975 e | 276041 e | .. |
| Final Energy Consumption | 1729164 e | 1868542 e | 1901512 e | 1950278 e | 1993602 e | 1967873 e | 1988603 e | .. |
| Gas from Biomass | | | | | | | | |
| Production | 29974 | 54018 e | 61949 e | 71356 e | 76870 e | 83411 e | 97903 e | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | -8247 | -11680 | -13779 | -16805 | -776 | -6 | -17 | .. |
| Transformation Sector | 7931 e | 26635 | 30551 | 36153 | 56639 e | 63715 e | 78337 e | .. |
| Final Energy Consumption | 13796 | 15703 e | 17619 e | 18398 e | 19455 e | 19690 e | 19549 e | .. |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | 744 | 477 | 400 | 467 | 432 | 547 | 790 | .. |
| Net Imports ⁽¹⁾ | - | - | -5 | -2 | 9 | 6 | 6 | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | 2 | - | .. |
| Transformation Sector | 744 | 251 | 60 | 14 | 14 | 27 | 52 | .. |
| Final Energy Consumption | - | 226 | 335 | 451 | 427 | 528 | 744 | .. |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

**Growth rates have not been calculated for aggregates due to unavailability of data for some countries which causes breaks in series.

IEA Total

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------------------------------|
| TPES (Mtoe) ⁽¹⁾ | 4267.06 | 4631.99 | 4778.38 | 4823.94 | 4845.97 | 4949.49 | 5052.55 | 1.7 |
| of which: Renewables (Mtoe) ⁽²⁾ | 249.66 e | 273.99 e | 282.63 e | 286.23 e | 286.51 e | 291.28 e | 294.92 e | 1.7 |
| Renewables/TPES(%) | 5.9 | 5.9 | 5.9 | 5.9 | 5.9 | 5.9 | 5.8 | -0.0 |
| GDP (1995 bil. US\$) | 21395.08 | 23469.65 | 24135.97 | 24891.04 | 25461.26 | 26189.71 | 27116.45 | 2.4 |
| TPES/GDP ⁽³⁾ | 0.20 | 0.20 | 0.20 | 0.19 | 0.19 | 0.19 | 0.19 | -0.7 |
| TPES/GDP (1973 = 100) | 73 | 72 | 72 | 71 | 70 | 69 | 68 | -0.7 |
| Population (millions) | 918.22 | 951.73 | 957.59 | 963.53 | 969.17 | 974.75 | 980.63 | 0.7 |
| TPES/population ⁽⁴⁾ | 4.65 | 4.87 | 4.99 | 5.01 | 5.00 | 5.08 | 5.15 | 1.0 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 7275.0 | 8187.2 | 8410.6 | 8524.7 | 8736.8 | 8943.8 | 9243.6 | 2.4 |
| of which: Renewables (TWh) ⁽²⁾ | 1255.36 e | 1408.50 e | 1445.80 e | 1487.49 e | 1452.07 e | 1440.22 e | 1451.56 e | 1.5 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 17.3 | 17.2 | 17.2 | 17.4 | 16.6 | 16.1 | 15.7 | -0.9 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 182.37 e | 269.49 e | 277.99 e | 278.35 e | 278.67 e | 292.58 e | 296.47 e | 5.0 |
| Renewable/TPES (%) | 4.3 e | 5.8 e | 5.8 e | 5.8 e | 5.8 e | 5.9 e | 5.9 e | 3.2 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

(1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.

(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.

(3) In units of toe/1995 thousand US\$.

(4) In units of toe/per capita.

(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants

(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------------|
| Total Capacity | 382138 e | 420383 e | 423108 e | 427549 e | 429698 e | 439741 e | 449555 e | 1.6 |
| Hydro | 358818 | 390435 | 391009 | 393974 | 394653 | 398038 e | 400810 e | 1.1 |
| of which: Pumped Storage | 42892 | 79126 | 80710 | 78465 e | 82453 e | 82093 e | 80399 e | 6.5 |
| Geothermal | 3717 | 4245 | 4194 | 4268 | 4365 | 4520 e | 4617 e | 2.2 |
| Solar Photovoltaic | .. | .. | .. | .. | .. | 266 | 339 e | .. |
| Solar Thermal | 348 | 349 | 349 | 350 | 375 | 425 | 425 | 2.0 |
| Tide, Wave, Ocean | 260 | 260 | 260 | 260 e | 260 e | 260 e | 258 e | -0.1 |
| Wind | 2386 | 4235 | 5124 | 6228 e | 8001 e | 11390 e | 16103 e | 21.0 |
| Industrial Waste | .. | .. | .. | .. | .. | 1186 | 1739 | .. |
| Municipal Solid Waste | .. | .. | .. | .. | .. | 5855 e | 6757 e | .. |
| Solid Biomass | .. | .. | .. | .. | .. | 13448 e | 13319 e | .. |
| Gas from Biomass | .. | .. | .. | .. | .. | 1641 | 2545 e | .. |
| Comb. Renewables Non-Specified | .. | .. | .. | .. | .. | 2712 e | 2643 e | .. |
| Solar Collectors Surface (1000 m ²) | .. | .. | .. | .. | .. | .. | .. | .. |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

IEA Total

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|---------|------------------|------------------|------------------|------------------|------------------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | .. | 1474411 e | 1517662 e | 1559877 e | 1528321 e | 1517320 e | 1537610 e | .. |
| Hydro | 1182867 | 1320296 | 1357616 | 1389713 e | 1355738 e | 1332854 | 1337103 e | 1.2 |
| of which: Pumped Storage | 40749 | 56323 | 60977 | 60142 | 62337 e | 61612 e | 67962 e | 5.2 |
| Geothermal | 23782 | 23727 | 25455 | 25232 | 25728 | 26259 | 25654 | 0.8 |
| Solar Photovoltaics | 17 | 74 e | 81 e | 98 e | 128 e | 139 e | 186 e | 27.0 |
| Solar Thermal | 664 | 850 | 932 | 926 e | 920 e | 903 e | 913 | 3.2 |
| Tide, Wave, Ocean | 597 | 601 | 579 | 602 | 622 | 612 | 605 | 0.1 |
| Wind | 3838 | 7346 e | 8384 e | 10716 e | 14427 e | 19115 e | 28879 e | 22.4 |
| Industrial Waste | .. | 8997 | 10189 e | 11553 e | 12847 e | 11121 e | 13260 e | .. |
| Municipal Solid Waste Renew. | .. | 25048 | 27814 | 29652 | 32581 e | 31364 e | 31554 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 591 | 693 | 689 | 1072 e | 4364 e | 4826 e | .. |
| Solid Biomass | 64734 e | 79064 | 77694 | 81351 | 75391 e | 80912 e | 82622 e | 2.5 |
| Gas from Biomass | .. | 5103 | 6006 | 6754 | 8867 e | 9677 | 12008 | .. |
| Comb. Renewables Non-Specified | 1384 | 2714 | 2219 | 2591 | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | .. | 1416297 e | 1463244 e | 1500083 e | 1466455 e | 1449665 e | 1464956 e | .. |
| Hydro | 1182867 | 1320296 | 1357616 | 1389713 e | 1355738 e | 1332854 | 1337103 e | 1.2 |
| of which: Pumped Storage | 40749 | 56323 | 60977 | 60142 | 62337 e | 61612 e | 67962 e | 5.2 |
| Geothermal | 23782 | 23673 | 25398 | 25175 | 25671 | 25788 | 23760 | -0.0 |
| Solar Photovoltaics | 17 | 74 e | 81 e | 98 e | 128 e | 139 e | 186 e | 27.0 |
| Solar Thermal | 664 | 850 | 932 | 926 e | 920 e | 903 e | 913 | 3.2 |
| Tide, Wave, Ocean | 597 | 601 | 579 | 602 | 622 | 612 | 605 | 0.1 |
| Wind | 3838 | 7346 e | 8384 e | 10716 e | 14427 e | 19115 e | 28879 e | 22.4 |
| Industrial Waste | .. | 4913 | 5164 e | 5232 e | 6128 e | 4542 e | 5353 | .. |
| Municipal Solid Waste Renew. | .. | 19941 | 21359 | 22416 | 24364 | 23745 | 23720 | .. |
| Municipal Solid Waste Non-Renew. | .. | c | c | c | 318 | 2015 | 2387 | .. |
| Solid Biomass | 29958 e | 33567 | 37474 | 37977 | 30963 | 32316 e | 32683 e | 0.9 |
| Gas from Biomass | .. | 4193 | 4989 | 5567 | 7176 e | 7636 | 9367 | .. |
| Comb. Renewables Non-Specified | 1384 | 843 | 1268 | 1661 | - | - | - | - |
| CHP Plants | .. | 58114 e | 54418 e | 59794 e | 61866 e | 67655 e | 72654 e | .. |
| Geothermal | - | 54 | 57 | 57 | 57 | 471 | 1894 | - |
| Industrial Waste | .. | 4084 | 5025 e | 6321 e | 6719 e | 6579 e | 7907 e | .. |
| Municipal Solid Waste Renew. | .. | 5107 | 6455 | 7236 | 8217 e | 7619 e | 7834 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 591 | 693 | 689 | 754 e | 2349 e | 2439 e | .. |
| Solid Biomass | 34776 e | 45497 e | 40220 e | 43374 e | 44428 e | 48596 e | 49939 | 3.7 |
| Gas from Biomass | .. | 910 | 1017 | 1187 | 1691 | 2041 | 2641 | .. |
| Comb. Renewables Non-Specified | - | 1871 | 951 | 930 | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

IEA Total

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|----------------------------------|------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---|
| Total Heat | .. | 244389 e | 319472 e | 323089 e | 344201 e | 874037 e | 876120 e | .. |
| Geothermal | .. | 47 | 32 | 50 | 54 | 398 | 436 | .. |
| Solar Thermal | .. | 6 | 188 | 239 | 277 | 336 | 371 | .. |
| Industrial Waste | .. | 8458 e | 13167 e | 16387 e | 18236 e | 35857 e | 44388 e | .. |
| Municipal Solid Waste Renew. | .. | 110138 e | 116246 e | 120758 e | 133314 e | 147342 e | 158579 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 8981 e | 9778 e | 10170 e | 10640 e | 24623 e | 23234 e | .. |
| Solid Biomass | .. | 94427 | 156492 e | 153083 e | 155176 e | 584724 e | 563206 e | .. |
| Gas from Biomass | .. | 3422 e | 4111 e | 5154 e | 4672 e | 58439 e | 62863 e | .. |
| Waste Heat and Heat Pumps | .. | 18910 e | 19458 e | 17248 e | 21832 e | 22318 e | 23043 e | .. |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | .. | 141657 e | 202210 e | 201229 e | 207950 e | 215565 e | 206194 e | .. |
| Geothermal | .. | - | - | - | - | - | - | .. |
| Solar Thermal | .. | - | - | - | - | - | - | .. |
| Industrial Waste | .. | 3176 | 6016 | 7544 | 7356 | 11737 e | 12167 | .. |
| Municipal Solid Waste Renew. | .. | 70680 e | 72417 e | 71151 e | 77788 e | 65998 e | 67989 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 7038 e | 8128 e | 8191 e | 8438 e | 21402 e | 19554 e | .. |
| Solid Biomass | .. | 56098 | 110891 e | 108585 e | 108242 | 110433 | 100295 e | .. |
| Gas from Biomass | .. | 2231 | 2559 | 3312 | 3238 | 2960 | 2711 | .. |
| Waste Heat and Heat Pumps | .. | 2434 | 2199 | 2446 | 2888 | 3035 | 3478 | .. |
| Heat Only Plants | .. | 102732 e | 117262 e | 121860 e | 136251 e | 658473 e | 669926 e | .. |
| Geothermal | .. | 47 | 32 | 50 | 54 | 398 | 436 | .. |
| Solar Thermal | .. | 6 | 188 | 239 | 277 | 336 | 371 | .. |
| Industrial Waste | .. | 5282 e | 7151 e | 8843 e | 10880 e | 24120 e | 32221 e | .. |
| Municipal Solid Waste Renew. | .. | 39458 e | 43829 e | 49607 e | 55526 e | 81344 e | 90590 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 1943 e | 1650 e | 1979 e | 2202 e | 3221 e | 3680 e | .. |
| Solid Biomass | .. | 38329 | 45601 | 44498 e | 46934 e | 474291 e | 462911 e | .. |
| Gas from Biomass | .. | 1191 e | 1552 e | 1842 e | 1434 e | 55479 e | 60152 e | .. |
| Waste Heat and Heat Pumps | .. | 16476 e | 17259 e | 14802 e | 18944 e | 19284 e | 19565 e | .. |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

IEA Total

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00** |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 52085 e | 68268 e | 70845 e | 72306 e | 72703 e | 76077 | 77352 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | -5987 | -5987 | -5987 | -5987 | -5987 | -6000 | -6000 | .. |
| Final Energy Consumption | 46098 | 62281 e | 64858 e | 66319 e | 66716 | 70077 | 71352 | .. |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 10300 | 21190 | 23680 | 26170 | 65204 e | 126236 | 126514 e | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Final Energy Consumption | 10300 | 21190 | 23680 | 26170 | 65204 e | 126236 e | 126514 e | .. |
| Industrial Waste | | | | | | | | |
| Production | 50585 e | 217625 e | 227351 e | 254372 e | 255189 e | 263986 e | 311270 e | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | -22133 | - | - | - | - | .. |
| Transformation Sector | 24736 e | 181182 e | 164989 e | 208028 e | 205116 e | 217296 e | 263419 e | .. |
| Final Energy Consumption | 25849 e | 36443 e | 40229 e | 46344 e | 50073 e | 46690 e | 47851 e | .. |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 362522 e | 551604 e | 598715 e | 616675 e | 645525 e | 644601 e | 650531 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | -6368 | -15479 | -15754 | -20507 | -7097 | -9754 | -70 | .. |
| Transformation Sector | 345936 e | 525357 | 565387 | 575827 | 614209 e | 619114 e | 627562 | .. |
| Final Energy Consumption | 10218 | 10768 | 17574 | 20341 | 24219 | 15733 | 22899 | .. |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | 12026 | 18813 e | 19454 e | 19658 e | 27198 e | 87877 e | 95758 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | -9 | -19 | .. |
| Transformation Sector | 11803 | 18557 e | 19221 e | 19433 e | 26801 e | 76214 e | 82274 | .. |
| Final Energy Consumption | 223 | 256 | 233 | 225 | 397 | 11654 | 13465 | .. |
| Solid Biomass | | | | | | | | |
| Production | 5015480 e | 5192793 e | 5342186 e | 5317273 e | 5343427 e | 5440847 e | 5522721 e | .. |
| Net Imports ⁽¹⁾ | 5684 e | 14790 | 16876 | 19610 | 20479 | 18642 | 24062 | .. |
| Miscellaneous to Balance ⁽²⁾ | 5613 | -3341 | -418 | -2164 | 3013 | 2600 | 3498 | .. |
| Transformation Sector | 1774149 e | 1669520 | 1792224 | 1784256 | 1690792 e | 2406480 e | 2441521 e | .. |
| Final Energy Consumption | 3252628 e | 3534722 e | 3566420 e | 3550463 e | 3676127 e | 3055609 e | 3108760 e | .. |
| Gas from Biomass | | | | | | | | |
| Production | 30528 | 99677 e | 114366 e | 124304 e | 133222 e | 212069 e | 243381 e | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | -8247 | -10959 | -12914 | -16519 | -714 | -24 | 133 | .. |
| Transformation Sector | 8822 e | 73399 | 84359 | 89923 | 113645 e | 192898 e | 224618 e | .. |
| Final Energy Consumption | 13459 | 15319 e | 17093 e | 17862 e | 18863 e | 19147 e | 18896 e | .. |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | 744 | 4540 | 3320 | 4287 | 4592 | 4956 | 5687 | .. |
| Net Imports ⁽¹⁾ | - | 49 | 34 | 9 | 17 | 17 | 21 | .. |
| Miscellaneous to Balance ⁽²⁾ | - | 34 | 15 | -65 | -7 | -96 | 46 | .. |
| Transformation Sector | 744 | 1391 | 1465 | 1501 | 1490 | 1757 | 1975 | .. |
| Final Energy Consumption | - | 3232 | 1904 | 2730 | 3112 | 3120 | 3779 | .. |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

**Growth rates have not been calculated for aggregates due to unavailability of data for some countries which causes breaks in series.

IEA North America

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|----------|---------|----------|----------|----------|---------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 2136.33 | 2319.86 | 2377.67 | 2403.08 | 2418.89 | 2490.82 | 2550.64 | 1.8 |
| of which: Renewables (Mtoe) ⁽²⁾ | 134.57 e | 146.80 | 153.96 | 152.22 | 149.87 | 154.29 | 152.43 | 1.3 |
| Renewables/TPES(%) | 6.3 | 6.3 | 6.5 | 6.3 | 6.2 | 6.2 | 6.0 | -0.5 |
| GDP (1995 bil. US\$) | 7056.70 | 7921.55 | 8195.22 | 8560.71 | 8927.76 | 9301.53 | 9691.78 | 3.2 |
| TPES/GDP ⁽³⁾ | 0.30 | 0.29 | 0.29 | 0.28 | 0.27 | 0.27 | 0.26 | -1.4 |
| TPES/GDP (1973 = 100) | 69 | 67 | 66 | 64 | 62 | 61 | 60 | -1.4 |
| Population (millions) | 277.68 | 292.43 | 295.18 | 298.07 | 300.81 | 303.49 | 306.17 | 1.0 |
| TPES/population ⁽⁴⁾ | 7.69 | 7.93 | 8.06 | 8.06 | 8.04 | 8.21 | 8.33 | 0.8 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 3663.5 | 4118.2 | 4224.0 | 4245.8 | 4366.0 | 4468.4 | 4608.6 | 2.3 |
| of which: Renewables (TWh) ⁽²⁾ | 642.82 e | 733.21 | 792.09 e | 797.42 e | 742.53 e | 729.86 | 697.74 | 0.8 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 17.5 | 17.8 | 18.8 | 18.8 | 17.0 | 16.3 | 15.1 | -1.5 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 71.17 | 146.40 | 153.55 | 149.04 | 146.81 | 154.29 | 152.43 | 7.9 |
| Renewable/TPES (%) | 3.3 | 6.3 | 6.5 | 6.2 | 6.1 | 6.2 | 6.0 | 6.0 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|---------------|---------------|---------------|---------------|---------------|-----------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 166421 | 181160 | 179872 | 182147 | 181958 | 184082 e | 183826 e | 1.0 |
| Hydro | 151741 | 164810 | 163318 | 165655 | 165515 | 166183 e | 165246 e | 0.9 |
| of which: Pumped Storage | 186 | 21564 | 21287 | 19487 e | 19075 e | 19122 e | 18197 e | 58.1 |
| Geothermal | 2669 | 2968 | 2893 | 2853 | 2917 | 3001 | 2983 | 1.1 |
| Solar Photovoltaic | .. | .. | .. | .. | .. | 156 | 177 | .. |
| Solar Thermal | 340 | 335 | 335 | 336 | 362 | 412 | 412 | 1.9 |
| Tide, Wave, Ocean | 20 | 20 | 20 | 20 e | 20 e | 20 e | 20 e | - |
| Wind | 1912 | 1753 | 1701 | 1602 e | 1721 e | 2329 e | 2443 e | 2.5 |
| Industrial Waste | .. | .. | .. | .. | .. | 739 | 1158 | .. |
| Municipal Solid Waste | .. | .. | .. | .. | .. | 2579 | 2806 | .. |
| Solid Biomass | .. | .. | .. | .. | .. | 6905 | 6578 | .. |
| Gas from Biomass | .. | .. | .. | .. | .. | 620 | 865 | .. |
| Comb. Renewables Non-Specified | .. | .. | .. | .. | .. | 1138 e | 1138 e | .. |
| Solar Collectors Surface (1000 m ²) | .. | .. | .. | .. | .. | .. | .. | .. |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

IEA North America

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|---------|---------------|-----------------|-----------------|-----------------|---------------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | .. | 761332 | 822809 e | 828067 e | 773578 e | 758752 | 731181 | .. |
| Hydro | 589249 | 673890 | 732460 | 738905 | 684550 | 662629 | 633553 | 0.7 |
| of which: Pumped Storage | 15919 | 23851 | 25889 | 25619 | 26096 | 23991 | 26893 | 5.4 |
| Geothermal | 16525 | 14941 | 15746 | 15179 | 15369 | 15438 | 14678 | -1.2 |
| Solar Photovoltaics | 3 | 4 | 3 | 4 | 3 | 3 | 3 | - |
| Solar Thermal | 663 | 827 | 906 | 896 | 890 | 873 | 883 | 2.9 |
| Tide, Wave, Ocean | 26 | 33 | 32 | 32 | 32 | 32 | 32 | 2.1 |
| Wind | 3066 | 3255 | 3472 | 3316 | 3080 | 4736 | 5848 | 6.7 |
| Industrial Waste | .. | 4268 | 4826 e | 5032 e | 4952 e | 4897 | 6552 | .. |
| Municipal Solid Waste Renew. | 10613 e | 14773 | 15646 | 15448 | 16021 | 16547 | 15653 | 4.0 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 38590 e | 46052 | 46133 | 45453 | 44549 | 49518 | 48995 | 2.4 |
| Gas from Biomass | .. | 3289 | 3585 | 3802 | 4132 | 4079 | 4984 | .. |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | .. | 724252 | 788706 e | 793809 e | 739458 e | 718875 | 687946 | .. |
| Hydro | 589249 | 673890 | 732460 | 738905 | 684550 | 662629 | 633553 | 0.7 |
| of which: Pumped Storage | 15919 | 23851 | 25889 | 25619 | 26096 | 23991 | 26893 | 5.4 |
| Geothermal | 16525 | 14941 | 15746 | 15179 | 15369 | 15023 | 12823 | -2.5 |
| Solar Photovoltaics | 3 | 4 | 3 | 4 | 3 | 3 | 3 | - |
| Solar Thermal | 663 | 827 | 906 | 896 | 890 | 873 | 883 | 2.9 |
| Tide, Wave, Ocean | 26 | 33 | 32 | 32 | 32 | 32 | 32 | 2.1 |
| Wind | 3066 | 3255 | 3472 | 3316 | 3080 | 4736 | 5848 | 6.7 |
| Industrial Waste | .. | 440 | 421 e | 405 e | 425 e | 659 | 566 | .. |
| Municipal Solid Waste Renew. | 9693 e | 13432 | 14084 | 13892 | 14072 | 14023 | 13451 | 3.3 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 13560 e | 14352 | 18227 | 17621 | 17292 | 17508 | 17144 | 2.4 |
| Gas from Biomass | .. | 3078 | 3355 | 3559 | 3745 | 3389 | 3643 | .. |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | .. | 37080 | 34103 e | 34258 e | 34120 e | 39877 | 43235 | .. |
| Geothermal | - | - | - | - | - | 415 | 1855 | - |
| Industrial Waste | .. | 3828 | 4405 e | 4627 e | 4527 e | 4238 | 5986 | .. |
| Municipal Solid Waste Renew. | 920 e | 1341 | 1562 | 1556 | 1949 | 2524 | 2202 | 9.1 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 25030 e | 31700 | 27906 | 27832 | 27257 | 32010 | 31851 | 2.4 |
| Gas from Biomass | .. | 211 | 230 | 243 | 387 | 690 | 1341 | .. |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

IEA North America

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|----------------------------------|------|--------------|--------------|--------------|--------------|---------------|---------------|---|
| Total Heat | .. | 28539 | 65900 | 66711 | 68905 | 565437 | 562596 | .. |
| Geothermal | .. | - | - | - | - | - | - | .. |
| Solar Thermal | .. | - | - | - | - | - | - | .. |
| Industrial Waste | .. | 1993 | 4248 | 5768 | 4609 | 17310 | 17040 | .. |
| Municipal Solid Waste Renew. | .. | 7270 | 3344 | 3420 | 9703 | 27849 | 31070 | .. |
| Municipal Solid Waste Non-Renew. | .. | - | - | - | - | - | - | .. |
| Solid Biomass | .. | 19276 | 58134 | 57300 | 54243 | 466450 | 456607 | .. |
| Gas from Biomass | .. | - | 174 | 223 | 350 | 53828 | 57879 | .. |
| Waste Heat and Heat Pumps | .. | - | - | - | - | - | - | .. |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | .. | 28539 | 65900 | 66711 | 68905 | 52842 | 50751 | .. |
| Geothermal | .. | - | - | - | - | - | - | .. |
| Solar Thermal | .. | - | - | - | - | - | - | .. |
| Industrial Waste | .. | 1993 | 4248 | 5768 | 4609 | 5756 | 4826 | .. |
| Municipal Solid Waste Renew. | .. | 7270 | 3344 | 3420 | 9703 | 5208 | 7463 | .. |
| Municipal Solid Waste Non-Renew. | .. | - | - | - | - | - | - | .. |
| Solid Biomass | .. | 19276 | 58134 | 57300 | 54243 | 41805 | 38462 | .. |
| Gas from Biomass | .. | - | 174 | 223 | 350 | 73 | - | .. |
| Waste Heat and Heat Pumps | .. | - | - | - | - | - | - | .. |
| Heat Only Plants | .. | - | - | - | - | 512595 | 511845 | .. |
| Geothermal | .. | - | - | - | - | - | - | .. |
| Solar Thermal | .. | - | - | - | - | - | - | .. |
| Industrial Waste | .. | - | - | - | - | 11554 | 12214 | .. |
| Municipal Solid Waste Renew. | .. | - | - | - | - | 22641 | 23607 | .. |
| Municipal Solid Waste Non-Renew. | .. | - | - | - | - | - | - | .. |
| Solid Biomass | .. | - | - | - | - | 424645 | 418145 | .. |
| Gas from Biomass | .. | - | - | - | - | 53755 | 57879 | .. |
| Waste Heat and Heat Pumps | .. | - | - | - | - | - | - | .. |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

IEA North America

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00** |
|---|-----------|---------|---------|----------|-----------|---------|---------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 14069 | 17000 | 17293 | 17879 | 18465 | 20363 | 21735 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Final Energy Consumption | 14069 | 17000 | 17293 | 17879 | 18465 | 20363 | 21735 | .. |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | - | - | - | - | - | 63313 | 60356 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Final Energy Consumption | - | - | - | - | - | 63313 | 60356 | .. |
| Industrial Waste | | | | | | | | |
| Production | - | 128432 | 123426 | 129139 e | 111828 | 128803 | 159946 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | -22133 | - | - | - | - | .. |
| Transformation Sector | - | 125190 | 98177 | 125874 | 107368 | 128803 | 159946 | .. |
| Final Energy Consumption | - | 3242 | 3116 e | 3265 e | 4460 e | - | - | .. |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 173829 e | 270237 | 286440 | 281394 | 286702 | 313018 | 297650 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Transformation Sector | 173829 e | 270237 | 286440 | 281394 | 286702 | 313018 | 297650 | .. |
| Final Energy Consumption | - | - | - | - | - | - | - | .. |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Transformation Sector | - | - | - | - | - | - | - | .. |
| Final Energy Consumption | - | - | - | - | - | - | - | .. |
| Solid Biomass | | | | | | | | |
| Production | 2773871 e | 2809406 | 2889073 | 2795342 | 2869404 | 2949028 | 2992732 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | 1697 | - | - | - | - | .. |
| Transformation Sector | 1501822 e | 1302595 | 1412118 | 1393893 | 1330261 | 2017527 | 2039950 | .. |
| Final Energy Consumption | 1272049 | 1506811 | 1478652 | 1401449 | 1539143 e | 931501 | 952782 | .. |
| Gas from Biomass | | | | | | | | |
| Production | - | 42788 | 46558 | 46808 | 49390 | 121266 | 138099 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Transformation Sector | - | 42788 | 46558 | 46808 | 49390 | 121266 | 138099 | .. |
| Final Energy Consumption | - | - | - | - | - | - | - | .. |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | 4063 | 2920 | 3820 | 4160 | 4409 | 4897 | .. |
| Net Imports ⁽¹⁾ | - | 49 | 39 | 11 | 8 | 11 | 15 | .. |
| Miscellaneous to Balance ⁽²⁾ | - | 34 | 15 | -65 | -7 | -98 | 46 | .. |
| Transformation Sector | - | 1140 | 1405 | 1487 | 1476 | 1730 | 1923 | .. |
| Final Energy Consumption | - | 3006 | 1569 | 2279 | 2685 | 2592 | 3035 | .. |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

**Growth rates have not been calculated for aggregates due to unavailability of data for some countries which causes breaks in series.

IEA Europe

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|--|----------|----------|----------|----------|----------|----------|----------|-------------------------------------|
| TPES (Mtoe) ⁽¹⁾ | 1497.75 | 1553.27 | 1606.86 | 1603.80 | 1629.66 | 1636.09 | 1654.77 | 1.0 |
| of which: Renewables (Mtoe) ⁽²⁾ | 88.65 e | 98.57 e | 98.87 e | 102.50 e | 105.91 e | 106.22 e | 110.86 e | 2.3 |
| Renewables/TPES(%) | 5.9 | 6.4 | 6.2 | 6.4 | 6.5 | 6.5 | 6.7 | 1.2 |
| GDP (1995 bil. US\$) | 8690.67 | 9333.55 | 9494.02 | 9740.47 | 10020.10 | 10261.01 | 10606.27 | 2.0 |
| TPES/GDP ⁽³⁾ | 0.17 | 0.17 | 0.17 | 0.16 | 0.16 | 0.16 | 0.16 | -1.0 |
| TPES/GDP (1973 = 100) | 79 | 76 | 77 | 75 | 74 | 73 | 71 | -1.0 |
| Population (millions) | 453.68 | 466.91 | 468.98 | 471.01 | 472.93 | 474.97 | 477.28 | 0.5 |
| TPES/population ⁽⁴⁾ | 3.30 | 3.33 | 3.43 | 3.41 | 3.45 | 3.44 | 3.47 | 0.5 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 2466.4 | 2678.7 | 2748.2 | 2787.4 | 2864.3 | 2917.2 | 3013.5 | 2.0 |
| of which: Renewables (TWh) ⁽²⁾ | 457.65 e | 520.78 e | 501.02 e | 526.92 e | 549.23 e | 554.95 e | 595.48 e | 2.7 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 18.6 | 19.4 | 18.2 | 18.9 | 19.2 | 19.0 | 19.8 | 0.6 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 84.75 e | 94.49 e | 94.67 e | 97.84 e | 101.16 e | 107.50 e | 112.40 e | 2.9 |
| Renewable/TPES (%) | 5.7 e | 6.1 e | 5.9 e | 6.1 e | 6.2 e | 6.6 e | 6.8 e | 1.8 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

(1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.

(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.

(3) In units of toe/1995 thousand US\$.

(4) In units of toe/per capita.

(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants

(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|---------------|-----------------|---------------|---------------|-----------------|-----------------|-----------------|-------------------------------------|
| Total Capacity | 160614 | 175689 e | 178761 | 180547 | 182774 e | 189101 e | 197572 e | 2.1 |
| Hydro | 154907 | 166231 | 167526 | 168083 | 167975 | 169848 e | 173236 e | 1.1 |
| of which: Pumped Storage | 24701 | 33177 | 34138 | 33693 | 36383 | 35576 e | 34807 e | 3.5 |
| Geothermal | 517 | 498 | 513 | 557 | 577 | 623 e | 628 e | 2.0 |
| Solar Photovoltaic | 8 | 47 | 58 | 72 | 103 | 105 | 157 e | 34.7 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | 240 | 240 | 240 | 240 | 240 | 240 | 238 | -0.1 |
| Wind | 474 | 2474 | 3415 | 4614 | 6221 | 8934 | 13409 | 39.7 |
| Industrial Waste | - | - | - | - | - | 198 | 332 | - |
| Municipal Solid Waste | 962 | 1560 | 2008 | 2021 | 2198 e | 2426 e | 2629 e | 10.6 |
| Solid Biomass | 2742 | 3203 e | 3532 | 3427 | 3687 | 4577 e | 4718 e | 5.6 |
| Gas from Biomass | 384 | 475 | 597 | 647 | 729 | 998 | 1199 e | 12.1 |
| Comb. Renewables Non-Specified | 380 | 961 | 872 | 886 | 1044 | 1152 | 1026 e | 10.4 |
| Solar Collectors Surface (1000 m ²) | 4059 | 7579 | 8430 | 9047 | 10229 | 10358 e | 11625 e | 11.1 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

IEA Europe

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|---------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | .. | 546378 e | 530116 e | 555073 e | 582162 e | 591695 e | 636527 e | .. |
| Hydro | 453202 | 506214 | 488452 | 503964 | 521951 | 528009 | 559366 e | 2.1 |
| of which: Pumped Storage | 17568 | 20302 | 23074 | 20978 | 23997 e | 26193 e | 29545 e | 5.3 |
| Geothermal | 3306 | 3564 | 3895 | 4039 | 4357 | 4564 | 4861 | 3.9 |
| Solar Photovoltaics | 14 | 43 | 47 | 57 | 80 | 83 e | 120 e | 24.0 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | 571 | 568 | 547 | 570 | 590 | 580 | 573 | 0.0 |
| Wind | 772 | 4081 | 4894 | 7376 | 11307 | 14259 | 22726 | 40.2 |
| Industrial Waste | .. | 4729 | 5363 | 6521 | 7895 | 6224 e | 6708 e | .. |
| Municipal Solid Waste Renew. | .. | 6984 | 8142 | 9454 | 11231 | 9188 | 10331 | .. |
| Municipal Solid Waste Non-Renew. | .. | 572 | 659 | 655 | 1038 | 4330 | 4791 | .. |
| Solid Biomass | 10397 e | 15329 | 14094 | 17439 | 19553 | 19361 e | 20518 e | 7.0 |
| Gas from Biomass | .. | 1580 | 1804 | 2407 | 4160 e | 5097 | 6533 | .. |
| Comb. Renewables Non-Specified | 1384 | 2714 | 2219 | 2591 | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | .. | 526712 e | 511258 e | 530965 e | 556013 e | 565545 e | 609377 e | .. |
| Hydro | 453202 | 506214 | 488452 | 503964 | 521951 | 528009 | 559366 e | 2.1 |
| of which: Pumped Storage | 17568 | 20302 | 23074 | 20978 | 23997 e | 26193 e | 29545 e | 5.3 |
| Geothermal | 3306 | 3564 | 3895 | 4039 | 4357 | 4564 | 4861 | 3.9 |
| Solar Photovoltaics | 14 | 43 | 47 | 57 | 80 | 83 e | 120 e | 24.0 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | 571 | 568 | 547 | 570 | 590 | 580 | 573 | 0.0 |
| Wind | 772 | 4081 | 4894 | 7376 | 11307 | 14259 | 22726 | 40.2 |
| Industrial Waste | .. | 4473 | 4743 | 4827 | 5703 | 3883 e | 4787 | .. |
| Municipal Solid Waste Renew. | .. | 3449 | 3618 | 4140 | 5320 | 4441 | 5060 | .. |
| Municipal Solid Waste Non-Renew. | .. | c | c | c | 318 | 2015 | 2387 | .. |
| Solid Biomass | 1581 e | 2538 | 2710 | 2794 | 3461 | 3920 e | 4230 e | 10.3 |
| Gas from Biomass | .. | 939 | 1084 | 1537 | 2926 e | 3791 | 5267 | .. |
| Comb. Renewables Non-Specified | 1384 | 843 | 1268 | 1661 | - | - | - | - |
| CHP Plants | .. | 19666 e | 18858 e | 24108 | 26149 | 26150 e | 27150 e | .. |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | .. | 256 | 620 | 1694 | 2192 | 2341 e | 1921 e | .. |
| Municipal Solid Waste Renew. | .. | 3535 | 4524 | 5314 | 5911 | 4747 | 5271 | .. |
| Municipal Solid Waste Non-Renew. | .. | 572 | 659 | 655 | 720 | 2315 | 2404 | .. |
| Solid Biomass | 8816 e | 12791 e | 11384 e | 14645 | 16092 | 15441 e | 16288 | 6.3 |
| Gas from Biomass | .. | 641 | 720 | 870 | 1234 | 1306 | 1266 | .. |
| Comb. Renewables Non-Specified | - | 1871 | 951 | 930 | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

IEA Europe

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|----------------------------------|------|-----------------|-----------------|-----------------|---------------|-----------------|-----------------|---|
| Total Heat | .. | 189884 e | 220653 e | 214634 e | 223910 | 251129 e | 245378 e | .. |
| Geothermal | .. | 47 | 32 | 50 | 54 | 398 | 436 | .. |
| Solar Thermal | .. | 6 | 188 | 239 | 277 | 336 | 371 | .. |
| Industrial Waste | .. | 2058 | 3096 | 3117 | 4420 | 8236 e | 15139 | .. |
| Municipal Solid Waste Renew. | .. | 85527 e | 90136 e | 89340 e | 88783 | 80291 e | 80315 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 8524 e | 9259 e | 9423 | 9589 | 23368 | 21790 | .. |
| Solid Biomass | .. | 75151 | 98358 e | 94377 e | 99193 | 116319 | 104389 e | .. |
| Gas from Biomass | .. | 2759 | 3272 | 4193 | 3421 | 3708 | 3686 | .. |
| Waste Heat and Heat Pumps | .. | 15812 | 16312 | 13895 | 18173 | 18473 | 19252 | .. |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | .. | 112182 e | 135072 e | 133059 e | 137386 | 161021 | 152537 e | .. |
| Geothermal | .. | - | - | - | - | - | - | .. |
| Solar Thermal | .. | - | - | - | - | - | - | .. |
| Industrial Waste | .. | 1183 | 1768 | 1776 | 2747 | 5981 e | 7341 | .. |
| Municipal Solid Waste Renew. | .. | 62687 e | 68117 e | 66605 e | 66804 | 59476 | 58283 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 6825 e | 7846 e | 7858 | 8060 | 21014 | 18891 | .. |
| Solid Biomass | .. | 36822 | 52757 e | 51285 e | 53999 | 68628 | 61833 e | .. |
| Gas from Biomass | .. | 2231 | 2385 | 3089 | 2888 | 2887 | 2711 | .. |
| Waste Heat and Heat Pumps | .. | 2434 | 2199 | 2446 | 2888 | 3035 | 3478 | .. |
| Heat Only Plants | .. | 77702 | 85581 | 81575 e | 86524 | 90109 e | 92841 | .. |
| Geothermal | .. | 47 | 32 | 50 | 54 | 398 | 436 | .. |
| Solar Thermal | .. | 6 | 188 | 239 | 277 | 336 | 371 | .. |
| Industrial Waste | .. | 875 | 1328 | 1341 | 1673 | 2255 | 7798 | .. |
| Municipal Solid Waste Renew. | .. | 22840 | 22019 | 22735 e | 21979 | 20815 e | 22032 | .. |
| Municipal Solid Waste Non-Renew. | .. | 1699 | 1413 | 1565 | 1529 | 2354 | 2899 | .. |
| Solid Biomass | .. | 38329 | 45601 | 43092 | 45194 | 47691 | 42556 | .. |
| Gas from Biomass | .. | 528 | 887 | 1104 | 533 | 821 | 975 | .. |
| Waste Heat and Heat Pumps | .. | 13378 | 14113 | 11449 | 15285 | 15439 | 15774 | .. |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

IEA Europe

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00** |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---------------------------------------|
| Geothermal Direct Use | | | | | | | | |
| Production | 20629 e | 23921 e | 24385 e | 24510 e | 25020 e | 25646 | 26458 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Final Energy Consumption | 20629 | 23921 | 24385 | 24510 | 25020 | 25646 | 26458 | .. |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 6779 | 16857 | 18812 | 20645 | 23165 e | 24251 | 26813 e | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Final Energy Consumption | 6779 | 16857 | 18812 | 20645 | 23165 e | 24251 e | 26813 e | .. |
| Industrial Waste | | | | | | | | |
| Production | 39548 e | 71644 e | 85261 e | 100122 e | 112456 e | 100678 e | 113590 e | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Transformation Sector | 24736 e | 50306 e | 59346 e | 72677 e | 86187 e | 75618 e | 88299 e | .. |
| Final Energy Consumption | 14812 e | 21338 e | 25915 e | 27445 e | 26269 e | 25060 e | 25291 e | .. |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 174079 e | 234887 e | 253534 e | 264672 e | 270899 e | 235773 e | 248278 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | -6368 | -15478 | -15754 | -20506 | -7097 | -9754 | -71 | .. |
| Transformation Sector | 157493 e | 208641 | 220206 | 223825 | 239583 e | 210286 e | 225308 | .. |
| Final Energy Consumption | 10218 | 10768 | 17574 | 20341 | 24219 | 15733 | 22899 | .. |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | 12026 | 17692 | 17982 | 17872 | 25001 | 85425 | 92857 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | -9 | -19 | .. |
| Transformation Sector | 11803 | 17436 | 17749 | 17647 | 24604 | 73762 | 79373 | .. |
| Final Energy Consumption | 223 | 256 | 233 | 225 | 397 | 11654 | 13465 | .. |
| Solid Biomass | | | | | | | | |
| Production | 1792593 e | 1916118 e | 1963261 e | 2012301 e | 2064127 e | 2073345 e | 2086572 e | .. |
| Net Imports ⁽¹⁾ | 5684 e | 14790 | 16876 | 19610 | 20479 | 18642 | 24062 | .. |
| Miscellaneous to Balance ⁽²⁾ | 5613 | -3341 | -2115 | -2164 | 150 | 598 | - | .. |
| Transformation Sector | 127757 e | 214750 | 228377 | 230484 | 242469 e | 269704 e | 268783 e | .. |
| Final Energy Consumption | 1676133 e | 1712817 e | 1749645 e | 1799263 e | 1842287 e | 1822881 e | 1841851 e | .. |
| Gas from Biomass | | | | | | | | |
| Production | 29581 | 53467 e | 61221 e | 70667 e | 75989 e | 82357 e | 96640 e | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | -8247 | -11679 | -13768 | -16804 | -753 | 16 | 10 | .. |
| Transformation Sector | 7917 e | 26510 | 30414 | 36065 | 56435 e | 63366 e | 77894 e | .. |
| Final Energy Consumption | 13417 | 15278 e | 17039 e | 17798 e | 18801 e | 19007 e | 18756 e | .. |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | 744 | 477 | 400 | 467 | 432 | 547 | 790 | .. |
| Net Imports ⁽¹⁾ | - | - | -5 | -2 | 9 | 6 | 6 | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | 2 | - | .. |
| Transformation Sector | 744 | 251 | 60 | 14 | 14 | 27 | 52 | .. |
| Final Energy Consumption | - | 226 | 335 | 451 | 427 | 528 | 744 | .. |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

**Growth rates have not been calculated for aggregates due to unavailability of data for some countries which causes breaks in series.

European Union

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|----------|----------|----------|----------|----------|----------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 1322.75 | 1376.24 | 1422.64 | 1414.87 | 1439.59 | 1448.80 | 1460.28 | 1.0 |
| of which: Renewables (Mtoe) ⁽²⁾ | 64.04 e | 71.42 e | 73.47 e | 76.05 e | 78.72 e | 78.50 e | 82.54 e | 2.6 |
| Renewables/TPES(%) | 4.8 | 5.2 | 5.2 | 5.4 | 5.5 | 5.4 | 5.7 | 1.6 |
| GDP (1995 bil. US\$) | 8010.39 | 8613.66 | 8751.28 | 8969.91 | 9230.57 | 9472.10 | 9785.91 | 2.0 |
| TPES/GDP ⁽³⁾ | 0.17 | 0.16 | 0.16 | 0.16 | 0.16 | 0.15 | 0.15 | -1.0 |
| TPES/GDP (1973 = 100) | 77 | 74 | 76 | 74 | 73 | 71 | 70 | -1.0 |
| Population (millions) | 365.79 | 373.31 | 374.32 | 375.31 | 376.16 | 377.19 | 378.47 | 0.3 |
| TPES/population ⁽⁴⁾ | 3.62 | 3.69 | 3.80 | 3.77 | 3.83 | 3.84 | 3.86 | 0.7 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 2141.7 | 2313.5 | 2394.0 | 2412.1 | 2473.6 | 2507.9 | 2572.3 | 1.8 |
| of which: Renewables (TWh) ⁽²⁾ | 281.26 e | 324.93 e | 324.48 e | 339.32 e | 354.57 e | 354.73 e | 382.07 e | 3.1 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 13.1 | 14.0 | 13.6 | 14.1 | 14.3 | 14.1 | 14.9 | 1.2 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 60.05 e | 67.19 e | 69.11 e | 71.24 e | 73.79 e | 79.44 e | 83.72 e | 3.4 |
| Renewable/TPES (%) | 4.5 e | 4.9 e | 4.9 e | 5.0 e | 5.1 e | 5.5 e | 5.7 e | 2.4 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

(1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.

(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.

(3) In units of toe/1995 thousand US\$.

(4) In units of toe/per capita.

(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants

(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|---------------|-----------------|---------------|---------------|---------------|-----------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 115010 | 124044 e | 126289 | 128039 | 130290 | 135588 e | 142073 e | 2.1 |
| Hydro | 109541 | 114979 | 115463 | 115985 | 115962 | 116927 e | 118339 e | 0.8 |
| of which: Pumped Storage | 22179 | 30558 | 30691 | 30247 | 32946 | 32143 e | 31342 e | 3.5 |
| Geothermal | 499 | 480 | 495 | 539 | 559 | 605 e | 610 e | 2.0 |
| Solar Photovoltaic | 6 | 39 | 49 | 62 | 91 | 92 | 142 e | 37.2 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | 240 | 240 | 240 | 240 | 240 | 240 | 238 | -0.1 |
| Wind | 474 | 2471 | 3409 | 4608 | 6205 | 8903 | 13372 | 39.7 |
| Industrial Waste | - | - | - | - | - | 179 | 313 | - |
| Municipal Solid Waste | 814 | 1342 | 1783 | 1796 | 1930 | 2142 e | 2342 e | 11.1 |
| Solid Biomass | 2742 | 3203 e | 3532 | 3427 | 3687 | 4474 e | 4610 e | 5.3 |
| Gas from Biomass | 381 | 466 | 588 | 638 | 719 | 985 | 1187 e | 12.0 |
| Comb. Renewables Non-Specified | 313 | 824 | 730 | 744 | 897 | 1041 | 920 e | 11.4 |
| Solar Collectors Surface (1000 m ²) | 3456 | 6579 | 7363 | 7913 | 9032 | 9105 e | 10322 e | 11.6 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

European Union

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|---------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | .. | 348051 e | 350994 e | 364560 e | 384435 e | 388607 e | 419543 e | .. |
| Hydro | 276067 | 309983 | 311496 | 315772 | 326766 | 328027 | 345543 e | 2.3 |
| of which: Pumped Storage | 16144 | 18289 | 21105 | 18591 | 21457 e | 24207 e | 26968 e | 5.3 |
| Geothermal | 3226 | 3478 | 3811 | 3956 | 4272 | 4483 | 4785 | 4.0 |
| Solar Photovoltaics | 13 | 38 | 41 | 49 | 72 | 74 e | 109 e | 23.7 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | 571 | 568 | 547 | 570 | 590 | 580 | 573 | 0.0 |
| Wind | 772 | 4071 | 4884 | 7364 | 11288 | 14209 | 22660 | 40.2 |
| Industrial Waste | .. | 4713 | 5267 | 6487 | 7879 | 6020 e | 6432 e | .. |
| Municipal Solid Waste Renew. | .. | 6483 | 7570 | 8909 | 10561 | 8338 | 9401 | .. |
| Municipal Solid Waste Non-Renew. | .. | 119 | 144 | 162 | 526 | 3646 | 4069 | .. |
| Solid Biomass | 10207 e | 14531 | 13377 | 16575 | 18627 | 18441 e | 19748 e | 6.8 |
| Gas from Biomass | .. | 1353 | 1638 | 2125 | 3854 e | 4789 | 6223 | .. |
| Comb. Renewables Non-Specified | 1384 | 2714 | 2219 | 2591 | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | .. | 330077 e | 333855 e | 342376 e | 360345 e | 365009 e | 394976 e | .. |
| Hydro | 276067 | 309983 | 311496 | 315772 | 326766 | 328027 | 345543 e | 2.3 |
| of which: Pumped Storage | 16144 | 18289 | 21105 | 18591 | 21457 e | 24207 e | 26968 e | 5.3 |
| Geothermal | 3226 | 3478 | 3811 | 3956 | 4272 | 4483 | 4785 | 4.0 |
| Solar Photovoltaics | 13 | 38 | 41 | 49 | 72 | 74 e | 109 e | 23.7 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | 571 | 568 | 547 | 570 | 590 | 580 | 573 | 0.0 |
| Wind | 772 | 4071 | 4884 | 7364 | 11288 | 14209 | 22660 | 40.2 |
| Industrial Waste | .. | 4473 | 4743 | 4826 | 5703 | 3874 e | 4753 | .. |
| Municipal Solid Waste Renew. | .. | 3449 | 3618 | 4140 | 5320 | 4439 | 5060 | .. |
| Municipal Solid Waste Non-Renew. | .. | c | c | c | 318 | 2015 | 2387 | .. |
| Solid Biomass | 1397 e | 2246 | 2370 | 2541 | 3136 | 3549 e | 3866 e | 10.7 |
| Gas from Biomass | .. | 928 | 1077 | 1497 | 2880 e | 3759 | 5240 | .. |
| Comb. Renewables Non-Specified | 1384 | 843 | 1268 | 1661 | - | - | - | - |
| CHP Plants | .. | 17974 e | 17139 e | 22184 | 24090 | 23598 e | 24567 e | .. |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | .. | 240 | 524 | 1661 | 2176 | 2146 e | 1679 e | .. |
| Municipal Solid Waste Renew. | .. | 3034 | 3952 | 4769 | 5241 | 3899 | 4341 | .. |
| Municipal Solid Waste Non-Renew. | .. | 119 | 144 | 162 | 208 | 1631 | 1682 | .. |
| Solid Biomass | 8810 e | 12285 e | 11007 e | 14034 | 15491 | 14892 e | 15882 | 6.1 |
| Gas from Biomass | .. | 425 | 561 | 628 | 974 | 1030 | 983 | .. |
| Comb. Renewables Non-Specified | - | 1871 | 951 | 930 | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

European Union

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|----------------------------------|------|-----------------|-----------------|-----------------|---------------|-----------------|-----------------|---|
| Total Heat | .. | 171194 e | 200333 e | 192489 e | 201200 | 221784 e | 219961 e | .. |
| Geothermal | .. | 47 | 32 | 50 | 54 | 398 | 436 | .. |
| Solar Thermal | .. | 6 | 188 | 239 | 277 | 336 | 371 | .. |
| Industrial Waste | .. | 980 | 1932 | 1717 | 2764 | 4074 | 12199 | .. |
| Municipal Solid Waste Renew. | .. | 76104 e | 80064 e | 79094 e | 78372 | 69725 e | 70386 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 3015 | 3074 | 3269 | 3353 | 15026 | 14302 | .. |
| Solid Biomass | .. | 73845 | 96821 e | 91927 e | 96541 | 111709 | 100938 e | .. |
| Gas from Biomass | .. | 1454 | 1992 | 2406 | 1809 | 2218 | 2256 | .. |
| Waste Heat and Heat Pumps | .. | 15743 | 16230 | 13787 | 18030 | 18298 | 19073 | .. |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | .. | 96851 e | 118775 e | 115819 e | 118749 | 135011 | 130652 e | .. |
| Geothermal | .. | - | - | - | - | - | - | .. |
| Solar Thermal | .. | - | - | - | - | - | - | .. |
| Industrial Waste | .. | 980 | 1597 | 1387 | 2441 | 2278 | 5049 | .. |
| Municipal Solid Waste Renew. | .. | 55302 e | 60159 e | 58546 e | 58493 | 51078 | 50456 e | .. |
| Municipal Solid Waste Non-Renew. | .. | 1316 | 1661 | 1704 | 1824 | 12672 | 11403 | .. |
| Solid Biomass | .. | 35883 | 52039 e | 50395 e | 51784 | 64496 | 58899 e | .. |
| Gas from Biomass | .. | 936 | 1120 | 1341 | 1319 | 1452 | 1367 | .. |
| Waste Heat and Heat Pumps | .. | 2434 | 2199 | 2446 | 2888 | 3035 | 3478 | .. |
| Heat Only Plants | .. | 74343 | 81557 | 76670 e | 82450 | 86773 e | 89309 | .. |
| Geothermal | .. | 47 | 32 | 50 | 54 | 398 | 436 | .. |
| Solar Thermal | .. | 6 | 188 | 239 | 277 | 336 | 371 | .. |
| Industrial Waste | .. | - | 335 | 330 | 323 | 1796 | 7150 | .. |
| Municipal Solid Waste Renew. | .. | 20802 | 19905 | 20548 e | 19879 | 18647 e | 19930 | .. |
| Municipal Solid Waste Non-Renew. | .. | 1699 | 1413 | 1565 | 1529 | 2354 | 2899 | .. |
| Solid Biomass | .. | 37962 | 44782 | 41532 | 44757 | 47213 | 42039 | .. |
| Gas from Biomass | .. | 518 | 872 | 1065 | 490 | 766 | 889 | .. |
| Waste Heat and Heat Pumps | .. | 13309 | 14030 | 11341 | 15141 | 15263 | 15595 | .. |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

European Union

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00** |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 13500 e | 15185 e | 15031 e | 14811 e | 14620 e | 14618 | 15227 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Final Energy Consumption | 13500 | 15185 | 15031 | 14811 | 14620 | 14618 | 15227 | .. |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 5291 | 10225 | 11442 | 12373 | 13521 e | 13451 | 14866 e | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Final Energy Consumption | 5291 | 10225 | 11442 | 12373 | 13521 e | 13451 e | 14866 e | .. |
| Industrial Waste | | | | | | | | |
| Production | 32838 e | 61882 e | 74120 e | 88045 e | 99893 e | 83281 e | 95520 e | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Transformation Sector | 24736 e | 48994 e | 57225 e | 70690 e | 83944 e | 68276 e | 82002 e | .. |
| Final Energy Consumption | 8102 e | 12888 e | 16895 e | 17355 e | 15949 e | 15005 e | 13518 e | .. |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 161319 e | 216976 e | 235638 e | 247135 e | 251468 e | 214060 e | 226364 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | -6368 | -15478 | -15754 | -20506 | -7097 | -9754 | -71 | .. |
| Transformation Sector | 144733 e | 190730 | 202310 | 206288 | 220152 e | 189312 e | 203592 | .. |
| Final Energy Consumption | 10218 | 10768 | 17574 | 20341 | 24219 | 14994 | 22701 | .. |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | 3781 | 4585 | 4757 | 5105 | 11331 | 67468 | 72963 | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | -17 | .. |
| Transformation Sector | 3558 | 4329 | 4524 | 4880 | 10934 | 55818 | 60773 | .. |
| Final Energy Consumption | 223 | 256 | 233 | 225 | 397 | 11650 | 12173 | .. |
| Solid Biomass | | | | | | | | |
| Production | 1417840 e | 1519758 e | 1571430 e | 1618546 e | 1668029 e | 1679166 e | 1717006 e | .. |
| Net Imports ⁽¹⁾ | 6286 | 14410 | 16496 | 19163 | 20043 | 18118 | 23855 | .. |
| Miscellaneous to Balance ⁽²⁾ | 6274 | -1797 | -2116 | -2413 | - | -191 | - | .. |
| Transformation Sector | 126049 e | 196462 | 213378 | 215072 | 229861 e | 254397 e | 255105 e | .. |
| Final Energy Consumption | 1304351 e | 1335909 e | 1372432 e | 1420224 e | 1458211 e | 1442696 e | 1485756 e | .. |
| Gas from Biomass | | | | | | | | |
| Production | 29581 | 49206 e | 57663 e | 65178 e | 70581 | 76898 e | 91208 e | .. |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | .. |
| Miscellaneous to Balance ⁽²⁾ | -8247 | -11679 | -13768 | -16804 | -753 | 16 | 10 | .. |
| Transformation Sector | 7917 e | 22900 | 27510 | 31619 | 52066 e | 59067 e | 73608 e | .. |
| Final Energy Consumption | 13417 | 14627 e | 16385 e | 16755 e | 17762 e | 17847 e | 17610 e | .. |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | 744 | 477 | 400 | 467 | 432 | 512 | 720 | .. |
| Net Imports ⁽¹⁾ | - | - | -5 | -2 | 9 | 6 | 6 | .. |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | .. |
| Transformation Sector | 744 | 251 | 60 | 14 | 14 | 27 | 52 | .. |
| Final Energy Consumption | - | 226 | 335 | 451 | 427 | 491 | 674 | .. |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

**Growth rates have not been calculated for aggregates due to unavailability of data for some countries which causes breaks in series.

Australia

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|--|--------|---------|---------|---------|---------|---------|--------|---|
| TPES (Mtoe) ⁽¹⁾ | 87.54 | 94.38 | 100.94 | 103.04 | 104.01 | 107.69 | 110.17 | 2.3 |
| of which: Renewables (Mtoe) ⁽²⁾ | 5.07 | 5.53 | 6.15 | 6.44 e | 6.23 e | 6.32 e | 6.72 e | 2.9 |
| Renewables/TPES(%) | 5.8 | 5.9 | 6.1 | 6.3 | 6.0 | 5.9 | 6.1 | 0.5 |
| GDP (1995 bil. US\$) | 317.96 | 372.73 | 386.44 | 403.64 | 424.90 | 443.05 | 451.61 | 3.6 |
| TPES/GDP ⁽³⁾ | 0.28 | 0.25 | 0.26 | 0.26 | 0.24 | 0.24 | 0.24 | -1.2 |
| TPES/GDP (1973 = 100) | 94 | 86 | 89 | 87 | 83 | 83 | 83 | -1.2 |
| Population (millions) | 17.09 | 18.07 | 18.31 | 18.52 | 18.73 | 18.94 | 19.16 | 1.2 |
| TPES/population ⁽⁴⁾ | 5.12 | 5.22 | 5.51 | 5.56 | 5.55 | 5.69 | 5.75 | 1.2 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 154.3 | 173.0 | 177.3 | 182.8 | 195.6 | 203.0 | 208.1 | 3.0 |
| of which: Renewables (TWh) ⁽²⁾ | 14.75 | 16.61 e | 16.80 e | 17.94 e | 16.93 e | 17.79 e | 18.57 | 2.3 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 9.6 | 9.6 | 9.5 | 9.8 | 8.7 | 8.8 | 8.9 | -0.7 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 5.07 | 5.53 | 6.15 | 6.44 e | 6.23 e | 6.32 e | 6.72 | 2.9 |
| Renewable/TPES (%) | 5.8 | 5.9 | 6.1 | 6.3 e | 6.0 e | 5.9 e | 6.1 | 0.5 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

(1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.

(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.

(3) In units of toe/1995 thousand US\$.

(4) In units of toe/per capita.

(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants

(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|---------------|-------------|---------------|---------------|---------------|---------------|---------------|---|
| Total Capacity | 7388 e | 7982 | 7673 e | 7516 e | 7507 e | 8114 e | 8655 e | 1.6 |
| Hydro | 7381 | 7586 | 7544 | 7501 | 7491 | 7609 | 7669 | 0.4 |
| of which: Pumped Storage | - | 500 | 500 | 500 | 1490 | 1490 | 1490 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | - | - | - | - | - | - | - |
| Solar Thermal | 7 | 13 | 13 | 13 | 13 | 13 | 13 | 6.4 |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 2 | 2 | 2 | 3 | 10 e | 33 | - |
| Industrial Waste | - | - | - | - | - | 150 | 150 | - |
| Municipal Solid Waste | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | 332 | 332 | - |
| Gas from Biomass | - | - | - | - | - | - | 458 | - |
| Comb. Renewables Non-Specified | .. | 381 | 114 | .. | .. | - | - | .. |
| Solar Collectors Surface (1000 m ²) | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Australia

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|--------------|----------------|----------------|----------------|----------------|----------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 15480 | 16962 e | 17123 e | 18284 e | 17281 e | 18146 e | 18925 | 2.0 |
| Hydro | 14880 | 16239 | 16100 | 17242 e | 16144 e | 17036 | 17137 | 1.4 |
| of which: Pumped Storage | 732 | 354 | 323 | 340 | 350 | 360 | 360 | -6.9 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | 23 | 26 | 30 e | 30 e | 30 e | 30 | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 7 | 7 | 7 | 8 | 27 e | 56 | - |
| Industrial Waste | - | - | - | - | - | .. | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 600 | 670 e | 670 e | 670 e | 670 e | 674 e | 1323 | 8.2 |
| Gas from Biomass | - | 23 | 320 | 335 | 429 | 379 | 379 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 14880 | 16292 | 16453 | 17614 e | 16611 e | 17472 e | 17602 | 1.7 |
| Hydro | 14880 | 16239 | 16100 | 17242 e | 16144 e | 17036 | 17137 | 1.4 |
| of which: Pumped Storage | 732 | 354 | 323 | 340 | 350 | 360 | 360 | -6.9 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | 23 | 26 | 30 e | 30 e | 30 e | 30 | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 7 | 7 | 7 | 8 | 27 e | 56 | - |
| Industrial Waste | - | - | - | - | - | .. | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | 23 | 320 | 335 | 429 | 379 | 379 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | 600 | 670 e | 670 e | 670 e | 670 e | 674 e | 1323 | 8.2 |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 600 | 670 e | 670 e | 670 e | 670 e | 674 e | 1323 | 8.2 |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Australia

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|----------|----------|---------|----------|----------|----------|----------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 3405 | 3408 | 3528 | 3618 | 3685 | 3880 | 3982 | 1.6 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 3405 | 3408 | 3528 | 3618 | 3685 | 3880 | 3982 | 1.6 |
| Industrial Waste | | | | | | | | |
| Production | 7767 | 7823 | 6888 | 7204 | 7414 | 7490 | 7490 | -0.4 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 7767 | 7823 | 6888 | 7204 | 7414 | 7490 | 7490 | -0.4 |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 158108 | 170313 | 193668 | 201329 | 195491 | 194762 | 210962 | 2.9 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 29683 e | 24120 e | 24120 e | 24120 e | 24120 e | 24264 e | 36700 | 2.1 |
| Final Energy Consumption | 128425 e | 146193 e | 169548 | 177209 e | 171371 e | 170498 e | 174262 e | 3.1 |
| Gas from Biomass | | | | | | | | |
| Production | - | 676 | 3222 | 3692 | 4579 | 5780 e | 5780 e | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 676 | 3222 | 3692 | 4579 | 5780 e | 5780 e | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Austria

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|--|--------|---------|---------|--------|---------|--------|--------|--|
| TPES (Mtoe) ⁽¹⁾ | 25.22 | 26.36 | 27.72 | 28.10 | 28.32 | 28.57 | 28.58 | 1.3 |
| of which: Renewables (Mtoe) ⁽²⁾ | 5.45 | 6.23 | 6.17 e | 6.28 | 6.32 e | 6.59 e | 6.54 e | 1.8 |
| Renewables/TPES(%) | 21.6 | 23.6 | 22.3 | 22.3 | 22.3 | 23.1 | 22.9 | 0.6 |
| GDP (1995 bil. US\$) | 212.47 | 235.16 | 239.86 | 243.69 | 252.27 | 259.35 | 267.02 | 2.3 |
| TPES/GDP ⁽³⁾ | 0.12 | 0.11 | 0.12 | 0.12 | 0.11 | 0.11 | 0.11 | -1.0 |
| TPES/GDP (1973 = 100) | 76 | 72 | 74 | 74 | 72 | 70 | 68 | -1.0 |
| Population (millions) | 7.72 | 8.05 | 8.06 | 8.07 | 8.08 | 8.09 | 8.11 | 0.5 |
| TPES/population ⁽⁴⁾ | 3.27 | 3.28 | 3.44 | 3.48 | 3.51 | 3.53 | 3.52 | 0.8 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 49.4 | 55.2 | 53.5 | 55.5 | 56.1 | 59.3 | 60.3 | 2.0 |
| of which: Renewables (TWh) ⁽²⁾ | 32.61 | 38.90 e | 35.78 e | 37.66 | 39.06 e | 42.17 | 43.64 | 3.0 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 66.0 | 70.5 | 66.9 | 67.8 | 69.6 | 71.1 | 72.3 | 0.9 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 5.44 | 6.15 | 6.10 | 6.23 | 6.27 e | 6.59 | 6.54 | 1.9 |
| Renewable/TPES (%) | 21.6 | 23.3 | 22.0 | 22.2 | 22.1 e | 23.1 | 22.9 | 0.6 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS
(MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|--------------|--------------|--------------|--------------|--------------|----------------|----------------|--|
| Total Capacity | 11353 | 11856 | 11998 | 12176 | 12228 | 12440 e | 12459 e | 0.9 |
| Hydro | 10947 | 11304 | 11367 | 11533 | 11444 | 11648 | 11648 | 0.6 |
| of which: Pumped Storage | - | 2975 | 2975 | 2975 | 3937 | 3568 | 3568 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | 1 | 1 | 1 | 1 | 1 | 1 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 1 | 10 | 19 | 27 | 35 | 54 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | 6 | 6 | 13 | 14 | 9 | 9 e | 9 e | 4.1 |
| Solid Biomass | 400 | 544 | 607 | 609 | 747 | 747 e | 747 e | 6.4 |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| Solar Collectors Surface (1000 m ²) | 434 | 1241 | 1457 | 1458 | 1876 | 1900 e | 1900 e | 15.9 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Austria

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|--------------|----------------|----------------|--------------|--------------|--------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 33608 | 40359 e | 37196 e | 39050 | 40463 | 43556 | 45685 | 3.1 |
| Hydro | 32492 | 38477 | 35580 | 37294 | 38716 | 41727 | 43900 | 3.1 |
| of which: Pumped Storage | 998 | 1412 | 1367 | 1306 | 1339 e | 1234 | 1905 | 6.7 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | 2 | 3 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 1 | 5 | 20 | 45 | 51 | 67 | - |
| Industrial Waste | - | 48 | 45 | 89 | 69 | 107 | 96 | - |
| Municipal Solid Waste Renew. | .. | 39 | 36 | 72 | 75 | 25 | 27 | .. |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | 42 | 44 | - |
| Solid Biomass | 1116 | 1767 e | 1482 e | 1498 | 1492 | 1544 | 1483 | 2.9 |
| Gas from Biomass | - | 27 | 48 | 77 | 66 | 58 | 65 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 32492 | 38524 | 35686 | 37391 | 38830 | 41905 | 44111 | 3.1 |
| Hydro | 32492 | 38477 | 35580 | 37294 | 38716 | 41727 | 43900 | 3.1 |
| of which: Pumped Storage | 998 | 1412 | 1367 | 1306 | 1339 e | 1234 | 1905 | 6.7 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | 2 | 3 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 1 | 5 | 20 | 45 | 51 | 67 | - |
| Industrial Waste | - | - | - | - | - | 31 | 48 | - |
| Municipal Solid Waste Renew. | .. | - | - | - | - | 12 | 12 | .. |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | 19 | 19 | - |
| Solid Biomass | - | 21 | 54 | 4 | 6 | 22 | 18 | - |
| Gas from Biomass | - | 25 | 47 | 73 | 63 | 41 | 44 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | 1116 | 1835 e | 1510 e | 1659 | 1633 | 1651 | 1574 | 3.5 |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | 48 | 45 | 89 | 69 | 76 | 48 | - |
| Municipal Solid Waste Renew. | .. | 39 | 36 | 72 | 75 | 13 | 15 | .. |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | 23 | 25 | - |
| Solid Biomass | 1116 | 1746 e | 1428 e | 1494 | 1486 | 1522 | 1465 | 2.8 |
| Gas from Biomass | - | 2 | 1 | 4 | 3 | 17 | 21 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Austria

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|------|-------------|-------------|-------------|-------------|-------------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | - | 7869 | 7872 | 8887 | 9393 | 9848 | 11973 | - |
| Geothermal | - | - | - | - | - | 344 | 378 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | 966 | 1024 | 978 | 712 | 592 | 574 | - |
| Municipal Solid Waste Renew. | - | 3178 | 3166 | 3446 | 3318 | 1220 | 1747 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | 1989 | 2851 | - |
| Solid Biomass | - | 3707 | 3656 | 4437 | 5337 | 5703 | 6423 | - |
| Gas from Biomass | - | 18 | 26 | 26 | 26 | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | - | 2934 | 2937 | 2709 | 2377 | 2344 | 2779 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | 966 | 1024 | 978 | 712 | 592 | 574 | - |
| Municipal Solid Waste Renew. | - | 1648 | 1581 | 1568 | 1520 | 597 | 690 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | 973 | 1126 | - |
| Solid Biomass | - | 302 | 306 | 140 | 120 | 182 | 389 | - |
| Gas from Biomass | - | 18 | 26 | 23 | 25 | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | - | 4935 | 4935 | 6178 | 7016 | 7504 | 9194 | - |
| Geothermal | - | - | - | - | - | 344 | 378 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | 1530 | 1585 | 1878 | 1798 | 623 | 1057 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | 1016 | 1725 | - |
| Solid Biomass | - | 3405 | 3350 | 4297 | 5217 | 5521 | 6034 | - |
| Gas from Biomass | - | - | - | 3 | 1 | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Austria

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|--------|--------|--------|--------|--------|--------|--------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | - | - | - | - | 173 | 191 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | 173 | 191 | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 547 | 1494 | 1763 | 2016 | 2283 | 1973 | 1973 | 13.7 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 547 | 1494 | 1763 | 2016 | 2283 | 1973 | 1973 | 13.7 |
| Industrial Waste | | | | | | | | |
| Production | 977 | 5485 | 6550 | 6594 | 5360 | 7412 | 6392 | 20.7 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 1881 | 2828 | 2647 | 1867 | 3081 | 1576 | - |
| Final Energy Consumption | 977 | 3604 | 3722 | 3947 | 3493 | 4331 | 4816 | 17.3 |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | - | 3959 | 5006 e | 5283 | 5066 | 2207 | 2367 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 3959 | 5006 e | 5283 | 5066 | 2207 | 2367 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | 3601 | 3861 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | 3601 | 3861 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 112432 | 120361 | 125061 | 122694 | 120036 | 125634 | 117928 | 0.5 |
| Net Imports ⁽¹⁾ | 2443 | 1142 | 2316 | 2022 | 1591 | -2044 | -2067 | - |
| Miscellaneous to Balance ⁽²⁾ | -589 | 189 | 243 | -54 | - | -191 | - | x |
| Transformation Sector | 8767 | 17044 | 16984 | 19847 | 19068 | 20911 | 17726 | 7.3 |
| Final Energy Consumption | 105519 | 104648 | 110636 | 104815 | 102559 | 102488 | 98135 | -0.7 |
| Gas from Biomass | | | | | | | | |
| Production | - | 156 | 777 | 1149 | 1105 | 1160 e | 1234 e | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 156 | 357 | 730 | 668 | 669 | 740 | - |
| Final Energy Consumption | - | - | 420 | 419 | 437 | 491 e | 494 e | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | 18 | 20 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | 18 | 20 | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Belgium

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|--|--------|--------|--------|--------|--------|--------|--------|-------------------------------------|
| TPES (Mtoe) ⁽¹⁾ | 48.43 | 52.40 | 56.43 | 57.10 | 58.35 | 58.55 | 59.22 | 2.0 |
| of which: Renewables (Mtoe) ⁽²⁾ | 0.65 | 0.68 | 0.69 | 0.68 | 0.72 | 0.74 | 0.56 | -1.5 |
| Renewables/TPES(%) | 1.3 | 1.3 | 1.2 | 1.2 | 1.2 | 1.3 | 0.9 | -3.5 |
| GDP (1995 bil. US\$) | 257.86 | 276.86 | 280.17 | 290.17 | 296.69 | 305.64 | 317.96 | 2.1 |
| TPES/GDP ⁽³⁾ | 0.19 | 0.19 | 0.20 | 0.20 | 0.20 | 0.19 | 0.19 | -0.1 |
| TPES/GDP (1973 = 100) | 71 | 71 | 76 | 74 | 74 | 72 | 70 | -0.1 |
| Population (millions) | 9.97 | 10.14 | 10.16 | 10.18 | 10.20 | 10.22 | 10.25 | 0.3 |
| TPES/population ⁽⁴⁾ | 4.86 | 5.17 | 5.56 | 5.61 | 5.72 | 5.73 | 5.77 | 1.7 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 70.2 | 73.6 | 75.2 | 77.9 | 82.1 | 83.4 | 82.7 | 1.6 |
| of which: Renewables (TWh) ⁽²⁾ | 0.77 | 0.95 | 0.86 | 0.86 | 1.07 | 1.18 | 1.01 | 2.9 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 1.1 | 1.3 | 1.1 | 1.1 | 1.3 | 1.4 | 1.2 | 1.2 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 0.39 | 0.45 | 0.50 e | 0.45 e | 0.48 e | 0.58 e | 0.46 e | 1.6 |
| Renewable/TPES (%) | 0.8 | 0.9 | 0.9 e | 0.8 e | 0.8 e | 1.0 e | 0.8 e | -0.4 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------------------------|
| Total Capacity | 1485 | 1569 | 1542 | 1539 | 1565 | 1539 | 1633 | 1.0 |
| Hydro | 1401 | 1403 | 1403 | 1403 | 1404 | 1410 | 1410 | 0.1 |
| of which: Pumped Storage | 1307 | 1307 | 1307 | 1307 | 1307 | 1307 | 1307 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 5 | 5 | 5 | 5 | 6 | 10 | 14 | 10.8 |
| Industrial Waste | - | - | - | - | - | - | 26 | - |
| Municipal Solid Waste | - | - | - | - | - | 72 | 97 | - |
| Solid Biomass | - | - | - | - | - | 38 | 47 | - |
| Gas from Biomass | - | - | - | - | - | 9 | 39 | - |
| Comb. Renewables Non-Specified | 79 | 161 | 134 | 131 | 155 | - | - | - |
| Solar Collectors Surface (1000 m ²) | 34 | 36 | 36 | 36 | 36 | 38 | 41 | 1.9 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Belgium

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 1627 | 2281 | 2257 | 2183 | 2508 | 2701 | 2885 | 5.9 |
| Hydro | 897 | 1230 | 1200 | 1277 | 1497 | 1489 | 1699 | 6.6 |
| of which: Pumped Storage | 631 | 892 | 961 | 972 | 1108 | 1148 | 1240 | 7.0 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 7 | 9 | 8 | 8 | 11 | 13 | 15 | 7.9 |
| Industrial Waste | 231 | 441 | 439 | 349 | 334 | 371 | 311 | 3.0 |
| Municipal Solid Waste Renew. | 350 | 467 | 493 | 458 | 516 | 554 | 284 | -2.1 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | 320 | - |
| Solid Biomass | 135 | 121 | 97 | 60 | 95 | 199 | 153 | 1.3 |
| Gas from Biomass | 7 | 13 | 20 | 31 | 55 | 75 | 103 | 30.9 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 1623 | 2280 | 2256 | 2182 | 2508 | 2701 | 2885 | 5.9 |
| Hydro | 897 | 1230 | 1200 | 1277 | 1497 | 1489 | 1699 | 6.6 |
| of which: Pumped Storage | 631 | 892 | 961 | 972 | 1108 | 1148 | 1240 | 7.0 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 7 | 9 | 8 | 8 | 11 | 13 | 15 | 7.9 |
| Industrial Waste | 227 | 440 | 438 | 348 | 334 | 371 | 311 | 3.2 |
| Municipal Solid Waste Renew. | 350 | 467 | 493 | 458 | 516 | 554 | 284 | -2.1 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | 320 | - |
| Solid Biomass | 135 | 121 | 97 | 60 | 95 | 199 | 153 | 1.3 |
| Gas from Biomass | 7 | 13 | 20 | 31 | 55 | 75 | 103 | 30.9 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | 4 | 1 | 1 | 1 | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | 4 | 1 | 1 | 1 | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Belgium

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|------------|------------|------------|--------------|------------|--------------|----------------------------------|-------------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | 368 | 188 | 390 | 379 e | 348 | 369 e | 359 | -0.2 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | 68 | 14 | 29 | 22 | - | - | - | - |
| Municipal Solid Waste Renew. | 300 | 174 | 338 | 330 e | 321 | 321 e | 324 | 0.8 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | 23 | 27 | 27 | 48 | 35 | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | 68 | 14 | 52 | 49 | 27 | 48 | 35 | -6.4 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | 68 | 14 | 29 | 22 | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | 23 | 27 | 27 | 48 | 35 | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | 300 | 174 | 338 | 330 e | 321 | 321 e | 324 | 0.8 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 300 | 174 | 338 | 330 e | 321 | 321 e | 324 | 0.8 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Belgium

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|-------|-------|-------|-------|-------|--------|-------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 43 | 53 | 70 | 56 | 53 | 54 | 53 | 2.1 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 43 | 53 | 70 | 56 | 53 | 54 | 53 | 2.1 |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 35 | 39 | 37 | 41 | 31 | 40 | 47 | 3.0 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 35 | 39 | 37 | 41 | 31 | 40 | 47 | 3.0 |
| Industrial Waste | | | | | | | | |
| Production | 3271 | 5351 | 4781 | 4394 | 4998 | 5552 e | 4943 | 4.2 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 3271 | 5351 | 4781 | 4394 | 4998 | 5552 e | 4943 | 4.2 |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 11764 | 13544 | 13593 | 14294 | 13134 | 12738 | 5790 | -6.8 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 11764 | 13544 | 13593 | 14294 | 13134 | 12738 | 5766 | -6.9 |
| Final Energy Consumption | - | - | - | - | - | - | 24 | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | 5766 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | 5766 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 14064 | 9719 | 9326 | 8827 | 11196 | 11122 | 10156 | -3.2 |
| Net Imports ⁽¹⁾ | - | 3575 | 4370 | 3751 | 3286 | 4550 | 4373 | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 5937 | 6193 | 4079 | 4242 | 4691 | 6502 | 6247 | 0.5 |
| Final Energy Consumption | 8127 | 7101 | 9617 | 8336 | 9791 | 9170 | 8282 | 0.2 |
| Gas from Biomass | | | | | | | | |
| Production | 269 | 461 | 432 | 537 | 914 | 1139 | 1213 | 16.3 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 146 | 173 | 149 | 224 | 605 | 925 | 1104 | 22.4 |
| Final Energy Consumption | 123 | 288 | 283 | 313 | 309 | 214 | 109 | -1.2 |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Canada

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|--------|--------|--------|--------|--------|--------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 209.09 | 231.75 | 237.20 | 239.67 | 237.35 | 243.03 | 250.97 | 1.8 |
| of which: Renewables (Mtoe) ⁽²⁾ | 33.66 | 38.64 | 40.33 | 39.97 | 38.74 | 40.95 | 42.04 | 2.2 |
| Renewables/TPES(%) | 16.1 | 16.7 | 17.0 | 16.7 | 16.3 | 16.9 | 16.8 | 0.4 |
| GDP (1995 bil. US\$) | 536.20 | 583.15 | 592.22 | 617.71 | 641.86 | 674.83 | 704.88 | 2.8 |
| TPES/GDP ⁽³⁾ | 0.39 | 0.40 | 0.40 | 0.39 | 0.37 | 0.36 | 0.36 | -0.9 |
| TPES/GDP (1973 = 100) | 78 | 79 | 80 | 77 | 74 | 72 | 71 | -0.9 |
| Population (millions) | 27.70 | 29.35 | 29.67 | 29.99 | 30.25 | 30.49 | 30.75 | 1.0 |
| TPES/population ⁽⁴⁾ | 7.55 | 7.89 | 7.99 | 7.99 | 7.85 | 7.97 | 8.16 | 0.8 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 481.9 | 559.9 | 572.8 | 573.5 | 561.5 | 578.6 | 605.1 | 2.3 |
| of which: Renewables (TWh) ⁽²⁾ | 300.59 | 341.48 | 361.40 | 356.88 | 338.49 | 353.25 | 365.92 | 2.0 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 62.4 | 61.0 | 63.1 | 62.2 | 60.3 | 61.0 | 60.5 | -0.3 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 33.66 | 38.64 | 40.33 | 39.97 | 38.74 | 40.95 | 42.04 | 2.2 |
| Renewable/TPES (%) | 16.1 | 16.7 | 17.0 | 16.7 | 16.3 | 16.9 | 16.8 | 0.4 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|--------------|--------------|--------------|--------------|--------------|----------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 60317 | 65785 | 66748 | 68011 | 68149 | 68359 e | 68359 e | 1.3 |
| Hydro | 59381 | 64750 | 65658 | 66823 | 66955 | 67121 e | 67121 e | 1.2 |
| of which: Pumped Storage | 186 | 177 | 177 | 177 e | 177 e | 177 e | 177 e | -0.5 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | - | - | - | - | - | - | - |
| Solar Thermal | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 7.2 |
| Tide, Wave, Ocean | 20 | 20 | 20 | 20 e | 20 e | 20 e | 20 e | - |
| Wind | 1 | 22 | 23 | 23 e | 23 e | 78 e | 78 e | 54.6 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | 914 | 991 | 1045 | 1143 | 1149 | 1138 e | 1138 e | 2.2 |
| Solar Collectors Surface (1000 m ²) | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Canada

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 300703 | 341594 | 361515 | 356990 | 338602 | 353360 | 366030 | 2.0 |
| Hydro | 296848 | 336034 | 355758 | 350809 | 332001 | 345667 | 358413 | 1.9 |
| of which: Pumped Storage | 111 | 111 | 111 | 111 | 111 | 111 | 111 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | 3 | 3 | 3 | 3 | 3 | 3 | - |
| Tide, Wave, Ocean | 26 | 33 | 32 | 32 | 32 | 32 | 32 | 2.1 |
| Wind | - | 59 | 62 | 62 | 62 | 203 | 203 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 3829 | 5465 | 5660 | 6084 | 6504 | 7455 | 7379 | 6.8 |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 300703 | 341594 | 361515 | 356990 | 338602 | 353360 | 366030 | 2.0 |
| Hydro | 296848 | 336034 | 355758 | 350809 | 332001 | 345667 | 358413 | 1.9 |
| of which: Pumped Storage | 111 | 111 | 111 | 111 | 111 | 111 | 111 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | 3 | 3 | 3 | 3 | 3 | 3 | - |
| Tide, Wave, Ocean | 26 | 33 | 32 | 32 | 32 | 32 | 32 | 2.1 |
| Wind | - | 59 | 62 | 62 | 62 | 203 | 203 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 3829 | 5465 | 5660 | 6084 | 6504 | 7455 | 7379 | 6.8 |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Canada

**5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)**

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|--------|--------|--------|--------|--------|--------|--------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Industrial Waste | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 340703 | 408164 | 407832 | 410547 | 426819 | 469631 | 469337 | 3.3 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 14727 | 20974 | 21736 | 23471 | 25337 | 28939 | 28645 | 6.9 |
| Final Energy Consumption | 325976 | 387190 | 386096 | 387076 | 401482 | 440692 | 440692 | 3.1 |
| Gas from Biomass | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Czech Republic

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|-------|--------|--------|--------|--------|-------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 47.40 | 41.38 | 42.60 | 42.40 | 41.05 | 38.24 | 40.38 | -1.6 |
| of which: Renewables (Mtoe) ⁽²⁾ | 0.12 | 0.59 e | 0.57 e | 0.65 e | 0.64 e | 0.68 | 0.55 | 16.1 |
| Renewables/TPES(%) | 0.3 | 1.4 | 1.3 | 1.5 | 1.6 | 1.8 | 1.4 | 18.0 |
| GDP (1995 bil. US\$) | 54.61 | 52.04 | 54.27 | 53.85 | 53.21 | 53.00 | 54.56 | -0.0 |
| TPES/GDP ⁽³⁾ | 0.87 | 0.80 | 0.78 | 0.79 | 0.77 | 0.72 | 0.74 | -1.6 |
| TPES/GDP (1973 = 100) | 77 | 71 | 70 | 70 | 69 | 64 | 66 | -1.6 |
| Population (millions) | 10.36 | 10.33 | 10.32 | 10.30 | 10.29 | 10.29 | 10.27 | -0.1 |
| TPES/population ⁽⁴⁾ | 4.57 | 4.01 | 4.13 | 4.12 | 3.99 | 3.72 | 3.93 | -1.5 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 62.6 | 60.6 | 63.8 | 64.2 | 64.6 | 64.2 | 72.9 | 1.5 |
| of which: Renewables (TWh) ⁽²⁾ | 1.45 | 2.41 | 2.26 | 2.19 | 1.98 | 2.36 | 2.28 | 4.6 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 2.3 | 4.0 | 3.5 | 3.4 | 3.1 | 3.7 | 3.1 | 3.1 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 0.12 | 0.59 | 0.57 | 0.65 | 0.64 | 0.68 | 0.55 | 16.1 |
| Renewable/TPES (%) | 0.3 | 1.4 | 1.3 | 1.5 | 1.6 | 1.8 | 1.4 | 18.0 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

(1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.

(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.

(3) In units of toe/1995 thousand US\$.

(4) In units of toe/per capita.

(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants

(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|------|-------------|-------------|-------------|-------------|-------------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | .. | 1399 | 2014 | 2050 | 2033 | 2158 | 2098 | - |
| Hydro | .. | 1399 | 2014 | 2050 | 2033 | 2153 | 2097 | - |
| of which: Pumped Storage | .. | 491 | 1146 | 1145 | 1145 | 1145 | 1145 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | - | 5 | 1 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | .. | .. | .. | .. | - | - | - |
| Solar Collectors Surface (1000 m ²) | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Czech Republic

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 1445 | 2695 | 2791 | 2608 | 2482 | 3048 | 3036 | 7.7 |
| Hydro | 1445 | 2274 | 2403 | 2080 | 1884 | 2215 | 2313 | 4.8 |
| of which: Pumped Storage | - | 272 | 434 | 381 | 488 | 535 | 555 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | - | 1 | - | - |
| Industrial Waste | - | 16 | 96 | 34 | 11 | 149 | 201 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | 7 | 5 | - |
| Solid Biomass | - | 302 | 254 | 344 | 428 | 528 | 382 | - |
| Gas from Biomass | - | 103 | 38 | 150 | 159 | 148 | 135 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 1445 | 2312 | 2476 | 2159 | 2011 | 2382 | 2488 | 5.6 |
| Hydro | 1445 | 2274 | 2403 | 2080 | 1884 | 2215 | 2313 | 4.8 |
| of which: Pumped Storage | - | 272 | 434 | 381 | 488 | 535 | 555 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | - | 1 | - | - |
| Industrial Waste | - | - | - | 1 | - | 9 | 13 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | 27 | 66 | 38 | 81 | 125 | 135 | - |
| Gas from Biomass | - | 11 | 7 | 40 | 46 | 32 | 27 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | - | 383 | 315 | 449 | 471 | 666 | 548 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | 16 | 96 | 33 | 11 | 140 | 188 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | 7 | 5 | - |
| Solid Biomass | - | 275 | 188 | 306 | 347 | 403 | 247 | - |
| Gas from Biomass | - | 92 | 31 | 110 | 113 | 116 | 108 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Czech Republic

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|------|------|------|------|------|--------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | - | 2415 | 2506 | 3962 | 4204 | 10766 | 7740 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | 928 | 879 | 903 | 1143 | 3750 e | 2473 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | 2150 | 1664 | - |
| Solid Biomass | - | 1090 | 1287 | 2226 | 2431 | 4391 | 3219 | - |
| Gas from Biomass | - | 397 | 340 | 833 | 630 | 475 | 384 | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | - | 1539 | 1229 | 2083 | 3117 | 10424 | 7200 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | 203 | 171 | 389 | 306 | 3703 e | 2292 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | 2150 | 1664 | - |
| Solid Biomass | - | 939 | 718 | 890 | 2215 | 4132 | 2934 | - |
| Gas from Biomass | - | 397 | 340 | 804 | 596 | 439 | 310 | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | - | 876 | 1277 | 1879 | 1087 | 342 | 540 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | 725 | 708 | 514 | 837 | 47 | 181 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | 151 | 569 | 1336 | 216 | 259 | 285 | - |
| Gas from Biomass | - | - | - | 29 | 34 | 36 | 74 | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Czech Republic

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|------|---------|---------|---------|---------|---------|--------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Industrial Waste | | | | | | | | |
| Production | - | 1162 e | 1835 e | 1490 e | 1567 e | 6325 | 5528 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 1162 | 1835 | 1490 | 1567 | 6270 | 5105 | - |
| Final Energy Consumption | - | - | - | - | - | 55 | 423 | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | 3142 | 3994 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | -9 | -2 | x |
| Transformation Sector | - | - | - | - | - | 3129 | 2700 | - |
| Final Energy Consumption | - | - | - | - | - | 4 | 1292 | - |
| Solid Biomass | | | | | | | | |
| Production | - | 16152 e | 16151 e | 18954 e | 19785 e | 19767 | 13320 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | -87 | - | x |
| Transformation Sector | - | 3649 | 3699 | 5954 | 6785 | 9459 | 7922 | - |
| Final Energy Consumption | - | 12503 e | 12452 e | 13000 e | 13000 e | 10221 e | 5398 e | - |
| Gas from Biomass | | | | | | | | |
| Production | - | 1417 e | 609 e | 2175 e | 1880 e | 1733 | 1509 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 1417 | 609 | 2175 | 1880 | 1629 | 1427 | - |
| Final Energy Consumption | - | - | - | - | - | 104 | 82 | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | 35 | 70 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | 2 | - | x |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | 37 | 70 | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Denmark

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|--------|--------|--------|--------|--------|--------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 18.07 | 20.29 | 22.57 | 21.02 | 20.80 | 19.97 | 19.46 | 0.7 |
| of which: Renewables (Mtoe) ⁽²⁾ | 1.59 | 1.59 | 1.56 | 1.64 | 1.72 e | 1.80 | 1.97 | 2.2 |
| Renewables/TPES(%) | 8.8 | 7.8 | 6.9 | 7.8 | 8.3 | 9.0 | 10.1 | 1.4 |
| GDP (1995 bil. US\$) | 163.49 | 180.24 | 184.78 | 190.26 | 195.50 | 199.67 | 206.08 | 2.3 |
| TPES/GDP ⁽³⁾ | 0.11 | 0.11 | 0.12 | 0.11 | 0.11 | 0.10 | 0.09 | -1.6 |
| TPES/GDP (1973 = 100) | 72 | 73 | 79 | 72 | 69 | 65 | 61 | -1.6 |
| Population (millions) | 5.14 | 5.22 | 5.26 | 5.28 | 5.30 | 5.32 | 5.34 | 0.4 |
| TPES/population ⁽⁴⁾ | 3.52 | 3.89 | 4.29 | 3.98 | 3.92 | 3.75 | 3.64 | 0.4 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 26.0 | 36.7 | 53.6 | 44.3 | 41.1 | 38.9 | 36.2 | 3.4 |
| of which: Renewables (TWh) ⁽²⁾ | 0.83 | 2.00 | 2.28 | 3.15 | 4.15 | 4.66 | 6.09 | 22.0 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 3.2 | 5.5 | 4.2 | 7.1 | 10.1 | 12.0 | 16.8 | 18.0 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 1.59 | 1.59 | 1.56 | 1.64 | 1.72 e | 1.80 | 1.97 | 2.2 |
| Renewable/TPES (%) | 8.8 | 7.8 | 6.9 | 7.8 | 8.3 e | 9.0 | 10.1 | 1.4 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS
(MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|------------|------------|-------------|-------------|-------------|-------------|-------------------------------|-------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 413 | 836 | 1093 | 1371 | 1681 | 2130 | 3183 | 22.7 |
| Hydro | 10 | 10 | 10 | 10 | 11 | 11 | 10 | - |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 343 | 616 | 842 | 1130 | 1443 | 1771 | 2814 | 23.4 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | - | 153 | 181 | 171 | 167 | 198 | 233 | - |
| Solid Biomass | 40 | 40 | 40 | 40 | 40 | 110 | 86 | 8.0 |
| Gas from Biomass | 20 | 17 | 20 | 20 | 20 | 40 | 40 | 7.2 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| Solar Collectors Surface (1000 m ²) | 57 | 144 | 184 | 213 | 230 | 246 e | 246 e | 15.7 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Denmark

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|------------|-------------|-------------|-------------|-------------|-------------|-------------------------------|-------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 848 | 2122 | 2420 | 3312 | 4317 | 4861 | 6324 | 22.3 |
| Hydro | 28 | 30 | 19 | 19 | 27 | 31 | 29 | 0.4 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 610 | 1177 | 1227 | 1934 | 2820 | 3029 | 4441 | 22.0 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 47 | 475 | 614 | 690 | 703 | 867 | 1000 | 35.8 |
| Municipal Solid Waste Non-Renew. | 15 | 119 | 144 | 162 | 168 | 206 | 238 | 31.8 |
| Solid Biomass | 108 | 209 | 302 | 344 | 409 | 531 | 409 | 14.2 |
| Gas from Biomass | 40 | 112 | 114 | 163 | 190 | 197 | 207 | 17.9 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 638 | 1221 | 1314 | 2036 | 2848 | 3062 | 4473 | 21.5 |
| Hydro | 28 | 30 | 19 | 19 | 27 | 31 | 29 | 0.4 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 610 | 1177 | 1227 | 1934 | 2820 | 3029 | 4441 | 22.0 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | 9 | 66 | 82 | - | - | - | - |
| Gas from Biomass | - | 5 | 2 | 1 | 1 | 2 | 3 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | 210 | 901 | 1106 | 1276 | 1469 | 1799 | 1851 | 24.3 |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 47 | 475 | 614 | 690 | 703 | 867 | 1000 | 35.8 |
| Municipal Solid Waste Non-Renew. | 15 | 119 | 144 | 162 | 168 | 206 | 238 | 31.8 |
| Solid Biomass | 108 | 200 | 236 | 262 | 409 | 531 | 409 | 14.2 |
| Gas from Biomass | 40 | 107 | 112 | 162 | 189 | 195 | 204 | 17.7 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Denmark

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------------------------|-------------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | 19518 | 27913 | 30234 | 31127 | 32717 | 33208 | 34626 | 5.9 |
| Geothermal | 48 | 47 | 32 | 50 | 54 | 54 | 58 | 1.9 |
| Solar Thermal | 6 | 6 | 6 | 19 | 16 | 23 | 24 | 14.9 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 9040 | 12031 | 13036 | 13860 | 14087 | 14740 | 15645 | 5.6 |
| Municipal Solid Waste Non-Renew. | 2924 | 3015 | 3074 | 3269 | 3353 | 3506 | 3724 | 2.4 |
| Solid Biomass | 7373 | 9647 | 10564 | 10327 | 11277 | 10682 | 10557 | 3.7 |
| Gas from Biomass | 127 | 466 | 509 | 694 | 772 | 840 | 902 | 21.7 |
| Waste Heat and Heat Pumps | - | 2701 | 3013 | 2908 | 3158 | 3363 | 3716 | - |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | 882 | 8613 | 11259 | 11665 | 12551 | 14592 | 16839 | 34.3 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 348 | 5252 | 7043 | 7222 | 7661 | 9110 | 10719 | 40.9 |
| Municipal Solid Waste Non-Renew. | 112 | 1316 | 1661 | 1704 | 1824 | 2168 | 2550 | 36.7 |
| Solid Biomass | 319 | 1708 | 2187 | 2181 | 2431 | 2651 | 2879 | 24.6 |
| Gas from Biomass | 103 | 337 | 368 | 558 | 635 | 663 | 691 | 21.0 |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | 18636 | 19300 | 18975 | 19462 | 20166 | 18616 | 17787 | -0.5 |
| Geothermal | 48 | 47 | 32 | 50 | 54 | 54 | 58 | 1.9 |
| Solar Thermal | 6 | 6 | 6 | 19 | 16 | 23 | 24 | 14.9 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 8692 | 6779 | 5993 | 6638 | 6426 | 5630 | 4926 | -5.5 |
| Municipal Solid Waste Non-Renew. | 2812 | 1699 | 1413 | 1565 | 1529 | 1338 | 1174 | -8.4 |
| Solid Biomass | 7054 | 7939 | 8377 | 8146 | 8846 | 8031 | 7678 | 0.9 |
| Gas from Biomass | 24 | 129 | 141 | 136 | 137 | 177 | 211 | 24.3 |
| Waste Heat and Heat Pumps | - | 2701 | 3013 | 2908 | 3158 | 3363 | 3716 | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Denmark

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|-------|-------|-------|-------|-------|-------|-------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 94 | 206 | 249 | 261 | 284 e | 295 | 306 | 12.5 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 94 | 206 | 249 | 261 | 284 e | 295 | 306 | 12.5 |
| Industrial Waste | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 11690 | 18293 | 20167 | 21642 | 21458 | 23510 | 24510 | 7.7 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | -71 | x |
| Transformation Sector | 10999 | 17274 | 19178 | 20687 | 20885 | 22320 | 23368 | 7.8 |
| Final Energy Consumption | 691 | 1019 | 989 | 955 | 573 | 1190 | 1071 | 4.5 |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | 3781 | 4585 | 4757 | 5105 | 5106 | 5593 | 5832 | 4.4 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | -17 | x |
| Transformation Sector | 3558 | 4329 | 4524 | 4880 | 4969 | 5310 | 5560 | 4.6 |
| Final Energy Consumption | 223 | 256 | 233 | 225 | 137 | 283 | 255 | 1.3 |
| Solid Biomass | | | | | | | | |
| Production | 31472 | 34872 | 36865 | 36813 | 36962 | 37208 | 37183 | 1.7 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 9033 | 12021 | 13637 | 13594 | 15098 | 15622 | 14585 | 4.9 |
| Final Energy Consumption | 22439 | 22851 | 23228 | 23219 | 21864 | 21586 | 22598 | 0.1 |
| Gas from Biomass | | | | | | | | |
| Production | 752 | 1809 | 2095 | 2475 | 2717 | 2641 | 2898 | 14.4 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | -24 | -51 | -83 | -63 | -37 | 16 | 15 | x |
| Transformation Sector | 504 | 1456 | 1584 | 1974 | 2315 | 2258 | 2432 | 17.0 |
| Final Energy Consumption | 224 | 302 | 428 | 438 | 365 | 399 | 481 | 7.9 |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | 744 | 251 | 60 | 14 | 14 | 27 | 52 | -23.4 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 744 | 251 | 60 | 14 | 14 | 27 | 52 | -23.4 |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Finland

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|--------|--------|--------|--------|--------|--------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 28.81 | 29.26 | 32.09 | 33.06 | 33.46 | 33.35 | 33.15 | 1.4 |
| of which: Renewables (Mtoe) ⁽²⁾ | 5.50 | 6.13 | 6.17 | 6.75 | 7.26 | 7.26 | 7.80 e | 3.6 |
| Renewables/TPES(%) | 19.1 | 21.0 | 19.2 | 20.4 | 21.7 | 21.8 | 23.5 | 2.1 |
| GDP (1995 bil. US\$) | 133.73 | 129.29 | 134.47 | 142.93 | 150.56 | 156.61 | 165.54 | 2.2 |
| TPES/GDP ⁽³⁾ | 0.22 | 0.23 | 0.24 | 0.23 | 0.22 | 0.21 | 0.20 | -0.7 |
| TPES/GDP (1973 = 100) | 82 | 86 | 91 | 88 | 85 | 81 | 76 | -0.7 |
| Population (millions) | 4.99 | 5.11 | 5.13 | 5.14 | 5.15 | 5.17 | 5.18 | 0.4 |
| TPES/population ⁽⁴⁾ | 5.78 | 5.73 | 6.26 | 6.43 | 6.49 | 6.46 | 6.40 | 1.0 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 54.4 | 63.9 | 69.4 | 69.2 | 70.2 | 69.4 | 70.0 | 2.6 |
| of which: Renewables (TWh) ⁽²⁾ | 15.54 | 19.54 | 17.76 | 20.15 | 24.41 | 21.19 | 23.30 | 4.1 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 28.6 | 30.6 | 25.6 | 29.1 | 34.8 | 30.5 | 33.3 | 1.5 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 5.14 | 5.88 | 6.12 | 6.75 | 7.26 | 7.26 | 7.80 | 4.3 |
| Renewable/TPES (%) | 17.8 | 20.1 | 19.1 | 20.4 | 21.7 | 21.8 | 23.5 | 2.8 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS
(MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|-------------|---------------|-------------|-------------|-------------|-------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 3604 | 3929 e | 3892 | 3973 | 3998 | 4119 | 4220 | 1.6 |
| Hydro | 2621 | 2777 | 2785 | 2861 | 2881 | 2881 | 2882 | 1.0 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 6 | 7 | 12 | 17 | 38 | 38 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | - | - | - | - | - | - | - | - |
| Solid Biomass | 983 | 1146 e | 1100 | 1100 | 1100 | 1200 | 1300 | 2.8 |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| Solar Collectors Surface (1000 m ²) | - | - | 7 | 7 | 8 | 8 | 8 e | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Finland

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 15541 | 19544 | 18014 | 20440 | 24766 | 21525 | 23619 | 4.3 |
| Hydro | 10859 | 12925 | 11860 | 12242 | 15051 | 12780 | 14660 | 3.0 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 11 | 11 | 17 | 23 | 49 | 78 | - |
| Industrial Waste | - | - | 254 | 290 | 359 | 333 | 324 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | 59 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 4682 | 6608 | 5866 | 7868 | 9303 | 8341 | 8476 | 6.1 |
| Gas from Biomass | - | - | 23 | 23 | 30 | 22 | 22 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 10859 | 13057 | 11977 | 12385 | 15138 | 12881 | 15203 | 3.4 |
| Hydro | 10859 | 12925 | 11860 | 12242 | 15051 | 12780 | 14660 | 3.0 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 11 | 11 | 17 | 23 | 49 | 78 | - |
| Industrial Waste | - | - | - | - | - | 2 | 50 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | 2 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | 121 | 106 | 126 | 64 | 50 | 413 | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | 4682 | 6487 | 6037 | 8055 | 9628 | 8644 | 8416 | 6.0 |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | 254 | 290 | 359 | 331 | 274 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | 57 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 4682 | 6487 | 5760 | 7742 | 9239 | 8291 | 8063 | 5.6 |
| Gas from Biomass | - | - | 23 | 23 | 30 | 22 | 22 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Finland

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|------|------|-------|-------|-------|-------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | - | 6593 | 19367 | 18050 | 20796 | 25878 | 22555 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | 879 | 717 | 732 | 792 | 5755 | - |
| Municipal Solid Waste Renew. | - | 475 | 690 | 688 | 522 | 552 | 903 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | 6118 | 17765 | 16605 | 19520 | 24471 | 15731 | - |
| Gas from Biomass | - | - | 30 | 36 | 18 | 62 | 165 | - |
| Waste Heat and Heat Pumps | - | - | 3 | 4 | 4 | 1 | 1 | - |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | - | 2836 | 14213 | 13332 | 13879 | 18281 | 14390 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | 544 | 387 | 409 | 442 | 1423 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | 319 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | 2836 | 13639 | 12909 | 13452 | 17807 | 12628 | - |
| Gas from Biomass | - | - | 30 | 36 | 18 | 32 | 20 | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | - | 3757 | 5154 | 4718 | 6917 | 7597 | 8165 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | 335 | 330 | 323 | 350 | 4332 | - |
| Municipal Solid Waste Renew. | - | 475 | 690 | 688 | 522 | 552 | 584 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | 3282 | 4126 | 3696 | 6068 | 6664 | 3103 | - |
| Gas from Biomass | - | - | - | - | - | 30 | 145 | - |
| Waste Heat and Heat Pumps | - | - | 3 | 4 | 4 | 1 | 1 | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Finland

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|--------|--------|--------|--------|--------|--------|--------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | - | 6 | 7 | 8 | 9 | 9 | 9 e | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | 6 | 7 | 8 | 9 | 9 | 9 e | - |
| Industrial Waste | | | | | | | | |
| Production | - | - | 6438 | 7212 | 6847 | 5478 e | 8660 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | 2459 | 2385 | 2420 | 2714 | 7868 | - |
| Final Energy Consumption | - | - | 3979 | 4827 | 4427 | 2764 e | 792 | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 784 | 487 | 720 | 804 | 610 | 613 | 1895 | 9.2 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | -5 | - | - | - | - | x |
| Transformation Sector | 784 | 487 | 715 | 804 | 610 | 613 | 1340 | 5.5 |
| Final Energy Consumption | - | - | - | - | - | - | 555 | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 180437 | 209171 | 214162 | 237257 | 248244 | 256443 | 270997 | 4.2 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | 9847 | 519 | -1 | - | - | - | - | x |
| Transformation Sector | 42843 | 44581 | 48397 | 57086 | 61639 | 66521 | 63138 | 4.0 |
| Final Energy Consumption | 147441 | 165109 | 165764 | 180171 | 186605 | 189922 | 207859 | 3.5 |
| Gas from Biomass | | | | | | | | |
| Production | - | - | 650 | 494 | 690 | 764 | 751 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | 1 | - | - | - | - | x |
| Transformation Sector | - | - | 157 | 149 | 350 | 168 | 293 | - |
| Final Energy Consumption | - | - | 494 | 345 | 340 | 596 | 458 | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

France

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|--|---------|---------|---------|---------|---------|---------|---------|-------------------------------------|
| TPES (Mtoe) ⁽¹⁾ | 226.03 | 239.90 | 252.66 | 246.00 | 254.41 | 255.17 | 257.13 | 1.3 |
| of which: Renewables (Mtoe) ⁽²⁾ | 15.65 | 17.87 | 17.82 | 16.78 | 16.93 | 17.58 e | 17.40 e | 1.1 |
| Renewables/TPES(%) | 6.9 | 7.5 | 7.1 | 6.8 | 6.7 | 6.9 | 6.8 | -0.2 |
| GDP (1995 bil. US\$) | 1473.22 | 1553.13 | 1570.26 | 1600.17 | 1654.59 | 1702.85 | 1755.62 | 1.8 |
| TPES/GDP ⁽³⁾ | 0.15 | 0.15 | 0.16 | 0.15 | 0.15 | 0.15 | 0.15 | -0.5 |
| TPES/GDP (1973 = 100) | 84 | 84 | 88 | 84 | 84 | 82 | 80 | -0.5 |
| Population (millions) | 58.03 | 59.33 | 59.53 | 59.74 | 59.94 | 60.16 | 60.43 | 0.4 |
| TPES/population ⁽⁴⁾ | 3.90 | 4.04 | 4.24 | 4.12 | 4.24 | 4.24 | 4.25 | 0.9 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 416.8 | 490.9 | 508.0 | 500.8 | 507.1 | 519.3 | 535.8 | 2.5 |
| of which: Renewables (TWh) ⁽²⁾ | 55.60 | 75.77 | 68.16 | 67.18 | 65.49 | 75.82 | 70.88 | 2.5 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 13.3 | 15.4 | 13.4 | 13.4 | 12.9 | 14.6 | 13.2 | -0.1 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 14.57 | 16.99 | 16.37 | 16.31 | 16.97 e | 17.78 | 17.40 | 1.8 |
| Renewable/TPES (%) | 6.5 | 7.1 | 6.5 | 6.6 | 6.7 e | 7.0 | 6.8 | 0.5 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|--------------|--------------|--------------|--------------|--------------|----------------|----------------|-------------------------------------|
| Total Capacity | 24987 | 25489 | 25594 | 25619 | 25635 | 25661 e | 25933 e | 0.4 |
| Hydro | 24747 | 24987 | 25074 | 25089 | 25095 | 25115 | 25356 | 0.2 |
| of which: Pumped Storage | 4293 | 4292 | 4292 | 4292 | 4303 | 4302 | 4302 | 0.0 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | 3 | 5 | 6 | 8 | 9 | 11 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | 240 | 240 | 240 | 240 | 240 | 240 | 238 | -0.1 |
| Wind | - | 4 | 7 | 12 | 20 | 25 | 56 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | - | 255 | 268 | 272 | 272 | 272 e | 272 e | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| Solar Collectors Surface (1000 m ²) | 320 | 389 | 409 | 438 | 460 | 475 | 543 | 5.4 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

France

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 59598 | 78726 | 73227 | 70841 | 69445 | 80488 | 75756 | 2.4 |
| Hydro | 57350 | 75922 | 70230 | 67490 | 66030 | 77021 | 71816 | 2.3 |
| of which: Pumped Storage | 4002 | 2961 | 5070 | 3666 | 3960 | 4672 | 4878 | 2.0 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | 571 | 568 | 547 | 570 | 590 | 580 | 573 | 0.0 |
| Wind | - | 9 | 16 | 19 | 40 | 49 | 77 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 443 | 728 | 932 | 1099 | 1140 | 1140 | 1522 | 13.1 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 1116 | 1368 | 1365 | 1520 | 1500 | 1485 | 1422 | 2.5 |
| Gas from Biomass | 118 | 131 | 137 | 143 | 145 | 213 | 346 | 11.4 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 59598 | 78076 | 72468 | 69871 | 68520 | 79563 | 74807 | 2.3 |
| Hydro | 57350 | 75922 | 70230 | 67490 | 66030 | 77021 | 71816 | 2.3 |
| of which: Pumped Storage | 4002 | 2961 | 5070 | 3666 | 3960 | 4672 | 4878 | 2.0 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | 571 | 568 | 547 | 570 | 590 | 580 | 573 | 0.0 |
| Wind | - | 9 | 16 | 19 | 40 | 49 | 77 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 443 | 78 | 173 | 129 | 215 | 215 | 573 | 2.6 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 1116 | 1368 | 1365 | 1520 | 1500 | 1485 | 1422 | 2.5 |
| Gas from Biomass | 118 | 131 | 137 | 143 | 145 | 213 | 346 | 11.4 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | - | 650 | 759 | 970 | 925 | 925 | 949 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | 650 | 759 | 970 | 925 | 925 | 949 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

France

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------------------------|-------------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | 20180 | 25587 | 27682 | 25544 | 26079 | 26094 | 28361 | 3.5 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 20012 | 24912 | 26921 | 24870 | 25372 | 25394 | 27661 | 3.3 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 168 | 675 | 761 | 674 | 707 | 700 | 700 | 15.3 |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | - | 17543 | 19845 | 18380 | 18548 | 18558 | 20138 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | 17543 | 19845 | 18380 | 18548 | 18558 | 20138 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | 20180 | 8044 | 7837 | 7164 | 7531 | 7536 | 8223 | -8.6 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 20012 | 7369 | 7076 | 6490 | 6824 | 6836 | 7523 | -9.3 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 168 | 675 | 761 | 674 | 707 | 700 | 700 | 15.3 |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

France

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|--------|--------|--------|--------|--------|----------|----------|-------------------------------------|
| Geothermal Direct Use | | | | | | | | |
| Production | 4622 | 5522 | 5311 | 5108 | 4913 | 4696 | 5190 | 1.2 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 4622 | 5522 | 5311 | 5108 | 4913 | 4696 | 5190 | 1.2 |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 506 | 608 | 640 | 679 | 713 | 743 | 1055 | 7.6 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 506 | 608 | 640 | 679 | 713 | 743 | 1055 | 7.6 |
| Industrial Waste | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 47974 | 68682 | 67393 | 63407 | 65334 | 65334 | 75824 | 4.7 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 47974 | 68682 | 67393 | 63407 | 61397 | 61397 | 72313 | 4.2 |
| Final Energy Consumption | - | - | - | - | 3937 | 3937 | 3511 | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 403392 | 398041 | 422626 | 385785 | 397075 | 386608 e | 384924 e | -0.5 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 5552 | 7241 | 7315 | 7967 | 8030 | 7167 e | 6991 e | 2.3 |
| Final Energy Consumption | 397840 | 390800 | 415311 | 377818 | 389045 | 379441 | 377933 | -0.5 |
| Gas from Biomass | | | | | | | | |
| Production | 4874 | 5494 | 5742 | 6005 | 6278 | 6607 | 7158 | 3.9 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | -5 | x |
| Transformation Sector | 564 e | 630 e | 659 e | 688 e | 694 e | 1023 e | 1661 e | 11.4 |
| Final Energy Consumption | 4310 | 4864 | 5083 | 5317 | 5584 | 5584 | 5492 | 2.5 |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | 191 | 285 | 363 | 318 | 337 | 398 | - |
| Net Imports ⁽¹⁾ | - | - | -5 | -2 | 9 | 6 | 6 | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | 191 | 280 | 361 | 327 | 343 | 404 | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Germany

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|---------|---------|---------|---------|---------|---------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 355.53 | 339.87 | 351.29 | 347.30 | 344.77 | 341.05 | 339.64 | -0.5 |
| of which: Renewables (Mtoe) ⁽²⁾ | 5.83 e | 6.51 e | 6.74 e | 7.70 e | 8.31 e | 7.97 e | 8.95 e | 4.4 |
| Renewables/TPES(%) | 1.6 | 1.9 | 1.9 | 2.2 | 2.4 | 2.3 | 2.6 | 4.9 |
| GDP (1995 bil. US\$) | 2270.26 | 2458.26 | 2477.10 | 2511.71 | 2560.83 | 2608.14 | 2686.50 | 1.7 |
| TPES/GDP ⁽³⁾ | 0.16 | 0.14 | 0.14 | 0.14 | 0.13 | 0.13 | 0.13 | -2.1 |
| TPES/GDP (1973 = 100) | 73 | 64 | 66 | 64 | 63 | 61 | 59 | -2.1 |
| Population (millions) | 79.36 | 81.66 | 81.90 | 82.05 | 82.03 | 82.09 | 82.17 | 0.3 |
| TPES/population ⁽⁴⁾ | 4.48 | 4.16 | 4.29 | 4.23 | 4.20 | 4.15 | 4.13 | -0.8 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 547.6 | 532.6 | 550.6 | 548.0 | 552.4 | 550.3 | 567.1 | 0.4 |
| of which: Renewables (TWh) ⁽²⁾ | 20.48 | 27.28 e | 27.89 e | 24.46 e | 26.52 e | 28.89 e | 35.66 e | 5.7 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 3.7 | 5.1 | 5.1 | 4.5 | 4.8 | 5.2 | 6.3 | 5.3 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 5.14 e | 4.69 e | 4.90 e | 4.53 e | 4.79 e | 9.13 e | 10.18 e | 7.1 |
| Renewable/TPES (%) | 1.5 e | 1.4 e | 1.4 e | 1.3 e | 1.4 e | 2.7 e | 3.0 e | 7.5 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

(1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.

(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.

(3) In units of toe/1995 thousand US\$.

(4) In units of toe/per capita.

(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants

(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|-------------|--------------|--------------|--------------|--------------|----------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 7815 | 11334 | 11926 | 12235 | 13139 | 14993 e | 17101 e | 8.1 |
| Hydro | 6851 | 8876 | 8940 | 8841 | 8854 | 8853 e | 8982 e | 2.7 |
| of which: Pumped Storage | - | 4528 | 4635 | 4545 | 5857 | 5469 e | 4654 e | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | 2 | 10 | 17 | 25 | 49 | 40 | 80 | 44.6 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 48 | 1137 | 1564 | 1966 | 2672 | 4138 | 6095 | 62.3 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | 550 | 509 | 551 | 527 | 540 | 555 | 585 | 0.6 |
| Solid Biomass | - | 79 | 79 | 84 | 103 | 127 | 129 | - |
| Gas from Biomass | 229 | 229 | 229 | 229 | 229 | 287 | 345 | 4.2 |
| Comb. Renewables Non-Specified | 135 | 494 | 546 | 563 | 692 | 993 | 885 | 20.7 |
| Solar Collectors Surface (1000 m ²) | 350 | 1426 | 1786 | 2166 | 2535 | 2418 | 2890 | 23.5 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Germany

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|--------------|----------------|----------------|----------------|----------------|--------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 25217 | 35665 e | 36709 e | 32221 e | 35598 e | 37211 | 45495 | 6.1 |
| Hydro | 19791 | 26250 | 26638 | 20900 | 21234 | 23402 | 25962 | 2.8 |
| of which: Pumped Storage | 2365 | 4470 | 4681 | 3543 | 4018 | 3755 e | 4230 e | 6.0 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | 1 | 7 | 12 | 18 | 35 | 30 | 60 | 50.6 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 71 | 1712 | 2078 | 3034 | 4593 | 5528 | 9352 | 62.9 |
| Industrial Waste | 2373 | 3915 | 4134 | 4219 | 5060 | 3000 | 3946 | 5.2 |
| Municipal Solid Waste Renew. | 2605 | 2696 | 2686 | 2794 | 3236 | 1913 | 2028 | -2.5 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | 1566 | 1660 | - |
| Solid Biomass | 129 | 496 | 569 | 505 | 677 | 823 | 804 | 20.1 |
| Gas from Biomass | 247 | 589 e | 592 e | 751 e | 763 e | 949 | 1683 | 21.2 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 25217 | 35665 e | 36709 e | 32221 e | 35598 e | 37211 | 45495 | 6.1 |
| Hydro | 19791 | 26250 | 26638 | 20900 | 21234 | 23402 | 25962 | 2.8 |
| of which: Pumped Storage | 2365 | 4470 | 4681 | 3543 | 4018 | 3755 e | 4230 e | 6.0 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | 1 | 7 | 12 | 18 | 35 | 30 | 60 | 50.6 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 71 | 1712 | 2078 | 3034 | 4593 | 5528 | 9352 | 62.9 |
| Industrial Waste | 2373 | 3915 | 4134 | 4219 | 5060 | 3000 | 3946 | 5.2 |
| Municipal Solid Waste Renew. | 2605 | 2696 | 2686 | 2794 | 3236 | 1913 | 2028 | -2.5 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | 1566 | 1660 | - |
| Solid Biomass | 129 | 496 | 569 | 505 | 677 | 823 | 804 | 20.1 |
| Gas from Biomass | 247 | 589 e | 592 e | 751 e | 763 e | 949 | 1683 | 21.2 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Germany

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|--------------|----------------|----------------|----------------|--------------|--------------|----------------------------------|-------------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | 19771 | 21224 e | 22432 e | 20465 e | 20717 | 21814 | 17872 e | -1.0 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 19771 | 20836 e | 22014 e | 20045 e | 20075 | 11649 | 9511 | -7.1 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | 9531 | 7727 | - |
| Solid Biomass | - | 388 | 418 e | 420 e | 642 | 634 | 634 e | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | 19771 | 21224 e | 22432 e | 20465 e | 20717 | 21814 | 17872 e | -1.0 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 19771 | 20836 e | 22014 e | 20045 e | 20075 | 11649 | 9511 | -7.1 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | 9531 | 7727 | - |
| Solid Biomass | - | 388 | 418 e | 420 e | 642 | 634 | 634 e | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Germany

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|----------|----------|----------|----------|----------|---------|----------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 292 e | 360 e | 400 e | 407 e | 407 e | 407 | 407 | 3.4 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 292 | 360 | 400 | 407 | 407 | 407 | 407 | 3.4 |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 455 | 1690 | 2353 | 2853 | 3339 | 3158 | 3807 | 23.7 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 455 | 1690 | 2353 | 2853 | 3339 | 3158 | 3807 | 23.7 |
| Industrial Waste | | | | | | | | |
| Production | 20526 e | 37719 e | 42408 e | 45634 e | 53867 e | 32727 e | 43047 e | 7.7 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 20526 e | 37719 e | 42408 e | 45634 e | 53867 e | 32727 e | 43047 e | 7.7 |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 44835 e | 47050 e | 50725 e | 51321 e | 56060 | 33244 | 31360 | -3.5 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 44835 e | 47050 e | 50725 e | 51321 e | 56060 | 33244 | 31360 | -3.5 |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | 27199 | 25658 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | 27199 | 25658 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 123259 e | 124000 e | 125343 e | 175412 e | 190372 e | 187244 | 197101 | 4.8 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 21799 e | 22350 e | 23693 e | 11507 e | 16389 | 16346 | 14472 e | -4.0 |
| Final Energy Consumption | 101460 | 101650 | 101650 | 163905 | 173983 | 170898 | 182629 e | 6.1 |
| Gas from Biomass | | | | | | | | |
| Production | 12231 | 13946 | 15450 | 16382 | 16529 | 15186 e | 23341 e | 6.7 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 6360 | 10656 | 11839 | 12783 | 11889 | 10353 e | 18360 e | 11.2 |
| Final Energy Consumption | 5871 | 3290 | 3611 | 3599 | 4640 | 4833 | 4981 | -1.6 |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | 35 | 55 | 90 | 100 | 130 | 250 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | 35 | 55 | 90 | 100 | 130 | 250 | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Greece

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|--|--------|--------|--------|--------|--------|--------|--------|---|
| TPES (Mtoe) ⁽¹⁾ | 21.75 | 23.13 | 24.16 | 25.05 | 26.38 | 26.62 | 27.82 | 2.5 |
| of which: Renewables (Mtoe) ⁽²⁾ | 1.10 | 1.29 | 1.37 | 1.34 | 1.33 | 1.42 | 1.40 | 2.4 |
| Renewables/TPES(%) | 5.1 | 5.6 | 5.7 | 5.4 | 5.0 | 5.3 | 5.0 | -0.1 |
| GDP (1995 bil. US\$) | 110.50 | 117.56 | 120.34 | 124.71 | 128.91 | 133.32 | 139.07 | 2.3 |
| TPES/GDP ⁽³⁾ | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.2 |
| TPES/GDP (1973 = 100) | 135 | 135 | 137 | 137 | 140 | 137 | 137 | 0.2 |
| Population (millions) | 10.16 | 10.45 | 10.48 | 10.50 | 10.52 | 10.53 | 10.56 | 0.4 |
| TPES/population ⁽⁴⁾ | 2.14 | 2.21 | 2.31 | 2.39 | 2.51 | 2.53 | 2.64 | 2.1 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 34.8 | 41.3 | 42.4 | 43.3 | 46.2 | 49.4 | 53.4 | 4.4 |
| of which: Renewables (TWh) ⁽²⁾ | 1.77 | 3.56 | 4.39 | 3.92 | 3.79 | 4.76 | 4.15 | 8.9 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 5.1 | 8.6 | 10.3 | 9.1 | 8.2 | 9.6 | 7.8 | 4.3 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 0.67 | 0.94 | 1.37 | 1.34 | 1.33 e | 1.42 | 1.40 | 7.6 |
| Renewable/TPES (%) | 3.1 | 4.1 | 5.7 | 5.3 | 5.0 e | 5.3 | 5.0 | 5.0 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|-------------|-------------|-------------|-------------|-------------|---------------|---------------|---|
| Total Capacity | 2458 | 2600 | 2599 | 2804 | 2944 | 3118 e | 3336 e | 3.1 |
| Hydro | 2408 | 2523 | 2522 | 2727 | 2856 | 2959 | 3072 | 2.5 |
| of which: Pumped Storage | 315 | 315 | 315 | 315 | 615 | 615 | 699 | 8.3 |
| Geothermal | 2 | 2 | 2 | 2 | 2 | 2 e | 2 e | - |
| Solar Photovoltaic | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 1 | 27 | 27 | 27 | 38 | 109 | 226 | 72.0 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | 1 | - |
| Comb. Renewables Non-Specified | 47 | 48 | 48 | 48 | 48 | 48 | 35 | -2.9 |
| Solar Collectors Surface (1000 m ²) | 1448 | 2101 | 2168 | 2228 | 2381 | 2440 | 2941 | 7.3 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Greece

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 1999 | 3920 | 4657 | 4245 | 4096 | 5187 | 4726 | 9.0 |
| Hydro | 1997 | 3782 | 4504 | 4096 | 3866 | 4829 | 4111 | 7.5 |
| of which: Pumped Storage | 228 | 253 | 156 | 214 | 149 | 237 | 418 | 6.2 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 2 | 34 | 38 | 36 | 70 | 162 | 451 | 71.9 |
| Industrial Waste | - | 103 | 115 | 113 | 160 | 195 | 163 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | 1 | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | 1 | 1 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 1999 | 3817 | 4542 | 4132 | 3936 | 4991 | 4562 | 8.6 |
| Hydro | 1997 | 3782 | 4504 | 4096 | 3866 | 4829 | 4111 | 7.5 |
| of which: Pumped Storage | 228 | 253 | 156 | 214 | 149 | 237 | 418 | 6.2 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 2 | 34 | 38 | 36 | 70 | 162 | 451 | 71.9 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | 1 | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | - | 103 | 115 | 113 | 160 | 196 | 164 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | 103 | 115 | 113 | 160 | 195 | 163 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | 1 | 1 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Greece

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|-------|-------|-------|-------|-------|-------|-------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 108 | 115 | 115 | 98 | 105 | 88 | 67 | -4.7 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 108 | 115 | 115 | 98 | 105 | 88 | 67 | -4.7 |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 2363 | 3442 | 3588 | 3737 | 3903 | 4045 | 4138 | 5.8 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 2363 | 3442 | 3588 | 3737 | 3903 | 4045 | 4138 | 5.8 |
| Industrial Waste | | | | | | | | |
| Production | - | 1560 | 1672 | 1755 | 1997 | 2665 | 2662 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 1560 | 1672 | 1755 | 1997 | 2665 | 2662 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 37384 | 37556 | 38008 | 38125 | 37960 | 38160 | 39547 | 0.6 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 24 | - | - | - | 33 | - | - |
| Final Energy Consumption | 37384 | 37532 | 38008 | 38125 | 37960 | 38127 | 39547 | 0.6 |
| Gas from Biomass | | | | | | | | |
| Production | 19 | 30 | 27 | 28 | 37 | 53 | 59 | 12.0 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | 5 | 41 | 7 | - |
| Final Energy Consumption | 19 | 30 | 27 | 28 | 32 | 12 | 52 | 10.6 |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Hungary

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|-------|-------|-------|-------|-------|-------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 28.44 | 25.53 | 25.97 | 25.41 | 25.26 | 25.20 | 24.78 | -1.4 |
| of which: Renewables (Mtoe) ⁽²⁾ | 0.37 | 0.49 | 0.36 | 0.38 | 0.36 | 0.37 | 0.40 | 0.7 |
| Renewables/TPES(%) | 1.3 | 1.9 | 1.4 | 1.5 | 1.4 | 1.5 | 1.6 | 2.1 |
| GDP (1995 bil. US\$) | 50.35 | 44.67 | 45.27 | 47.34 | 49.64 | 51.71 | 54.41 | 0.8 |
| TPES/GDP ⁽³⁾ | 0.56 | 0.57 | 0.57 | 0.54 | 0.51 | 0.49 | 0.46 | -2.1 |
| TPES/GDP (1973 = 100) | 90 | 91 | 91 | 85 | 81 | 77 | 72 | -2.1 |
| Population (millions) | 10.37 | 10.23 | 10.19 | 10.16 | 10.14 | 10.07 | 10.02 | -0.3 |
| TPES/population ⁽⁴⁾ | 2.74 | 2.50 | 2.55 | 2.50 | 2.49 | 2.50 | 2.47 | -1.0 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 28.4 | 34.0 | 35.1 | 35.4 | 37.2 | 37.8 | 35.0 | 2.1 |
| of which: Renewables (TWh) ⁽²⁾ | 0.18 | 0.16 | 0.21 | 0.22 | 0.26 | 0.30 | 0.29 | 4.9 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 0.6 | 0.5 | 0.6 | 0.6 | 0.7 | 0.8 | 0.8 | 2.7 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 0.37 | 0.49 | 0.36 | 0.38 | 0.36 | 0.37 | 0.40 | 0.7 |
| Renewable/TPES (%) | 1.3 | 1.9 | 1.4 | 1.5 | 1.4 | 1.5 | 1.6 | 2.1 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|-----------|-----------|-----------|-----------|-------------|-----------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 48 | 48 | 48 | 48 | 72 e | 73 | 73 | 4.3 |
| Hydro | 48 | 48 | 48 | 48 | 48 | 48 | 48 | - |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | - | - | - | - | 24 e | 24 | 24 | - |
| Solid Biomass | - | - | - | - | - | 1 | 1 | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| Solar Collectors Surface (1000 m ²) | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Hungary

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|------------|------------|------------|------------|------------|------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 178 | 163 | 207 | 216 | 260 | 295 | 286 | 4.9 |
| Hydro | 178 | 163 | 207 | 216 | 155 | 181 | 178 | - |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | 105 | 111 | 105 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | 3 | 3 | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 178 | 163 | 207 | 216 | 155 | 184 | 181 | 0.2 |
| Hydro | 178 | 163 | 207 | 216 | 155 | 181 | 178 | - |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | 3 | 3 | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | - | - | - | - | 105 | 111 | 105 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | 105 | 111 | 105 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Hungary

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|------------|------------|------------|------------|------------|------------|----------------------------------|--------------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | 240 | 158 | 192 | 165 | 415 | 433 | 297 | 2.2 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | 310 | 365 | 225 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 240 | 158 | 192 | 165 | 105 | 68 | 72 | -11.3 |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | - | - | - | - | 310 | 365 | 225 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | 310 | 365 | 225 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | 240 | 158 | 192 | 165 | 105 | 68 | 72 | -11.3 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 240 | 158 | 192 | 165 | 105 | 68 | 72 | -11.3 |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Hungary

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|-------|-------|-------|-------|-------|-------|-------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | - | - | - | - | 184 | 194 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | 184 | 194 | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Industrial Waste | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | - | - | - | - | 917 | 1093 | 838 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | 917 | 1093 | 838 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 16665 | 19859 | 14475 | 14687 | 13562 | 13608 | 14925 | -1.1 |
| Net Imports ⁽¹⁾ | -1158 | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | -661 | -2 | 1 | 249 | 150 | - | - | x |
| Transformation Sector | 636 | 223 | 263 | 249 | 150 | 108 | 133 | -14.5 |
| Final Energy Consumption | 14210 | 19634 | 14213 | 14687 | 13562 | 13500 | 14792 | 0.4 |
| Gas from Biomass | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Iceland

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|------|------|------|------|------|-------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 2.10 | 2.14 | 2.27 | 2.33 | 2.63 | 3.17 | 3.43 | 5.0 |
| of which: Renewables (Mtoe) ⁽²⁾ | 1.31 | 1.38 | 1.40 | 1.48 | 1.74 | 2.27 | 2.49 | 6.6 |
| Renewables/TPES(%) | 62.5 | 64.4 | 61.8 | 63.6 | 66.3 | 71.7 | 72.6 | 1.5 |
| GDP (1995 bil. US\$) | 6.81 | 6.98 | 7.34 | 7.67 | 8.08 | 8.40 | 8.82 | 2.6 |
| TPES/GDP ⁽³⁾ | 0.31 | 0.31 | 0.31 | 0.30 | 0.33 | 0.38 | 0.39 | 2.4 |
| TPES/GDP (1973 = 100) | 91 | 91 | 91 | 90 | 96 | 111 | 115 | 2.4 |
| Population (millions) | 0.26 | 0.27 | 0.27 | 0.27 | 0.27 | 0.28 | 0.28 | 1.0 |
| TPES/population ⁽⁴⁾ | 8.22 | 8.03 | 8.44 | 8.60 | 9.59 | 11.45 | 12.20 | 4.0 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 4.5 | 5.0 | 5.1 | 5.6 | 6.3 | 7.2 | 7.7 | 5.5 |
| of which: Renewables (TWh) ⁽²⁾ | 4.49 | 4.97 | 5.12 | 5.58 | 6.28 | 7.18 | 7.68 | 5.5 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 99.5 | 99.8 | 99.9 | 99.9 | 99.9 | 99.9 | 99.9 | 0.0 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 1.33 | 1.38 | 1.40 | 1.48 | 1.74 | 2.27 | 2.49 | 6.5 |
| Renewable/TPES (%) | 63.2 | 64.4 | 61.8 | 63.6 | 66.3 | 71.7 | 72.6 | 1.4 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|------------|------------|------------|-------------|-------------|-------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 802 | 935 | 935 | 1003 | 1096 | 1188 | 1236 | 4.4 |
| Hydro | 756 | 884 | 884 | 923 | 956 | 1016 | 1064 | 3.5 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | 46 | 51 | 51 | 80 | 140 | 172 | 172 | 14.1 |
| Solar Photovoltaic | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| Solar Collectors Surface (1000 m ²) | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Iceland

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 4487 | 4972 | 5118 | 5582 | 6276 | 7183 | 7679 | 5.5 |
| Hydro | 4204 | 4682 | 4772 | 5207 | 5621 | 6047 | 6356 | 4.2 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | 283 | 290 | 346 | 375 | 655 | 1136 | 1323 | 16.7 |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 4487 | 4865 | 5004 | 5460 | 6052 | 6549 | 6830 | 4.3 |
| Hydro | 4204 | 4682 | 4772 | 5207 | 5621 | 6047 | 6356 | 4.2 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | 283 | 183 | 232 | 253 | 431 | 502 | 474 | 5.3 |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | - | 107 | 114 | 122 | 224 | 634 | 849 | - |
| Geothermal | - | 107 | 114 | 122 | 224 | 634 | 849 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Iceland

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------------------------|-------------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | 4819 | 7457 | 7004 | 7502 | 6239 | 7910 | 7405 | 4.4 |
| Geothermal | 4819 | 7421 | 6968 | 7466 | 6203 | 7874 | 7369 | 4.3 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | 36 | 36 | 36 | 36 | 36 | 36 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | 4247 | 7103 | 6630 | 7148 | 5885 | 7556 | 6967 | 5.1 |
| Geothermal | 4247 | 7103 | 6630 | 7148 | 5885 | 7556 | 6967 | 5.1 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | 572 | 354 | 374 | 354 | 354 | 354 | 438 | -2.6 |
| Geothermal | 572 | 318 | 338 | 318 | 318 | 318 | 402 | -3.5 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | 36 | 36 | 36 | 36 | 36 | 36 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Iceland

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|-------|-------|-------|-------|-------|-------|-------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 24729 | 22991 | 22128 | 22250 | 22817 | 24625 | 26328 | 0.6 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | -1726 | -2863 | -3053 | -3069 | -3155 | -3135 | -3387 | x |
| Final Energy Consumption | 23003 | 20128 | 19075 | 19181 | 19662 | 21490 | 22941 | -0.0 |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Industrial Waste | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | - | 45 | 45 | 45 | 45 | 45 | 45 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 45 | 45 | 45 | 45 | 45 | 45 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Gas from Biomass | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Ireland

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|-------|--------|-------|-------|-------|-------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 10.46 | 11.35 | 11.93 | 12.53 | 13.26 | 13.94 | 14.62 | 3.4 |
| of which: Renewables (Mtoe) ⁽²⁾ | 0.17 | 0.22 | 0.19 | 0.20 | 0.26 | 0.26 | 0.26 | 4.4 |
| Renewables/TPES(%) | 1.6 | 2.0 | 1.6 | 1.6 | 2.0 | 1.8 | 1.8 | 1.0 |
| GDP (1995 bil. US\$) | 52.88 | 66.54 | 71.70 | 79.46 | 86.30 | 95.67 | 106.63 | 7.3 |
| TPES/GDP ⁽³⁾ | 0.20 | 0.17 | 0.17 | 0.16 | 0.15 | 0.15 | 0.14 | -3.6 |
| TPES/GDP (1973 = 100) | 74 | 64 | 62 | 59 | 58 | 55 | 51 | -3.6 |
| Population (millions) | 3.51 | 3.60 | 3.63 | 3.66 | 3.71 | 3.75 | 3.79 | 0.8 |
| TPES/population ⁽⁴⁾ | 2.98 | 3.15 | 3.29 | 3.42 | 3.58 | 3.72 | 3.86 | 2.6 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 14.2 | 17.6 | 18.9 | 19.7 | 20.9 | 21.8 | 23.7 | 5.2 |
| of which: Renewables (TWh) ⁽²⁾ | 0.70 | 0.73 e | 0.76 | 0.81 | 1.17 | 1.12 | 1.19 | 5.5 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 4.9 | 4.1 | 4.0 | 4.1 | 5.6 | 5.2 | 5.0 | 0.2 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 0.06 | 0.23 | 0.18 | 0.23 | 0.25 | 0.25 | 0.26 | 15.7 |
| Renewable/TPES (%) | 0.6 | 2.0 | 1.5 | 1.8 | 1.9 | 1.8 | 1.8 | 11.9 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|------------|------------|------------|------------|------------|------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 513 | 523 | 538 | 589 | 597 | 607 | 656 | 2.5 |
| Hydro | 513 | 517 | 522 | 525 | 525 | 525 | 525 | 0.2 |
| of which: Pumped Storage | 290 | 290 | 290 | 292 | 292 | 292 | 292 | 0.1 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 6 | 6 | 52 | 60 | 67 | 116 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | 10 | 12 | 12 | 15 | 15 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| Solar Collectors Surface (1000 m ²) | 2 | 2 | 3 | 3 | 5 | 5 e | 5 e | 9.6 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Ireland

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|------------|--------------|-------------|-------------|-------------|-------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 983 | 984 e | 1023 | 1073 | 1443 | 1368 | 1489 | 4.2 |
| Hydro | 983 | 968 | 982 | 942 | 1189 | 1090 | 1150 | 1.6 |
| of which: Pumped Storage | 286 | 255 | 260 | 264 | 273 | 244 | 304 | 0.6 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 16 | 14 | 50 | 169 | 187 | 244 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | 27 | 81 | 85 | 91 | 95 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 983 | 984 e | 1023 | 1073 | 1443 | 1368 | 1489 | 4.2 |
| Hydro | 983 | 968 | 982 | 942 | 1189 | 1090 | 1150 | 1.6 |
| of which: Pumped Storage | 286 | 255 | 260 | 264 | 273 | 244 | 304 | 0.6 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 16 | 14 | 50 | 169 | 187 | 244 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | 27 | 81 | 85 | 91 | 95 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | | | | | | | | |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Ireland

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|------|------|------|------|------|------|------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 2 | 2 | 2 | 2 | 2 | 7 | 7 | 13.3 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 2 | 2 | 2 | 2 | 2 | 7 | 7 | 13.3 |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 2 | 4 | 4 | 4 | 5 | 5 | 5 | 9.6 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 2 | 4 | 4 | 4 | 5 | 5 | 5 | 9.6 |
| Industrial Waste | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 4416 | 6629 | 4569 | 4570 | 5478 | 5478 | 5695 | 2.6 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 4416 | 6629 | 4569 | 4570 | 5478 | 5478 | 5695 | 2.6 |
| Gas from Biomass | | | | | | | | |
| Production | 95 | 119 | 576 | 1091 | 1455 | 1534 | 1168 | 28.5 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | 425 | 915 | 1267 | 1348 | 988 | - |
| Final Energy Consumption | 95 | 119 | 151 | 176 | 188 | 186 | 180 | 6.6 |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Italy

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|--|---------|---------|---------|---------|---------|---------|---------|-------------------------------------|
| TPES (Mtoe) ⁽¹⁾ | 151.63 | 159.82 | 159.26 | 161.54 | 166.01 | 169.02 | 171.57 | 1.2 |
| of which: Renewables (Mtoe) ⁽²⁾ | 5.56 e | 6.79 e | 7.34 e | 7.61 e | 7.97 e | 8.68 e | 8.87 e | 4.8 |
| Renewables/TPES(%) | 3.7 | 4.3 | 4.6 | 4.7 | 4.8 | 5.1 | 5.2 | 3.5 |
| GDP (1995 bil. US\$) | 1030.05 | 1097.21 | 1109.20 | 1131.68 | 1152.17 | 1170.75 | 1204.87 | 1.6 |
| TPES/GDP ⁽³⁾ | 0.15 | 0.15 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | -0.3 |
| TPES/GDP (1973 = 100) | 74 | 73 | 72 | 72 | 73 | 73 | 72 | -0.3 |
| Population (millions) | 56.72 | 57.30 | 57.40 | 57.51 | 57.59 | 57.65 | 57.73 | 0.2 |
| TPES/population ⁽⁴⁾ | 2.67 | 2.79 | 2.77 | 2.81 | 2.88 | 2.93 | 2.97 | 1.1 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 213.2 | 237.4 | 239.4 | 246.5 | 253.6 | 259.2 | 269.9 | 2.4 |
| of which: Renewables (TWh) ⁽²⁾ | 34.94 | 41.54 | 46.34 | 46.37 | 46.71 | 51.64 e | 51.08 | 3.9 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 16.4 | 17.5 | 19.4 | 18.8 | 18.4 | 19.9 | 18.9 | 1.5 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 5.56 | 6.72 e | 7.27 e | 7.51 e | 7.78 e | 8.45 e | 8.86 e | 4.8 |
| Renewable/TPES (%) | 3.7 | 4.2 e | 4.6 e | 4.7 e | 4.7 e | 5.0 e | 5.2 e | 3.5 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

(1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.

(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.

(3) In units of toe/1995 thousand US\$.

(4) In units of toe/per capita.

(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants

(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|--------------|--------------|--------------|--------------|--------------|--------------|----------------|-------------------------------------|
| Total Capacity | 19364 | 20520 | 20699 | 20886 | 21232 | 21944 | 22183 e | 1.4 |
| Hydro | 18770 | 19844 | 19876 | 19946 | 20058 | 20444 | 20346 | 0.8 |
| of which: Pumped Storage | 6188 | 6880 | 6877 | 6886 | 7000 | 7027 | 6957 | 1.2 |
| Geothermal | 496 | 470 | 485 | 529 | 547 | 585 | 590 | 1.8 |
| Solar Photovoltaic | 4 | 16 | 16 | 17 | 18 | 18 | 19 | 16.9 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 3 | 22 | 70 | 120 | 164 | 229 | 363 | 61.5 |
| Industrial Waste | - | - | - | - | - | 179 | 287 | - |
| Municipal Solid Waste | 46 | 79 | 80 | 89 | 167 | 168 | 219 | 16.9 |
| Solid Biomass | 4 | 68 | 96 | 90 | 154 | 180 | 180 e | 46.3 |
| Gas from Biomass | 41 | 21 | 76 | 95 | 124 | 141 | 179 | 15.9 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| Solar Collectors Surface (1000 m ²) | 10 | 180 | 180 | 180 | 240 | 240 | 240 | 37.4 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Italy

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|----------------|----------------------------------|-------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 38408 | 45753 | 51486 | 51451 | 53056 | 58421 e | 58093 | 4.2 |
| Hydro | 35079 | 41907 | 47072 | 46552 | 47365 | 51777 | 50900 | 3.8 |
| of which: Pumped Storage | 3453 | 4125 | 5035 | 4949 | 6145 | 6412 | 6695 | 6.8 |
| Geothermal | 3222 | 3436 | 3762 | 3905 | 4214 | 4403 | 4705 | 3.9 |
| Solar Photovoltaics | 4 | 13 | 14 | 15 | 16 | 17 e | 18 e | 16.2 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 2 | 9 | 33 | 118 | 231 | 403 | 563 | 75.8 |
| Industrial Waste | 16 | 88 | 109 | 134 | 202 | 367 e | 316 | 34.8 |
| Municipal Solid Waste Renew. | 71 | 206 | 241 | 293 | 465 | 653 | 804 | 27.5 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 12 | 28 | 48 | 61 | 69 | 219 e | 221 | 33.8 |
| Gas from Biomass | 2 | 66 | 207 | 373 | 494 | 582 | 566 | 75.9 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 38378 | 45563 | 51248 | 51117 | 52598 | 57597 e | 57120 | 4.1 |
| Hydro | 35079 | 41907 | 47072 | 46552 | 47365 | 51777 | 50900 | 3.8 |
| of which: Pumped Storage | 3453 | 4125 | 5035 | 4949 | 6145 | 6412 | 6695 | 6.8 |
| Geothermal | 3222 | 3436 | 3762 | 3905 | 4214 | 4403 | 4705 | 3.9 |
| Solar Photovoltaics | 4 | 13 | 14 | 15 | 16 | 17 e | 18 e | 16.2 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 2 | 9 | 33 | 118 | 231 | 403 | 563 | 75.8 |
| Industrial Waste | - | - | - | - | 46 | 191 e | 124 | - |
| Municipal Solid Waste Renew. | 71 | 155 | 224 | 216 | 260 | 235 | 267 | 14.2 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | 13 | 17 | 14 | 12 | 30 e | 19 | - |
| Gas from Biomass | - | 30 | 126 | 297 | 454 | 541 | 524 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | 30 | 190 | 238 | 334 | 458 | 824 e | 973 | 41.6 |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | 16 | 88 | 109 | 134 | 156 | 176 e | 192 | 28.2 |
| Municipal Solid Waste Renew. | - | 51 | 17 | 77 | 205 | 418 | 537 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 12 | 15 | 31 | 47 | 57 | 189 e | 202 | 32.6 |
| Gas from Biomass | 2 | 36 | 81 | 76 | 40 | 41 | 42 | 35.6 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Italy

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|---------|---------|---------|---------|---------|---------|---------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 8400 | 8916 | 8916 | 8916 | 8916 | 8916 | 8916 | 0.6 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 8400 | 8916 | 8916 | 8916 | 8916 | 8916 | 8916 | 0.6 |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 200 | 300 | 300 | 300 | 335 | 350 | 450 | 8.4 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 200 | 300 | 300 | 300 | 335 | 350 | 450 | 8.4 |
| Industrial Waste | | | | | | | | |
| Production | 6408 e | 4187 e | 4400 e | 4400 e | 4400 e | 6270 e | 5566 e | -1.4 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 586 | 712 | 901 | 1042 | 1800 | 3670 e | 2966 e | 17.6 |
| Final Energy Consumption | 5822 e | 3475 e | 3499 e | 3358 e | 2600 e | 2600 e | 2600 e | -7.7 |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 921 | 5200 | 5600 | 7200 | 11420 | 15672 | 14914 | 32.1 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | -2839 | -2743 | -3966 | -6987 | -9754 | - | x |
| Transformation Sector | 921 | 2361 | 2857 | 3234 | 4433 | 5918 e | 8114 | 24.3 |
| Final Energy Consumption | - | - | - | - | - | - | 6800 | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 28163 e | 40915 e | 38886 e | 40966 e | 41329 e | 46226 e | 46444 e | 5.1 |
| Net Imports ⁽¹⁾ | 3843 | 9693 | 9810 | 13390 | 15166 | 15612 | 21549 | 18.8 |
| Miscellaneous to Balance ⁽²⁾ | - | -1 | -2 | 1 | - | - | - | x |
| Transformation Sector | 1681 e | 5155 e | 5133 e | 5728 e | 5283 e | 6814 e | 4623 e | 10.6 |
| Final Energy Consumption | 30325 e | 45452 e | 43561 e | 48629 e | 51212 e | 55024 e | 63370 | 7.6 |
| Gas from Biomass | | | | | | | | |
| Production | - | 557 | 1937 | 3987 | 5926 | 6075 | 5093 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | -451 | -653 | - | - | x |
| Transformation Sector | - | 557 | 1937 | 3536 | 5273 | 6075 | 5093 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Japan

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|---------|---------|---------|---------|---------|---------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 438.85 | 497.81 | 511.12 | 517.86 | 511.10 | 515.55 | 524.71 | 1.8 |
| of which: Renewables (Mtoe) ⁽²⁾ | 15.89 | 16.95 e | 17.37 e | 18.67 e | 17.41 | 16.81 | 16.98 | 0.7 |
| Renewables/TPES(%) | 3.6 | 3.4 | 3.4 | 3.6 | 3.4 | 3.3 | 3.2 | -1.1 |
| GDP (1995 bil. US\$) | 4935.97 | 5291.75 | 5475.36 | 5573.94 | 5512.64 | 5549.53 | 5680.57 | 1.4 |
| TPES/GDP ⁽³⁾ | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.4 |
| TPES/GDP (1973 = 100) | 72 | 76 | 76 | 75 | 75 | 75 | 75 | 0.4 |
| Population (millions) | 123.54 | 125.57 | 125.86 | 126.17 | 126.49 | 126.69 | 126.92 | 0.3 |
| TPES/population ⁽⁴⁾ | 3.55 | 3.96 | 4.06 | 4.10 | 4.04 | 4.07 | 4.13 | 1.5 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 850.8 | 980.8 | 1000.4 | 1027.3 | 1036.2 | 1057.0 | 1081.9 | 2.4 |
| of which: Renewables (TWh) ⁽²⁾ | 107.82 | 105.03 | 104.39 | 115.46 | 111.23 | 106.07 | 107.23 | -0.1 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 12.7 | 10.7 | 10.4 | 11.2 | 10.7 | 10.0 | 9.9 | -2.4 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 15.89 | 16.95 e | 17.37 e | 18.67 e | 17.40 | 16.81 | 16.98 | 0.7 |
| Renewable/TPES (%) | 3.6 | 3.4 e | 3.4 e | 3.6 e | 3.4 | 3.3 | 3.2 | -1.1 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS
(MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|--------------|--------------|--------------|--------------|--------------|--------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 40494 | 46785 | 47813 | 48132 | 48093 | 48879 | 49964 | 2.1 |
| Hydro | 37830 | 43456 | 44407 | 44462 | 45382 | 45860 | 46324 | 2.0 |
| of which: Pumped Storage | 17005 | 22285 | 23185 | 23185 | 23905 | 24305 | 24305 | 3.6 |
| Geothermal | 270 | 504 | 530 | 530 | 533 | 533 | 533 | 7.0 |
| Solar Photovoltaic | - | 1 | 1 | 1 | 1 | 1 | 1 | - |
| Solar Thermal | 1 | 1 | 1 | 1 | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 6 | 6 | 6 | 20 | 81 | 175 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | - | - | - | - | - | 850 | 1322 | - |
| Solid Biomass | - | - | - | - | - | 1554 e | 1609 e | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | 2393 e | 2817 e | 2868 e | 3132 e | 2157 e | - | - | - |
| Solar Collectors Surface (1000 m ²) | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Japan

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 114348 | 114128 | 113303 | 126073 | 121307 | 115235 | 116793 | 0.2 |
| Hydro | 95835 | 91216 | 89433 | 100369 | 102587 | 95577 | 96817 | 0.1 |
| of which: Pumped Storage | 6530 | 9098 | 8914 | 10615 | 10074 | 9161 | 9564 | 3.9 |
| Geothermal | 1741 | 3173 | 3673 | 3756 | 3531 | 3451 | 3348 | 6.8 |
| Solar Photovoltaics | - | 1 | 1 | 1 | 1 | 1 | 1 | - |
| Solar Thermal | 1 | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 1 | 2 | 1 | 6 | 37 | 109 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 1954 | 3060 | 3657 | 4384 | 4972 | 5281 | 5209 | 10.3 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 14817 | 16677 | 16537 | 17562 | 10210 | 10888 | 11309 | -2.7 |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 114348 | 114128 | 113303 | 126073 | 121307 | 115235 | 116793 | 0.2 |
| Hydro | 95835 | 91216 | 89433 | 100369 | 102587 | 95577 | 96817 | 0.1 |
| of which: Pumped Storage | 6530 | 9098 | 8914 | 10615 | 10074 | 9161 | 9564 | 3.9 |
| Geothermal | 1741 | 3173 | 3673 | 3756 | 3531 | 3451 | 3348 | 6.8 |
| Solar Photovoltaics | - | 1 | 1 | 1 | 1 | 1 | 1 | - |
| Solar Thermal | 1 | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 1 | 2 | 1 | 6 | 37 | 109 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 1954 | 3060 | 3657 | 4384 | 4972 | 5281 | 5209 | 10.3 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 14817 | 16677 | 16537 | 17562 | 10210 | 10888 | 11309 | -2.7 |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Japan

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|--------------|---------------|---------------|---------------|---------------|---------------|----------------------------------|-------------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | 819 e | 3098 e | 3146 e | 3740 e | 4060 e | 4265 e | 4224 e | 17.8 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | 387 e | 401 | 420 | 433 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | 819 e | 3098 e | 3146 e | 3353 e | 3659 e | 3845 e | 3791 e | 16.6 |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | 819 e | 3098 e | 3146 e | 3740 e | 4060 e | 4265 e | 4224 e | 17.8 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | 387 e | 401 | 420 | 433 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | 819 e | 3098 e | 3146 e | 3353 e | 3659 e | 3845 e | 3791 e | 16.6 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Japan

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|--------|----------|---------|---------|---------|--------|--------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | 7830 e | 10010 e | 10670 e | 10071 | 9758 | 9329 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | 7830 e | 10010 e | 10670 e | 10071 | 9758 | 9329 | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | - | - | - | - | 36514 | 33029 | 33618 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | 36514 | 33029 | 33618 | - |
| Industrial Waste | | | | | | | | |
| Production | - | - | - | 413 | 414 | 433 | 454 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | 413 | 414 | 433 | 454 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 14614 | 22537 | 27300 | 32441 | 40985 | 43414 | 42236 | 11.2 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | -1 | - | -1 | - | - | 1 | x |
| Transformation Sector | 14614 | 22536 | 27300 | 32440 | 40985 | 43414 | 42237 | 11.2 |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 266669 | 269315 e | 267777 | 280002 | 180925 | 182093 | 190591 | -3.3 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | 2863 | 2384 | 2567 | x |
| Transformation Sector | 111726 | 124894 | 124688 | 131020 | 85850 e | 86608 | 86904 | -2.5 |
| Final Energy Consumption | 154943 | 144421 | 143089 | 148982 | 97938 | 97869 | 106254 | -3.7 |
| Gas from Biomass | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Korea

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|--------|--------|--------|--------|--------|--------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 92.58 | 150.63 | 164.80 | 178.51 | 164.98 | 181.23 | 193.63 | 7.7 |
| of which: Renewables (Mtoe) ⁽²⁾ | 0.55 | 0.92 e | 1.11 e | 1.34 e | 1.70 e | 1.84 e | 2.09 e | 14.3 |
| Renewables/TPES(%) | 0.6 | 0.6 | 0.7 | 0.8 | 1.0 | 1.0 | 1.1 | 6.2 |
| GDP (1995 bil. US\$) | 341.55 | 489.26 | 522.28 | 548.45 | 511.77 | 567.52 | 617.51 | 6.1 |
| TPES/GDP ⁽³⁾ | 0.27 | 0.31 | 0.32 | 0.33 | 0.32 | 0.32 | 0.31 | 1.5 |
| TPES/GDP (1973 = 100) | 117 | 133 | 136 | 140 | 139 | 138 | 135 | 1.5 |
| Population (millions) | 42.87 | 45.09 | 45.55 | 45.99 | 46.43 | 46.86 | 47.28 | 1.0 |
| TPES/population ⁽⁴⁾ | 2.16 | 3.34 | 3.62 | 3.88 | 3.55 | 3.87 | 4.10 | 6.6 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 107.7 | 201.1 | 224.0 | 244.4 | 236.9 | 260.4 | 292.5 | 10.5 |
| of which: Renewables (TWh) ⁽²⁾ | 6.36 | 3.02 e | 2.82 e | 3.22 e | 4.68 e | 4.58 e | 4.45 e | -3.5 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 5.9 | 1.5 | 1.3 | 1.3 | 2.0 | 1.8 | 1.5 | -12.7 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 0.55 | 0.91 e | 1.08 e | 1.30 e | 1.67 e | 1.87 e | 2.09 e | 14.3 |
| Renewable/TPES (%) | 0.6 | 0.6 e | 0.7 e | 0.7 e | 1.0 e | 1.0 e | 1.1 e | 6.2 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 2341 | 3095 | 3470 | 3540 | 3556 | 3574 | 3639 e | 4.5 |
| Hydro | 2340 | 3093 | 3094 | 3115 | 3131 | 3148 | 3149 | 3.0 |
| of which: Pumped Storage | 1000 | 1600 | 1600 | 1600 | 1600 | 1600 | 1600 | 4.8 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 14.9 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | - | - | 7 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | 374 | 422 | 422 | 422 | 479 e | - |
| Solar Collectors Surface (1000 m ²) | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Korea

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|-------------|---------------|---------------|---------------|---------------|---------------|----------------------------------|-------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 6361 | 5755 e | 5635 e | 5841 e | 6538 e | 6517 e | 6085 e | -0.4 |
| Hydro | 6361 | 5478 | 5201 | 5403 | 6099 | 6066 | 5610 | -1.2 |
| of which: Pumped Storage | - | 2718 | 2777 | 2590 | 1820 | 1907 | 1600 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | 26 e | 30 e | 36 e | 44 e | 52 e | 62 e | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 1 e | 1 e | 2 e | 4 e | 17 e | 17 e | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | 231 e | 369 e | 366 e | 357 e | 348 e | 361 e | - |
| Municipal Solid Waste Non-Renew. | - | 19 e | 34 e | 34 e | 34 e | 34 e | 35 e | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 6361 | 5505 e | 5232 e | 5441 e | 6147 e | 6135 e | 5689 e | -1.1 |
| Hydro | 6361 | 5478 | 5201 | 5403 | 6099 | 6066 | 5610 | -1.2 |
| of which: Pumped Storage | - | 2718 | 2777 | 2590 | 1820 | 1907 | 1600 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | 26 e | 30 e | 36 e | 44 e | 52 e | 62 e | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 1 e | 1 e | 2 e | 4 e | 17 e | 17 e | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | - | 250 e | 403 e | 400 e | 391 e | 382 e | 396 e | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | 231 e | 369 e | 366 e | 357 e | 348 e | 361 e | - |
| Municipal Solid Waste Non-Renew. | - | 19 e | 34 e | 34 e | 34 e | 34 e | 35 e | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Korea

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|------|---------|---------|---------|---------|---------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | - | 22868 e | 29773 e | 38004 e | 47326 e | 53206 e | 63922 e | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | 4407 e | 5823 e | 7115 e | 8806 e | 9891 e | 11776 e | - |
| Municipal Solid Waste Renew. | - | 17341 e | 22766 e | 27998 e | 34828 e | 39202 e | 47194 e | - |
| Municipal Solid Waste Non-Renew. | - | 457 e | 519 e | 747 e | 1051 e | 1255 e | 1444 e | - |
| Solid Biomass | - | - | - | 1406 e | 1740 e | 1955 e | 2210 e | - |
| Gas from Biomass | - | 663 e | 665 e | 738 e | 901 e | 903 e | 1298 e | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | - | 936 e | 1238 e | 1459 e | 1659 e | 1702 e | 2906 e | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | 723 e | 956 e | 1126 e | 1281 e | 1314 e | 2243 e | - |
| Municipal Solid Waste Non-Renew. | - | 213 e | 282 e | 333 e | 378 e | 388 e | 663 e | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | - | 21932 e | 28535 e | 36545 e | 45667 e | 51504 e | 61016 e | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | 4407 e | 5823 e | 7115 e | 8806 e | 9891 e | 11776 e | - |
| Municipal Solid Waste Renew. | - | 16618 e | 21810 e | 26872 e | 33547 e | 37888 e | 44951 e | - |
| Municipal Solid Waste Non-Renew. | - | 244 e | 237 e | 414 e | 673 e | 867 e | 781 e | - |
| Solid Biomass | - | - | - | 1406 e | 1740 e | 1955 e | 2210 e | - |
| Gas from Biomass | - | 663 e | 665 e | 738 e | 901 e | 903 e | 1298 e | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Korea

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|------|---------|---------|---------|---------|---------|-------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 116 | 925 | 1340 | 1907 | 1840 | 1763 | 1745 | 31.1 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 116 | 925 | 1340 | 1907 | 1840 | 1763 | 1745 | 31.1 |
| Industrial Waste | | | | | | | | |
| Production | - | 5686 e | 7466 e | 9064 e | 11147 e | 12442 e | 14720 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 5686 e | 7466 e | 9064 e | 11147 e | 12442 e | 14720 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | - | 23943 e | 31441 e | 38168 e | 46939 e | 52396 e | 62367 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 23943 e | 31441 e | 38168 e | 46939 e | 52396 e | 62367 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | 1121 e | 1472 e | 1786 e | 2197 e | 2452 e | 2901 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 1121 e | 1472 e | 1786 e | 2197 e | 2452 e | 2901 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | - | 2933 e | 3852 e | 4676 e | 5751 e | 6419 e | 7214 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | 1791 e | 2203 e | 2459 e | 2763 | - |
| Final Energy Consumption | - | 2933 e | 3852 e | 2885 e | 3548 e | 3960 e | 4451 | - |
| Gas from Biomass | | | | | | | | |
| Production | - | 856 e | 852 e | 940 e | 1140 e | 1136 e | 1622 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 856 e | 852 e | 940 e | 1140 e | 1136 e | 1622 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Luxembourg

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|-------|-------|-------|-------|-------|-------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 3.57 | 3.38 | 3.44 | 3.40 | 3.32 | 3.49 | 3.68 | 0.3 |
| of which: Renewables (Mtoe) ⁽²⁾ | 0.03 | 0.05 | 0.04 | 0.05 | 0.05 | 0.04 | 0.06 | 6.3 |
| Renewables/TPES(%) | 0.9 | 1.4 | 1.1 | 1.4 | 1.5 | 1.3 | 1.5 | 6.0 |
| GDP (1995 bil. US\$) | 13.88 | 18.09 | 18.74 | 20.43 | 21.62 | 22.91 | 24.63 | 5.9 |
| TPES/GDP ⁽³⁾ | 0.26 | 0.19 | 0.18 | 0.17 | 0.15 | 0.15 | 0.15 | -5.3 |
| TPES/GDP (1973 = 100) | 47 | 34 | 34 | 30 | 28 | 28 | 27 | -5.3 |
| Population (millions) | 0.38 | 0.41 | 0.42 | 0.42 | 0.43 | 0.44 | 0.44 | 1.5 |
| TPES/population ⁽⁴⁾ | 9.37 | 8.18 | 8.24 | 8.02 | 7.73 | 8.01 | 8.35 | -1.1 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 0.6 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | -3.6 |
| of which: Renewables (TWh) ⁽²⁾ | 0.10 | 0.14 | 0.10 | 0.13 | 0.17 | 0.15 | 0.20 | 6.9 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 16.7 | 29.0 | 23.2 | 32.5 | 47.5 | 43.0 | 46.9 | 10.9 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 0.03 | 0.05 | 0.04 | 0.04 | 0.05 | 0.04 | 0.06 | 6.3 |
| Renewable/TPES (%) | 0.9 | 1.4 | 1.1 | 1.3 | 1.4 | 1.3 | 1.5 | 6.0 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 1138 | 1146 | 1173 | 1153 | 1160 | 1157 | 1162 | 0.2 |
| Hydro | 1132 | 1140 | 1163 | 1140 | 1141 | 1139 | 1139 | 0.1 |
| of which: Pumped Storage | 1100 | 1100 | 1129 | 1100 | 1100 | 1100 | 1100 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | 3 | 10 | 9 | 14 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | 6 | 6 | 10 | 10 | 9 | 9 | 9 | 4.1 |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| Solar Collectors Surface (1000 m ²) | - | - | 1 | 1 | 2 | 2 | 2 | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Luxembourg

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|------------|------------|------------|------------|-------------|------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 857 | 884 | 918 | 986 | 1100 | 816 | 945 | 1.0 |
| Hydro | 823 | 831 | 876 | 937 | 1044 | 747 | 862 | 0.5 |
| of which: Pumped Storage | 753 | 743 | 816 | 854 | 929 | 662 | 742 | -0.1 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | 3 | 11 | 18 | 27 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 34 | 53 | 42 | 46 | 45 | 50 | 52 | 4.3 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | 1 | 4 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 857 | 884 | 918 | 986 | 1100 | 815 | 941 | 0.9 |
| Hydro | 823 | 831 | 876 | 937 | 1044 | 747 | 862 | 0.5 |
| of which: Pumped Storage | 753 | 743 | 816 | 854 | 929 | 662 | 742 | -0.1 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | 3 | 11 | 18 | 27 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 34 | 53 | 42 | 46 | 45 | 50 | 52 | 4.3 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | - | - | - | - | - | 1 | 4 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | 1 | 4 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Luxembourg

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|------|------|------|------|------|------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | - | - | - | - | - | 6 | 6 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | 6 | 6 | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | - | - | - | - | - | 6 | 6 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | 6 | 6 | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Luxembourg

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|------|------|------|------|------|------|------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | - | - | - | - | - | 2 | 2 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | 2 | 2 | - |
| Industrial Waste | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 1036 | 971 | 749 | 969 | 949 | 841 | 1151 | 1.1 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 1036 | 971 | 749 | 969 | 949 | 841 | 1151 | 1.1 |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | - | 645 | 645 | 645 | 645 | 645 | 668 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | 645 | 645 | 645 | 645 | 645 | 668 | - |
| Gas from Biomass | | | | | | | | |
| Production | - | 19 | 19 | 15 | 63 | 12 | 23 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | -19 | -19 | -15 | -63 | - | - | x |
| Transformation Sector | - | - | - | - | - | 12 | 23 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Mexico

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|--------|--------|--------|--------|--------|--------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 124.03 | 132.71 | 136.81 | 141.51 | 147.95 | 149.91 | 153.51 | 2.2 |
| of which: Renewables (Mtoe) ⁽²⁾ | 13.74 | 15.07 | 15.47 | 15.04 | 15.20 | 15.78 | 16.01 | 1.5 |
| Renewables/TPES(%) | 11.1 | 11.4 | 11.3 | 10.6 | 10.3 | 10.5 | 10.4 | -0.6 |
| GDP (1995 bil. US\$) | 265.26 | 286.17 | 300.91 | 321.29 | 337.45 | 350.12 | 374.36 | 3.5 |
| TPES/GDP ⁽³⁾ | 0.47 | 0.46 | 0.45 | 0.44 | 0.44 | 0.43 | 0.41 | -1.3 |
| TPES/GDP (1973 = 100) | 122 | 121 | 118 | 114 | 114 | 111 | 107 | -1.3 |
| Population (millions) | 81.75 | 90.90 | 92.45 | 93.99 | 95.52 | 97.43 | 97.22 | 1.7 |
| TPES/population ⁽⁴⁾ | 1.52 | 1.46 | 1.48 | 1.51 | 1.55 | 1.54 | 1.58 | 0.4 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 122.7 | 152.5 | 162.5 | 175.1 | 181.8 | 192.3 | 204.4 | 5.2 |
| of which: Renewables (TWh) ⁽²⁾ | 28.60 | 33.20 | 37.18 | 31.90 | 30.61 | 38.96 | 39.52 | 3.3 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 23.3 | 21.8 | 22.9 | 18.2 | 16.8 | 20.3 | 19.3 | -1.9 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 13.74 | 15.07 | 15.47 | 15.04 | 15.20 | 15.78 | 16.01 | 1.5 |
| Renewable/TPES (%) | 11.1 | 11.4 | 11.3 | 10.6 | 10.3 | 10.5 | 10.4 | -0.6 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|-------------|--------------|--------------|--------------|--------------|--------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 8580 | 10084 | 10780 | 10786 | 10667 | 10687 | 10805 | 2.3 |
| Hydro | 7880 | 9329 | 10034 | 10034 | 9703 | 9633 | 9634 | 2.0 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | 700 | 753 | 744 | 750 | 750 | 750 | 855 | 2.0 |
| Solar Photovoltaic | - | - | - | - | 12 | 13 | 13 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 2 | 2 | 2 | 3 | 3 | 3 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | 191 | 280 | 292 | - |
| Gas from Biomass | - | - | - | - | 8 | 8 | 8 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| Solar Collectors Surface (1000 m ²) | - | - | - | - | 293 | 328 | 373 | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Mexico

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 28602 | 33203 | 37176 | 31901 | 30613 | 38955 | 39518 | 3.3 |
| Hydro | 23478 | 27528 | 31442 | 26431 | 24625 | 32782 | 33133 | 3.5 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | 5124 | 5669 | 5729 | 5466 | 5657 | 5623 | 5901 | 1.4 |
| Solar Photovoltaics | - | - | - | - | 26 | 28 | 29 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 6 | 5 | 4 | 11 | 11 | 13 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | 279 | 500 | 433 | - |
| Gas from Biomass | - | - | - | - | 15 | 11 | 9 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 28602 | 33203 | 37176 | 31901 | 30613 | 38955 | 39518 | 3.3 |
| Hydro | 23478 | 27528 | 31442 | 26431 | 24625 | 32782 | 33133 | 3.5 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | 5124 | 5669 | 5729 | 5466 | 5657 | 5623 | 5901 | 1.4 |
| Solar Photovoltaics | - | - | - | - | 26 | 28 | 29 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 6 | 5 | 4 | 11 | 11 | 13 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | 279 | 500 | 433 | - |
| Gas from Biomass | - | - | - | - | 15 | 11 | 9 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Mexico

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|--------|--------|--------|--------|--------|--------|--------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | - | - | - | - | 1270 | 1422 | 1801 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | 1270 | 1422 | 1801 | - |
| Industrial Waste | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 306353 | 327641 | 328315 | 337910 | 342143 | 338480 | 336458 | 0.9 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | 20508 | 36166 | 33897 | - |
| Final Energy Consumption | 306353 | 327641 | 328315 | 337910 | 321635 | 302314 | 302561 | -0.1 |
| Gas from Biomass | | | | | | | | |
| Production | - | - | - | - | 387 | 224 | 257 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | 387 | 224 | 257 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Netherlands

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|--------|--------|--------|--------|--------|--------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 66.47 | 73.17 | 75.78 | 74.76 | 74.26 | 74.55 | 75.80 | 1.3 |
| of which: Renewables (Mtoe) ⁽²⁾ | 0.77 | 0.90 | 1.20 | 1.40 | 1.46 | 0.96 | 1.07 | 3.4 |
| Renewables/TPES(%) | 1.2 | 1.2 | 1.6 | 1.9 | 2.0 | 1.3 | 1.4 | 2.0 |
| GDP (1995 bil. US\$) | 373.47 | 414.80 | 427.40 | 443.81 | 463.11 | 480.29 | 496.95 | 2.9 |
| TPES/GDP ⁽³⁾ | 0.18 | 0.18 | 0.18 | 0.17 | 0.16 | 0.16 | 0.15 | -1.5 |
| TPES/GDP (1973 = 100) | 72 | 71 | 72 | 68 | 65 | 63 | 62 | -1.5 |
| Population (millions) | 14.95 | 15.46 | 15.53 | 15.61 | 15.70 | 15.81 | 15.92 | 0.6 |
| TPES/population ⁽⁴⁾ | 4.45 | 4.73 | 4.88 | 4.79 | 4.73 | 4.72 | 4.76 | 0.7 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 71.9 | 81.0 | 85.0 | 86.7 | 91.1 | 86.7 | 89.6 | 2.2 |
| of which: Renewables (TWh) ⁽²⁾ | 1.08 | 1.96 | 2.67 | 3.52 | 3.88 | 2.19 | 2.82 | 10.1 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 1.5 | 2.4 | 3.1 | 4.1 | 4.3 | 2.5 | 3.1 | 7.7 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 0.39 | 0.60 | 0.74 | 0.84 | 0.90 | 0.96 | 1.07 | 10.6 |
| Renewable/TPES (%) | 0.6 | 0.8 | 1.0 | 1.1 | 1.2 | 1.3 | 1.4 | 9.2 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS
(MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|------------|------------|------------|------------|------------|------------|-------------------------------|-------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 233 | 485 | 698 | 769 | 799 | 851 | 917 | 14.7 |
| Hydro | 36 | 37 | 37 | 37 | 37 | 37 | 38 | 0.5 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | 2 | 3 | 4 | 6 | 10 | 13 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 48 | 257 | 299 | 333 | 361 | 409 | 442 | 24.9 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | 149 | 189 | 359 | 395 | 395 | 395 | 424 | 11.0 |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| Solar Collectors Surface (1000 m ²) | 75 | 152 | 169 | 197 | 231 | 258 | 309 | 15.2 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Netherlands

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------------------|-------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 1079 | 1956 | 2666 | 4558 | 5006 | 4694 | 5149 | 16.9 |
| Hydro | 95 | 88 | 80 | 92 | 106 | 90 | 142 | 4.1 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | 1 | 2 | 2 | 2 | 5 | 6 | 8 | 23.1 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 50 | 317 | 437 | 475 | 640 | 645 | 829 | 32.4 |
| Industrial Waste | - | - | - | 1034 | 1123 | 1132 | 935 | - |
| Municipal Solid Waste Renew. | 933 | 1312 | 1877 | 2621 | 2860 | 1158 | 1176 | 2.3 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | 1377 | 1398 | - |
| Solid Biomass | - | - | - | 49 | .. | .. | 378 | - |
| Gas from Biomass | - | 237 | 270 | 285 | 272 | 286 | 283 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 146 | 407 | 519 | 569 | 751 | 741 | 979 | 21.0 |
| Hydro | 95 | 88 | 80 | 92 | 106 | 90 | 142 | 4.1 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | 1 | 2 | 2 | 2 | 5 | 6 | 8 | 23.1 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 50 | 317 | 437 | 475 | 640 | 645 | 829 | 32.4 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | 933 | 1549 | 2147 | 3989 | 4255 | 3953 | 4170 | 16.2 |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | 1034 | 1123 | 1132 | 935 | - |
| Municipal Solid Waste Renew. | 933 | 1312 | 1877 | 2621 | 2860 | 1158 | 1176 | 2.3 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | 1377 | 1398 | - |
| Solid Biomass | - | - | - | 49 | .. | .. | 378 | - |
| Gas from Biomass | - | 237 | 270 | 285 | 272 | 286 | 283 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Netherlands

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|------|------|------|------|------|------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | - | 200 | 392 | 440 | 461 | 513 | 553 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | 182 | 220 | 261 | 313 | 347 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | 200 | 210 | 220 | 200 | 200 | 206 | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | - | 200 | 210 | 220 | 200 | 200 | 206 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | 200 | 210 | 220 | 200 | 200 | 206 | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | - | - | 182 | 220 | 261 | 313 | 347 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | 182 | 220 | 261 | 313 | 347 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Netherlands

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|-------|-------|-------|-------|-------|-------|-------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 70 | 159 | 182 | 220 | 261 | 292 | 347 | 17.4 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 70 | 159 | 182 | 220 | 261 | 292 | 347 | 17.4 |
| Industrial Waste | | | | | | | | |
| Production | - | - | - | 9713 | 10550 | 10635 | 8774 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | 9713 | 10550 | 10635 | 8774 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 17982 | 20821 | 32408 | 39491 | 41624 | 20861 | 20998 | 1.6 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 8455 | 12118 | 16925 | 20562 | 22358 | 11585 | 11661 | 3.3 |
| Final Energy Consumption | 9527 | 8703 | 15483 | 18929 | 19266 | 9276 | 9337 | -0.2 |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | 24785 | 24949 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | 13765 | 13856 | - |
| Final Energy Consumption | - | - | - | - | - | 11020 | 11093 | - |
| Solid Biomass | | | | | | | | |
| Production | 11000 | 10240 | 10210 | 11222 | 11180 | 11180 | 14253 | 2.6 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | 582 | .. | .. | 3581 | - |
| Final Energy Consumption | 11000 | 10240 | 10210 | 10640 | 11180 | 11180 | 10672 | -0.3 |
| Gas from Biomass | | | | | | | | |
| Production | 2693 | 4990 | 5232 | 5370 | 5141 | 4969 | 5536 | 7.5 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 343 | 2846 | 3230 | 3060 | 2789 | 2920 | 3265 | 25.3 |
| Final Energy Consumption | 2350 | 2144 | 2002 | 2310 | 2352 | 2049 | 2271 | -0.3 |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

New Zealand

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|-------|-------|-------|-------|-------|-------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 14.02 | 16.03 | 16.99 | 17.65 | 17.33 | 18.11 | 18.63 | 2.9 |
| of which: Renewables (Mtoe) ⁽²⁾ | 4.92 | 5.21 | 5.18 | 5.07 | 5.40 | 5.80 | 5.84 | 1.7 |
| Renewables/TPES(%) | 35.1 | 32.5 | 30.5 | 28.7 | 31.1 | 32.0 | 31.3 | -1.1 |
| GDP (1995 bil. US\$) | 52.23 | 60.82 | 62.66 | 63.83 | 64.10 | 67.08 | 68.72 | 2.8 |
| TPES/GDP ⁽³⁾ | 0.27 | 0.26 | 0.27 | 0.28 | 0.27 | 0.27 | 0.27 | 0.1 |
| TPES/GDP (1973 = 100) | 139 | 137 | 141 | 143 | 140 | 140 | 140 | 0.1 |
| Population (millions) | 3.36 | 3.66 | 3.71 | 3.76 | 3.79 | 3.81 | 3.83 | 1.3 |
| TPES/population ⁽⁴⁾ | 4.17 | 4.38 | 4.58 | 4.69 | 4.57 | 4.75 | 4.86 | 1.6 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 32.3 | 35.4 | 36.5 | 37.0 | 37.8 | 37.8 | 39.0 | 1.9 |
| of which: Renewables (TWh) ⁽²⁾ | 25.96 | 29.86 | 28.68 | 26.54 | 27.46 | 26.98 | 28.10 | 0.8 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 80.5 | 84.4 | 78.5 | 71.7 | 72.7 | 71.4 | 72.0 | -1.1 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 4.92 | 5.21 | 5.18 | 5.07 | 5.40 | 5.80 | 5.84 | 1.7 |
| Renewable/TPES (%) | 35.1 | 32.5 | 30.5 | 28.7 | 31.1 | 32.0 | 31.3 | -1.1 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS
(MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 4880 | 5672 | 5519 | 5667 | 5810 | 5991 | 5899 | 1.9 |
| Hydro | 4619 | 5259 | 5120 | 5158 | 5159 | 5390 | 5186 | 1.2 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | 261 | 275 | 258 | 328 | 338 | 363 | 473 | 6.1 |
| Solar Photovoltaic | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | 4 | 36 | 36 | 36 | - |
| Industrial Waste | - | - | - | - | - | 99 | 99 | - |
| Municipal Solid Waste | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | 80 | 80 | 82 | - |
| Gas from Biomass | - | - | - | - | - | 23 | 23 | - |
| Comb. Renewables Non-Specified | - | 138 | 141 | 177 | 197 | - | - | - |
| Solar Collectors Surface (1000 m ²) | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

New Zealand

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 25960 | 29856 | 28676 | 26539 | 27455 | 26975 | 28099 | 0.8 |
| Hydro | 23340 | 27259 | 25970 | 23830 | 24407 | 23537 | 24620 | 0.5 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | 2210 | 2049 | 2141 | 2258 | 2471 | 2806 | 2767 | 2.3 |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 1 | 8 | 14 | 22 | 39 | 123 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 330 | 336 | 260 | 227 | 409 | 471 | 477 | 3.8 |
| Gas from Biomass | 80 | 211 | 297 | 210 | 146 | 122 | 112 | 3.4 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 25630 | 29408 | 28292 | 26181 | 26919 | 26403 | 27549 | 0.7 |
| Hydro | 23340 | 27259 | 25970 | 23830 | 24407 | 23537 | 24620 | 0.5 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | 2210 | 1995 | 2084 | 2201 | 2414 | 2750 | 2728 | 2.1 |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 1 | 8 | 14 | 22 | 39 | 123 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | 80 | 153 | 230 | 136 | 76 | 77 | 78 | -0.3 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | 330 | 448 | 384 | 358 | 536 | 572 | 550 | 5.2 |
| Geothermal | - | 54 | 57 | 57 | 57 | 56 | 39 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 330 | 336 | 260 | 227 | 409 | 471 | 477 | 3.8 |
| Gas from Biomass | - | 58 | 67 | 74 | 70 | 45 | 34 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

New Zealand

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|--------|--------|--------|--------|---------|-------|-------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 17387 | 19517 | 19157 | 19247 | 19147 | 20310 | 19830 | 1.3 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | -5987 | -5987 | -5987 | -5987 | -5987 | -6000 | -6000 | x |
| Final Energy Consumption | 11400 | 13530 | 13170 | 13260 | 13160 | 14310 | 13830 | 2.0 |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Industrial Waste | | | | | | | | |
| Production | 3270 e | 4040 e | 4310 e | 8430 e | 11930 e | 14140 | 15070 | 16.5 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 3270 | 4040 | 4310 | 8430 | 11930 | 14140 | 15070 | 16.5 |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 24239 | 24708 | 24555 | 23623 | 27729 | 35200 | 34650 | 3.6 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | -382 | 931 | x |
| Transformation Sector | 3161 | 3161 | 2921 | 2948 | 5889 | 5918 | 6421 | 7.3 |
| Final Energy Consumption | 21078 | 21547 | 21634 | 20675 | 21840 | 28900 | 29160 | 3.3 |
| Gas from Biomass | | | | | | | | |
| Production | 947 | 1890 | 2513 | 2197 | 2124 | 1530 | 1240 | 2.7 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | 720 | 854 | 285 | 39 | -40 | 123 | x |
| Transformation Sector | 905 | 2569 e | 3313 e | 2418 e | 2101 e | 1350 | 1223 | 3.1 |
| Final Energy Consumption | 42 | 41 | 54 | 64 | 62 | 140 | 140 | 12.8 |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Norway

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|--------|--------|--------|--------|--------|--------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 21.45 | 23.46 | 23.05 | 24.35 | 25.38 | 26.62 | 25.62 | 1.8 |
| of which: Renewables (Mtoe) ⁽²⁾ | 11.45 | 11.57 | 10.08 | 10.68 | 11.20 | 11.95 | 13.53 | 1.7 |
| Renewables/TPES(%) | 53.4 | 49.3 | 43.7 | 43.9 | 44.1 | 44.9 | 52.8 | -0.1 |
| GDP (1995 bil. US\$) | 122.33 | 146.60 | 153.78 | 161.00 | 164.90 | 166.67 | 170.45 | 3.4 |
| TPES/GDP ⁽³⁾ | 0.18 | 0.16 | 0.15 | 0.15 | 0.15 | 0.16 | 0.15 | -1.5 |
| TPES/GDP (1973 = 100) | 81 | 74 | 70 | 70 | 71 | 74 | 70 | -1.5 |
| Population (millions) | 4.24 | 4.36 | 4.38 | 4.41 | 4.43 | 4.46 | 4.49 | 0.6 |
| TPES/population ⁽⁴⁾ | 5.06 | 5.38 | 5.26 | 5.53 | 5.73 | 5.97 | 5.70 | 1.2 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 121.6 | 122.1 | 104.4 | 110.7 | 116.1 | 122.3 | 142.4 | 1.6 |
| of which: Renewables (TWh) ⁽²⁾ | 121.39 | 121.67 | 103.93 | 110.31 | 115.70 | 121.78 | 141.96 | 1.6 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 99.8 | 99.7 | 99.5 | 99.6 | 99.6 | 99.6 | 99.7 | -0.0 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 11.45 | 11.57 | 10.06 | 10.66 | 11.18 | 11.93 | 13.51 | 1.7 |
| Renewable/TPES (%) | 53.4 | 49.3 | 43.7 | 43.8 | 44.0 | 44.8 | 52.7 | -0.1 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|--------------|--------------|--------------|--------------|--------------|--------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 26951 | 28178 | 28298 | 28131 | 27775 | 28358 | 28503 | 0.6 |
| Hydro | 26884 | 28052 | 28166 | 27999 | 27645 | 28203 | 28348 | 0.5 |
| of which: Pumped Storage | 1067 | 673 | 672 | 672 | 663 | 663 | 695 | -4.2 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 3 | 4 | 4 | 4 | 14 | 14 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | 30 | 35 | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | 67 | 123 | 128 | 128 | 126 | 111 | 106 | 4.7 |
| Solar Collectors Surface (1000 m ²) | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Norway

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 121624 | 122622 | 104216 | 111214 | 116587 | 122214 | 142608 | 1.6 |
| Hydro | 121382 | 122299 | 103876 | 110938 | 116280 | 121887 | 142223 | 1.6 |
| of which: Pumped Storage | 237 | 956 | 285 | 907 | 886 | 433 | 626 | 10.2 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 10 | 9 | 10 | 11 | 25 | 30 | - |
| Industrial Waste | - | - | - | - | - | - | 21 | - |
| Municipal Solid Waste Renew. | 58 | 48 | 57 | 51 | 52 | 59 | 108 | 6.4 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 184 | 265 | 274 | 215 | 244 | 243 | 226 | 2.1 |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 121566 | 122574 | 104159 | 111163 | 116535 | 122155 | 142500 | 1.6 |
| Hydro | 121382 | 122299 | 103876 | 110938 | 116280 | 121887 | 142223 | 1.6 |
| of which: Pumped Storage | 237 | 956 | 285 | 907 | 886 | 433 | 626 | 10.2 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 10 | 9 | 10 | 11 | 25 | 30 | - |
| Industrial Waste | - | - | - | - | - | - | 21 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 184 | 265 | 274 | 215 | 244 | 243 | 226 | 2.1 |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | 58 | 48 | 57 | 51 | 52 | 59 | 108 | 6.4 |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 58 | 48 | 57 | 51 | 52 | 59 | 108 | 6.4 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Norway

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|---------------|-------------|-------------|-------------|-------------|-------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | 3700 e | 4201 | 4327 | 4766 | 4646 | 4767 | 4697 | 2.4 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | 150 | 285 | 497 | 513 | 412 | 467 | - |
| Municipal Solid Waste Renew. | 3596 | 3914 | 3886 | 4092 | 3865 | 4010 | 3879 | 0.8 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 73 e | 58 | 58 | 59 | 116 | 151 | 160 | 8.2 |
| Gas from Biomass | - | 10 | 15 | 10 | 9 | 19 | 12 | - |
| Waste Heat and Heat Pumps | 31 | 69 | 83 | 108 | 143 | 175 | 179 | 19.3 |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | 1421 | 1876 | 1772 | 1905 | 1765 | 1842 | 1777 | 2.3 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 1421 | 1876 | 1772 | 1905 | 1765 | 1842 | 1777 | 2.3 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | 2279 e | 2325 | 2555 | 2861 | 2881 | 2925 | 2920 | 2.5 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | 150 | 285 | 497 | 513 | 412 | 467 | - |
| Municipal Solid Waste Renew. | 2175 | 2038 | 2114 | 2187 | 2100 | 2168 | 2102 | -0.3 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 73 e | 58 | 58 | 59 | 116 | 151 | 160 | 8.2 |
| Gas from Biomass | - | 10 | 15 | 10 | 9 | 19 | 12 | - |
| Waste Heat and Heat Pumps | 31 | 69 | 83 | 108 | 143 | 175 | 179 | 19.3 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Norway

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|--------|-------|-------|-------|-------|-------|-------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Industrial Waste | | | | | | | | |
| Production | - | 150 | 286 | 497 | 513 | 412 | 544 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 150 | 286 | 497 | 513 | 412 | 544 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 4515 | 4803 | 4670 | 4769 | 4844 | 5781 | 5176 | 1.4 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 4515 | 4803 | 4670 | 4769 | 4844 | 5042 | 4978 | 1.0 |
| Final Energy Consumption | - | - | - | - | - | 739 | 198 | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 38669 | 42043 | 43396 | 45074 | 47197 | 55805 | 50008 | 2.6 |
| Net Imports ⁽¹⁾ | - | 90 | 90 | 117 | 246 | 434 | 207 | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 1072 e | 1442 | 1514 | 1207 | 1508 | 1497 | 1459 | 3.1 |
| Final Energy Consumption | 37597 | 40691 | 41972 | 43984 | 45935 | 54742 | 48756 | 2.6 |
| Gas from Biomass | | | | | | | | |
| Production | - | 663 | 672 | 1054 | 1049 | 1078 | 1078 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 12 | 18 | 11 | 10 | 22 | 14 | - |
| Final Energy Consumption | - | 651 | 654 | 1043 | 1039 | 1056 | 1064 | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Poland

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|--------|--------|--------|--------|--------|--------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 99.85 | 99.87 | 107.48 | 103.42 | 97.45 | 93.48 | 89.98 | -1.0 |
| of which: Renewables (Mtoe) ⁽²⁾ | 1.58 | 3.92 | 3.87 | 3.87 | 3.92 | 3.75 | 3.80 | 9.2 |
| Renewables/TPES(%) | 1.6 | 3.9 | 3.6 | 3.7 | 4.0 | 4.0 | 4.2 | 10.3 |
| GDP (1995 bil. US\$) | 114.10 | 127.05 | 134.71 | 143.91 | 150.88 | 156.99 | 163.35 | 3.7 |
| TPES/GDP ⁽³⁾ | 0.88 | 0.79 | 0.80 | 0.72 | 0.65 | 0.60 | 0.55 | -4.5 |
| TPES/GDP (1973 = 100) | 93 | 84 | 85 | 77 | 69 | 64 | 59 | -4.5 |
| Population (millions) | 38.12 | 38.59 | 38.62 | 38.65 | 38.67 | 38.65 | 38.65 | 0.1 |
| TPES/population ⁽⁴⁾ | 2.62 | 2.59 | 2.78 | 2.68 | 2.52 | 2.42 | 2.33 | -1.2 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 134.4 | 137.0 | 141.2 | 140.9 | 140.8 | 140.0 | 143.2 | 0.6 |
| of which: Renewables (TWh) ⁽²⁾ | 1.47 | 1.96 | 2.06 | 2.13 | 2.53 | 2.35 | 2.33 | 4.7 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 1.1 | 1.4 | 1.5 | 1.5 | 1.8 | 1.7 | 1.6 | 4.0 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 1.58 | 3.92 | 3.87 | 3.87 | 3.92 | 3.75 | 3.80 | 9.2 |
| Renewable/TPES (%) | 1.6 | 3.9 | 3.6 | 3.7 | 4.0 | 4.0 | 4.2 | 10.3 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 1977 | 2047 | 2047 | 2047 | 2181 | 2191 | 2199 | 1.1 |
| Hydro | 1977 | 2047 | 2047 | 2047 | 2174 | 2179 | 2183 | 1.0 |
| of which: Pumped Storage | 1205 | 1366 | 1366 | 1366 | 1366 | 1366 | 1366 | 1.3 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | 2 | 3 | 4 | - |
| Industrial Waste | - | - | - | - | - | 2 | 3 | - |
| Municipal Solid Waste | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | 5 | 7 | 9 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| Solar Collectors Surface (1000 m ²) | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Poland

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 3570 | 4213 | 4312 | 4416 | 4924 | 4789 | 4669 | 2.7 |
| Hydro | 3313 | 3851 | 3910 | 3816 | 4327 | 4282 | 4115 | 2.2 |
| of which: Pumped Storage | 1896 | 1964 | 1979 | 1855 | 2018 | 2127 | 2010 | 0.6 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 1 | - | 2 | 4 | 4 | 5 | - |
| Industrial Waste | 202 | 294 | 270 | 430 | 374 | 311 | 329 | 5.0 |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 55 | 54 | 118 | 162 | 206 | 169 | 189 | 13.1 |
| Gas from Biomass | - | 13 | 14 | 6 | 13 | 23 | 31 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 3313 | 3865 | 3924 | 3824 | 4344 | 4309 | 4151 | 2.3 |
| Hydro | 3313 | 3851 | 3910 | 3816 | 4327 | 4282 | 4115 | 2.2 |
| of which: Pumped Storage | 1896 | 1964 | 1979 | 1855 | 2018 | 2127 | 2010 | 0.6 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | 1 | - | 2 | 4 | 4 | 5 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | 13 | 14 | 6 | 13 | 23 | 31 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | 257 | 348 | 388 | 592 | 580 | 480 | 518 | 7.3 |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | 202 | 294 | 270 | 430 | 374 | 311 | 329 | 5.0 |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 55 | 54 | 118 | 162 | 206 | 169 | 189 | 13.1 |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Poland

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|--------------|-------------|-------------|-------------|-------------|-------------|----------------------------------|--------------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | 13926 | 2079 | 2561 | 2757 | 2949 | 2633 | 2618 | -15.4 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | 2958 | 1326 | 1127 | 1001 | 1052 | 737 | 779 | -12.5 |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 10958 | 747 | 1429 | 1751 | 1870 | 1857 | 1802 | -16.5 |
| Gas from Biomass | 10 | 6 | 5 | 5 | 27 | 39 | 37 | 14.0 |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | 10986 | 1628 | 2263 | 2135 | 2278 | 1875 | 2097 | -15.3 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | 2895 | 1194 | 1052 | 890 | 811 | 463 | 745 | -12.7 |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 8091 | 434 | 1211 | 1245 | 1467 | 1412 | 1352 | -16.4 |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | 2940 | 451 | 298 | 622 | 671 | 758 | 521 | -15.9 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | 63 | 132 | 75 | 111 | 241 | 274 | 34 | -6.0 |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 2867 | 313 | 218 | 506 | 403 | 445 | 450 | -16.9 |
| Gas from Biomass | 10 | 6 | 5 | 5 | 27 | 39 | 37 | 14.0 |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Poland

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|-------|--------|--------|--------|--------|--------|--------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Industrial Waste | | | | | | | | |
| Production | 32311 | 35109 | 21356 | 21480 | 17526 | 17272 | 18714 | -5.3 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | -5222 | -2690 | -508 | -301 | -589 | -247 | -250 | x |
| Transformation Sector | 5265 | 3878 | 3400 | 3282 | 3817 | 3090 | 3279 | -4.6 |
| Final Energy Consumption | 21824 | 28541 | 17448 | 17897 | 13120 | 13935 | 15185 | -3.6 |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | 12 | 64 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | 12 | 64 | - |
| Solid Biomass | | | | | | | | |
| Production | 60643 | 156943 | 154874 | 154398 | 153351 | 148470 | 150485 | 9.5 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | -6 | -52 | -584 | -285 | 1405 | -185 | -298 | x |
| Transformation Sector | 14571 | 1322 | 2656 | 3293 | 3673 | 3398 | 3461 | -13.4 |
| Final Energy Consumption | 46066 | 155569 | 151634 | 150820 | 151083 | 144887 | 146726 | 12.3 |
| Gas from Biomass | | | | | | | | |
| Production | 393 | 551 | 728 | 689 | 881 | 1054 | 1263 | 12.4 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | -1 | -11 | -1 | -23 | -22 | -27 | x |
| Transformation Sector | 14 | 125 | 137 | 88 | 204 | 349 | 443 | 41.3 |
| Final Energy Consumption | 379 | 425 | 580 | 600 | 654 | 683 | 793 | 7.7 |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Portugal

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|--|--------|--------|--------|--------|--------|--------|--------|-------------------------------------|
| TPES (Mtoe) ⁽¹⁾ | 17.16 | 19.99 | 19.88 | 20.89 | 22.63 | 24.34 | 24.61 | 3.7 |
| of which: Renewables (Mtoe) ⁽²⁾ | 2.69 e | 2.60 e | 3.16 e | 3.04 e | 3.03 e | 2.66 e | 3.13 e | 1.5 |
| Renewables/TPES(%) | 15.7 | 13.0 | 15.9 | 14.6 | 13.4 | 10.9 | 12.7 | -2.1 |
| GDP (1995 bil. US\$) | 98.55 | 107.22 | 111.34 | 115.73 | 120.96 | 125.06 | 129.32 | 2.8 |
| TPES/GDP ⁽³⁾ | 0.17 | 0.19 | 0.18 | 0.18 | 0.19 | 0.19 | 0.19 | 0.9 |
| TPES/GDP (1973 = 100) | 139 | 149 | 142 | 144 | 149 | 155 | 152 | 0.9 |
| Population (millions) | 9.90 | 9.92 | 9.93 | 9.94 | 9.97 | 9.99 | 10.01 | 0.1 |
| TPES/population ⁽⁴⁾ | 1.73 | 2.02 | 2.00 | 2.10 | 2.27 | 2.44 | 2.46 | 3.6 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 28.4 | 33.2 | 34.4 | 34.1 | 38.9 | 42.9 | 43.4 | 4.3 |
| of which: Renewables (TWh) ⁽²⁾ | 9.85 | 9.39 | 15.79 | 14.23 | 14.15 | 8.73 | 13.13 | 2.9 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 34.7 | 28.3 | 45.9 | 41.7 | 36.4 | 20.3 | 30.3 | -1.4 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 2.69 | 2.60 | 3.16 e | 3.04 | 3.03 | 2.66 | 3.13 | 1.5 |
| Renewable/TPES (%) | 15.7 | 13.0 | 15.9 e | 14.6 | 13.4 | 10.9 | 12.7 | -2.1 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------------------------------|
| Total Capacity | 3352 | 4427 | 4456 | 4478 | 4562 | 4810 | 4847 | 3.8 |
| Hydro | 3344 | 4409 | 4428 | 4438 | 4501 | 4292 | 4303 | 2.6 |
| of which: Pumped Storage | 561 | 561 | 561 | 561 | 561 | 561 | 561 | - |
| Geothermal | 1 | 8 | 8 | 8 | 10 | 18 | 18 | 33.5 |
| Solar Photovoltaic | - | - | - | 1 | 1 | 1 | 1 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 1 | 8 | 18 | 29 | 48 | 57 | 83 | 55.6 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | - | - | - | - | - | 81 | 81 | - |
| Solid Biomass | - | - | - | - | - | 360 | 360 | - |
| Gas from Biomass | - | - | - | - | - | 1 | 1 | - |
| Comb. Renewables Non-Specified | 6 | 2 | 2 | 2 | 2 | - | - | - |
| Solar Collectors Surface (1000 m ²) | 150 | 200 | 208 | 216 | 223 | 230 | 238 | 4.7 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Portugal

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|-------------|-------------|--------------|--------------|--------------|-------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 9998 | 9501 | 15888 | 14302 | 14224 | 9073 | 13517 | 3.1 |
| Hydro | 9303 | 8454 | 14857 | 13175 | 13054 | 7631 | 11715 | 2.3 |
| of which: Pumped Storage | 146 | 111 | 96 | 70 | 71 | 345 | 392 | 10.4 |
| Geothermal | 4 | 42 | 49 | 51 | 58 | 80 | 80 | 34.9 |
| Solar Photovoltaics | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 1 | 16 | 21 | 38 | 89 | 123 | 168 | 66.9 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | 157 | 514 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 689 | 987 | 959 | 1036 | 1021 | 1080 | 1037 | 4.2 |
| Gas from Biomass | - | 1 | 1 | 1 | 1 | 1 | 2 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 9309 | 8513 | 14928 | 13265 | 13202 | 7995 | 12485 | 3.0 |
| Hydro | 9303 | 8454 | 14857 | 13175 | 13054 | 7631 | 11715 | 2.3 |
| of which: Pumped Storage | 146 | 111 | 96 | 70 | 71 | 345 | 392 | 10.4 |
| Geothermal | 4 | 42 | 49 | 51 | 58 | 80 | 80 | 34.9 |
| Solar Photovoltaics | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 1 | 16 | 21 | 38 | 89 | 123 | 168 | 66.9 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | 157 | 514 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | 3 | 7 | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | 689 | 988 | 960 | 1037 | 1022 | 1078 | 1032 | 4.1 |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 689 | 987 | 959 | 1036 | 1021 | 1077 | 1030 | 4.1 |
| Gas from Biomass | - | 1 | 1 | 1 | 1 | 1 | 2 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Portugal

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|---------|---------|---------|---------|---------|---------|---------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | 42 | 42 | 42 | 42 | 42 | 42 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | 42 | 42 | 42 | 42 | 42 | 42 | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 458 | 617 | 658 | 683 | 712 | 749 | 770 | 5.3 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 458 | 617 | 658 | 683 | 712 | 749 | 770 | 5.3 |
| Industrial Waste | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | - | - | - | - | - | 2384 | 7295 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | 2384 | 7295 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 79073 e | 76534 e | 76400 e | 77505 e | 77120 e | 78489 e | 78615 e | -0.1 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 6253 | 6155 | 5851 | 6886 | 6501 | 7719 | 7551 | 1.9 |
| Final Energy Consumption | 72820 | 70379 | 70549 | 70619 | 70619 | 70770 | 71064 | -0.2 |
| Gas from Biomass | | | | | | | | |
| Production | - | 21 e | 21 e | 21 e | 12 | 38 | 48 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 21 e | 21 e | 21 e | 12 | 38 | 48 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Slovak Republic

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|-------|-------|-------|-------|-------|-------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 21.68 | 17.75 | 17.82 | 17.76 | 17.34 | 17.37 | 17.47 | -2.1 |
| of which: Renewables (Mtoe) ⁽²⁾ | 0.33 | 0.50 | 0.44 | 0.43 | 0.44 | 0.46 | 0.49 | 4.1 |
| Renewables/TPES(%) | 1.5 | 2.8 | 2.5 | 2.4 | 2.5 | 2.6 | 2.8 | 6.4 |
| GDP (1995 bil. US\$) | 20.21 | 18.38 | 19.52 | 20.73 | 21.58 | 21.99 | 22.47 | 1.1 |
| TPES/GDP ⁽³⁾ | 1.07 | 0.97 | 0.91 | 0.86 | 0.80 | 0.79 | 0.78 | -3.2 |
| TPES/GDP (1973 = 100) | 102 | 92 | 87 | 81 | 76 | 75 | 74 | -3.2 |
| Population (millions) | 5.30 | 5.36 | 5.37 | 5.38 | 5.39 | 5.40 | 5.40 | 0.2 |
| TPES/population ⁽⁴⁾ | 4.09 | 3.31 | 3.32 | 3.30 | 3.22 | 3.22 | 3.23 | -2.3 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 23.4 | 26.0 | 25.0 | 24.6 | 25.2 | 27.5 | 30.4 | 2.6 |
| of which: Renewables (TWh) ⁽²⁾ | 1.88 | 4.88 | 4.23 | 4.06 | 4.27 | 4.47 | 4.62 | 9.4 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 8.0 | 18.7 | 16.9 | 16.5 | 16.9 | 16.3 | 15.2 | 6.6 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 0.33 | 0.50 | 0.45 | 0.44 | 0.44 | 0.47 | 0.49 | 4.0 |
| Renewable/TPES (%) | 1.5 | 2.8 | 2.5 | 2.5 | 2.6 | 2.7 | 2.8 | 6.3 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

(1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.

(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.

(3) In units of toe/1995 thousand US\$.

(4) In units of toe/per capita.

(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants

(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|------|-------------|-------------|-------------|-------------|-------------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | - | 1640 | 1641 | 1665 | 1682 | 1684 | 1685 | - |
| Hydro | - | 1640 | 1641 | 1665 | 1682 | 1684 | 1685 | - |
| of which: Pumped Storage | - | 735 | 735 | 735 | 735 e | 735 e | 735 e | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| Solar Collectors Surface (1000 m ²) | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Slovak Republic

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 2515 | 5226 | 4533 | 4358 | 4567 | 4776 | 4975 | 7.1 |
| Hydro | 2515 | 5226 | 4533 | 4358 | 4567 | 4776 | 4975 | 7.1 |
| of which: Pumped Storage | 635 | 346 | 306 | 294 | 300 | 302 | 360 | -5.5 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 2515 | 5226 | 4533 | 4358 | 4567 | 4776 | 4975 | 7.1 |
| Hydro | 2515 | 5226 | 4533 | 4358 | 4567 | 4776 | 4975 | 7.1 |
| of which: Pumped Storage | 635 | 346 | 306 | 294 | 300 | 302 | 360 | -5.5 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | | | | | | | | |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Slovak Republic

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|------|------|------|------|------|------|------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Industrial Waste | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 6965 | 3196 | 3184 | 3454 | 3086 | 3050 | 4169 | -5.0 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | 53 | -35 | 24 | -67 | -72 | -346 | x |
| Transformation Sector | - | 3093 | 2916 | 3283 | 2787 | 2873 | 3797 | - |
| Final Energy Consumption | 6965 | 156 | 233 | 195 | 232 | 105 | 26 | -42.8 |
| Gas from Biomass | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Spain

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|---------|---------|---------|---------|---------|--------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 90.53 | 103.12 | 101.46 | 107.56 | 112.78 | 118.46 | 124.88 | 3.3 |
| of which: Renewables (Mtoe) ⁽²⁾ | 6.23 e | 5.60 e | 7.09 e | 6.74 | 6.88 e | 6.13 e | 7.00 e | 1.2 |
| Renewables/TPES(%) | 6.9 | 5.4 | 7.0 | 6.3 | 6.1 | 5.2 | 5.6 | -2.0 |
| GDP (1995 bil. US\$) | 546.53 | 584.19 | 598.43 | 622.52 | 649.52 | 676.34 | 704.05 | 2.6 |
| TPES/GDP ⁽³⁾ | 0.17 | 0.18 | 0.17 | 0.17 | 0.17 | 0.18 | 0.18 | 0.7 |
| TPES/GDP (1973 = 100) | 111 | 118 | 113 | 116 | 116 | 117 | 119 | 0.7 |
| Population (millions) | 38.85 | 39.22 | 39.28 | 39.35 | 39.45 | 39.63 | 39.93 | 0.3 |
| TPES/population ⁽⁴⁾ | 2.33 | 2.63 | 2.58 | 2.73 | 2.86 | 2.99 | 3.13 | 3.0 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 151.2 | 165.6 | 173.5 | 189.3 | 193.5 | 206.3 | 221.7 | 3.9 |
| of which: Renewables (TWh) ⁽²⁾ | 26.06 e | 24.60 e | 41.52 e | 37.36 e | 37.28 e | 27.81 | 35.68 e | 3.2 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 17.2 | 14.9 | 23.9 | 19.7 | 19.3 | 13.5 | 16.1 | -0.7 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 5.56 | 5.42 | 6.93 | 6.57 | 6.56 | 6.16 | 7.15 e | 2.6 |
| Renewable/TPES (%) | 6.1 | 5.3 | 6.8 | 6.1 | 5.8 | 5.2 | 5.7 e | -0.7 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|--------------|--------------|--------------|--------------|--------------|--------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 16380 | 17101 | 17327 | 17374 | 17695 | 18631 | 20710 e | 2.4 |
| Hydro | 16231 | 16784 | 16888 | 16691 | 16632 | 16897 | 17989 e | 1.0 |
| of which: Pumped Storage | 4911 | 5095 | 5095 | 5095 | 5095 | 5095 | 5095 e | 0.4 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | 7 | 7 | 7 | 7 | 9 | 12 e | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 7 | 115 | 211 | 455 | 834 | 1459 | 2443 | 79.6 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | 27 | 69 | 94 | 94 | 94 | 94 | 94 e | 13.3 |
| Solid Biomass | 115 | 126 | 127 | 127 | 128 | 138 | 138 e | 1.8 |
| Gas from Biomass | - | - | - | - | - | 34 | 34 e | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - e | - |
| Solar Collectors Surface (1000 m ²) | 281 | 319 | 329 | 321 | 341 | 362 | 362 e | 2.6 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Spain

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|----------------|----------------|----------------|----------------|----------------|--------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 26876 e | 26178 e | 42766 e | 38845 e | 39339 e | 30660 | 39384 e | 3.9 |
| Hydro | 26184 | 24569 | 40874 | 36002 | 35806 | 25437 | 31807 e | 2.0 |
| of which: Pumped Storage | 770 | 1457 | 1072 | 1224 | 1801 | 2574 | 3435 e | 16.1 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | 6 | 15 | 12 | 13 | 15 | 17 | 18 | 11.6 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 14 | 270 | 364 | 742 | 1352 | 2744 | 4955 | 79.8 |
| Industrial Waste | 50 e | 118 | 171 | 259 | 263 | 279 | 274 | 18.5 |
| Municipal Solid Waste Renew. | 160 e | 391 | 525 e | 732 | 746 | 918 | 1067 | 20.9 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 462 e | 668 | 672 e | 946 | 996 | 1074 | 995 e | 8.0 |
| Gas from Biomass | - | 147 e | 148 e | 151 e | 161 e | 191 | 268 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 26271 e | 25203 e | 41643 e | 37863 e | 38340 e | 29490 | 38305 e | 3.8 |
| Hydro | 26184 | 24569 | 40874 | 36002 | 35806 | 25437 | 31807 e | 2.0 |
| of which: Pumped Storage | 770 | 1457 | 1072 | 1224 | 1801 | 2574 | 3435 e | 16.1 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | 6 | 15 | 12 | 13 | 15 | 17 | 18 | 11.6 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 14 | 270 | 364 | 742 | 1352 | 2744 | 4955 | 79.8 |
| Industrial Waste | 50 e | 118 | 171 | 259 | 263 | 279 | 274 | 18.5 |
| Municipal Solid Waste Renew. | - | - | - | 497 | 507 | 570 | 667 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 17 e | 96 | 96 e | 230 | 268 | 299 | 330 e | 34.5 |
| Gas from Biomass | - | 135 e | 126 e | 120 e | 129 e | 144 | 254 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | 605 e | 975 | 1123 e | 982 | 999 | 1170 | 1079 | 6.0 |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 160 e | 391 | 525 e | 235 | 239 | 348 | 400 | 9.6 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 445 e | 572 | 576 e | 716 | 728 | 775 | 665 | 4.1 |
| Gas from Biomass | - | 12 | 22 e | 31 | 32 | 47 | 14 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Spain

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|-------------|------------|------------|------------|------------|------------|----------------------------------|-------------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | 84 e | 160 | 160 | 438 | 470 | 576 | 786 e | 25.1 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 84 e | 160 | 160 | 368 | 400 | 490 | 700 e | 23.6 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | 70 | 70 | 86 | 86 e | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | 84 e | 160 | 160 | 438 | 470 | 576 | 786 e | 25.1 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 84 e | 160 | 160 | 368 | 400 | 490 | 700 e | 23.6 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | 70 | 70 | 86 | 86 e | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Spain

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|----------|----------|----------|--------|--------|--------|--------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | 142 | 142 | 149 | 149 | 202 | 321 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | 142 | 142 | 149 | 149 | 202 | 321 | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | - | 1032 | 1059 | 956 | 1057 | 1171 | 1302 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | 1032 | 1059 | 956 | 1057 | 1171 | 1302 | - |
| Industrial Waste | | | | | | | | |
| Production | 853 e | 5041 e | 5446 e | 6520 e | 6570 e | 6538 e | 6534 e | 22.6 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 353 e | 1771 e | 2176 e | 3120 e | 3170 | 3138 | 3134 e | 24.4 |
| Final Energy Consumption | 500 e | 3270 e | 3270 e | 3400 e | 3400 e | 3400 e | 3400 e | 21.1 |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 3393 | 7846 | 8836 | 8104 | 7809 e | 8325 e | 11667 | 13.1 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | -68 | -98 | -98 | -110 | -110 | - | - | x |
| Transformation Sector | 3325 | 7748 | 8738 | 7994 | 7699 e | 8325 | 11667 | 13.4 |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 165624 e | 138183 e | 138994 e | 141863 | 148115 | 150957 | 155337 | -0.6 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 2345 e | 3912 e | 3932 e | 6235 | 6742 | 8872 | 12161 | 17.9 |
| Final Energy Consumption | 163279 | 134271 | 135062 | 135628 | 141373 | 142085 | 143176 | -1.3 |
| Gas from Biomass | | | | | | | | |
| Production | 425 | 3155 | 3211 | 3287 | 3414 | 3765 | 4548 | 26.7 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 2265 | 2320 | 2340 | 2462 e | 2845 e | 3529 | - |
| Final Energy Consumption | 425 | 890 | 891 | 947 | 952 e | 920 e | 1019 | 9.1 |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Sweden

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|---------|--------|---------|---------|---------|--------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 46.67 | 49.92 | 51.02 | 49.68 | 50.71 | 50.48 | 47.48 | 0.2 |
| of which: Renewables (Mtoe) ⁽²⁾ | 11.74 | 13.15 | 12.17 e | 13.86 e | 14.34 e | 14.13 | 15.06 | 2.5 |
| Renewables/TPES(%) | 25.2 | 26.3 | 23.9 | 27.9 | 28.3 | 28.0 | 31.7 | 2.3 |
| GDP (1995 bil. US\$) | 233.25 | 240.19 | 242.78 | 247.80 | 256.68 | 268.26 | 277.94 | 1.8 |
| TPES/GDP ⁽³⁾ | 0.20 | 0.21 | 0.21 | 0.20 | 0.20 | 0.19 | 0.17 | -1.6 |
| TPES/GDP (1973 = 100) | 85 | 88 | 89 | 85 | 84 | 80 | 72 | -1.6 |
| Population (millions) | 8.57 | 8.83 | 8.84 | 8.85 | 8.85 | 8.86 | 8.87 | 0.4 |
| TPES/population ⁽⁴⁾ | 5.45 | 5.66 | 5.77 | 5.62 | 5.73 | 5.70 | 5.35 | -0.2 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 146.0 | 148.3 | 140.6 | 149.4 | 159.0 | 155.1 | 145.9 | -0.0 |
| of which: Renewables (TWh) ⁽²⁾ | 74.37 e | 70.63 | 54.08 | 72.10 | 78.06 | 74.70 | 83.26 e | 1.1 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 50.9 | 47.6 | 38.5 | 48.3 | 49.1 | 48.1 | 57.1 | 1.1 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 11.74 | 13.07 | 12.09 | 13.78 | 14.26 | 14.05 | 14.98 | 2.5 |
| Renewable/TPES (%) | 25.2 | 26.2 | 23.7 | 27.7 | 28.1 | 27.8 | 31.5 | 2.3 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|--------------|--------------|--------------|--------------|--------------|--------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 17569 | 17495 | 17821 | 17989 | 17838 | 18235 | 18169 | 0.3 |
| Hydro | 16331 | 16152 | 16203 | 16462 | 16260 | 16451 | 16372 | 0.0 |
| of which: Pumped Storage | 427 | 427 | 427 | 91 | 91 | 19 | 19 | -26.7 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | - | - | - | - | 3 | 3 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 8 | 67 | 105 | 123 | 174 | 196 | 209 | 38.6 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | 30 | 76 | 76 | 73 | 73 | 77 | 77 | 9.9 |
| Solid Biomass | 1200 | 1200 | 1437 | 1331 | 1331 | 1490 | 1490 | 2.2 |
| Gas from Biomass | - | - | - | - | - | 18 | 18 | - |
| Comb. Renewables Non-Specified | .. | .. | .. | .. | .. | - | - | .. |
| Solar Collectors Surface (1000 m ²) | 90 | 135 | 161 | 173 | 181 | 185 | 285 | 12.2 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Sweden

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|----------------|--------------|--------------|--------------|--------------|--------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 74900 e | 70683 | 54111 | 72140 | 78404 | 74953 | 83365 e | 1.1 |
| Hydro | 73033 | 68160 | 51775 | 69099 | 75040 | 71713 | 78986 | 0.8 |
| of which: Pumped Storage | 530 | 58 | 35 | 43 | 40 | 22 | 35 | -23.8 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 6 | 99 | 144 | 203 | 317 | 358 | 447 | 53.9 |
| Industrial Waste | - | - | - | - | 309 | 236 | 67 e | - |
| Municipal Solid Waste Renew. | 103 e | 116 | 124 | 104 | 166 | 130 | 173 | 5.3 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 1758 e | 2278 | 2017 | 2688 | 2551 | 2507 | 3670 | 7.6 |
| Gas from Biomass | - | 30 | 51 | 46 | 21 | 9 | 22 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 73039 | 68259 | 51919 | 69302 | 75357 | 72071 | 79433 | 0.8 |
| Hydro | 73033 | 68160 | 51775 | 69099 | 75040 | 71713 | 78986 | 0.8 |
| of which: Pumped Storage | 530 | 58 | 35 | 43 | 40 | 22 | 35 | -23.8 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 6 | 99 | 144 | 203 | 317 | 358 | 447 | 53.9 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | 1861 e | 2424 | 2192 | 2838 | 3047 | 2882 | 3932 e | 7.8 |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | 309 | 236 | 67 e | - |
| Municipal Solid Waste Renew. | 103 e | 116 | 124 | 104 | 166 | 130 | 173 | 5.3 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 1758 e | 2278 | 2017 | 2688 | 2551 | 2507 | 3670 | 7.6 |
| Gas from Biomass | - | 30 | 51 | 46 | 21 | 9 | 22 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Sweden

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|----------------|--------------|--------------|--------------|--------------|---------------|----------------------------------|-------------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | 24434 e | 81460 | 91804 | 87159 | 90219 | 103478 | 102869 | 15.5 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | 1320 | 2690 | 5870 | - |
| Municipal Solid Waste Renew. | 12448 e | 14338 | 13739 | 15487 | 14277 | 15359 | 13895 | 1.1 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 11986 e | 53310 | 63657 | 59394 | 58988 | 69433 | 66807 | 18.7 |
| Gas from Biomass | - | 770 | 1194 | 1403 | 766 | 1062 | 942 | - |
| Waste Heat and Heat Pumps | .. | 13042 | 13214 | 10875 | 14868 | 14934 | 15355 | .. |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | 8518 e | 43327 | 47667 | 48561 | 49980 | 58592 | 57601 | 21.1 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | 1320 | 1244 | 3052 | - |
| Municipal Solid Waste Renew. | 4673 e | 9863 | 9516 | 10963 | 10289 | 10674 | 8379 | 6.0 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 3845 e | 30649 | 35489 | 34675 | 35069 | 43136 | 42283 | 27.1 |
| Gas from Biomass | - | 381 | 463 | 477 | 414 | 503 | 409 | - |
| Waste Heat and Heat Pumps | .. | 2434 | 2199 | 2446 | 2888 | 3035 | 3478 | .. |
| Heat Only Plants | 15916 e | 38134 | 44136 | 38598 | 40239 | 44886 | 45268 | 11.0 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | 1446 | 2818 | - |
| Municipal Solid Waste Renew. | 7775 e | 4475 | 4223 | 4524 | 3988 | 4685 | 5516 | -3.4 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 8141 e | 22661 | 28168 | 24719 | 23919 | 26297 | 24524 | 11.7 |
| Gas from Biomass | - | 389 | 731 | 926 | 352 | 559 | 533 | - |
| Waste Heat and Heat Pumps | .. | 10609 | 11014 | 8429 | 11980 | 11899 | 11877 | .. |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Sweden

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|--------|---------|----------|----------|----------|--------|--------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 133 | 200 | 174 | 187 | 195 | 200 | 215 | 4.9 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 133 | 200 | 174 | 187 | 195 e | 200 e | 215 e | 4.9 |
| Industrial Waste | | | | | | | | |
| Production | 209 | 84 | 42 | - | 3275 e | 4094 | 7032 | 42.1 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | 3275 e | 4094 | 7032 | - |
| Final Energy Consumption | 209 | 84 | 42 | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 14640 | 16536 | 16431 | 17733 | 17406 | 17621 | 16850 | 1.4 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 14640 | 16536 | 16431 | 17733 | 17406 | 17621 | 16850 | 1.4 |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 215730 | 284018 | 301358 e | 307861 e | 307295 e | 310062 | 323041 | 4.1 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 21839 | 71786 e | 84357 e | 81398 e | 81250 e | 91102 | 92987 | 15.6 |
| Final Energy Consumption | 193891 | 212232 | 217001 | 226463 | 226045 | 218960 | 230054 | 1.7 |
| Gas from Biomass | | | | | | | | |
| Production | - | 4140 | 4832 | 5199 | 4331 | 4279 | 4488 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 4140 | 4832 | 5199 | 4331 | 4279 | 4488 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Switzerland

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|--------|--------|--------|--------|--------|--------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 25.06 | 25.27 | 25.74 | 26.30 | 26.69 | 26.69 | 26.60 | 0.6 |
| of which: Renewables (Mtoe) ⁽²⁾ | 3.26 | 4.03 | 3.50 | 3.90 | 3.93 | 4.46 | 4.23 | 2.6 |
| Renewables/TPES(%) | 13.0 | 15.9 | 13.6 | 14.8 | 14.7 | 16.7 | 15.9 | 2.0 |
| GDP (1995 bil. US\$) | 308.43 | 307.26 | 308.24 | 313.55 | 320.93 | 326.15 | 335.86 | 0.9 |
| TPES/GDP ⁽³⁾ | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | -0.3 |
| TPES/GDP (1973 = 100) | 101 | 103 | 104 | 105 | 104 | 102 | 99 | -0.3 |
| Population (millions) | 6.71 | 7.04 | 7.07 | 7.09 | 7.11 | 7.14 | 7.19 | 0.7 |
| TPES/population ⁽⁴⁾ | 3.73 | 3.59 | 3.64 | 3.71 | 3.75 | 3.74 | 3.70 | -0.1 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 54.6 | 62.3 | 56.0 | 61.6 | 61.7 | 68.5 | 66.0 | 1.9 |
| of which: Renewables (TWh) ⁽²⁾ | 30.16 | 35.76 | 29.41 | 34.69 | 34.15 | 40.85 | 37.73 | 2.3 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 55.2 | 57.4 | 52.5 | 56.3 | 55.3 | 59.6 | 57.2 | 0.4 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 3.45 | 4.34 | 3.81 | 4.20 | 4.26 | 4.82 | 4.61 | 2.9 |
| Renewable/TPES (%) | 13.8 | 17.2 | 14.8 | 16.0 | 16.0 | 18.0 | 17.3 | 2.3 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|--------------|--------------|--------------|--------------|--------------|--------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 11823 | 12125 | 12145 | 12145 | 12249 | 12265 | 13518 | 1.3 |
| Hydro | 11670 | 11890 | 11900 | 11899 | 11980 | 11980 | 13229 | 1.3 |
| of which: Pumped Storage | 1455 | 1455 | 1629 | 1629 | 1629 | 1625 | 1625 | 1.1 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | 2 | 8 | 9 | 10 | 12 | 13 | 15 | 22.3 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | 2 | 2 | 3 | 3 | 3 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | 148 | 218 | 225 | 225 | 244 | 259 | 262 | 5.9 |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | 3 | 9 | 9 | 9 | 10 | 10 | 9 | 11.6 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| Solar Collectors Surface (1000 m ²) | 603 | 1000 | 1067 | 1134 | 1197 | 1253 | 1303 | 8.0 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Switzerland

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 31620 | 36998 | 31173 | 36282 | 35825 | 42548 | 39846 | 2.3 |
| Hydro | 30982 | 35954 | 29995 | 35142 | 34637 | 41022 | 38230 | 2.1 |
| of which: Pumped Storage | 1187 | 785 | 1250 | 1099 | 1166 | 1018 | 1396 | 1.6 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | 1 | 5 | 6 | 8 | 8 | 9 | 11 | 27.1 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | 1 | 2 | 3 | 3 | 3 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 276 | 453 | 515 | 494 | 513 | 678 | 717 | 10.0 |
| Municipal Solid Waste Non-Renew. | 275 | 453 | 515 | 493 | 512 | 677 | 717 | 10.1 |
| Solid Biomass | 6 | 9 | 13 | 11 | 13 | 13 | 14 | 8.8 |
| Gas from Biomass | 80 | 124 | 128 | 132 | 139 | 146 | 154 | 6.8 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 30983 | 35959 | 30002 | 35152 | 34648 | 41034 | 38244 | 2.1 |
| Hydro | 30982 | 35954 | 29995 | 35142 | 34637 | 41022 | 38230 | 2.1 |
| of which: Pumped Storage | 1187 | 785 | 1250 | 1099 | 1166 | 1018 | 1396 | 1.6 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | 1 | 5 | 6 | 8 | 8 | 9 | 11 | 27.1 |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | 1 | 2 | 3 | 3 | 3 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | 637 | 1039 | 1171 | 1130 | 1177 | 1514 | 1602 | 9.7 |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 276 | 453 | 515 | 494 | 513 | 678 | 717 | 10.0 |
| Municipal Solid Waste Non-Renew. | 275 | 453 | 515 | 493 | 512 | 677 | 717 | 10.1 |
| Solid Biomass | 6 | 9 | 13 | 11 | 13 | 13 | 14 | 8.8 |
| Gas from Biomass | 80 | 124 | 128 | 132 | 139 | 146 | 154 | 6.8 |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Switzerland

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|---------------|----------------|----------------|--------------|--------------|--------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | 9194 e | 11916 e | 13296 e | 13252 | 13445 | 13379 | 12683 | 3.3 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 4229 e | 5509 e | 6186 e | 6154 | 6236 | 6191 | 5825 | 3.3 |
| Municipal Solid Waste Non-Renew. | 4229 e | 5509 e | 6185 e | 6154 | 6236 | 6192 | 5824 | 3.3 |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | 736 | 898 | 925 | 944 | 973 | 996 | 1034 | 3.5 |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | 9194 e | 11916 e | 13296 e | 13252 | 13445 | 13379 | 12683 | 3.3 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | 4229 e | 5509 e | 6186 e | 6154 | 6236 | 6191 | 5825 | 3.3 |
| Municipal Solid Waste Non-Renew. | 4229 e | 5509 e | 6185 e | 6154 | 6236 | 6192 | 5824 | 3.3 |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | 736 | 898 | 925 | 944 | 973 | 996 | 1034 | 3.5 |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | - | - | - | - | - | - | - | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Switzerland

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|---------|--------|-------|-------|-------|--------|-------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 2553 | 3251 | 3585 | 3425 | 3692 | 3828 | 3808 | 4.1 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 2553 | 3251 | 3585 | 3425 | 3692 | 3828 | 3808 | 4.1 |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 316 | 646 | 714 | 779 | 853 | 921 | 980 | 12.0 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 316 | 646 | 714 | 779 | 853 | 921 | 980 | 12.0 |
| Industrial Waste | | | | | | | | |
| Production | 6710 | 8450 | 9020 | 10090 | 10320 | 10000 | 11350 | 5.4 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 6710 | 8450 | 9020 | 10090 | 10320 | 10000 | 11350 | 5.4 |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 8245 | 13108 | 13226 | 12768 | 13670 | 14815 | 15900 | 6.8 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 8245 | 13108 | 13226 | 12768 | 13670 | 14815 | 15900 | 6.8 |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | 8245 | 13107 | 13225 | 12767 | 13670 | 14815 | 15900 | 6.8 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 8245 | 13107 | 13225 | 12767 | 13670 | 14815 | 15900 | 6.8 |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 17697 e | 22443 | 22889 | 20997 | 23234 | 20560 | 21023 | 1.7 |
| Net Imports ⁽¹⁾ | 556 e | 290 | 290 | 330 | 190 | 90 | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | -1542 | - | - | - | 876 | - | x |
| Transformation Sector | - | 1349 e | 1080 | 792 | 869 | 936 e | 983 | - |
| Final Energy Consumption | 18253 e | 19842 | 22099 | 20535 | 22555 | 20590 | 20040 | 0.9 |
| Gas from Biomass | | | | | | | | |
| Production | - | 2181 | 2277 | 2260 | 2397 | 2504 | 2629 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 2181 | 2277 | 2260 | 2397 | 2504 e | 2629 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

Turkey

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|--|--------|--------|--------|--------|---------|---------|-------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| TPES (Mtoe) ⁽¹⁾ | 52.65 | 61.40 | 66.87 | 70.47 | 71.69 | 70.54 | 77.10 | 3.9 |
| of which: Renewables (Mtoe) ⁽²⁾ | 9.40 | 10.47 | 10.89 | 10.85 | 11.06 e | 10.25 e | 9.62 e | 0.2 |
| Renewables/TPES(%) | 17.9 | 17.1 | 16.3 | 15.4 | 15.4 | 14.5 | 12.5 | -3.5 |
| GDP (1995 bil. US\$) | 144.57 | 169.32 | 181.18 | 194.82 | 200.84 | 191.39 | 205.07 | 3.6 |
| TPES/GDP ⁽³⁾ | 0.36 | 0.36 | 0.37 | 0.36 | 0.36 | 0.37 | 0.38 | 0.3 |
| TPES/GDP (1973 = 100) | 102 | 102 | 104 | 102 | 100 | 104 | 106 | 0.3 |
| Population (millions) | 56.20 | 61.65 | 62.70 | 63.75 | 64.79 | 65.82 | 66.84 | 1.7 |
| TPES/population ⁽⁴⁾ | 0.94 | 1.00 | 1.07 | 1.11 | 1.11 | 1.07 | 1.15 | 2.1 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 57.5 | 86.2 | 94.9 | 103.3 | 111.0 | 116.4 | 124.9 | 8.1 |
| of which: Renewables (TWh) ⁽²⁾ | 23.23 | 35.85 | 40.74 | 40.19 | 42.57 | 34.93 | 31.15 | 3.0 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 40.4 | 41.6 | 42.9 | 38.9 | 38.3 | 30.0 | 24.9 | -4.7 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 9.30 | 10.31 | 10.75 | 10.71 | 10.94 | 10.26 | 9.62 | 0.3 |
| Renewable/TPES (%) | 17.7 | 16.8 | 16.1 | 15.2 | 15.3 | 14.6 | 12.5 | -3.4 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|---|-------------|-------------|-------------|--------------|--------------|--------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Capacity | 6782 | 9895 | 9967 | 10134 | 10355 | 10659 | 11307 | 5.2 |
| Hydro | 6764 | 9863 | 9935 | 10102 | 10307 | 10537 | 11175 | 5.1 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | 18 | 18 | 18 | 18 | 18 | 18 | 18 | - |
| Solar Photovoltaic | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | 9 | 9 | 19 | - |
| Industrial Waste | - | - | - | - | - | 19 | 19 | - |
| Municipal Solid Waste | - | - | - | - | - | 1 | 1 | - |
| Solid Biomass | - | - | - | - | - | 72 | 72 e | - |
| Gas from Biomass | - | - | - | - | - | 3 | 3 | - |
| Comb. Renewables Non-Specified | - | 14 | 14 | 14 | 21 | - | - | - |
| Solar Collectors Surface (1000 m ²) | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Turkey

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 23228 | 35849 | 40735 | 40193 | 42573 | 34983 | 31208 | 3.0 |
| Hydro | 23148 | 35541 | 40475 | 39816 | 42229 | 34677 | 30879 | 2.9 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | 80 | 86 | 84 | 83 | 85 | 81 | 76 | -0.5 |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | 5 | 21 | 33 | - |
| Industrial Waste | - | - | - | - | 5 | 55 | 54 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | 2 | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | 222 | 176 | 294 | 241 | 133 | 145 | - |
| Gas from Biomass | - | - | - | - | 8 | 14 | 21 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 23228 | 35627 | 40559 | 39899 | 42319 | 34781 | 30988 | 2.9 |
| Hydro | 23148 | 35541 | 40475 | 39816 | 42229 | 34677 | 30879 | 2.9 |
| of which: Pumped Storage | - | - | - | - | - | - | - | - |
| Geothermal | 80 | 86 | 84 | 83 | 85 | 81 | 76 | -0.5 |
| Solar Photovoltaics | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | - | - | - | - | 5 | 21 | 33 | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | 2 | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | - | - | - | - | - | - | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | - | 222 | 176 | 294 | 254 | 202 | 220 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | 5 | 55 | 54 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | 222 | 176 | 294 | 241 | 133 | 145 | - |
| Gas from Biomass | - | - | - | - | 8 | 14 | 21 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

Turkey

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|--------|--------|--------|--------|--------|--------|--------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 4576 | 5485 | 5769 | 6274 | 6708 | 7016 | 7229 | 4.7 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 4576 | 5485 | 5769 | 6274 | 6708 | 7016 | 7229 | 4.7 |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 1172 | 5986 | 6656 | 7493 | 8791 | 9879 | 10967 | 25.1 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 1172 | 5986 | 6656 | 7493 | 8791 | 9879 | 10967 | 25.1 |
| Industrial Waste | | | | | | | | |
| Production | - | - | - | - | 163 e | 660 e | 648 e | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | 163 e | 660 e | 648 e | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | - | - | - | - | - | 24 e | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | 24 e | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 301722 | 295863 | 294920 | 294043 | 292320 | 284439 | 270290 | -1.1 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 11625 | 8443 | 7210 | 3296 | 3307 | 3181 | - |
| Final Energy Consumption | 301722 | 284238 | 286477 | 286833 | 289024 | 281132 | 267109 | -1.2 |
| Gas from Biomass | | | | | | | | |
| Production | - | - | - | - | 82 e | 144 e | 216 e | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | 82 e | 144 e | 216 e | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

United Kingdom

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|--|---------|---------|---------|---------|---------|---------|---------|--|
| TPES (Mtoe) ⁽¹⁾ | 212.41 | 224.27 | 232.97 | 226.87 | 230.13 | 231.24 | 232.64 | 0.9 |
| of which: Renewables (Mtoe) ⁽²⁾ | 1.08 | 1.82 | 1.77 | 1.98 | 2.14 | 2.29 | 2.45 | 8.6 |
| Renewables/TPES(%) | 0.5 | 0.8 | 0.8 | 0.9 | 0.9 | 1.0 | 1.1 | 7.6 |
| GDP (1995 bil. US\$) | 1040.25 | 1134.94 | 1164.72 | 1204.85 | 1240.88 | 1267.26 | 1303.75 | 2.3 |
| TPES/GDP ⁽³⁾ | 0.20 | 0.20 | 0.20 | 0.19 | 0.19 | 0.18 | 0.18 | -1.3 |
| TPES/GDP (1973 = 100) | 69 | 67 | 68 | 64 | 63 | 62 | 61 | -1.3 |
| Population (millions) | 57.56 | 58.61 | 58.81 | 59.01 | 59.24 | 59.50 | 59.76 | 0.4 |
| TPES/population ⁽⁴⁾ | 3.69 | 3.83 | 3.96 | 3.84 | 3.88 | 3.89 | 3.89 | 0.5 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 317.0 | 335.9 | 349.0 | 347.0 | 361.0 | 365.5 | 372.2 | 1.6 |
| of which: Renewables (TWh) ⁽²⁾ | 6.56 | 7.94 | 6.10 | 7.43 | 8.69 | 9.74 | 10.01 | 4.3 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 2.1 | 2.4 | 1.7 | 2.1 | 2.4 | 2.7 | 2.7 | 2.6 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 1.08 | 1.82 | 1.77 | 1.98 | 2.14 | 2.29 | 2.45 | 8.6 |
| Renewable/TPES (%) | 0.5 | 0.8 | 0.8 | 0.9 | 0.9 | 1.0 | 1.1 | 7.6 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

- (1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.
(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.
(3) In units of toe/1995 thousand US\$.
(4) In units of toe/per capita.
(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants
(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--|
| Total Capacity | 4346 | 4734 | 4933 | 5084 | 5217 | 5353 | 5564 | 2.5 |
| Hydro | 4199 | 4216 | 4245 | 4282 | 4263 | 4265 | 4267 | 0.2 |
| of which: Pumped Storage | 2787 | 2788 | 2788 | 2788 | 2788 | 2788 | 2788 | 0.0 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaic | - | - | - | 1 | 1 | 1 | 2 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 10 | 200 | 238 | 322 | 331 | 351 | 405 | 44.8 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste | - | - | 151 | 151 | 204 | 212 | 242 | - |
| Solid Biomass | - | - | 46 | 46 | 84 | 84 | 133 | - |
| Gas from Biomass | 91 | 199 | 253 | 282 | 334 | 440 | 515 | 18.9 |
| Comb. Renewables Non-Specified | 46 | 119 | - | - | - | - | - | - |
| Solar Collectors Surface (1000 m ²) | 205 | 254 | 265 | 276 | 283 | 298 | 312 | 4.3 |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

United Kingdom

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|-------------|-------------|-------------|-------------|--------------|--------------|----------------------------------|------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 8546 | 9495 | 7656 | 8913 | 10670 | 13093 | 13111 | 4.4 |
| Hydro | 7153 | 6390 | 4949 | 5655 | 6741 | 8263 | 7804 | 0.9 |
| of which: Pumped Storage | 1982 | 1552 | 1556 | 1486 | 1624 | 2902 | 2694 | 3.1 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | 1 | 1 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 9 | 391 | 488 | 667 | 877 | 850 | 946 | 59.3 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | c | c | c | 609 | 773 | 695 | - |
| Municipal Solid Waste Non-Renew. | - | c | c | c | 358 | 455 | 409 | - |
| Solid Biomass | - | c | c | c | 514 | 638 | 700 | - |
| Gas from Biomass | - | c | c | c | 1571 | 2113 | 2556 | - |
| Comb. Renewables Non-Specified | 1384 | 2714 | 2219 | 2591 | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 8546 | 7624 | 6705 | 7983 | 10176 | 12618 | 12688 | 4.0 |
| Hydro | 7153 | 6390 | 4949 | 5655 | 6741 | 8263 | 7804 | 0.9 |
| of which: Pumped Storage | 1982 | 1552 | 1556 | 1486 | 1624 | 2902 | 2694 | 3.1 |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Photovoltaics | - | - | - | - | - | 1 | 1 | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 9 | 391 | 488 | 667 | 877 | 850 | 946 | 59.3 |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | c | c | c | 541 | 733 | 661 | - |
| Municipal Solid Waste Non-Renew. | - | c | c | c | 318 | 430 | 388 | - |
| Solid Biomass | - | c | c | c | 514 | 638 | 700 | - |
| Gas from Biomass | - | c | c | c | 1185 | 1703 | 2188 | - |
| Comb. Renewables Non-Specified | 1384 | 843 | 1268 | 1661 | - | - | - | - |
| CHP Plants | - | 1871 | 951 | 930 | 494 | 475 | 423 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | - | - | - |
| Municipal Solid Waste Renew. | - | c | c | c | 68 | 40 | 34 | - |
| Municipal Solid Waste Non-Renew. | - | c | c | c | 40 | 25 | 21 | - |
| Solid Biomass | - | - | - | - | - | - | - | - |
| Gas from Biomass | - | c | c | c | 386 | 410 | 368 | - |
| Comb. Renewables Non-Specified | - | 1871 | 951 | 930 | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

United Kingdom

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|-------|--------|--------|--------|-------|-------|-------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 33 | 33 | 33 | 33 | 33 | 33 | 33 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 33 | 33 | 33 | 33 | 33 | 33 | 33 | - |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | 428 | 428 | 428 | 428 | 394 | 419 | 440 | 0.3 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 428 | 428 | 428 | 428 | 394 | 419 | 440 | 0.3 |
| Industrial Waste | | | | | | | | |
| Production | 594 | 2455 | 2383 | 1823 | 2029 | 1910 | 1910 | 12.4 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 594 e | 2455 e | 2383 | 1823 | 2029 | 1910 | 1910 | 12.4 |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 6300 | 13587 | 14010 | 16887 | 10598 | 10710 | 11743 | 6.4 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | -6300 | -12541 | -12908 | -16430 | - | - | - | x |
| Transformation Sector | - | c | c | c | 10155 | 10119 | 10340 | - |
| Final Energy Consumption | - | 1046 | 1102 | 457 | 443 | 591 | 1403 | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | 6225 | 6290 | 6897 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | 5965 | 5943 | 6072 | - |
| Final Energy Consumption | - | - | - | - | 260 | 347 | 825 | - |
| Solid Biomass | | | | | | | | |
| Production | 11394 | 28874 | 28977 | 29001 | 35022 | 33710 | 35117 | 11.9 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | -2984 | -2504 | -2356 | -2360 | - | - | - | x |
| Transformation Sector | - | c | c | c | 5170 | 6788 | 11043 | - |
| Final Energy Consumption | 8410 | 26370 | 26621 | 26641 | 29852 | 26922 | 24074 | 11.1 |
| Gas from Biomass | | | | | | | | |
| Production | 8223 | 14309 | 16662 | 19138 | 21969 | 28676 | 33650 | 15.1 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | -8223 | -11609 | -13667 | -16275 | - | - | - | x |
| Transformation Sector | - | c | c | c | 19406 | 26113 | 31577 | - |
| Final Energy Consumption | - | 2700 e | 2995 e | 2863 e | 2563 | 2563 | 2073 | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.

United States

1. ENERGY SUPPLY, GDP, AND POPULATION

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|--|----------|---------|----------|----------|----------|---------|---------|--|
| TPES (Mtoe) ⁽¹⁾ | 1927.24 | 2088.12 | 2140.47 | 2163.41 | 2181.54 | 2247.79 | 2299.67 | 1.8 |
| of which: Renewables (Mtoe) ⁽²⁾ | 100.91 e | 108.16 | 113.63 | 112.25 | 111.13 | 113.33 | 110.39 | 0.9 |
| Renewables/TPES(%) | 5.2 | 5.2 | 5.3 | 5.2 | 5.1 | 5.0 | 4.8 | -0.9 |
| GDP (1995 bil. US\$) | 6520.50 | 7338.40 | 7603.00 | 7943.00 | 8285.90 | 8626.70 | 8986.90 | 3.3 |
| TPES/GDP ⁽³⁾ | 0.30 | 0.28 | 0.28 | 0.27 | 0.26 | 0.26 | 0.26 | -1.4 |
| TPES/GDP (1973 = 100) | 68 | 66 | 65 | 63 | 61 | 60 | 59 | -1.4 |
| Population (millions) | 249.98 | 263.07 | 265.50 | 268.09 | 270.56 | 273.00 | 275.42 | 1.0 |
| TPES/population ⁽⁴⁾ | 7.71 | 7.94 | 8.06 | 8.07 | 8.06 | 8.23 | 8.35 | 0.8 |
| Total Electricity Generation (TWh) ⁽⁵⁾ | 3181.5 | 3558.4 | 3651.2 | 3672.3 | 3804.5 | 3889.8 | 4003.5 | 2.3 |
| of which: Renewables (TWh) ⁽²⁾ | 342.22 e | 391.73 | 430.69 e | 440.54 e | 404.04 e | 376.62 | 331.82 | -0.3 |
| Renew./Total Elec.(%) ⁽⁶⁾ | 10.8 | 11.0 | 11.8 | 12.0 | 10.6 | 9.7 | 8.3 | -2.6 |
| <i>Memo Items: Contribution of Renewables to TPES in June 2002 before the revisions included in this publication</i> | | | | | | | | |
| TPES from Renewables (Mtoe) | 37.52 | 107.75 | 113.21 | 109.07 | 108.07 | 113.33 | 110.39 | 11.4 |
| Renewable/TPES (%) | 2.0 | 5.2 | 5.3 | 5.0 | 5.0 | 5.0 | 4.8 | 9.4 |

Source: IEA Country Submissions (2001), IEA/OECD *Energy Balances of OECD Countries* and OECD *Main Economic Indicators*.

(1) Total TPES was calculated in June 2002 and therefore does not include the revisions included in this publication.

(2) Renewables do not include industrial waste, non-renewable municipal solid waste and pumped storage production.

(3) In units of toe/1995 thousand US\$.

(4) In units of toe/per capita.

(5) Electricity generation = gross production - amount of electricity produced in pumped storage plants

(6) Electricity share generated from renewables over the total electricity production.

2. NET GENERATING CAPACITY OF RENEWABLE AND WASTE PRODUCTS (MW)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--|
| Total Capacity | 106104 | 115375 | 113124 | 114136 | 113809 | 115723 | 115467 | 0.8 |
| Hydro | 92360 | 100060 | 97660 | 98832 | 98560 | 99062 | 98125 | 0.6 |
| of which: Pumped Storage | - | 21387 | 21110 | 19310 | 18898 | 18945 | 18020 | - |
| Geothermal | 2669 | 2968 | 2893 | 2853 | 2917 | 3001 | 2983 | 1.1 |
| Solar Photovoltaic | - | - | - | - | 5 | 156 | 177 | - |
| Solar Thermal | 339 | 333 | 333 | 334 | 360 | 410 | 410 | 1.9 |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 1911 | 1731 | 1678 | 1579 | 1698 | 2251 | 2365 | 2.2 |
| Industrial Waste | - | - | - | - | - | 739 | 1158 | - |
| Municipal Solid Waste | - | - | - | - | - | 2579 | 2806 | - |
| Solid Biomass | - | - | - | - | - | 6905 | 6578 | - |
| Gas from Biomass | - | - | - | - | - | 620 | 865 | - |
| Comb. Renewables Non-Specified | 8825 | 10283 | 10560 | 10538 | 10269 | - | - | - |
| Solar Collectors Surface (1000 m ²) | - | - | - | - | - | 66813 | 66693 | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

United States

3. GROSS ELECTRICITY GENERATION FROM RENEWABLE SOURCES (GWh)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|-----------------|---------------|-----------------|-----------------|-----------------|---------------|----------------------------------|-------------|
| | | | | | | | 2000 | 90-00 |
| Total Electricity | 358032 e | 419738 | 461294 e | 471077 e | 434976 e | 405392 | 365151 | 0.2 |
| Hydro | 292401 | 337856 | 376702 | 388096 | 352549 | 316962 | 275140 | -0.6 |
| of which: Pumped Storage | 15808 | 23740 | 25778 | 25508 | 25985 | 23880 | 26782 | 5.4 |
| Geothermal | 16525 | 14941 | 15746 | 15179 | 15369 | 15438 | 14678 | -1.2 |
| Solar Photovoltaics | 3 | 4 | 3 | 4 | 3 | 3 | 3 | - |
| Solar Thermal | 663 | 824 | 903 | 893 | 887 | 870 | 880 | 2.9 |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 3066 | 3196 | 3410 | 3254 | 3018 | 4533 | 5645 | 6.3 |
| Industrial Waste | - | 4268 | 4826 e | 5032 e | 4952 e | 4897 | 6552 | - |
| Municipal Solid Waste Renew. | 10613 e | 14773 | 15646 | 15448 | 16021 | 16547 | 15653 | 4.0 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 34761 e | 40587 | 40473 | 39369 | 38045 | 42063 | 41616 | 1.8 |
| Gas from Biomass | - | 3289 | 3585 | 3802 | 4132 | 4079 | 4984 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| Electricity Only Plants | 332082 e | 382658 | 427191 e | 436819 e | 400856 e | 365515 | 321916 | -0.3 |
| Hydro | 292401 | 337856 | 376702 | 388096 | 352549 | 316962 | 275140 | -0.6 |
| of which: Pumped Storage | 15808 | 23740 | 25778 | 25508 | 25985 | 23880 | 26782 | 5.4 |
| Geothermal | 16525 | 14941 | 15746 | 15179 | 15369 | 15023 | 12823 | -2.5 |
| Solar Photovoltaics | 3 | 4 | 3 | 4 | 3 | 3 | 3 | - |
| Solar Thermal | 663 | 824 | 903 | 893 | 887 | 870 | 880 | 2.9 |
| Tide, Wave, Ocean | - | - | - | - | - | - | - | - |
| Wind | 3066 | 3196 | 3410 | 3254 | 3018 | 4533 | 5645 | 6.3 |
| Industrial Waste | - | 440 | 421 e | 405 e | 425 e | 659 | 566 | - |
| Municipal Solid Waste Renew. | 9693 e | 13432 | 14084 | 13892 | 14072 | 14023 | 13451 | 3.3 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 9731 e | 8887 | 12567 | 11537 | 10788 | 10053 | 9765 | 0.0 |
| Gas from Biomass | - | 3078 | 3355 | 3559 | 3745 | 3389 | 3643 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |
| CHP Plants | 25950 e | 37080 | 34103 e | 34258 e | 34120 e | 39877 | 43235 | 5.2 |
| Geothermal | - | - | - | - | - | 415 | 1855 | - |
| Industrial Waste | - | 3828 | 4405 e | 4627 e | 4527 e | 4238 | 5986 | - |
| Municipal Solid Waste Renew. | 920 e | 1341 | 1562 | 1556 | 1949 | 2524 | 2202 | 9.1 |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | 25030 e | 31700 | 27906 | 27832 | 27257 | 32010 | 31851 | 2.4 |
| Gas from Biomass | - | 211 | 230 | 243 | 387 | 690 | 1341 | - |
| Comb. Renewables Non-Specified | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

United States

4. GROSS HEAT PRODUCTION FROM RENEWABLE SOURCES (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | Average annual percent change | |
|----------------------------------|------|--------------|--------------|--------------|--------------|---------------|----------------------------------|-------|
| | | | | | | | 2000 | 90-00 |
| Total Heat | - | 28539 | 65900 | 66711 | 68905 | 565437 | 562596 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | 1993 | 4248 | 5768 | 4609 | 17310 | 17040 | - |
| Municipal Solid Waste Renew. | - | 7270 | 3344 | 3420 | 9703 | 27849 | 31070 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | 19276 | 58134 | 57300 | 54243 | 466450 | 456607 | - |
| Gas from Biomass | - | - | 174 | 223 | 350 | 53828 | 57879 | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| <i>of which:</i> | | | | | | | | |
| CHP Plants | - | 28539 | 65900 | 66711 | 68905 | 52842 | 50751 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | 1993 | 4248 | 5768 | 4609 | 5756 | 4826 | - |
| Municipal Solid Waste Renew. | - | 7270 | 3344 | 3420 | 9703 | 5208 | 7463 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | 19276 | 58134 | 57300 | 54243 | 41805 | 38462 | - |
| Gas from Biomass | - | - | 174 | 223 | 350 | 73 | - | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |
| Heat Only Plants | - | - | - | - | - | 512595 | 511845 | - |
| Geothermal | - | - | - | - | - | - | - | - |
| Solar Thermal | - | - | - | - | - | - | - | - |
| Industrial Waste | - | - | - | - | - | 11554 | 12214 | - |
| Municipal Solid Waste Renew. | - | - | - | - | - | 22641 | 23607 | - |
| Municipal Solid Waste Non-Renew. | - | - | - | - | - | - | - | - |
| Solid Biomass | - | - | - | - | - | 424645 | 418145 | - |
| Gas from Biomass | - | - | - | - | - | 53755 | 57879 | - |
| Waste Heat and Heat Pumps | - | - | - | - | - | - | - | - |

Source: IEA Country Submissions (2001).

Notes: Please refer to notes in Principles and Definitions for data coverage.

United States

5. PRIMARY ENERGY SUPPLY, TRANSFORMATION, AND FINAL CONSUMPTION
OF RENEWABLE PRODUCTS (TJ)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Average annual percent change 90-00 |
|---|-----------|---------|---------|----------|-----------|---------|---------|---|
| Geothermal Direct Use | | | | | | | | |
| Production | 14069 | 17000 | 17293 | 17879 | 18465 | 20363 | 21735 | 4.4 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | 14069 | 17000 | 17293 | 17879 | 18465 | 20363 | 21735 | 4.4 |
| Solar Thermal Direct Use | | | | | | | | |
| Indigenous Production | - | - | - | - | - | 63313 | 60356 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | 63313 | 60356 | - |
| Industrial Waste | | | | | | | | |
| Production | - | 128432 | 123426 | 129139 e | 111828 | 128803 | 159946 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | -22133 | - | - | - | - | x |
| Transformation Sector | - | 125190 | 98177 | 125874 | 107368 | 128803 | 159946 | - |
| Final Energy Consumption | - | 3242 | 3116 e | 3265 e | 4460 e | - | - | - |
| Municipal Solid Waste - Renewables | | | | | | | | |
| Production | 173829 e | 270237 | 286440 | 281394 | 286702 | 313018 | 297650 | 5.5 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | 173829 e | 270237 | 286440 | 281394 | 286702 | 313018 | 297650 | 5.5 |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Municipal Solid Waste - Non-Renewables | | | | | | | | |
| Production | - | - | - | - | - | - | - | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | - | - | - | - | - | - | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Solid Biomass | | | | | | | | |
| Production | 2433168 e | 2401242 | 2481241 | 2384795 | 2442585 | 2479397 | 2523395 | 0.4 |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | 1697 | - | - | - | - | x |
| Transformation Sector | 1487095 e | 1281621 | 1390382 | 1370422 | 1304924 | 1988588 | 2011305 | 3.1 |
| Final Energy Consumption | 946073 | 1119621 | 1092556 | 1014373 | 1137661 e | 490809 | 512090 | -6.0 |
| Gas from Biomass | | | | | | | | |
| Production | - | 42788 | 46558 | 46808 | 49390 | 121266 | 138099 | - |
| Net Imports ⁽¹⁾ | - | - | - | - | - | - | - | - |
| Miscellaneous to Balance ⁽²⁾ | - | - | - | - | - | - | - | - |
| Transformation Sector | - | 42788 | 46558 | 46808 | 49390 | 121266 | 138099 | - |
| Final Energy Consumption | - | - | - | - | - | - | - | - |
| Liquid Biofuels (1000 tonnes) | | | | | | | | |
| Production | - | 4063 | 2920 | 3820 | 4160 | 4409 | 4897 | - |
| Net Imports ⁽¹⁾ | - | 49 | 39 | 11 | 8 | 11 | 15 | - |
| Miscellaneous to Balance ⁽²⁾ | - | 34 | 15 | -65 | -7 | -98 | 46 | x |
| Transformation Sector | - | 1140 | 1405 | 1487 | 1476 | 1730 | 1923 | - |
| Final Energy Consumption | - | 3006 | 1569 | 2279 | 2685 | 2592 | 3035 | - |

(1) Net imports = total imports - total exports

(2) Includes statistical difference, stock changes, energy consumed in the energy sector and distribution losses.

Source: IEA Country Submissions (2001)

Notes: Please refer to notes in Principles and Definitions for data coverage.



INTERNATIONAL ENERGY AGENCY ENERGY STATISTICS DIVISION POSSIBLE STAFF VACANCIES

The Division is responsible for statistical support and advice to the policy and operational Divisions of the International Energy Agency. It also produces a wide range of annual and quarterly publications complemented by CD-ROMs and on-line data services. For these purposes, the Division maintains, on a central computer and an expanding network of microcomputers, extensive international databases covering most aspects of energy supply and use.

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TEN ANNUAL PUBLICATIONS

Renewables Information 2002

This annual publication of comprehensive information on the use of renewables and waste in the OECD region was first published in 2002. The report addresses a need for development of reliable statistics on this energy form. Support for increasing renewable energy's role in the energy sector has never been greater, and this publication seeks to increase understanding of the current market and trends over recent years. The report contains analysis of renewables and waste energy supply, electricity production and installed electricity generating capacity in OECD countries. The analysis is supported by detailed statistical tables for eight regional aggregates and for each of the thirty OECD countries. *Published November 2002.*

Coal Information 2001

Issued annually since 1983, this publication provides comprehensive information on current world coal market trends and long-term prospects. Compiled in cooperation with the Coal Industry Advisory Board, it contains thorough analysis and current country-specific statistics for OECD Member countries and selected non-OECD countries on coal prices, demand, trade, production, productive capacity, emissions standards for coal-fired boilers, coal ports, coal-fired power stations and coal data for non-OECD countries. This publication is a key reference tool for all sectors of the coal industry as well as for OECD Member country governments. **Caution: this publication is not being updated in 2002. However, new data are available on CD ROM and in our on-line service.** *Published August 2001.*

Electricity Information 2002

This publication brings together in one volume the IEA's data on electricity and heat supply and demand in the OECD. The report presents a comprehensive picture of electricity capacity and production, consumption, trade and prices for the OECD regions and individual countries in over 20 separate tables for each OECD country. Detailed data on the fuels used for electricity and heat production are also presented. *Published September 2002.*

Natural Gas Information 2002

A detailed reference work on gas supply and demand, covering not only the OECD countries but also the rest of the world. Contains essential information on LNG and pipeline trade, gas reserves, storage capacity and prices. The main part of the book, however, concentrates on OECD countries, showing a detailed gas supply and demand balance for each individual country and for the three OECD regions: North America, Europe and Asia-Pacific, as well as a breakdown of gas consumption by end-user. Import and export data are reported by source and destination. *Published September 2002.*

Oil Information 2002

A comprehensive reference book on current developments in oil supply and demand. The first part of this publication contains key data on world production, trade, prices and consumption of major oil product groups, with time series back to the early 1970s. The second part gives a more detailed and comprehensive picture of oil supply, demand, trade, production and consumption by end-user for each OECD country individually and for the OECD regions. Trade data are reported extensively by origin and destination. *Published August 2002.*

Energy Statistics of OECD Countries 1999-2000

No other publication offers such in-depth statistical coverage. It is intended for anyone involved in analytical or policy work related to energy issues. It contains data on energy supply and consumption in original units for coal, oil, natural gas, combustible renewables/wastes and products derived from these primary fuels, as well as for electricity and heat. Data are presented for the two most recent years available in detailed supply and consumption tables. Historical tables summarise data on production, trade and final consumption. Each issue includes definitions of products and flows and explanatory notes on the individual country data. *Published June 2002.*

Energy Balances of OECD Countries 1999-2000

A companion volume to *Energy Statistics of OECD Countries*, this publication presents standardised energy balances expressed in million tonnes of oil equivalent. Energy supply and consumption data are divided by main fuel: coal, oil, gas, nuclear, hydro, geothermal/solar, combustible renewables/wastes, electricity and heat. This allows for easy comparison of the contributions each fuel makes to the economy and their interrelationships through the conversion of one fuel to another. All of this is essential for estimating total energy supply, forecasting, energy conservation, and analysing the potential for interfuel substitution. Complete energy balances are presented for the two most recent years available. Historical tables summarise key energy and economic indicators as well as data on production, trade and final consumption. Each issue includes definitions of products and flows and explanatory notes on the individual country data as well as conversion factors from original units to tonnes of oil equivalent. *Published June 2002.*

Energy Statistics of Non-OECD Countries 1999-2000

This publication offers the same in-depth statistical coverage as the homonymous publication covering OECD countries. It includes data in original units for over 100 individual countries and nine main regions. The consistency of OECD and non-OECD countries' detailed statistics provides an accurate picture of the global energy situation. For a description of the content, please see *Energy Statistics of OECD Countries* above. *Published September 2002.*

Energy Balances of Non-OECD Countries 1999-2000

A companion volume to the publication *Energy Statistics of Non-OECD Countries*, this publication presents energy balances in million tonnes of oil equivalent and key economic and energy indicators for over 100 individual countries and nine main regions. It offers the same statistical coverage as the homonymous publication covering OECD Countries, and thus provides an accurate picture of the global energy situation. For a description of the content, please see *Energy Balances of OECD Countries* above. *Published September 2002.*

CO₂ Emissions from Fuel Combustion - 2002 Edition

In order for nations to tackle the problem of climate change, they need accurate greenhouse gas emissions data. This publication provides a new basis for comparative analysis of CO₂ emissions from fossil fuel combustion, a major source of anthropogenic emissions. The data in this book are designed to assist in understanding the evolution of these emissions from 1971 to 2000 on a country, regional and worldwide basis. They should help in the preparation and the follow-up to the Eighth Conference of the Parties (COP-8) meeting under the U.N. Climate Convention in New Delhi in October-November 2002. Emissions were calculated using IEA energy databases and the default methods and emissions factors from the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. *Published October 2002.*

TWO QUARTERLIES

Oil, Gas, Coal and Electricity, Quarterly Statistics

Oil statistics cover OECD production, trade (by origin and destination), refinery intake and output, stock changes and consumption for crude oil, NGL and nine selected oil product groups. Statistics for natural gas show OECD supply, consumption and trade (by origin and destination). Coal data cover the main OECD and world-wide producers of hard and brown coal and major exporters and importers of steam and coking coal. Trade data for the main OECD countries are reported by origin and destination. Electricity statistics cover production (by major fuel category), consumption and trade for 29 OECD countries. Quarterly data on world oil and coal production are included, as well as world steam and coking coal trade.

Energy Prices and Taxes

This publication responds to the needs of the energy industry and OECD governments for up-to-date information on prices and taxes in national and international energy markets. It contains for OECD countries and certain non-OECD countries prices at all market levels: import prices, industry prices and consumer prices. The statistics cover the main petroleum products, gas, coal and electricity, giving for imported products an average price both for importing country and country of origin. Every issue includes full notes on sources and methods and a description of price mechanisms in each country.

CD-ROMs

To complement its publications, the Energy Statistics Division produces CD-ROMs containing the complete databases which are used for preparing the statistics publications. State-of-the-art software allows you to access and manipulate all these data in a very user-friendly manner and includes graphic and mapping facilities.

Annual CD-ROMs

- Energy Statistics of OECD Countries, 1960-2000
- Energy Balances of OECD Countries, 1960-2000
- Energy Statistics of Non-OECD Countries, 1971-2000
- Energy Balances of Non-OECD Countries, 1971-2000
- CO₂ Emissions from Fuel Combustion 1960/1971-2000
- Coal Information 2002
- Electricity Information 2002
- Natural Gas Information 2002
- Oil Information 2002

Quarterly CD-ROMs

- Energy Prices and Taxes

ON-LINE DATA SERVICES

All the databases available on CD-ROM are now also accessible over the Internet at <http://data.iea.org/>. For additional information on this new service see the note at the beginning of these pages.

Furthermore, the IEA *Monthly Oil Data Service* and a *Monthly Gas Data Service* (see boxes below) can also be accessed over the Internet.

The IEA Monthly Oil Data Service

The IEA Monthly Oil Data Service provides the detailed databases of historical and projected information which is used in preparing the IEA's monthly Oil Market Report (OMR). The IEA Monthly Oil Data Service comprises three packages:

- *Supply, Demand, Balances and Stocks;*
- *Trade;*
- *Field-by-Field Supply;*

available separately or combined as a subscriber service on the Internet. The data are available two days after the official release of the Oil Market Report.

A full description of this service is available on our web site (<http://www.iea.org>.)

The IEA Monthly Gas Data Service

The Monthly Gas Data Service provides for OECD countries historical and current data on natural gas supply and demand, as well as detailed information on trade origins and destinations. Data can be obtained in different ways from the Internet.

A description of the service is available on our web site (<http://data.iea.org>).

For more information on any of the IEA statistics products, please feel free to contact Ms. Sharon Michel in the Energy Statistics Division, E-mail: sharon.michel@iea.org; Tel: (+33 1) 40 57 66 25; Fax: (+33 1) 40 57 66 49.