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FORWAST

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Description of the three chosen macro-economic scenarios for EU-27 until 2035

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ANNEXES

1 INTRODUCTION

This deliverable is part of FORWAST work package 5 “Scenario and waste technology definitions”. The objectives of FORWAST are:

- to provide an inventory of the historically cumulated physical stock of materials in the EU-27 and to forecast the expected amounts of generated waste, per resource category, in the next 25 years.
- to assess the life-cycle wide environmental impacts that result from different scenarios of waste prevention, recycling and waste treatment.

This forecasting component is done by defining two sets of scenarios: a first set of macroeconomic scenarios and a second set describing different waste management policies.

The results presented in deliverable 5-1 “Review of macroeconomic scenarios” were used as starting point for the selection of the three macroeconomic scenarios presented here. As mentioned in the proposal, following scenarios were developed: a baseline scenario, a low growth scenario and a high growth scenario, (where “low” and “high” are defined using the baseline as reference). Each scenario comprises a qualitative description, followed by quantitative information about the population and economic development, about the evolution of fuel prices and energy demand. At the end projections of CO₂, NO_x, SO_x, NMVOC, HN₃, CH₄ and PM_{2.5} emissions are presented.

1.1 Baseline

As suggested in deliverable 5-1 the scenario „European Energy and Transport Trends to 2030 – Update 2005” (EET) was selected as baseline. This scenario was created by the Institute of Communication and Computer Systems of the National Technical University of Athens (ICCS-NTUA), E3M-Lab, Greece, for the EU - Directorate-General for Energy and Transport. This scenario is part of a larger set of projections built on an integrated approach considering supply and demand issues.

As mentioned in deliverable 5-1, the reasons for selecting this scenario were:

- It provides disaggregated data for each EU-country (Annex II) as well as some aggregated data for the EU-15 countries, the accession countries and EU-27 totals.
- The GDP growth is disaggregated into different sectors (industry, construction, services, agriculture and energy sector), and can thus be readily integrated into the FORWAST model.
- The results were obtained using the PRIMES model, which has been successfully peer reviewed.

- It is a recent study (published in 2006) and has data for each decade from 1990 to 2030, falling only 5 years short of the FORWAST time horizon.
- There is information available about the fuel consumption and its corresponding emissions, which can be useful for verifying the FORWAST results.

The objective of the EET scenarios is to examine different issues related to energy and transport, which are important drivers of the economic performance. More specifically, projections on energy supply, demand and transformation are provided. These projections were carried out in order to support the development of energy and transport policies.

A first set of EET scenarios was published in 2003 (Mantzou *et al.*, 2003). It comprised many different scenarios, exploring the effect of different drivers, e.g.: high oil and gas prices, energy efficiency, the spreading of nuclear energy, the use of renewable energy sources, the effect of different policies and different GDP growth rates. Regarding this last driver, three scenarios were developed: a baseline, a high growth and a low growth rate. An update of the baseline scenario was published in the year 2006, and this is the scenario selected as baseline for the FORWAST project. It is interesting to note that the updated baseline is very similar to the low growth scenario published only two years earlier, which illustrates the difficulties and large uncertainties involved in scenario development.

1.2 Low and High growth scenarios

The IPCC scenarios were used as starting point for the low and high growth scenarios. The aim of the IPCC scenarios is to study the long-term nature and uncertainty of climate change, as well as its driving forces. Because the evolution of these driving forces is highly uncertain, the scenario approach was chosen for analysing future outcomes and to assess the associated uncertainties. For encompassing the current range of future greenhouse gases (GHG) uncertainties, 40 emissions scenarios were created. These scenarios belong to 4 families, each with an individual storyline that assumes a different direction of future developments. All scenarios belonging to a family cover a wide range of the underlying uncertainties in the driving forces. For this reason, their plausibility should not be considered solely on the basis of an extrapolation of current economic, social and technological trends.

These scenarios extend to the end of the 21st century and cover a wide range of main driving forces of future emissions (demographical, technological and economic factors). None of the scenarios includes any future policy that explicitly addresses climate change. GHGs emissions are, however, directly affected by non-climate change policies designed for a variety of other purposes.

The authors of the scenarios stress that the possibility that any single scenario (emission path) will occur is highly uncertain. They also mention that, as it happens in all kinds of scenarios, they include subjective elements and are open to various interpretations. Each storyline

represents thus a different development, which might be viewed as positively by some and negatively by others.

During the FORWAST meeting in Vienna it was agreed to select one scenario with higher economic growth and lower emissions than the baseline, and another with a lower economic growth and higher emissions than the baseline. It was also agreed that the low growth scenario should be as low as possible to be able to assess the effect of low GDP growth on the use and recycling of resources in the stocks.

The IPCC scenarios provide aggregated results for four world regions: OECD90, Africa and Latin America, Asia and Countries undergoing economic reforms. Hence the EU-27 countries belong to two different world regions:

- OECD90: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, Netherlands, Portugal, Spain, Sweden, United Kingdom. This group of countries is named EU-OLD in this deliverable
- Countries undergoing economic reforms: Bulgaria, Czech Republic, Hungary, Poland, Rumania, Slovakia, Slovenia, Estonia, Latvia, Lithuania. This group of countries is named EU-NEW in this deliverable.

Thus, two sets of low and high growth scenarios were constructed: one for the EU-OLD and another for the EU-NEW. The IPCC scenarios provide information for each decade, from 2000 to 2100. For obtaining data for the EU-OLD and EU-NEW, the growth rate of the corresponding world region was used. The starting points were the baseline data of 2000.

For selecting the scenarios, the GDP and emissions of the EU-OLD were plotted for each scenario. The EU-OLD was selected, because it dominates the evolution of the EU-27 economy (as shown in the baseline). These curves were then compared to the baseline. The scenarios not fulfilling the conditions mentioned above (higher growth and lower emissions and lower growth and higher emissions) as well as the scenarios with GDP or emission values “similar” to the baseline were eliminated. This resulted in one scenario with higher GDP and lower emissions than the baseline (the A1 Image scenario) and in three scenarios with lower GDP and higher emissions. In this case, the scenario with the lowest GDP was selected to comply with the other request defined in the meeting, resulting in the selection of the A2 Minicam scenario.

2 BASELINE

2.1 Baseline description

The selected baseline considers current trends and policies implemented in the member states by the end of 2004. In this scenario the affluence of the European population continues to increase, driven by policy measures that envision the completion of the Lisbon Strategy. This strategy promotes competitiveness in order to create market incentives that stimulate economic growth and integration.

This opening of the European market is reflected both in an increasing transport activity and in a high mobility of the population, which is also related to the enlargement of the Schengen area. Current challenges, as for example the terrorist threat, lead to the creation of structures that increase the control over citizens such as: biometric documents, better information and coordination among governmental agencies of different countries and the strengthening of judicial cooperation in both common criminal and civil law. The cooperation is also extended to other areas: to improve responsiveness to emergencies and disasters, common prevention of rare diseases, among others. It is also expected that the EU adopts common visa and immigration policies as well as a common asylum seeking system (European Council, 2006).

The baseline takes into account the high energy import prices and the lower economic growth rates observed in the last years. The subdued economic growth rates related to demographic development are also incorporated.

In general, the baseline does not assume that indicative targets (as for example the share of renewables in energy production in 2010) will be necessarily met, meaning that it reflects the implemented policies, rather than their outcome.

When looking specifically at the energy and transport markets, it is seen that they open more and more with time, improving by this competitiveness and reducing the prices for the consumers.

This scenario covers the period from 1990 to 2030, where data from 1990-2000 are statistical data and the data for 2005 (not shown in the report) are modelled results partly calibrated to the available statistics. For obtaining the data for 2035, the growth rate from 2020 to 2030 was used.

2.2 Population

The population growth figures were taken from historical data and projections provided by EUROSTAT. It is projected that the EU-27 population remains rather stable and that it

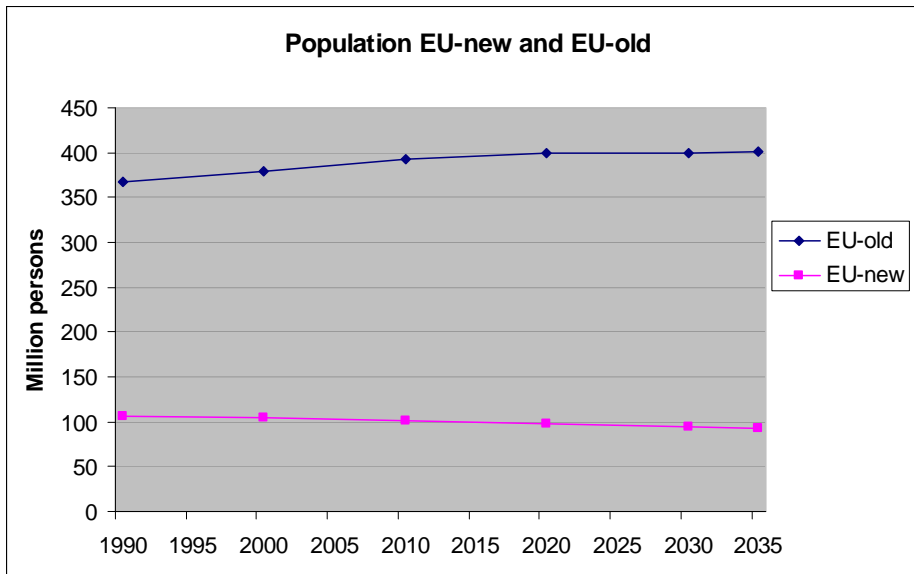


Figure 1: Population in the EU-OLD and EU-NEW from 1990 to 2035 – Baseline scenario

reaches a peak near 2020 at some 500 million. The population in the EU-OLD¹ grows from 383 million in 2000 to 400 million in 2035. The EU-NEW², following the opposite trend, experiences a population decline from 104 million in 2000 to 92 million in 2035 (Fig.1). The increase of the life expectancy, the birth rate decline and changes in societal and economic condition cause a change in the household size, which constitutes an important parameter affecting energy and material consumption (and by this also waste production).

Household size is expected to decrease substantially both in the EU-OLD (from 2.6 in 2000 to 1.9 in 2035) and in the EU-NEW (from 3.0 in 2000 to 2.2 in 2035). The household size affects the consumption of materials because there are many durable goods which are found in small quantities in each household. Usually there is one dryer, dishwasher, laundry machine, vacuum cleaner, refrigerator, deep freezer and microwave per household (Ferrer-i-Carbonell and van den Bergh, 2004). If the size of households decreases, more of these durable goods are needed to fulfil the needs of the whole population.

On the other side, there are other durable goods (as for example TVs, hi-fi equipment, and increasingly cars and personal computers) of which households tend to own more than one (Ferrer-i-Carbonell and van den Bergh, 2004). In these cases, there is no (or at least a smaller) effect of decreasing household size on the amount of materials consumed.

The analysis gets more complicate, however, due to the fact different household types have different consumption patterns. For example, when looking at 2 person households, it is expected that the amounts and types of goods and services consumed by 2 students, 2 retired persons, one single parent and a child and a couple without children, differ from each other. A study examining energy requirements of different household types (Kok *et.al*, 2003), found

¹ EU-OLD refers in this document to following 17 countries: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, The Netherlands, Portugal, Spain, Sweden and the United Kingdom.

² EU-NEW refers in this document to following 10 countries: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

that energy requirements per household increased with household size. But since the additional energy required by each successive household member becomes smaller, the energy required per person declines with increasing household size. This trend is, however, not visible anymore, when all types of households are compared together since single households have higher energy requirements than 1 retired person households, as is also the case for 2 adult households compared to 2 pensioner households. Furthermore, households with 1 adult and children have much lower energy requirements than 2 adults and slightly lower than 2 retired persons households.

This indicates that household size should be used in conjunction with additional demographic data to obtain meaningful information about energy and material consumption.

2.3 GDP

The GDP projections for the EU-27 Member States are based on short and long term forecasts produced by the DG of Economical and Financial Affairs. The economic growth is not uniformly distributed among all EU-countries: the new Member States (NMS) have higher growth rates than the old member states (Table 1), showing that convergence continues over the projection period. However, even with this higher growth rates, the contribution of the new Member States remains rather limited in terms of the overall EU-27 GDP, since the economic growth of the EU-27 continues to be dominated by the evolution of the EU-OLD economy (Figure 2). The per capita GDP in 2035 is still more that two times higher in the EU-15 (40.393 EUR00) than in the new member States (16.833 EUR00).

With regards to the evolution of the economic growth, it is assumed that the recent economic slowdown is only transitory, and that the long-term economic environment remains positive in general terms. The EU-25 is expected to benefit from economic and monetary unification, from the increased competition and opening of the internal market, but also from the increasing trade rates with countries outside the EU-27, which are incentivated by the progressive falling of trade barriers.

The gross value added per sector plots (Figure 2) reflect the trend of structural changes commonly observed in developed economies, where the share of the primary and secondary sectors decreases, while the importance of services and high value added activities increases. This has also an effect on material and energy intensity, since services and higher value added products are usually less material and energy intensive.

The share of services in the total economic activities increases from 66.2 in 2000 to 73.2 in 2035 in the EU-OLD and from 49.4 to 58.3 for the EU-NEW (Table 2). For the EU-OLD a decline in the GDP share for all other activities is observed, since they grow at a lower rate than the total economy (but still show positive growth rates, meaning that the total value added of each activity does increase). For the EU-NEW the share of industrial production in

Table 1: Gross value added growth rate – Baseline scenario

	Gross value added growth rate (%)			
	1990-2000	2000-2010	2010-2020	2020-2035
EU-old				
Total economy	2.1	2.0	2.2	1.5
Industry	1.4	1.4	2.1	1.5
Construction	0.2	1.4	1.8	1.1
Services	2.5	2.3	2.3	1.6
Agriculture	1.2	0.1	0.8	0.5
Energy sector	2.2	0.7	1.0	0.7
EU-new				
Total economy	1.0	4.3	4.2	3.3
Industry	1.2	5.3	4.4	3.1
Construction	-1.2	3.0	5.1	3.5
Services	2.1	4.4	4.4	3.6
Agriculture	-2.2	3.2	2.4	2.0
Energy sector	-2.4	0.9	2.2	2.3

the total gross value added increases from 2000 to 2035, the share of construction activities remains rather stable and the share of the remaining activities decreases.

The changes in production patterns with time show an increase in the share of services in the gross value added. Some reasons for this happening is the increasing complexity of modern industrial organisations, where manufacturing activities have become more and more service intensive both upstream (design, research and development) and downstream (marketing and advertising). Also the increase in trade, foreign direct investment and improved technology has led to a higher use in services (Banga, 2005). However it is important to have in mind that with increasing monetization of the economy an important part of household activities is outsourced. This means that the measured growth in national income can be in this cases biased upward since such shifts in production do not result in a corresponding increase in total input of the combined household and marked sectors.

The increase in service production mentioned above is usually accompanied by an increase in service consumption. More developed and affluent countries show a larger share of service production and consumption. If the relative growth of the production and consumption of services are not proportional; they are equilibrated by import and export of services.

One factor that facilitated the parallel growth of the demand and supply of services is that the often require a physical proximity. If this is not the case (e.g., banking, insurance), a physical proximity might at least be useful. It must be noted, however that the development in electronics, information and communication technologies, has now made services available even when the producers and consumers do not interact directly (e.g. long distance education), which makes the export of services easier (Banga, 2005).

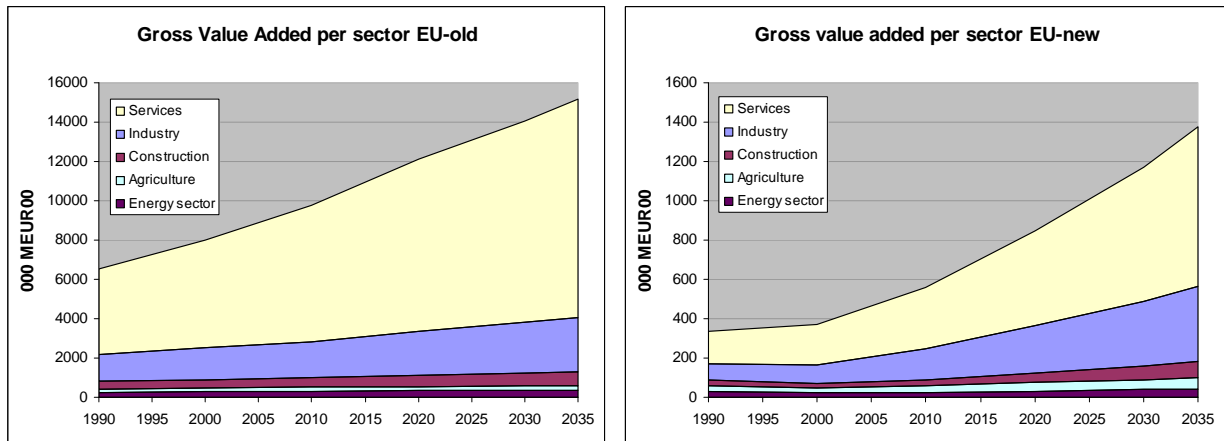


Figure 2: EU-OLD and EU-NEW sectoral gross value added - Baseline scenario

With respect to the consumption of services, it is observed that the share of income devoted to services increases with increasing income. This is usually explained by pointing at the high income elasticity of demand for final product services. This means that at any relative price of services, the quantity of services rises more than the quantity of non-service commodities as real per capita income increase (Banga, 2005).

Cassar and Cordina (2001) show in a publication that this hold true for Malta during the period 1988-1998, where the share of household income decreased for: food and beverages, clothing, rent, fuel, power, and health care. This was compensated by an increase in the proportion of consumed recreation, entertaining, education and transport and communication services. Similar results were found by Higgs (2007), who studied the changes in the expenditure pattern of retired persons from 1975-1999.

Another important assumption for the modelling of the GDP evolution is that the increases in commodity prices and inflation are expected to remain modest.

Table 2: Sectoral share of gross value added – Baseline scenario

	Share of total gross value added (%)				
	2000	2010	2020	2030	2035
EU-old					
Industry	20.0	18.9	18.7	18.5	18.4
Construction	5.2	4.9	4.7	4.5	4.4
Services	68.8	71.1	72.1	72.8	73.2
Agriculture	2.6	2.1	1.9	1.7	1.6
Energy sector	3.4	3.0	2.7	2.5	2.4
EU-new					
Industry	25.7	28.2	28.5	27.9	27.6
Construction	6.1	5.4	5.9	6.0	6.0
Services	55.4	55.8	56.8	58.3	59.0
Agriculture	6.7	6.1	5.1	4.5	4.2
Energy sector	6.1	4.4	3.6	3.3	3.1

2.4 Energy consumption

The assumptions made for projecting the energy consumption consider national differences in policies regarding nuclear energy production. They also take into account the phase out of nuclear energy plants. This means, that the agreed nuclear phase out in Belgium, Germany and Sweden as well as plans (agreed or under negotiation) concerning the refurbishment or closures of nuclear plants in the new Member States are considered. With regard to the use of biofuels in transport, it was assumed that all countries will follow EU-rules sooner or later. The impact of blending gasoline and diesel with biofuels was assumed to be negligible on consumer prices, since the higher production costs will be probably offset by tax reductions scheduled to be implemented on those fuel blends.

Primary energy demand shows a 12 % increase in the EU-OLD and a 62 % increase in the EU-NEW between the years 2000 and 2035 (Figure 3).

The EU-OLD demand increase is more pronounced in the short term, because the lower growth rates in recent years limited the scope for energy intensity improvements. In the long run, consumption virtually stabilises reflecting a more service oriented economy, low economic growth and a stagnating population. The energy sources which have the highest growth rates are natural gas and renewable energy forms. The share of these energy sources in the total consumption increases from 23% (2000) to 27% (2035) for natural gas and from 6% (2000) to 13% (2035) for renewable energy sources.

Important declines in the growth rates are observed for oil and nuclear energy: their share in the total energy demand declines between 2000 and 2035 from 40% to 34% and from 15% to 11% for oil and nuclear energy respectively.

For the EU-NEW on the other hand, there is a continuous growth in the consumption rate, only stabilizing after the projection horizon. Oil, natural gas, nuclear energy and renewable energy sources all show a similar increase in the demand growth rate. A significant decrease

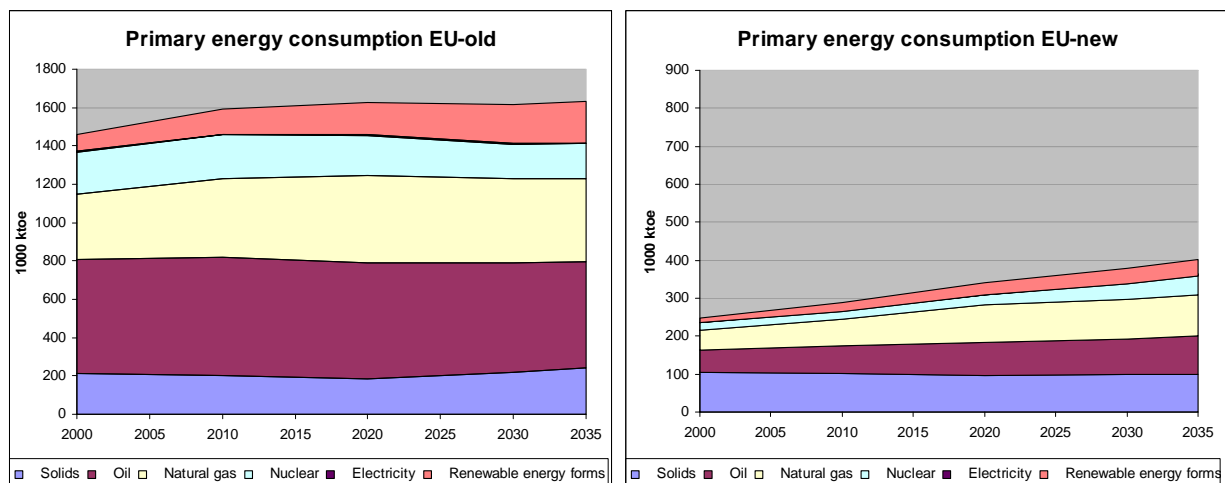


Figure 3: EU-OLD and EU-NEW primary energy consumption – Baseline scenario

of the demand is only evident for solid fossil fuels, with a declining share in the total energy demand (from 42 % in the year 2000 to 25% in 2035).

Novel energy forms, such as hydrogen and methanol are not expected to make significant inroads in the EU-27 energy system under baseline conditions up to 2035.

With regards to final energy demand, it is interesting to notice the important increase in electricity and gas demand (Figure 4). This demand increase is driven by the higher standards of living that are associated with widespread ownership of private cars, domestic appliances and increasing comfort levels in space heating and cooling. The energy demand increase can, however, be regarded as modest, since the historical growth of electricity consumption has been above the GDP growth rates. Saturation effects, technological progress and the exploitation of energy saving options are the main factors limiting electricity demand growth.

The share of solid fossil fuels in the final demand shows a decline in the period 2000 - 2035. In the EU-OLD it changes from 4% to 2% and in the EU-NEW from 15% to 54%.

The final energy demand for novel energy forms does not increase substantially mainly because of cost considerations. Other renewable energy forms, such as solar energy used in water heaters, grow quite rapidly (over 5.7% per year in the period from 2000-2030), but remain insignificant as a proportion of the overall final consumption.

It is further assumed that the available energy production patterns change in the new Member States. These changes are caused by the closure of unprofitable coal mines, which started in the 1990s and are expected to continue to some extent over the next decades.

The material intensity was calculated for fossil fuels. The transformation of the fossil energy carriers from toes to ton was done following a methodology similar to the one proposed in (Skovgaard *et al.* 2005). Data about the domestic energy consumption in the EU-OLD and EU-NEW from 1990 to 2005 was taken from EUROSTAT. For oil and coal it was possible to get the time data series of the consumption in toes and in t. With this, a trend line showing

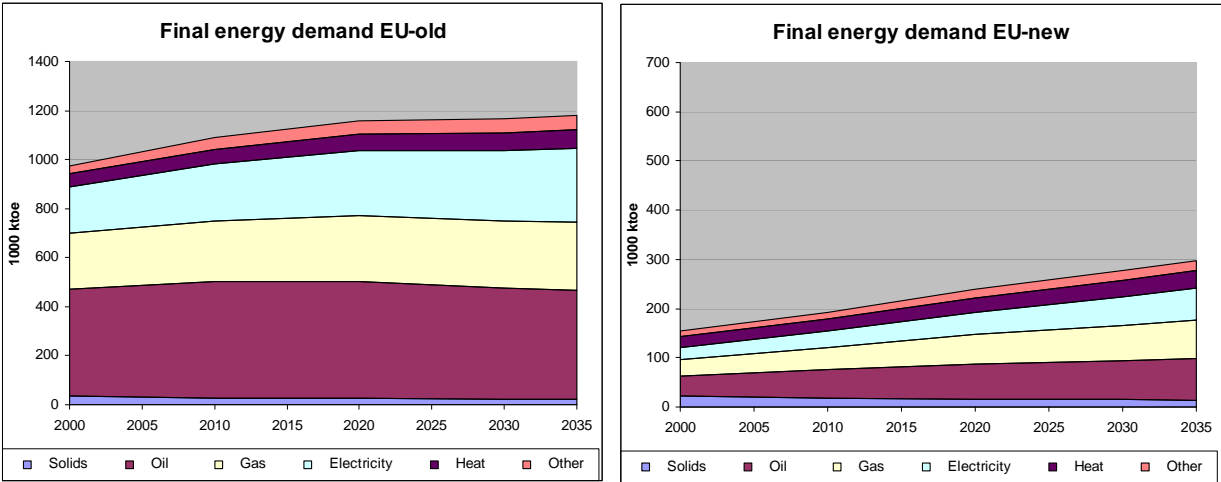


Figure 4: EU-OLD and EU-NEW final energy demand – Baseline scenario

how the amount of energy produced by t of fuel has changed with time was constructed. This should give an idea about the changes in the fossil fuel efficiency.

For solid fossil fuels the trend was positive for both the EU-OLD and the EU-NEW (meaning that efficiency increased with time). The slope of the curve is higher for the EU-OLD countries (Figure 5), indicating that they had a higher efficiency growth rate. It was assumed that the efficiency trend continues linearly until 2035.

For oil the trend for the EU-15 was negative and the toe/t conversion factors ranged from 1.00690 toe/t to 1.00085 toe/t. Because it was expected that the efficiency should at least remain constant (and not decrease) it was decided to discard this values and use instead an average value of 0.982 t/toe.

For gas there was not data available in tonnes, and thus the tendency for oil was used. The transformation from toes to t was done using an average calorific value (31.736 MJ/m³) and density (0.78 kg/m³) provided by Ritthof *et al.* (2002). For the transformation of toes into Joules, a factor of 41.868 GJ/toes was used.

The results from this calculations indicate that the oil and coal intensity for the EU-OLD decreases from the year 1990 to 2035 from 77.9 to 33.7 t/MEUR00 and from 95.5 to 28.3 tMEUR00 respectively. For natural gas the intensity peaks the year 2010 (47547 t/MEUR00), when it starts to decline, reaching 35525 t/MEUR00 in 2035.

A decrease in intensity for all fossil fuel sources in the EU-NEW is observed.

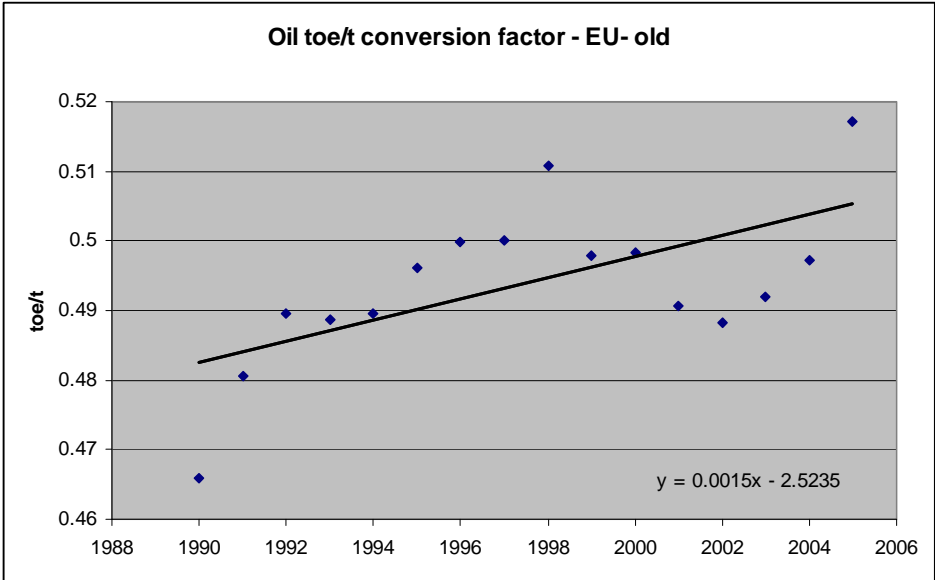


Figure 5: Evolution of the toes per ton of solid fossil fuels in the EU-OLD

2.5 Energy prices

With regards to energy prices, it is assumed that there exist abundant oil and gas resources and that international energy prices increase moderately until 2030 (taking into account the rather high prices observed in 2005, when the modelling started). Table 3 shows the evolution of fossil fuel prices. It can be seen that there is a significant increase in both oil and gas prices, in comparison to the much smaller increase in the coal prices. A decrease in the oil-gas price gap can be observed, since gas prices raise proportionally more than oil prices.

For comparison purposes it is useful to note that the oil prices in this baseline are similar to those used in the DG RTD sponsored update of the World Energy Technology Outlook project, but higher than the ones assumed in the 2005 update of the IEA World Energy Outlook.

As mentioned by IPCC (2001), the energy prices have three main components: the production, transport and distribution costs, the consumers' willingness to pay and the profit margins. In addition energy prices are influenced by other factors, each of which can decouple energy price trends from any underlying balance between demand and supply. These factors range from speculative elements to taxes and also geopolitical aspects. This constitutes a great challenge for energy prices modellers, who have developed many different approaches for the modelling of future energy prices. Up to now, however, none of them is able to take all aforementioned factors into account.

Table 3: Fossil fuel prices evolution – Baseline scenario

	1990	2000	2010	2020	2030	2035
	U\$1990 / GJ					
Crude oil	4.9	4.7	6.7	7.2	8.6	9.4
Natural gas	2.7	2.5	5.1	5.5	6.7	7.4
Hard coal	2.3	1.3	1.9	2.1	2.2	2.3

2.6 CO₂ Emissions

A strong decoupling of energy demand from economic growth as well as a decoupling between energy demand and CO₂ emissions, has been observed in the EU-27 during the last decade and is expected to continue. When comparing the sectoral GDP the emitted CO₂ growth (Table 1 and Table 4 respectively), it can be seen that GDP grows at a higher rate than the emissions.

Table 4: Baseline CO₂ Emission growth rate (%)

	CO ₂ Emission growth rate (%)			
	1990-2000	2000-2010	2010-2020	2020-2035
EU-old	0.20	0.52	0.03	0.04
EU-new	-3.36	1.10	1.01	0.49

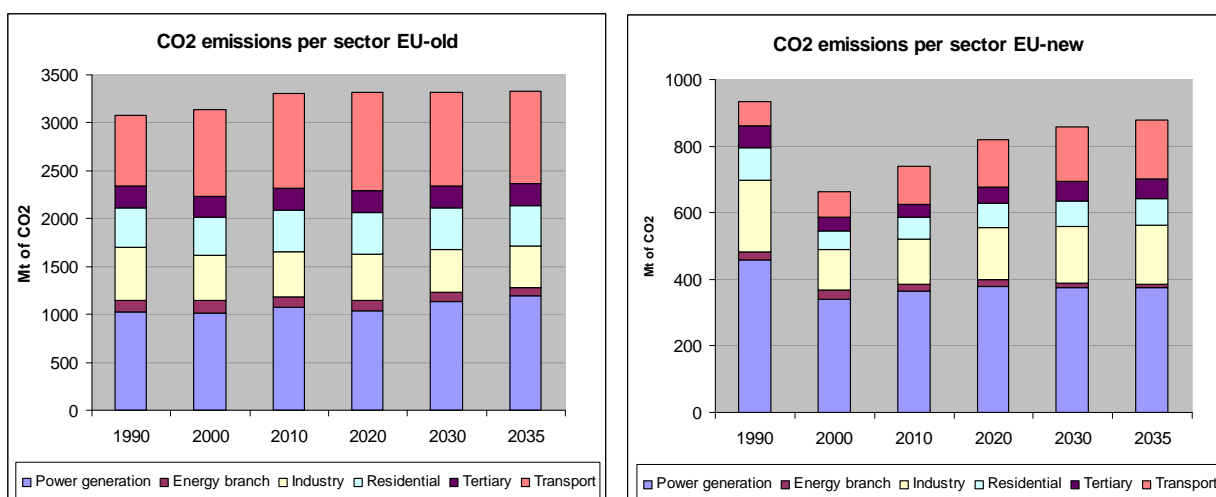


Figure 6: EU-OLD and EU-NEW fossil CO₂ emissions – Baseline scenario

In future, the CO₂ emissions are projected to grow over the projection period (Figure 6). This growth is much more pronounced in the new EU Member States than in the EU-OLD, but it still is not large enough to bring the 2035 emissions up to 1990 levels. The EU-OLD, however, rises 8% from 1990 levels. The demand side is the main driver for emission growth between 2010 and 2020, while the power generation sector becomes the main driver for this increase between 2020 and 2030 due to massive decommissioning of nuclear power plants and increasing competitiveness of coal in the power sector.

Policy initiatives related to climate change are included only to the extent that they are agreed policy measures. It is assumed that no specific new policies and measures aimed at fulfilling Kyoto targets are implemented in the next 25 years. The baseline thus considers the establishment of an emission trading regime in Europe. A constant permit price of 5 EUR/00t CO₂ is assumed from 2010 onwards for those sectors covered by the EU Emission Trading Scheme as a reflection of the medium term price level of the emerging international carbon market. The effect of voluntary agreements of the car industry on CO₂ emissions for new cars is also considered in this scenario.

Energy policies that aim at the promotion of renewable energy (wind, hydro, solar, biomass and waste) and co-generation, as well as energy efficiency measures are assumed to continue. This involves subsidies on capital costs and preferential electricity selling prices

The emission coefficients also show a decrease with time, which is caused by the smaller increase of the emissions with respect to GDP (Table 5).

Table 5: Baseline CO₂ emission coefficients

	CO ₂ Emission coefficients (kg/000EUR 00)					
	1990	2000	2010	2020	2030	2035
EU-old	0.45	0.37	0.32	0.26	0.22	0.21
EU-new	2.54	1.60	1.17	0.85	0.64	0.56

2.7 Other Emissions

It is assumed that the stringent regulations for acid rain pollutants and also other clean air policies continue, thus stabilizing the emissions.

The values for the 1990 emissions were taken from EUROSTAT and the projections for SO_x, NO_x, NH₃, NMVOCs and PM_{2.5} emissions were obtained from Amman *et al.* (2007). The values used as baseline are the “national activity projections until 2020”, which are supplied by each country. For obtaining the emissions from 2020 until 2035, the change of the growth rates between the periods 2000-2010 and 2010-2020 was used in the cases where the changes in the second period were smaller than the change in the first one. This happened mostly with the emissions in the EU-OLD. In the remaining cases, mostly for the emissions in the new Member States, the average growth rate of the years 2000-2020 was used. Because there was no information that could be used as a CH₄ baseline, the emission growth rates for NH₃ were used. The reason being, that both emissions are related to agricultural activities.

The results for the EU-OLD show that there is a sharp decline in the SO_x, NO_x, NMVOXC_s and PM_{2.5} emissions between 2000 and 2035, while CH₄ and NH₃ emissions remain almost stagnant (Figure 7 and Figure 8). For the EU-NEW all emissions decline, except CH₄ and NH₃ emissions, which rise during 2000 to 2010.

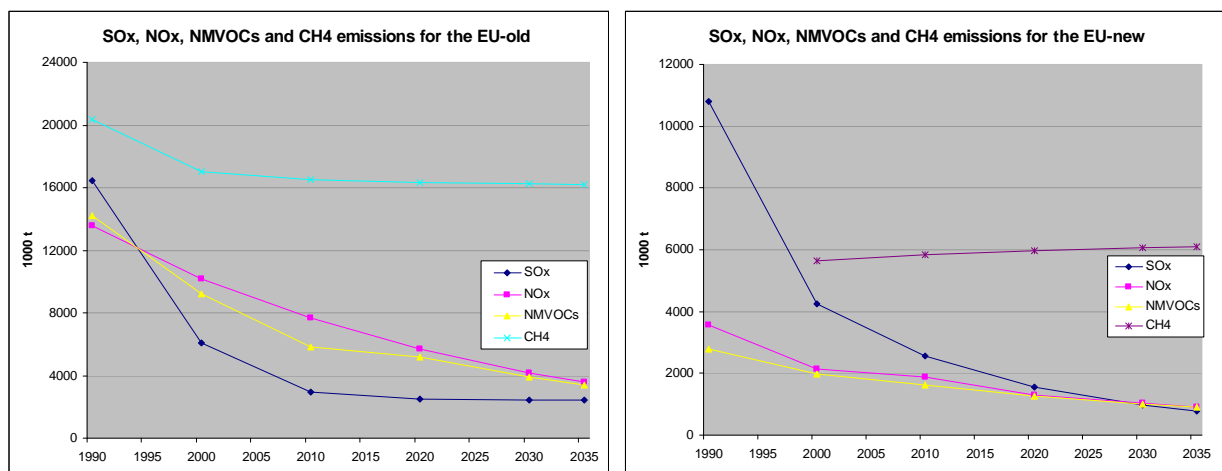


Figure 7: EU-OLD and EU-NEW SO_x, NO_x, NMVOCs and CH₄ emissions – Baseline scenario

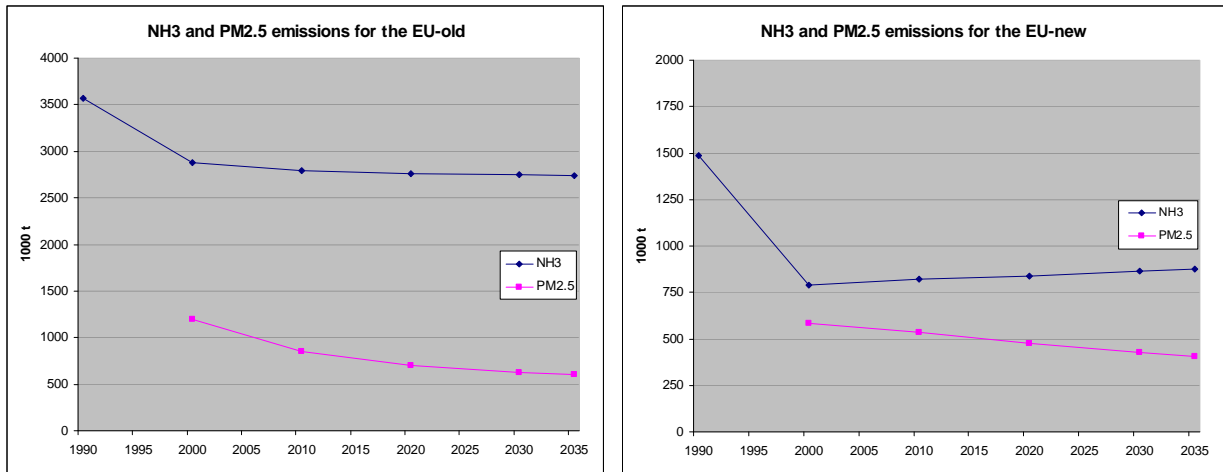


Figure 8: EU-OLD and EU-NEW NH₃ and PM_{2.5} emissions – Baseline scenario

As in the case of CO₂, there is no clear observed relationship between the emissions and the sectoral GDP growth rates (compare Table 1 and Table 6): the gross value added growth rates are positive for all economic sectors, while most emissions show a negative growth rate.

The emission coefficients show a decrease in time (Table 7), indicating that the economies reach a higher efficiency. It can be observed that even the emissions with a positive growth rate show a decrease in the emission coefficients. This happens, because the GDP increase is higher than the increase in emissions.

Table 6: Emission growth rates for emissions other than CO₂ (%)

	Emission growth rate (%)			
	1990-2000	2000-2010	2010-2020	2020-2035
EU-old				
SOx	-9.48	-7.04	-1.54	-0.25
NOx	-2.80	-2.81	-2.92	-3.08
NH3	-2.12	-0.31	-0.13	-0.04
NMVOC	-4.22	-4.47	-1.13	-2.82
CH4	-1.77	-0.31	-0.13	-0.04
PM2.5		-3.35	-1.95	-0.98
EU-new				
SOx	-8.93	-4.97	-4.75	-4.48
NOx	-5.09	-1.18	-3.61	-2.40
NH3	-6.13	0.37	0.23	0.30
NMVOC	-3.37	-2.00	-2.50	-2.25
CH4		0.37	0.23	0.12
PM2.5		-0.89	-1.22	-1.06

Table 7: Emission coefficients for emissions other than CO₂

	Emission coefficients					
	1990	2000	2010	2020	2030	2035
EU-old						
SO _x (t/MEUR00)	2.39	0.71	0.28	0.20	0.16	0.15
NO _x (t/MEUR00)	1.97	1.19	0.74	0.44	0.28	0.22
NH ₃ (t/MEUR00)	0.52	0.34	0.27	0.21	0.18	0.17
NMVOC (t/MEUR00)	2.06	1.08	0.56	0.41	0.26	0.21
CH ₄ (t/MEUR00)	2.96	1.98	1.59	1.27	1.08	1.00
PM2.5 (t/MEUR00)		0.14	0.08	0.05	0.04	0.04
EU-new						
SO _x (t/MEUR00)	29.37	10.23	4.02	1.63	0.74	0.50
NO _x (t/MEUR00)	9.73	5.12	2.98	1.36	0.77	0.58
NH ₃ (t/MEUR00)	4.04	1.90	1.29	0.87	0.65	0.56
NMVOC (t/MEUR00)	7.58	4.78	2.55	1.30	0.75	0.57
CH ₄ (t/MEUR00)		13.57	9.22	6.21	4.55	3.88
PM2.5 (t/MEUR00)		1.41	0.84	0.49	0.32	0.26

2.8 Other characteristics

Other important assumptions considered in the model are:

- The weather conditions (represented by the degree-days parameter), are assumed to remain constant at 2000 levels for the next 25 years. This assumption is important since weather conditions determine the intensity and pattern of energy use.
- The tax rates reflect the situation of July 2005 and increase thereafter with inflation, thus assuming no structural change in the tax systems. There is, however, an exception to this rule: for the NMS a gradual convergence of the energy taxes toward those in the EU-15 is included in the model.
- The discount rate is a critical factor when developing economic forecasts and it also influences the investment decisions regarding energy using equipment. Specific discount rates were assigned to different economic agents in order to model their responses correctly: 8% for large utilities, 12% for large industrial and commercial utilities and 17.5 for households.
- The baseline takes into account economic growth by modernisation of installations in all sectors of the economy, thereby improving the efficiency of the energy system.

2.9 Description of the model

The PRIMES model was used for the development of the baseline scenario. This model focuses on market related mechanisms influencing the evolution of energy demand and supply and the context for technology penetration in the market. It is a market-oriented model which determines equilibrium by finding the prices of each energy form such that the quantity producers find best to supply matches the quantity consumers wish to use. The equilibrium is static within each time period but is repeated in a time-forward path under dynamic relationships. PRIMES is organised in a modular way, representing in a different manner energy supply, conversion and end use sectors. Additionally there are cost evaluation models and also a price setting mechanism allowing the modelling of different economic and policy scenarios (Capros, s.a.).

To model the technological penetration several parameters and formulas are built in to represent some non-economic factors, such as learning by doing curves and parameters representing the subjective perception of technology costs as seen by consumers, among others (Capros, s.a.).

3 LOW GROWTH SCENARIO

3.1 Description

This scenario presents a world that consolidates into different economic regions, each of which is self-reliant in terms of resources. The economic, cultural and social interactions between regions are not very important, leading to relatively small world trade flows and to a large per capita income difference between developed and developing countries. People, ideas and capital are not very mobile, which results in a slower technological diffusion. The technological change is very variable between different regions, in some it is very fast, while in others it is rather slow. This is because industry adapts to local resource endowments, culture and education levels. Regions with abundant energy and mineral resources evolve more resource intensive, while those in resource poor countries place a very high priority on minimizing import dependence through technological innovation to improve resource efficiency and make use of substitute inputs. The fuel mix depends primarily on the resource availability. High-income but resource-poor regions shift towards advanced post-fossil technologies (renewables or nuclear).

This emphasis on regional scale creates a favourable environment for the development of family and community life. This can create an increasing tendency towards cultural pluralism with mutual acceptance of diversity and fundamental differences.

This leads to a very slow decline in the fertility rates and results in a very large population. Agricultural productivity is one of the main research and innovation areas and also environmental concerns. Initial higher levels of soil erosion and water pollution are eased through the development of more sustainable high-yield agriculture. Global environmental concerns are relatively weak, but there are attempts to bring local and regional pollution under control and to maintain environmental amenities. Rigorous environmental controls on pollutants affecting the quality of water, soil and agricultural productivity are necessary to ensure food security in a world with a large population. Hence, in terms of traditional pollutants this scenario is far from an environmental “worst-case” scenario, even if it has very high GHG emissions.

The social and political structures diversify: some regions move toward stronger welfare systems and reduced income inequality, while others move toward more heterogeneous income distributions.

3.2 Population

The population trajectory used in this scenario results in a higher population growth than in the baseline. It must be noted, however, that these values are well within the UN-long range population projections and corresponding uncertainties estimated by demographers. It represents well an upper bound of population growth scenarios found in current scenario literature.

One reason for this is the lower mobility (of goods, persons and ideas) in comparison to the baseline and the consequent higher impact of national and local structures and traditions, which incentivates community life, affects family values and promotes higher fertility rates.

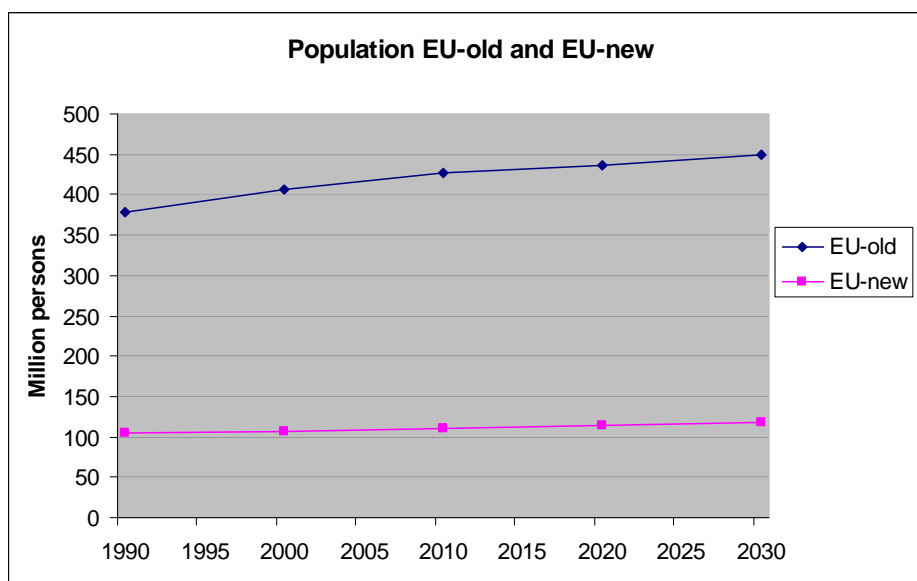


Figure 9: Population in the EU-OLD and EU-NEW from 1990 to 2035 – Low growth scenario

It can be seen in Figure 9 that population in the EU-OLD grows from 379 million in 2000 to 449 million in 2035. The EU-NEW shows for most decades between 2000-2040 lower population growth rates than the EU-OLD exhibiting a population increase from 104 million in 2000 to 118 million in 2035.

3.3 GDP

For the baseline modelling, and specifically for obtaining the share of the economic activities in the gross value added (GVA), the PRIMES model was used by the authors of the scenario. Since this model is not available for public use, an alternative approach for calculating the GDP share of each economic sector in the high and low growth scenarios had to be developed.

The sectoral allocation of the GDP was obtained by using some regressions. Due to data availability reasons, it was not possible to fit the regressions to the EU-OLD and EU-NEW, as used in the remaining of this document. Instead, one regression was fitted for the EU-15 and another for the EU-NEW* (in this case EU-NEW* refers to the 10 new member states, and not to the 10 countries belonging to the “countries undergoing economic reforms” group). The parameters obtained for the EU-15 were used for the EU-OLD and the ones obtained for the new Member States were assigned to the EU-NEW countries.

For fitting the EU-15 regressions, data from the updated baseline (Mantzou *et al.*, 2007) described in chapter 2, and also from the first version of the study (Mantzou *et al.*, 2003) were used. For the EU-NEW, however, this resulted in an unsatisfactory fitting of the curves. It was thus decided to use only the data from the updated baseline for this group of countries.

The shares of each sector (industry, construction, services, agriculture and energy) were plotted against the total GVA. In most cases the tools provided by Excel proved to be good enough, but in one case it turned out to be necessary to fit a parabola. This happened for the new Member States where the share of industrial production first increases with GDP and decreases later on. This regression fitting was done using Nonlin (Sherrod, 1981).

The final equations are:

EU-OLD	Industry	$y = -1.5344 \ln(x) + 34.107$
	Construction	$y = 81.26 x^{-0.3013}$
	Services	$y = 5.2824 \ln(x) + 21.073$
	Agriculture	$y = 506.02 x^{-0.592}$
	Energy	$y = -0.9769 \ln(x) + 11.982$
EU-NEW	Industry	$y = -8.80174E-6 x^2 + 1.6858E-2 x + 20.732173$
	Construction	$y = -0.6283 \ln(x) + 10.287$
	Services	$y = 4.9712 \ln(x) + 23.4$
	Agriculture	$y = 122.44 x^{-0.4691}$
	Energy	$y = 290.95 x^{-0.6382}$

Where y stands for the share of the economic activity (industry, construction, services, agriculture or energy) in the total GVA, and x stands for total GVA. Plots with the data and fitted curves and R^2 are found in the Annex.

For the allocation of the GVA into the different subsectors (e.g. services are separated into market, nonmarket and trade sectors) the baseline proportions were used.

The difference between 100 % and the sum of the different shares ranged from -0.8 % to 0.7 % and was allocated proportionally to the share.

The growth rates in this scenario are lower than in the baseline (except for the EU-OLD growth rate between 2030 and 2035). This is primarily the effect of a more fragmented and less globalized world. The growth rates in the new Member Countries are higher, indicating a convergence towards EU-OLD GDP levels.

Table 8: Gross value added growth rate – Low growth scenario

	Gross value added growth rate (%)			
	2000-2010	2010-2020	2020-2030	2030-2035
EU-old				
Total economy	1.8	1.5	0.4	1.5
Industry	1.7	1.3	0.4	1.3
Construction	1.3	1.0	0.3	-0.5
Services	1.9	1.6	0.5	0.5
Agriculture	0.7	0.6	0.2	2.0
Energy sector	1.2	1.0	0.3	0.4
EU-new				
Total economy	1.2	2.2	2.1	2.1
Industry	1.4	2.5	2.4	2.3
Construction	1.1	1.9	1.9	-1.6
Services	1.3	2.4	2.3	-1.5
Agriculture	0.6	1.1	1.1	4.0
Energy sector	0.4	0.8	0.7	2.8

The sectors with the highest gross value added growth rate are services and industry for the EU-OLD as well as for the EU-NEW (Table 8). This changes, however, during the 2030-2035 period where agriculture turns into the sector with the highest growth rate. This might be the effect of implemented policies for the support of agriculture, which is a sector playing a crucial role in a scenario with high population and lower trade volumes.

With respect to the share of each activity in the total gross value added, it can be seen in Table 16 that the shares do not show large variations with time. Services show a small increase, while the share of industry remains rather stable. The shares of the energy and agriculture sectors show a large decrease in the EU-NEW, from 6.2 to 4.4 and 7.3 to 5.6 respectively. Figure 10 presents the gross value added for each economic sector. It can be clearly seen that services are the most important economic activity, and that its importance increases with time.

This growth of the proportion of the service sector in the total gross value added is probably accompanied by an increase in the consumption of services (see section 2.1). These differences between the produced and consumed amounts of services must be equilibrated by trade. Since this scenario presents a more regionalised world, with more restrictions for

Table 9: Sectoral share of gross value added – Low growth scenario

	Share of total gross value added (%)				
	2000	2010	2020	2030	2035
EU-old					
Industry	20.3	20.1	19.8	19.8	19.7
Construction	5.4	5.1	4.9	4.9	4.7
Services	68.6	69.6	70.3	70.5	70.9
Agriculture	2.5	2.2	2.0	2.0	1.9
Energy sector	3.2	3.0	2.9	2.8	2.8
EU-new					
Industry	25.9	26.3	27.1	27.8	28.1
Construction	6.6	6.5	6.4	6.2	6.1
Services	53.1	53.6	54.5	55.3	55.7
Agriculture	7.7	7.3	6.6	5.9	5.6
Energy sector	6.7	6.2	5.4	4.7	4.4

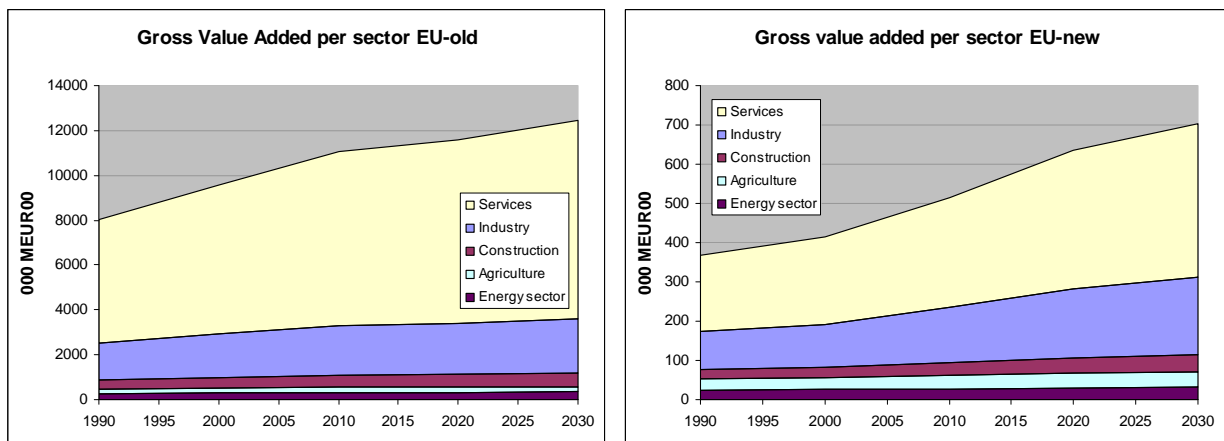


Figure 10: EU-OLD and EU-NEW sectoral gross value added - Low growth scenario

interregional trade, it is expected that also the amounts of traded services will be lower than in the baseline and high growth scenarios. This indicates that, in this scenario, the produced and consumed amounts of services must be more balanced from a regional perspective.

The per capita GDP increases in the EU-OLD from 21.138 EUR00 in the year 2000 to 27.748 EUR00 in 2035. In the EU-NEW a per capita GDP of 5.974 EUR00 is reached in 2035. These values are much smaller than the ones obtained in the baseline scenario, which can be explained not only by the lower growth rates, but also by the higher population numbers.

When comparing the total value added figures for the baseline and the low growth scenario, it is interesting to note that in the low growth scenario the GDP differences between the EU-OLD and EU-NEW are smaller than in the baseline. When normalized to population, however, the GDP differences are much smaller in the baseline, indicating a faster convergence.

3.4 Energy consumption

A fundamental assumption behind this scenario is the progressive depletion of oil resources, which reflects the prevailing view as to the finiteness of conventional oil. The decline in the oil market is not to be interpreted as a physical running out, but as a gradual replacement process with other alternatives as oil prices rise. In this scenario oil and natural gas satisfy the demand for primary energy sources as the oil availability declines. In the EU-OLD, there is a larger increase in the gas than in the coal consumption (when observing the period 2000-2035), while in the EU-NEW there is a much more pronounced increase in the coal than in the gas consumption (Figure 11).

Renewable energy sources only increase their importance marginally, since the development of them is limited on the one hand by the slow technological progress and slower economic growth rates. On the other hand, the high population growth limits the availability of land for energy biomass production.

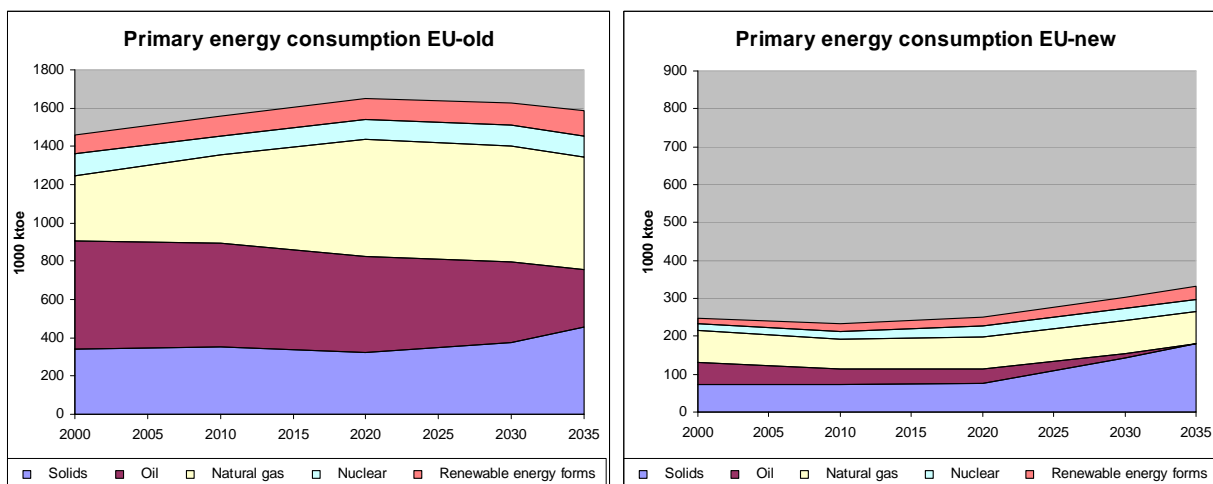


Figure 11: EU-OLD and EU-NEW primary energy consumption – Low growth scenario

The energy efficiency (energy demanded/GDP) shows a larger increase in the EU-NEW than in the EU-15. This occurs because the EU-NEW has a higher growth rate, meaning that the industry can restructure more easily, and also because there is a larger potential for increasing the energy efficiency.

The final energy demand projections also show a decrease in the oil consumption and an increase in the electricity use (Figure 12).

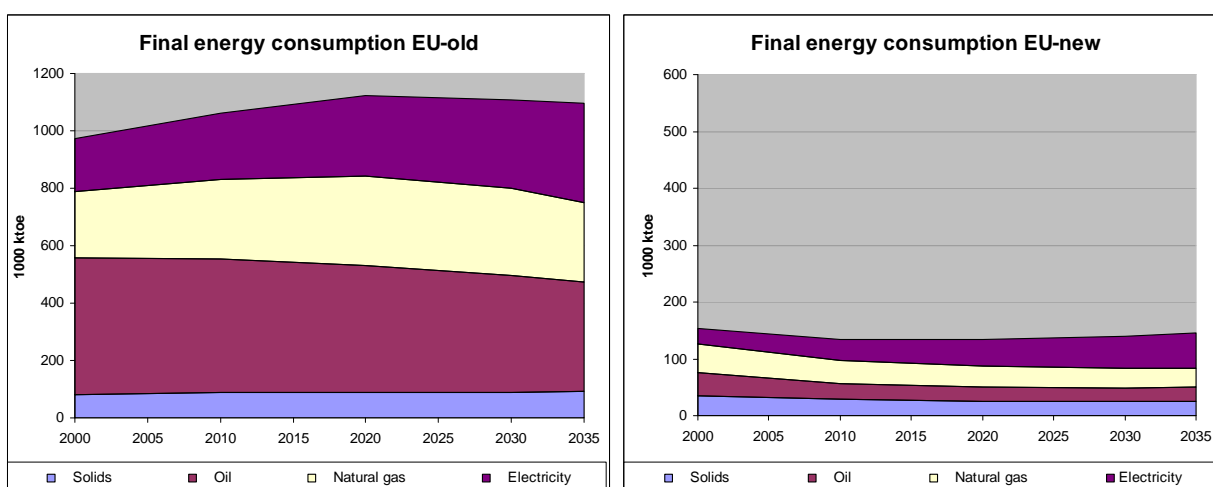


Figure 12: EU-OLD and EU-NEW final energy demand – Low growth scenario

3.5 Energy prices

The prices of fossil fuels show a progressive increase during the projection period (Table 10). Oil and gas show the highest increases, while coal prices increase more moderately. Unlike the situation in the baseline, the oil-gas price gap does not close with time, but continues to increase. When comparing to the baseline, the price of oil is higher in this scenario (reflecting the progressive depletion of oil resources), while gas and coal have lower prices.

Table 10: Fossil fuel prices evolution – Low growth scenario

	1990	2000	2010	2020	2030	2035
	U\$1990 / GJ					
Crude oil	3.9	5.4	7.4	10.2	11.1	11.6
Natural gas	1.6	2.0	2.5	3.2	3.9	4.3
Hard coal	1.0	1.2	1.4	1.7	1.8	1.8

3.6 Fossil CO₂ Emissions

Fossil fuel CO₂ emissions grow for the EU-OLD as well as for the EU-NEW (Figure 13). The emissions in this scenario are higher than the emissions in the baseline, even considering a lower primary energy demand. The main reason for this is the lower technological development and innovation in the low growth scenario.

Table 11: CO₂ emission growth rate (%) – Low growth scenario

	CO ₂ Emission growth rate (%)			
	2000-2010	2010-2020	2020-2030	2030-2035
EU-old	0.67	0.31	0.04	0.46
EU-new	-1.15	0.28	2.39	2.41

When comparing the CO₂ growth rates (Table 11) with the sectoral GDP growth rates, no clear relationship becomes evident. The growth rates of both, GDP and CO₂ emissions are in almost all cases positive. Since the gross value added grows faster than the emissions there is a decline in the emission coefficient (Table 12).

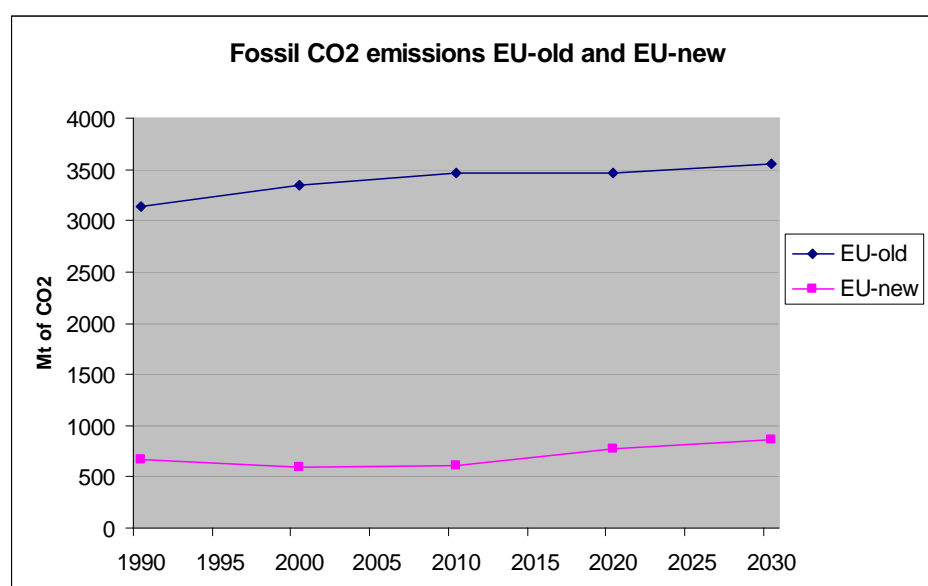


Figure 13: EU-OLD and EU-NEW fossil CO₂ emissions – Low growth scenario

Table 12: CO₂ emission coefficients – Low growth scenario

	Emission coefficients (kg/000EUR00)				
	2000	2010	2020	2030	2035
EU-old	0.37	0.33	0.29	0.28	0.27
EU-new	1.60	1.26	1.05	1.07	1.09

The share of non fossil fuel CO₂ emissions (with respect to the total anthropogenic CO₂ emissions) increases until 2020, and declines from there on. The proportion of non fossil fuel CO₂ reaches a maximum of 9.3 % in the EU-NEW and 5.7 % in the EU-OLD (Table 13). This CO₂ comes primarily from land use changes.

Table 13: Share of other anthropogenic CO₂ emissions in the total anthropogenic CO₂ emissions (%) – Low growth scenario

	2000	2010	2020	2030	2035
EU-old	0.0	3.6	5.7	5.4	4.7
EU-new	0.0	3.8	9.3	8.8	7.3

3.7 Other Emissions

The SO_x, CH₄ and NMVOCs emissions were taken from the scenario result. For the projection of the NO_x emissions the growth rate of N₂O was used and for the NH₃ emissions it was assumed they have a similar growth rate than CH₄. For PM_{2.5} an average of different growth rates was used for the EU-OLD, while the N₂O emissions were used in the EU-NEW.

It can be seen that all emissions increase, except the SO_x emissions in the EU-OLD which decrease from 6079 kt in the year 2000 to 2516kt in 2035 (Figure 14 and Figure 15).

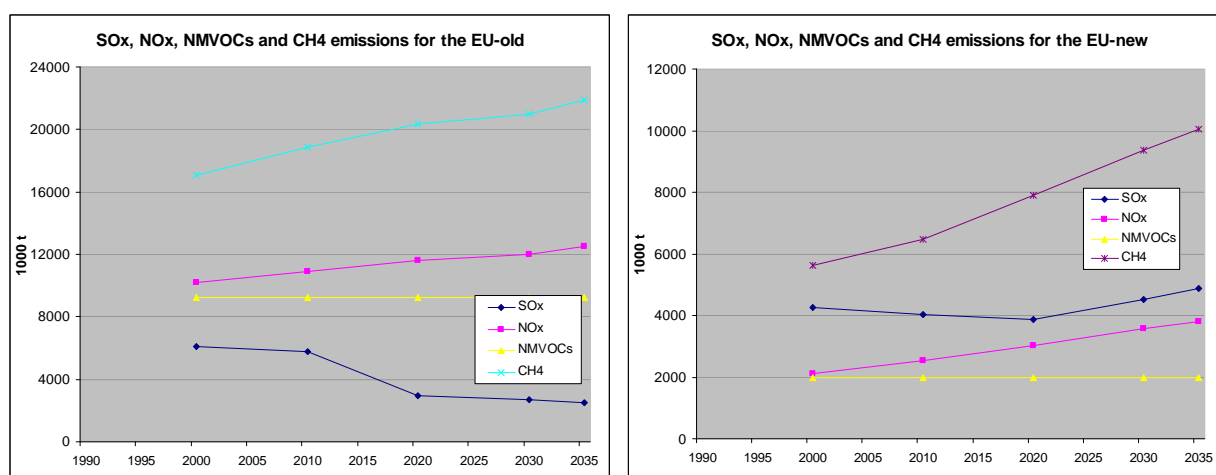


Figure 14 : EU-OLD and EU-NEW SO_x, NO_x, NMVOCs and CH₄ emissions – Low growth scenario

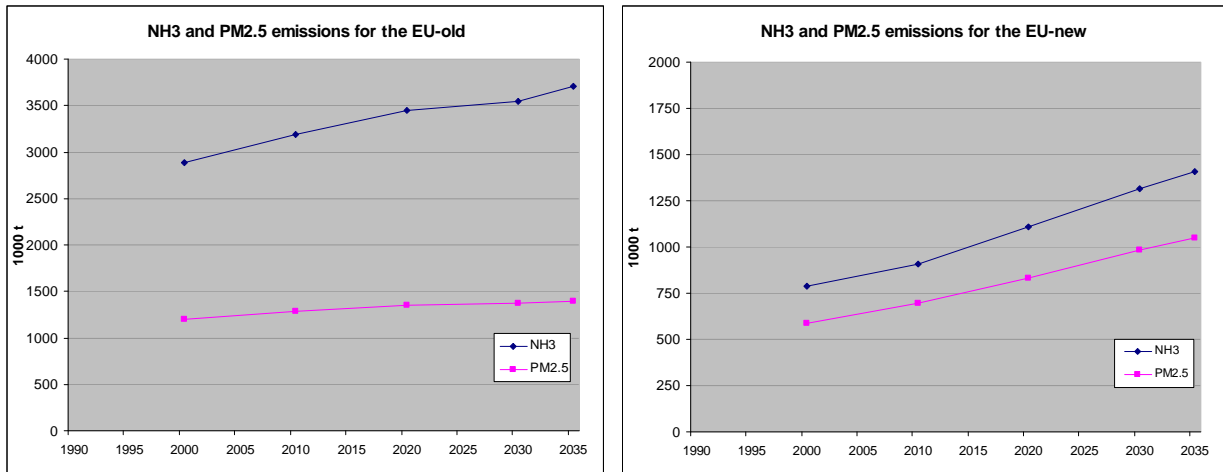


Figure 15: EU-OLD and EU-NEW NH₃ and PM_{2.5} emissions – Low growth scenario

For emissions other than CO₂ there is also a decline in the emission coefficients (Table 14). In comparison to the baseline, this scenario has higher coefficients for all emissions. This can be explained by the slower technological development and innovation in the low growth scenario caused by a more regionalised economy. Also the slower GDP growth rates and higher population suggest that there is less income available for environmental protection than in the baseline.

Table 14: Emission coefficients for emissions other than CO₂ – Low growth scenario

	Emission coefficients				
	2000	2010	2020	2030	2035
EU-old					
SO _x (t/MEUR00)	0.71	0.56	0.25	0.22	0.19
NO _x (t/MEUR00)	1.19	1.06	0.98	0.97	0.94
NH ₃ (t/MEUR00)	0.34	0.31	0.29	0.29	0.28
NMVOC (t/MEUR00)	1.08	0.90	0.78	0.74	0.69
CH ₄ (t/MEUR00)	1.98	1.84	1.72	1.69	1.64
PM _{2.5} (t/MEUR00)	0.14	0.12	0.11	0.11	0.10
EU-new					
SO _x (t/MEUR00)	10.23	8.62	6.66	6.33	6.14
NO _x (t/MEUR00)	5.12	5.42	5.20	4.98	4.81
NH ₃ (t/MEUR00)	1.90	1.94	1.91	1.83	1.77
NMVOC (t/MEUR00)	4.78	4.24	3.41	2.76	2.50
CH ₄ (t/MEUR00)	13.57	13.84	13.62	13.07	12.65
PM _{2.5} (t/MEUR00)	1.41	1.49	1.43	1.37	1.32

3.8 Other characteristics

The low growth scenario also provides information about changes in the land uses. It can be seen that in the EU-NEW the area covered by forests decreases at the expense of cropland and grassland areas. In the EU-OLD no important changes can be observed (Table 15).

Table 15: Land use share of different vegetation covers – Low growth scenario

	Land use share (%)			
	2000	2010	2020	2030
EU-old				
Cropland	13.3	13.7	14.3	14.5
Grasslands	26.2	27.3	28.8	29.3
Energy Biomass	0.1	0.2	0.3	0.4
Forest	29.8	29.5	28.6	28.0
Others	30.6	29.3	28.0	27.7
EU-new				
Cropland	12.5	13.3	14.5	15.5
Grasslands	17.2	18.7	21.0	23.0
Energy Biomass	0.0	0.0	0.1	0.3
Forest	42.7	41.8	39.6	37.0
Others	27.5	26.1	24.8	24.2

3.9 Model used

The model used by the IPCC authors to build this scenario was the Mini Climate Assessment Model. This model combines a module to estimate global GHG emissions with an energy model (providing information on the relationships of energy, economy and GHG emissions) and an agriculture, forestry and land use model. In addition, some tools for estimating regional climate changes as well as damage functions for the estimation of its impacts are included.

The model uses a straightforward population times labour productivity process to estimate aggregate labour productivity levels. A partial equilibrium model uses prices to balance energy supply and demand for all primary energy categories (coal, oil, gas, nuclear, hydro, solar and biomass).

The land use model considers different technical change coefficients for crops, livestock, forestry and modern biomass production.

The biomass, which is supplied from agriculture to the energy sector, provides the link between the land use model and the energy use model.

Once the model reaches equilibrium, the GHG emissions are calculated. The CO₂, CH₄ and N₂O energy derived emissions reflect fossil fuel use by type of fuel, while the agriculture derived emissions reflect land use changes, fertiliser use and the amount and type and amount

of livestock. These emissions are used as inputs to the climate change module, providing information about GHG concentrations, changes in radiative forcing and consequent changes in global mean temperature. This change in temperature is then used in another module that provides information about climatic patterns and produces estimates for regional changes in precipitation, temperature and cloud cover. Finally, the damage functions are used to estimate market and non market based damages.

4 HIGH GROWTH SCENARIO

4.1 Description

This scenario is characterised by high and successful economic development. When looking at a global scale, it is seen that regional average income per capita converges and that current distinctions between “poor” and “rich” countries eventually dissolved (This happens, however, only by the end of this century). Also on a European scale the disparities disappear, and the consumption of both tangible and intangible commodities increases steadily.

The primary dynamics of this development are: a strong commitment to market-based solutions, high savings and commitment to education at household level, high rates of investment and innovation in education, technology and institutions and national and international levels and a high mobility of people, technologies and ideas.

There are important advances in communication and transportation technologies, enabling the fast exchange of people and knowledge. Technological development contributes to an abundant supply of energy and mineral resources by increasing the amount of economically recoverable reserves and also by reducing the energy and material intensity needed to produce a given level of resources.

The demographic and economic trends are closely linked in this scenario, as affluence is correlated with long life and small families (low fertility and low mortality), leading to a moderate population growth. The increase of average age of the population creates some problems such as a reduction of the available workforce, a possible reduction of average productivity and the extension of the period after retirement, where people need an income. These problems are solved by more education and training during the whole working life and through a flexible accumulation of private savings in private pension systems.

The increase in per capita income causes a higher valuation of the natural environment and facilitates the implementation of environmental policies. These would concern the water and air qualities (health protection), traffic congestion, noise reduction and land use. Economic instruments are assumed to be the preferred policy instrument. The natural amenities are valued and the rapid technological development “frees” natural resources currently devoted to provision of human needs for other purposes. The concept of environmental quality changes from the current emphasis on conservation to an active management of natural and environmental services, which increases ecologic resilience.

The rapid increase in income shifts the dietary pattern initially toward an increased consumption of meat and dairy products, but might subsequently decrease as a result of the increased emphasis on health of an ageing society. High incomes also translate into a high car ownership, sprawling suburbia and dense transport networks.

4.2 Population

In this scenario the income increase leads to a reduction of the population growth rates. The growth rate in the EU-OLD is larger than in the EU-NEW. This leads to a 2035 population of 450 million in the EU-OLD and to 110 million in the EU-NEW. The population growth in the EU-OLD is higher until 2020, when it starts to desaccelerate. In the EU-NEW there is a slight increase in population until 2020, after which the growth rate becomes negative (Figure 16).

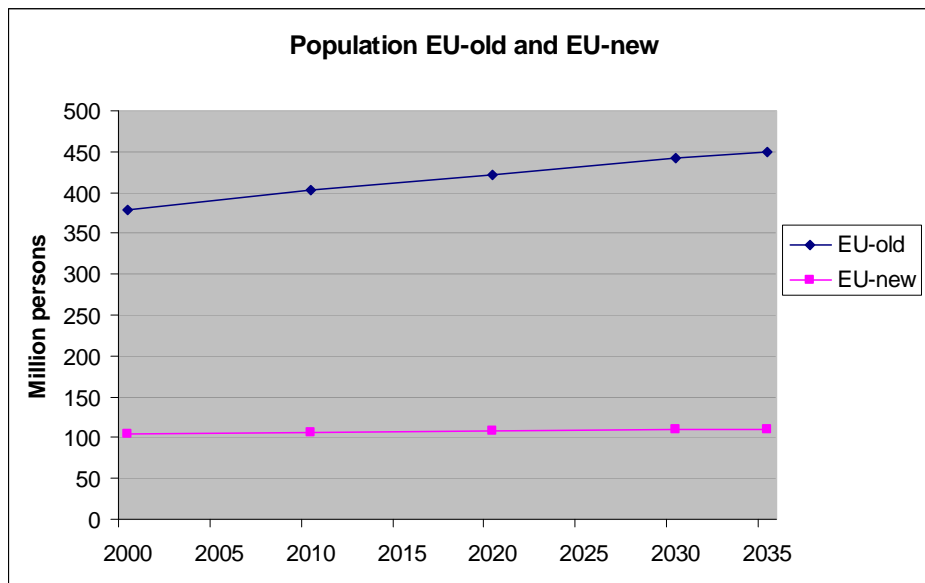


Figure 16: Population in the EU-OLD and EU-NEW from 1990 to 2035 – High growth scenario

4.3 GDP

The total sectoral growth rates can be seen in Table 16. The growth rates are much higher in the EU-NEW, indicating a convergence towards EU-OLD levels.

When looking at the period between the year 2000 and 2035, it can be seen that the growth rate declines with time for all activities. The highest growth rates are found in the services and industry sectors, followed by the construction sector. Agriculture and the energy sectors have the lowest growth rates.

The EU-OLD per capita GDP shows an increase from 26.145 EUR00 in the year 2000 to 45.915 EUR00 in 2035. In the EU-NEW it rises from 3.974 EUR00 in 2000 to 24.634 EUR00 in 2035. These values are higher than the ones obtained in the low growth and also in the baseline scenarios.

Table 16: Gross value added growth rate – High growth scenario

	Gross value added growth rate (%)			
	2000-2010	2010-2020	2020-2030	2030-2035
EU-old				
Total economy	2.9	2.8	2.2	1.8
Industry	2.7	2.6	2.0	1.7
Construction	2.0	2.0	1.5	1.3
Services	3.1	3.1	2.4	1.9
Agriculture	1.2	1.1	0.9	0.7
Energy sector	2.0	1.8	1.4	1.1
EU-new				
Total economy	3.9	6.5	6.1	5.4
Industry	4.4	7.0	5.7	5.1
Construction	3.5	5.7	5.5	4.8
Services	4.2	7.0	6.7	5.8
Agriculture	2.0	3.3	3.3	2.8
Energy sector	1.3	2.2	2.2	1.9

With respect to the share of each activity in the total gross value added, it can be seen that the construction, agricultural and energetic sectors decrease their GDP share between 2000 and 2035, while the service sector increases its importance (Table 17). The industrial sector diminishes its GDP share in the EU-OLD. In the EU-NEW it increases until 2020 and decreases thereafter. The most important differences between the EU-OLD and EU-NEW countries are the shares of the service sector (which is higher in the EU-OLD) and in the industrial sector (which is higher in the EU-NEW). In 2035 the service sector is responsible for 73 % of the gross value added in the EU-OLD, while in the EU-NEW they account only for 62 %. The share of the industrial sector, on the other hand accounts for 18 % of the gross value added in the EU-OLD and for 27 % in the EU-NEW.

Table 17: Sectoral share of gross value added – High growth scenario

	Share of total gross value added (%)				
	2000	2010	2020	2030	2035
EU-old					
Industry	20.3	18.9	18.7	18.5	18.4
Construction	5.4	4.9	4.7	4.5	4.4
Services	68.6	71.1	72.1	72.8	73.2
Agriculture	2.5	2.1	1.9	1.7	1.6
Energy sector	3.2	3.0	2.7	2.5	2.4
EU-new					
Industry	25.9	27.3	28.5	27.7	27.3
Construction	6.6	6.3	5.9	5.6	5.4
Services	53.1	54.7	57.3	60.7	62.0
Agriculture	7.7	6.4	4.7	3.6	3.2
Energy sector	6.7	5.3	3.5	2.4	2.0

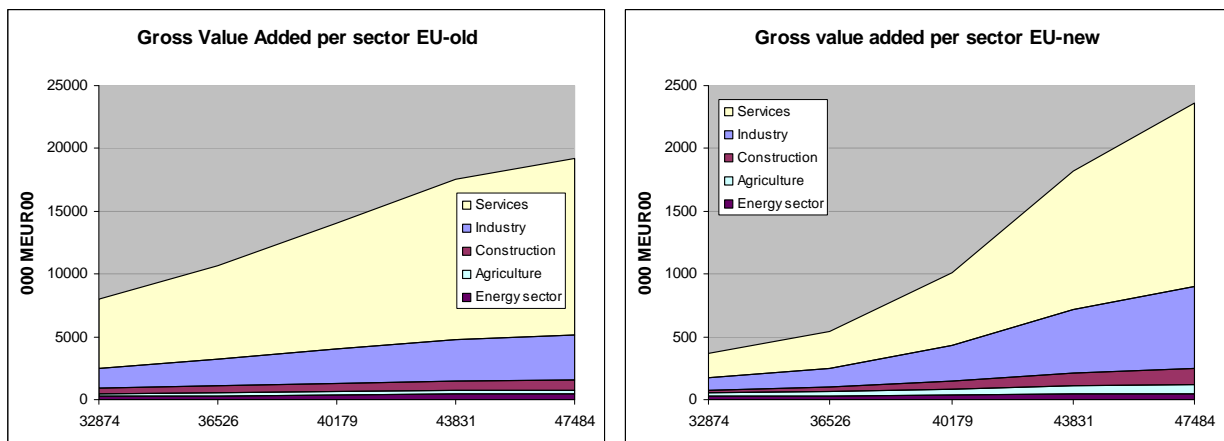


Figure 17: EU-OLD and EU-NEW sectoral gross value added - High growth scenario

Figure 17 shows clearly that the services sector is responsible for most of the GDP increase between 2000 and 2035. This high growth of the service sector might be partly in the form of increasing monetisation of activities that were not included previously in GDP accounts (e.g., childcare, household work).

This increase in the production of services is probably accompanied by an increase in the consumption of them (see section 2.1). The remaining differences between the produced and consumed amounts of services must be equilibrated by trade. This scenario presents an interconnected world, with falling trade barriers, dense transport networks and significant developments in transport and communication technologies. This allows, on one hand, an increased mobility of the population (thus being able to consume services provided in other areas). On the other side, the IT and communication technologies create more possibilities for a consumption of services with no direct interaction with the producer (e.g. distance education).

4.4 Energy consumption

The amount of primary energy consumed in the EU-OLD peaks in 2030 and starts to decline from there on. The amount of solid fossil fuels stays almost constant, while the amount of consumed oil and gas increases until 2020 and declines after that. The amount of renewable energy forms also shows an increase. When looking at the overall structure of primary energy consumption it becomes clear that energy consumption relies even in 2035 strongly on fossil fuels, which supply over 70 % of the consumed energy (Figure 18).

The EU-NEW shows an increase in the primary energy consumption, which is satisfied by an increase of all primary energy sources. The share fossil fuels in the primary energy consumption is even higher than in the EU-OLD.

The decrease in energy intensity (energy demanded/GDP) confirms the above mentioned explanation. The energy intensity in the EU-OLD decreases from 0.17 toe/MEUR00 in 2000

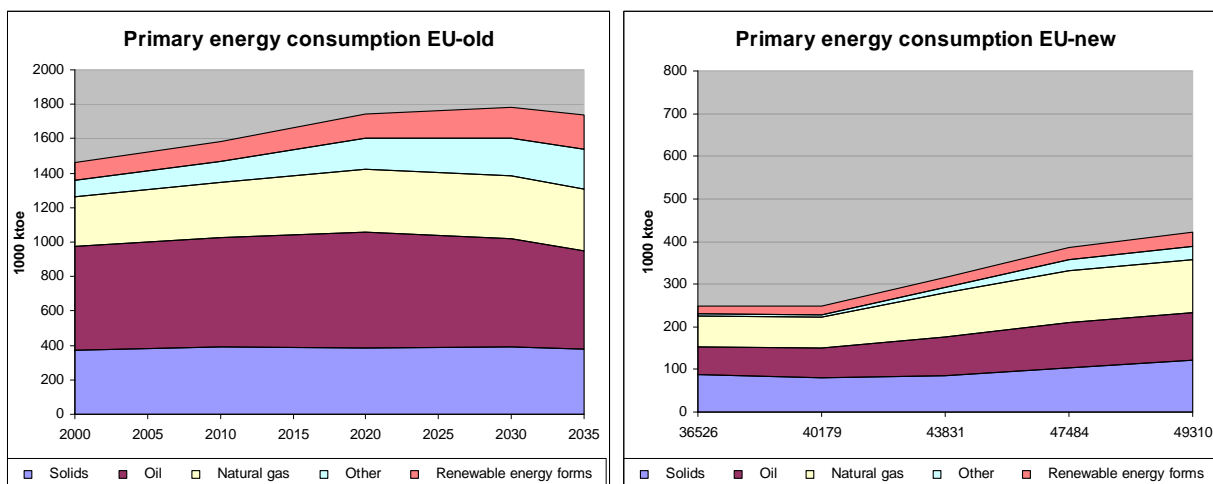


Figure 18: EU-OLD and EU-NEW primary energy consumption – High growth scenario

to 0.08 toe/MEUR00 in 2035. The EU-NEW exhibits an energy intensity decrease from 0.6 toe/MEUR00 in the year 2000 to 0.15 toe/MEUR00 in 2035.

Figure 19 shows the development of the final energy demand, which increases both in the EU-OLD and EU-NEW. An important characteristic is the large increase in electricity demand, driven by the higher standards of living.

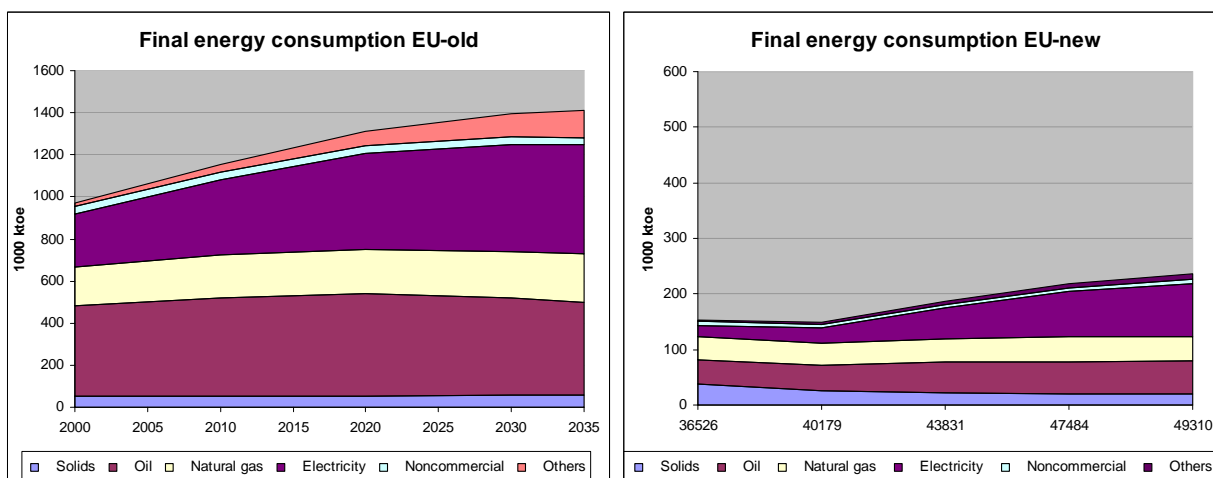


Figure 19: EU-OLD and EU-NEW final energy demand – High growth scenario

4.5 Energy prices

There were no available projections of fossil fuel prices for the A1-IMAGE model. Because of this, prices of other A1 models (Minicam and ASF) were put together on a table to provide some reference values (Table 18)

The oil prices show the largest increase, while natural gas and coal prices remain almost stagnant in one model (ASF) and show a small increase in the other (Minicam). In comparison with the other scenarios it is observed that this scenario has, in general, lower prices. This is primarily an effect of technological development.

Table 18: Fossil fuel prices evolution – High growth scenario

		1990	2000	2010	2020	2030	2035
		U\$1990 / GJ					
Crude oil	Minicam	3.9	5.1	6.6	8.6	9.2	9.5
	ASF		4.4	4.8	5.3	5.8	6.1
Natural gas	Minicam	1.6	1.9	2.3	2.8	3.1	3.3
	ASF		5.0	5.0	5.0	5.1	5.1
Hard coal	Minicam	1.0	1.2	1.4	1.6	1.7	1.7
	ASF		1.5	1.5	1.6	1.7	1.7

4.6 CO₂ emissions

The fossil CO₂ emissions for the EU-OLD remain almost constant (by around 3137 Mt CO₂) until the year 2035, while the EU-NEW emissions show an increase from 664 Mt of CO₂ in 2000 to 1069 Mt of CO₂ in the year 2035 (Figure 20).

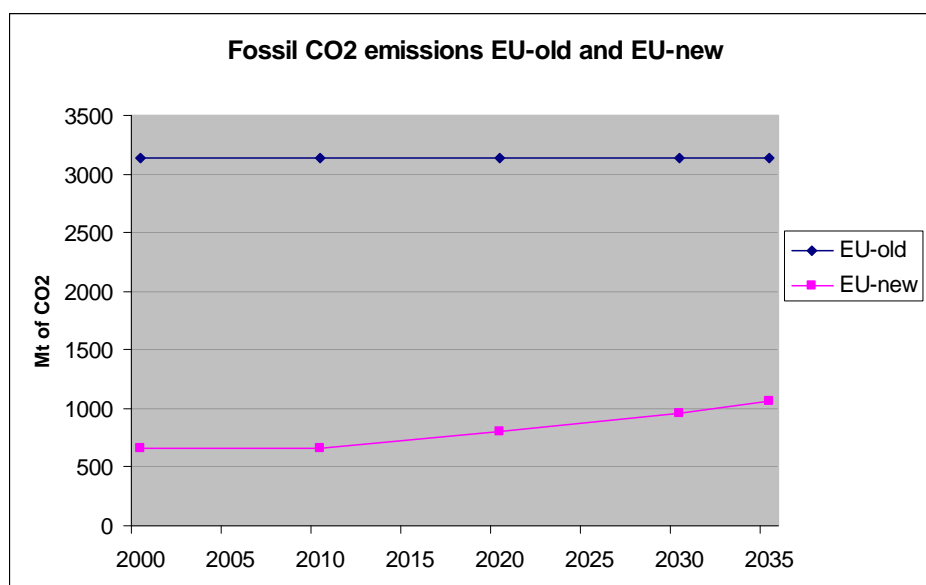


Figure 20: EU-OLD and EU-NEW fossil CO₂ emissions – High growth scenario

When comparing to the baseline, it can be seen that the situation is different in the EU-old than in the EU-new (Table 19). In the EU-15 there is no growth in the CO₂ emissions in the high growth scenario, while there is a positive growth in the baseline. For the EU-new, on the other hand, the growth rate of CO₂ emissions is higher in the high growth scenario than in the baseline. This is caused by the higher gross value added growth rates.

Table 19: CO₂ emission growth rate – High growth scenario

	CO ₂ Emission growth rate (%)			
	2000-2010	2010-2020	2020-2030	2030-2035
EU-old	0.00	0.00	0.00	0.00
EU-new	0.00	2.01	1.67	2.08

Table 20: CO₂ emission coefficients – High growth scenario

	CO ₂ Emission coefficients (kg/000EUR00)				
	2000	2010	2020	2030	2035
EU-old	0.37	0.30	0.22	0.17	0.15
EU-new	1.60	1.09	0.71	0.47	0.40

When comparing the CO₂ emission coefficients to the ones in the baseline, it is seen that they are smaller in the high growth scenario (Table 20).

The share of non fossil fuel CO₂ emissions of anthropogenic origin is more important in the EU-NEW (Table 21). The EU-NEW has negative emissions, indicating that the CO₂ is being sequestered. This is the effect of a land cover management, which considers CO₂ emission minimization as one of its objectives.

Table 21: Share of other anthropogenic CO₂ emissions in the total anthropogenic CO₂ emissions (%) – High growth scenario

	2000	2010	2020	2030	2035
EU-old	0.0	3.1	1.8	-0.9	0.1
EU-new	0.0	-1.0	-9.2	-25.4	-26.6

4.7 Other emissions

The SO_x, NO_x, NMVOCs and CH₄ emissions were taken from the scenario result. The emissions for NH₃ and PM_{2.5} were taken from the case A scenario published by Amman *et al.* (2007). This scenario assumes that there are strong reductions in the emissions. Since this was not confirmed when considering the emissions calculated by the model (Figure 21), it was assumed that the 2020 targets were reached only in the year 2035 in the EU-OLD. For the EU-NEW these reductions resulted in very different patterns than the ones observed in Figure 21. Because there was information for SO_x provided by the IPCC model and also available information about targets in Amman *et al.* (2007), it was possible to obtain the achieved reductions. This proportion of achieved reductions was used for projecting the NH₃ and PM_{2.5} emissions until 2020, after which they were assumed to remain constant (Figure 22).

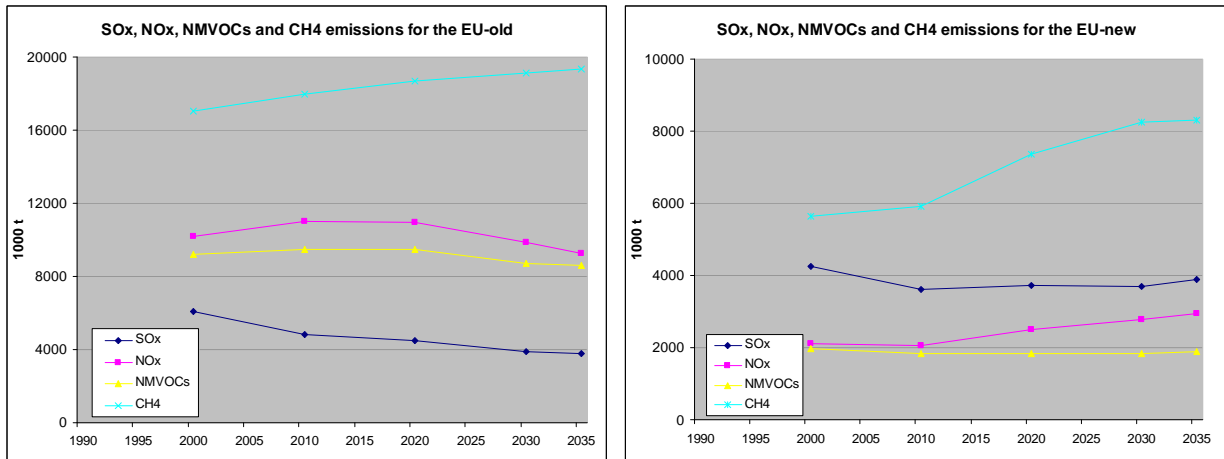


Figure 21: EU-OLD and EU-NEW SO_x, NO_x, NMVOCs and CH₄ emissions – High growth scenario

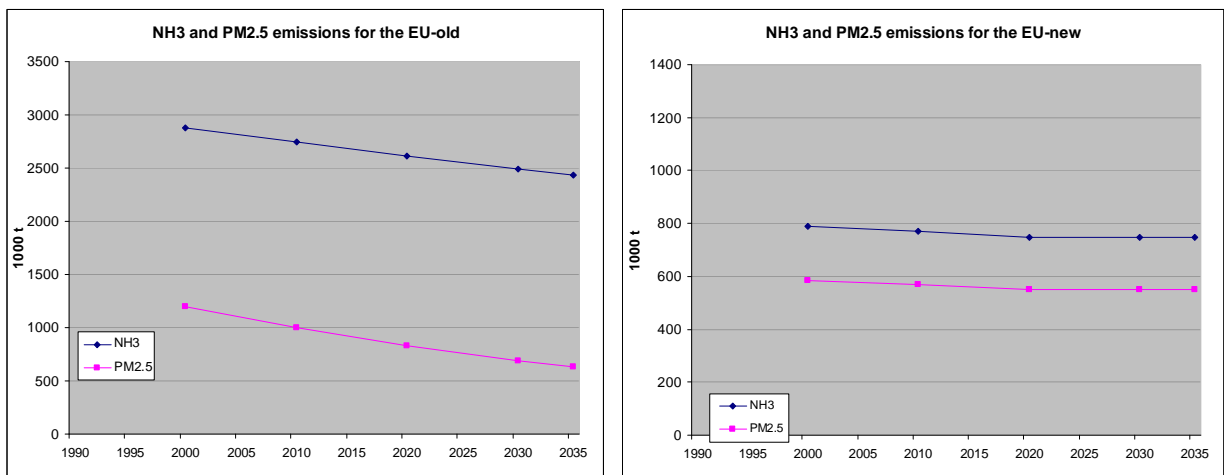


Figure 22: EU-OLD and EU-NEW NH₃ and PM_{2.5} emissions – High growth scenario

It is seen that the level of SO_x, NO_x and NMVOCs emissions in the EU-OLD are lower in the year 2035 than in 2000. The CH₄ emissions, however, increase steadily. In the EU-NEW the SO_x emissions are lower in the year 2035 compared to the year 2000, but the emissions of NO_x and CH₄ increase. The NMVOCs emissions stay constant. The PM_{2.5} and NH₃ emissions decline stronger in the EU-OLD than in the EU-NEW.

Table 22 shows the emission coefficients. When comparing to the values in the baseline it can be seen that in 2035 the high growth scenario has lower coefficients for NH₃, CH₄ and PM_{2.5}, as would be expected due to the higher importance that environmental aspects have in comparison to the baseline. The reason for the SO_x, NO_x and NMVOCs emission coefficients being higher in the high growth scenario are differences in the assumptions and methodologies for calculating and forecasting the emissions in both cases.

Table 22: Emissions coefficients for other emissions than CO₂ – High growth scenario

	Emission coefficients				
	2000	2010	2020	2030	2035
EU-old					
SO _x (t/MEUR00)	0.71	0.46	0.32	0.21	0.18
NO _x (t/MEUR00)	1.19	1.05	0.78	0.53	0.45
NH ₃ (t/MEUR00)	0.34	0.26	0.19	0.13	0.12
NMVOC (t/MEUR00)	1.08	0.90	0.68	0.47	0.42
CH ₄ (t/MEUR00)	1.98	1.71	1.33	1.03	0.94
PM2.5 (t/MEUR00)	0.14	0.09	0.06	0.04	0.03
EU-new					
SO _x (t/MEUR00)	10.23	5.96	3.28	1.80	1.46
NO _x (t/MEUR00)	5.12	3.38	2.18	1.36	1.11
NH ₃ (t/MEUR00)	1.90	1.27	0.66	0.37	0.28
NMVOC (t/MEUR00)	4.78	3.01	1.60	0.89	0.71
CH ₄ (t/MEUR00)	13.57	9.74	6.47	4.02	3.12
PM2.5 (t/MEUR00)	1.41	0.94	0.48	0.27	0.21

4.8 Other characteristics

The share of land covered by each type of vegetation shows minor changes (Table 23). In the EU-OLD, the area covered by grassland decreases at the expense of areas covered by forests and other biomass. In the EU-OLD the area covered by forests increases from 51 % in 2000 to 55 % in 2035, which is partly responsible for the carbon sequestration observed in Table 21.

Table 23: Land use share of different vegetation covers – High growth scenario

	Land use share (%)			
	2000	2010	2020	2030
EU-old				
Cropland	11.7	11.7	11.9	11.8
Grasslands	20.9	18.0	15.9	15.0
Energy Biomass	0.0	0.1	0.3	0.6
Forest	36.0	37.5	38.9	39.3
Others	31.4	32.7	33.0	33.2
EU-new				
Cropland	12.2	9.8	10.0	10.0
Grasslands	17.2	13.5	14.4	14.9
Energy Biomass	0.1	0.0	0.0	0.2
Forest	50.3	51.5	51.2	54.9
Others	20.2	25.2	24.2	20.0

4.9 Model used

The model used by the authors of this scenario is the *Integrated Model to Assess the Greenhouse Effect* (IMAGE 2). This model consists of three sub-systems of models (Consortium for International Earth Science Information Network, 1995):

- The energy-industry system, which computes the greenhouse gases in 13 world regions as a function of energy consumption and industrial production. End use energy consumption is computed from various economic driving forces. This system includes a number of modules: Energy-economy, Energy emissions, Industrial production and Industrial emissions.
- The terrestrial environment system, which simulates the changes in global land cover on a grid scale described by climatic and economic factors. The role of land cover and other factors are then taken into account to compute the fluxes of CO₂ and other greenhouse gases from the biosphere to the atmosphere. This system includes the following modules: Agricultural demand, Terrestrial vegetation, Land cover, Terrestrial carbon and Land use emissions.
- The atmosphere-ocean system, which computes the build-up of greenhouse gases in the atmosphere and the resulting zonal average temperature and precipitation patterns. It includes following modules: Atmospheric composition, Zonal atmospheric climate, Oceanic climate and Oceanic biosphere/chemistry.

In order to provide a long-term perspective of climate change, the model's time horizon extends to the year 2100. The time steps of different submodels vary, depending on their mathematical and computational requirements, but vary typically from one day to five years.

5 COMPARISON OF THE THREE SCENARIOS

5.1 Population

The population is lower in the baseline than in the other two scenarios, where the evolution from 2000 to 2035 and also the final values in 2035 are very similar (Figure 23).

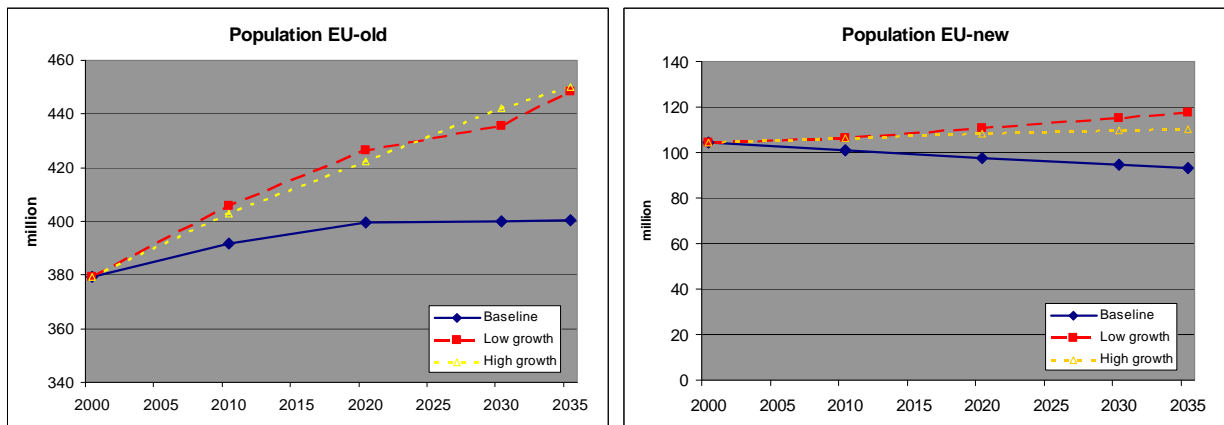


Figure 23: Population projections for all three scenarios

5.2 GDP

The GDP in the year 2035 is higher in the low growth scenario, followed by the baseline. The low growth scenario has the lowest GDP value in 2035 (Figure 24).

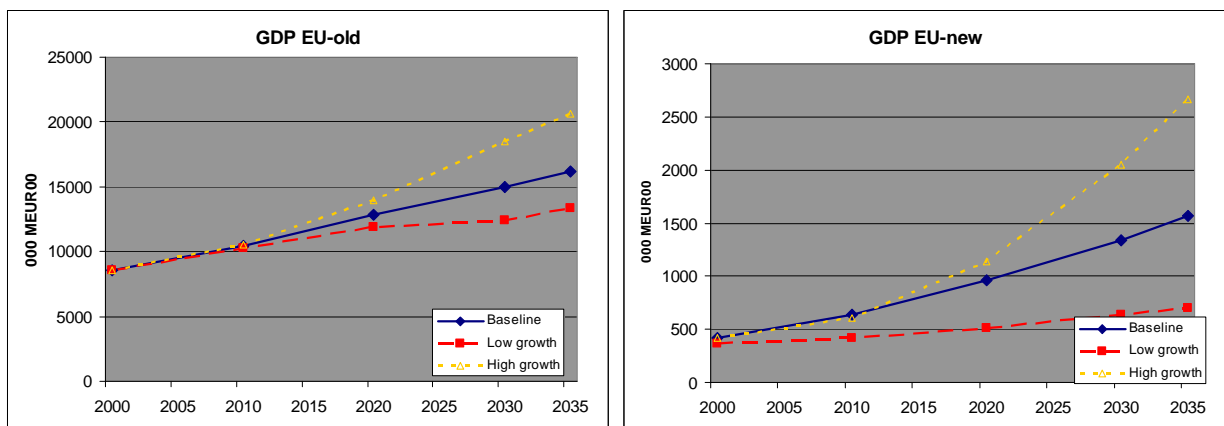


Figure 24: GDP projections for all three scenarios

5.3 CO₂ Emissions

In the EU-OLD the CO₂ emissions are highest in the low growth scenario, followed by the baseline. In the EU-NEW however, the high growth scenario has the highest emissions, while the low growth and the baseline have similar values (Figure 25).

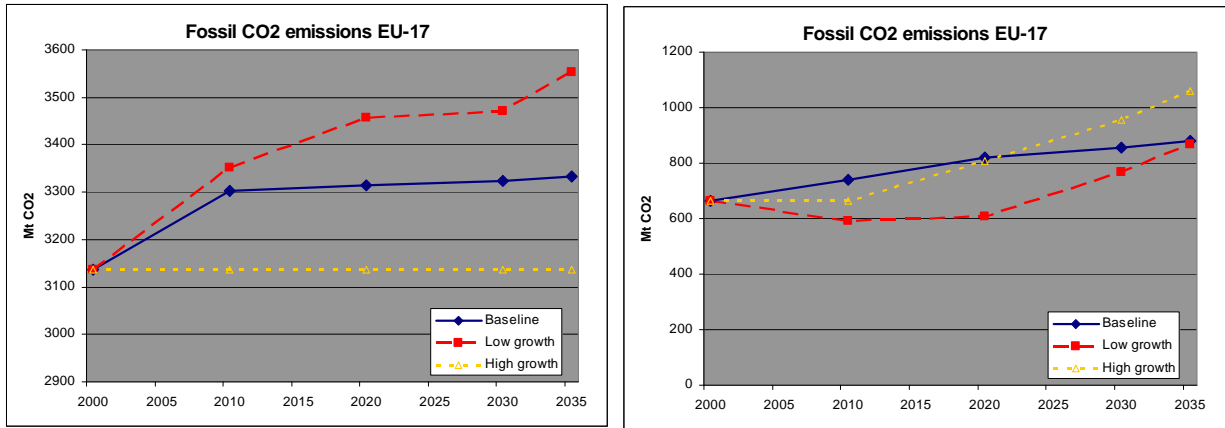


Figure 25: Fossil CO₂ emissions for all three scenarios

5.4 Other Emissions

With respect to the SO_x, NO_x, NMVOCs and CH₄ emissions, it is seen that the baseline has the lowest values. The low growth scenario has the lowest emissions for most of these contaminants (Figure 26 and Figure 27).

The NH₃ emissions are highest for the low growth scenario, followed by the baseline. For PM_{2.5}, the highest emissions are also seen in the low growth scenario, while the other two scenarios have almost the same amount of emissions (Figure 28).

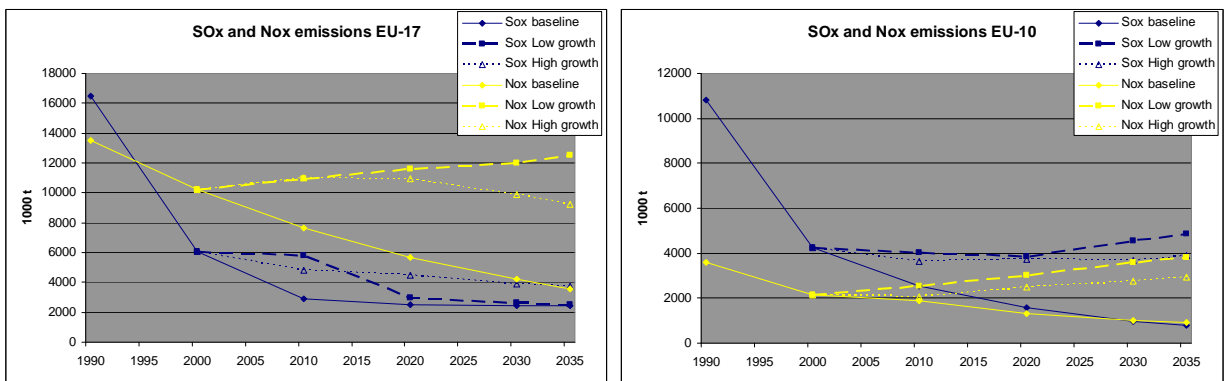


Figure 26: SO_x and NO_x emissions for all three scenarios

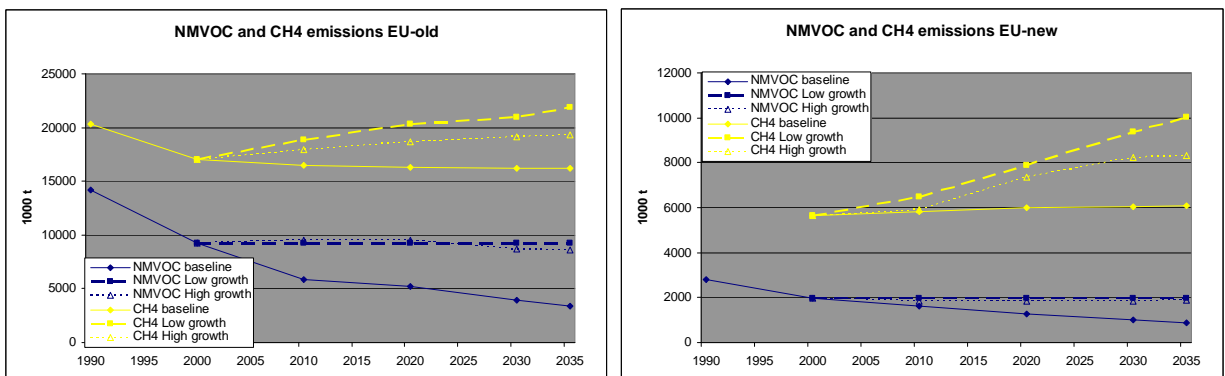


Figure 27: NMVOCs and CH₄ emissions for all three scenarios

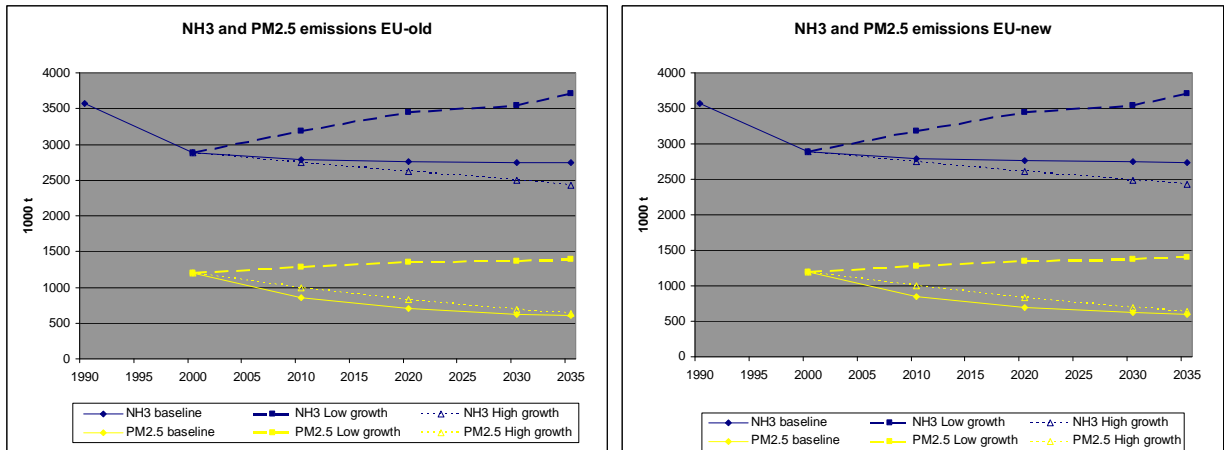


Figure 28: NH₃ and PM_{2.5} emissions for all three scenarios

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ANNEX I

Macroeconomic scenarios for the EU-old and EU-new

- **low growth scenario**
- **high growth scenario**
- **baseline scenario**

Low growth scenario EU-old

	2000	2010	2020	2030	2035
Population (Million)	379.2	405.6	426.4	435.7	448.6
GDP (in 000 MEUR'00)	8586.0	10257.8	11861.5	12398.0	13334.6
Gross Inland Consumption (1000 ktoe)	1460.0	1557.8	1647.6	1625.5	1587.6
Solids	341.7	349.7	320.9	376.0	457.3
Oil	566.8	546.7	504.0	418.9	297.6
Natural gas	338.8	459.4	612.7	608.0	587.5
Nuclear	114.4	98.8	102.7	106.7	113.7
Renewable energy forms	98.3	103.2	107.2	115.9	131.6
Final Energy Demand by fuel (1000 ktoe)	974.1	1061.5	1124.6	1107.6	1097.8
Non-commercial	0.0	0.0	0.0	0.0	0.0
Solids	81.9	88.3	87.4	88.5	91.8
Oil	474.2	463.8	443.5	409.3	379.5
Gas	233.7	278.7	310.4	301.8	279.9
Electricity	184.5	230.8	283.3	308.0	346.5
Other	0.0	0.0	0.0	0.0	0.0
Energy intensity (toe/MEUR'00)	170.0	151.9	138.9	131.1	119.1
Oil intensity (t/MEUR'00)	64.8	52.3	41.7	33.2	21.9
Natural gas intensity (t/MEUR'00)	47727.6	54172.5	62489.7	59325.6	53292.3
Solid fossil fuels intensity (t/MEUR'00)	83.5	69.4	53.4	58.2	64.8
Gross Inl. Cons./Capita (toe/inhabitant)	3.9	3.8	3.9	3.7	3.5

Total fossil CO2 Emissions (Mt of CO2)	3136.7	3352.1	3458.0	3471.7	3552.7
CO2 Emissions Index (1990=100)	102.0	109.0	112.4	112.9	115.5
Other emissions					
SOx (1000 t)	6079	5782	2957	2668	2516
NOx (1000 t)	10197	10913	11619	11981	12504
NH3 (1000 t)	2882	3186	3446	3544	3704
NMVOC (1000 t)	9230	9233	9235	9233	9232
CH4 (1000 t)	17041	18838	20373	20954	21902
PM2.5 (1000 t)	1196	1281	1349	1371	1396

	2000	2010	2020	2030	2035
Gross Value Added (in 000 MEuro'00)	8014.7	9575.3	11072.3	11573.1	12447.3
Industry	1628.8	1920.5	2196.1	2287.4	2446.0
iron and steel	53.5	48.5	52.6	49.2	47.9
non ferrous metals	20.8	24.3	29.2	29.4	30.1
chemicals	156.4	213.0	271.2	297.6	329.1
petrochemicals, fertilisers and others	101.2	123.4	144.1	143.3	146.4
pharmaceuticals and cosmetics	54.6	89.5	127.0	154.0	182.5
non metallic minerals	77.5	88.9	96.1	94.2	95.8
paper, pulp, printing	149.9	182.1	196.8	206.0	222.1
paper and pulp production	51.1	59.6	62.6	63.0	66.3
printing and publishing	98.7	122.3	134.0	142.9	155.9
food, drink, tobacco	191.4	225.1	260.5	270.9	288.5
textiles and leather	118.8	103.6	85.5	71.2	65.7
engineering	692.9	828.8	972.3	1027.9	1108.5
other industries	168.3	206.6	231.7	241.5	258.4
Construction	434.2	491.9	544.4	561.5	590.7
Services	5496.9	6659.7	7785.9	8164.7	8828.3
market services	1982.6	20579.8	2998.3	3214.4	3531.5
non-market services	1776.0	1444.4	2253.2	2196.8	2230.4
trade	1738.5	0.0	2534.4	2753.9	3066.3
Agriculture	198.2	213.2	226.2	230.3	237.3
Energy sector	256.6	290.1	319.7	329.1	345.1

Low growth scenario EU-new

	2000	2010	2020	2030	2035
Population (Million)	104.4	106.5	110.5	115.2	117.7
GDP (in 000 MEUR'00)	414.8	467.2	580.2	716.3	793.2
Gross Inland Consumption (1000 ktoe)	248.6	232.4	250.0	304.2	333.5
Solids	74.3	74.0	76.2	143.0	179.6
Oil	57.6	41.0	37.1	12.4	0.0
Natural gas	84.6	76.4	86.0	86.9	84.5
Nuclear	16.6	21.7	26.8	30.8	33.1
Renewable energy forms	15.5	19.3	23.9	31.2	36.3
Final Energy Demand by fuel (1000 ktoe)	153.7	134.0	134.5	140.7	145.3
Non-commercial	0.0	0.0	0.0	0.0	0.0
Solids	35.4	29.3	25.6	25.6	26.2
Oil	40.1	27.3	25.2	23.6	23.9
Gas	50.6	40.7	35.6	34.7	32.8
Electricity	27.7	36.8	48.1	56.8	62.4
Other	0.0	0.0	0.0	0.0	0.0
Energy intensity (toe/MEUR'00)	599.3	497.4	430.9	424.7	420.5
Oil intensity (t/MEUR'00)	136.5	86.2	62.7	16.9	0.0
Natural gas intensity (t/MEUR'00)	246763.0	197755.6	179370.8	146724.9	128892.3
Solid fossil fuels intensity (t/MEUR'00)	375.7	322.1	259.4	382.7	428.0
Gross Inl. Cons./Capita (toe/inhabitant)	2.4	2.2	2.3	2.6	2.8

Total fossil CO2 Emissions (Mt of CO2)	663.5	591.0	607.5	769.6	866.9
CO2 Emissions Index (1990=100)	71.0	63.3	65.0	82.4	92.8
Other emissions					
SOx (1000 t)	4244	4027	3864	4534	4869
NOx (1000 t)	2125	2532	3015	3570	3814
NH3 (1000 t)	790	907	1108	1314	1408
NMVOC (1000 t)	1981	1979	1978	1980	1982
CH4 (1000 t)	5630	6465	7900	9362	10033
PM2.5 (1000 t)	585	697	830	983	1050

	2000	2010	2020	2030	2035
Gross Value Added (in 000 MEuro'00)	367.8	414.3	514.5	635.2	703.3
Industry	95.2	109.1	139.5	176.7	197.6
iron and steel	4.5	4.3	4.1	3.9	3.6
non ferrous metals	0.9	1.2	1.2	1.2	1.2
chemicals	7.7	7.9	10.1	14.6	17.7
petrochemicals, fertilisers and others	6.0	4.3	4.4	5.5	6.3
pharmaceuticals and cosmetics	1.6	3.4	5.5	9.1	11.3
non metallic minerals	5.7	6.6	8.4	10.6	11.4
paper, pulp, printing	6.3	7.0	8.9	10.8	11.2
paper and pulp production	3.5	2.3	2.6	2.9	2.7
printing and publishing	2.8	4.4	6.3	8.1	8.6
food, drink, tobacco	16.6	23.0	30.8	38.3	42.6
textiles and leather	11.3	9.2	8.8	8.9	8.6
engineering	30.9	36.9	48.6	63.5	72.9
other industries	10.9	13.1	18.8	24.8	28.6
Construction	24.3	27.1	32.8	39.5	43.2
Services	195.1	222.1	280.5	351.5	391.9
market services	47.2	54.7	73.8	95.8	109.2
non-market services	67.6	65.3	70.3	77.9	79.1
trade	80.2	101.9	136.4	177.7	203.7
Agriculture	28.3	30.2	33.7	37.6	39.6
Energy sector	24.8	25.9	27.9	30.0	31.0

High growth scenario EU-old

	2000	2010	2020	2030	2035
Population (Million)	379.2	402.9	422.3	442.3	450.0
GDP (in 000 MEUR'00)	8586.0	10533.3	13980.2	18510.1	20662.9
Gross Inland Consumption (1000 ktoe)	1460.3	1581.2	1743.5	1781.1	1737.1
Solids	371.8	389.2	386.7	388.5	378.3
Oil	603.4	635.4	669.3	633.6	568.3
Natural gas	288.1	323.9	367.9	359.9	359.7
Non fossil electric	94.7	120.9	179.3	221.6	234.5
Renewable energy forms	102.2	111.8	140.3	177.6	196.3
Final Energy Demand by fuel (1000 ktoe)	972.8	1155.9	1313.6	1397.0	1409.6
Non-commercial	36.0	36.0	36.1	35.2	34.4
Solids	51.2	50.4	52.6	55.4	56.0
Oil	430.0	468.1	487.8	463.0	440.0
Gas	187.0	207.1	210.8	222.0	232.5
Electricity	250.4	357.0	457.8	509.7	517.6
Other	18.2	37.2	68.4	111.6	129.1
Energy intensity (toe/MEUR'00)	170.1	150.1	124.7	96.2	84.1
Oil intensity (t/MEUR'00)	69.0	59.2	47.0	33.6	27.0
Natural gas intensity (t/MEUR'00)	40594.4	37196.7	31836.6	23518.9	21056.5
Solid fossil fuels intensity (t/MEUR'00)	90.9	75.2	54.6	40.2	34.6
Gross Inl. Cons./Capita (toe/inhabitant)	3.9	3.9	4.1	4.0	3.9

Total fossil CO2 Emissions (Mt of CO2)	3136.7	3136.7	3136.7	3136.7	3136.7
CO2 Emissions Index (1990=100)	102.0	102.0	102.0	102.0	102.0
Other emissions					
SOx (1000 t)	6079	4795	4477	3908	3765
NOx (1000 t)	10197	11036	10952	9861	9255
NH3 (1000 t)	2882	2745	2614	2490	2430
NMVOC (1000 t)	9230	9487	9487	8718	8589
CH4 (1000 t)	17041	17968	18663	19127	19357
PM2.5 (1000 t)	1196	997	831	692	632

	2000	2010	2020	2030	2035
Gross Value Added (in 000 MEuro'00)	8014.7	10637.4	14084.2	17550.7	19202.3
Industry	1628.8	2116.4	2740.0	3351.7	3638.7
iron and steel	41.1	50.7	58.9	65.6	67.9
non ferrous metals	20.6	28.2	35.2	41.3	43.8
chemicals	180.7	261.4	356.5	450.9	498.3
petrochemicals, fertilisers and others	104.6	138.8	171.7	200.6	212.7
pharmaceuticals and cosmetics	75.9	122.4	184.4	250.0	285.5
non metallic minerals	75.4	92.6	112.8	131.3	139.0
paper, pulp, printing	154.5	189.6	246.7	304.3	331.8
paper and pulp production	50.5	60.3	75.4	90.8	97.7
printing and publishing	103.7	129.2	171.2	213.6	234.1
food, drink, tobacco	190.9	251.0	324.4	395.4	428.1
textiles and leather	87.9	82.4	85.2	90.0	90.8
engineering	703.0	937.1	1231.3	1519.0	1654.8
other industries	175.2	223.3	289.3	354.1	384.2
Construction	434.2	529.4	643.7	750.0	798.2
Services	5496.9	7457.7	10077.7	12749.4	14032.7
market services	139.0	2872.0	3967.5	5100.1	5655.5
non-market services	380.4	2158.3	2711.5	3221.1	3433.8
trade	5463.9	2427.6	3399.1	4428.3	4943.5
Agriculture	198.2	222.6	249.4	272.6	282.6
Energy sector	256.6	311.3	373.3	427.0	450.1

High growth scenario EU-new

	2000	2010	2020	2030	2035
Population (Million)	104.4	106.3	108.3	109.8	110.0
GDP (in 000 MEUR'00)	414.8	607.6	1139.2	2050.6	2665.4
Gross Inland Consumption (1000 ktoe)	248.9	248.2	316.1	385.2	421.6
Solids	88.3	79.0	85.6	104.8	122.0
Oil	65.6	70.0	89.8	104.7	111.0
Natural gas	71.6	74.4	104.1	121.8	124.4
Nuclear	5.4	5.8	13.5	26.5	32.0
Renewable energy forms	18.0	19.1	23.1	27.4	32.2
Final Energy Demand by fuel (1000 koe)	153.5	149.4	187.0	219.5	235.6
Non-commercial	7.3	7.0	7.0	6.6	6.5
Solids	36.9	26.3	21.7	19.6	20.1
Oil	44.7	46.0	55.0	58.4	59.3
Gas	41.9	38.4	43.5	45.5	44.0
Electricity	20.1	27.8	54.4	81.4	95.7
Other	2.6	3.8	5.4	8.0	10.0
Energy intensity (toe/MEUR'00)	600.0	408.4	277.4	187.8	158.2
Oil intensity (t/MEUR'00)	155.2	113.1	77.4	50.1	40.9
Natural gas intensity (t/MEUR'00)	208688.0	148045.9	110505.8	71837.7	56461.6
Solid fossil fuels intensity (t/MEUR'00)	446.7	264.5	148.3	98.0	86.5
Gross Inl. Cons./Capita (toe/inhabitant)	2.4	2.3	2.9	3.5	3.8

Total fossil CO2 Emissions (Mt of CO2)	663.5	663.5	809.5	955.4	1059.3
CO2 Emissions Index (1990=100)	71.0	71.0	86.6	102.3	113.4
Other emissions					
SOx (1000 t)	4244	3623	3735	3692	3879
NOx (1000 t)	2125	2052	2488	2779	2955
NH3 (1000 t)	790	769	749	749	749
NMVOC (1000 t)	1981	1828	1828	1828	1903
CH4 (1000 t)	5630	5920	7369	8238	8310
PM2.5 (1000 t)	585	568	552	552	552

	2000	2010	2020	2030	2035
Gross Value Added (in 000 MEuro'00)	367.8	538.7	1010.2	1818.3	2363.4
Industry	95.2	147.0	288.4	503.3	645.9
iron and steel	3.7	4.3	6.3	9.1	10.6
non ferrous metals	1.0	1.3	2.0	2.9	3.4
chemicals	6.9	10.6	23.8	45.1	59.6
petrochemicals, fertilisers and others	3.7	4.7	9.0	16.1	20.8
pharmaceuticals and cosmetics	2.9	5.8	14.8	28.7	38.8
non metallic minerals	5.7	8.9	17.3	29.0	36.4
paper, pulp, printing	6.2	9.3	17.6	28.6	35.4
paper and pulp production	2.0	2.7	4.7	6.8	8.0
printing and publishing	3.8	6.6	13.2	21.9	27.5
food, drink, tobacco	20.1	32.5	62.5	108.5	138.7
textiles and leather	8.1	9.2	14.5	21.9	26.2
engineering	32.2	51.2	103.7	185.7	241.1
other industries	11.4	19.8	40.5	72.7	94.5
Construction	24.3	34.2	59.5	101.3	127.8
Services	195.1	294.7	579.1	1103.9	1465.7
market services	48.1	77.6	157.8	307.5	412.2
non-market services	57.4	73.9	128.4	222.9	282.1
trade	89.6	143.4	292.9	573.8	771.4
Agriculture	28.3	34.5	47.8	65.8	75.7
Energy sector	24.8	28.3	35.3	44.0	48.3

Baseline scenario EU-old

	1990	2000	2010	2020	2030	2035
Population (Million)	366.709	379.15	391.858	399.777	400.135	400.3
Average household size (persons)	2.6	2.4	2.3	2.1	2.0	1.9
GDP (in 000 MEUR'00)	6890.7	8586	10410.4	12862.2	14982.4	16170.2
Primary Production (ktoe)	707952	761689	709754	580699	551984	560348
Solids	210736	100174	68259	59996	58618	58155
Oil	117781	160551	114818	50828	41597	38144
Natural gas	132976	190579	166420	93035	75017	67541
Nuclear	181438	222846	231521	207163	177587	180405
Renewable energy sources	65020	87538	128736	169681	199167	216102
Net Imports (ktoe)	645824	745358	928786	1099531	1115303	1128826
Solids	89729	110178	135105	123498	159971	185726
Oil	461263	476278	547093	608173	583859	571018
Natural gas	92495	155261	242761	364085	366511	367846
Electricity	2333	3642	3822	3773	4961	4236
Gross Inland Consumption (ktoe)	1322362	1460257	1591053	1628170	1612769	1631478
Solids	303673	215773	203363	183493	218590	241790
Oil	546492	591169	614424	606937	570936	554170
Natural gas	223409	339290	409181	457120	441527	434771
Nuclear	181438	222846	231521	207163	177587	180405
Electricity	2333	3642	3822	3773	4961	4240
Renewable energy forms	65020	87538	128736	169681	199167	216102
Final Energy Demand by sector (ktoe)	868051	972820	1089361	1157965	1166633	1171429
Industry	272900	285288	307325	323660	326760	328549
energy intensive industries	182525	183187	191731	195496	190438	187958
other industrial sectors	90374	102098	115594	128167	136321	140591
Residential	220195	238705	269520	287468	293613	296735
Tertiary	121484	137555	161906	177540	184828	188583
Transport	253472	311273	350609	369301	361433	357562
Final Energy Demand by fuel (koe)						
Solids	79838	35367	28625	25332	21626	20295
Oil	394611	436210	475042	479264	455623	447577
Gas	173015	226415	244664	265493	271099	275184
Electricity	156159	192123	233783	267349	289921	303490
Heat (from CHP and distric heating)	36557	50709	59894	64761	68996	73288
Other	27872	31999	47327	55764	59367	62082
Energy intensity (toe/MEUR'00)	191.9	170.1	152.8	126.6	107.6	100.9
Oil intensity (t/MEUR'00)	77.9	67.6	58.0	46.3	37.4	33.7
Natural gas intensity (t/MEUR'00)	39220	47803	47547	42992	35649	32525
Solid fossil fuels intensity (t/MEUR'00)	95.5	52.7	39.7	28.2	28.0	28.3
Gross Inl. Cons./Capita (toe/inhabitant)	3.6	3.9	4.1	4.1	4.0	4.1

Total fossil CO₂ Emissions (Mt of CO₂)	3075.8	3136.7	3302.5	3313.4	3322.9	3332.4
Power generation/district heating	1023.8	1019.2	1069.3	1042.4	1138.9	1190.5
Energy branch	127.3	127.1	112.8	102.8	89.4	83.4
Industry	546.6	472.9	477	482	452.9	439.0
Residential	420	401.8	427.5	435.1	425.5	420.8
Tertiary	220.7	207.7	225.5	233.5	232.6	232.2
Transport	737.2	908.2	990	1017.55	983.3	966.6
CO₂ Emissions Index (1990=100)	100	102	107	108	108	108
Other emissions						
SO _x (1000 t)	16467	6079	2931	2509	2425	2416
NO _x (1000 t)	13547	10197	7670	5703	4190	3569
NH ₃ (1000 t)	3570	2882	2793	2758	2744	2741
NMVOC (1000 t)	14208	9230	5842	5214	3918	3397
CH ₄ (1000 t)	20371	17041	16515	16308	16225	16209
PM2.5 (1000 t)		1196	851	699	624	603

	1990	2000	2010	2020	2030	2035
Gross Value Added (in 000 MEuro'00)	6525.7	8014.7	9760.1	12090.1	14073.4	15194.6
Industry	1395.4	1604.8	1841.4	2256.5	2606	2802.6
iron and steel	45.8	40.5	44.1	48.5	51	52.3
non ferrous metals	17.8	20.3	24.5	29	32.1	33.8
chemicals	134	178	227.4	293.6	350.6	383.8
petrochemicals, fertilisers and others	86.7	103.1	120.8	141.4	156	163.9
pharmaceuticals and cosmetics	46.8	74.8	106.5	151.9	194.4	219.9
non metallic minerals	66.4	74.3	80.6	92.9	102.1	107.0
paper, pulp, printing	128.4	152.2	165	203.2	236.6	255.6
paper and pulp production	43.8	49.8	52.5	62.1	70.6	75.3
printing and publishing	84.6	102.2	112.4	141	166.1	180.3
food, drink, tobacco	164	188.1	218.4	267.2	307.4	329.7
textiles and leather	101.8	86.6	71.7	70.2	70	69.9
engineering	593.6	692.6	815.3	1014	1181	1274.5
other industries	144.2	172.6	194.3	238.22	275.3	296.0
Construction	407.2	414.7	475.2	565.5	631.8	667.8
Services	4320.1	5514.5	6939.5	8717	10249.9	11120.3
market services	1558.2	2086.5	2672.4	3431.8	4100.2	4481.7
non-market services	1395.8	1757.5	2008.3	2345.35	2589.6	2721.1
trade	1366.3	1770	2258.9	2940.17	3560.1	3917.5
Agriculture	181.1	204.8	206.7	224.5	236.2	242.3
Energy sector	221.9	276.1	297.2	327	349.7	361.6

Baseline scenario EU-new

	1990	2000	2010	2020	2030	2035
Population (Million)	106.023	104.37	100.979	97.631	94.646	93.2
Average household size (persons)	3.0	2.7	2.5	2.4	2.3	2.2
GDP (in 000 MEUR'00)	368.2	414.8	633.8	963.2	1333.3	1568.7
Primary Production (ktoe)	220125	175457	168431	170370	180660	192513
Solids	153969	114153	97618	82995	72905	68492
Oil	10620	9459	8607	8343	8057	7940
Natural gas	29671	17062	18486	16491	14733	13954
Nuclear	19264	20915	22016	28531	43721	56691
Renewable energy sources	6603	13870	21709	34011	41242	45436
Net Imports (ktoe)	103652	72210	119759	172285	200024	216094
Solids	-8313	-11710	2871	14040	24699	35069
Oil	68462	49496	65135	78271	88518	94199
Natural gas	42427	36381	53960	82161	90027	94496
Electricity	987	-1957	-2208	-2188	-3220	-7670
Gross Inland Consumption (ktoe)	323112	248876	287401	341678	379577	402664
Solids	147122	104934	100488	97034	97606	99249
Oil	77759	57802	72951	85638	95467	100905
Natural gas	71375	53313	72444	98652	104761	108048
Nuclear	19264	20915	22016	28531	43721	56691
Electricity	987	-1957	-2208	-2188	-3220	-7670
Renewable energy forms	6603	13870	21709	34011	41242	45441
Final Energy Demand by sector (ktoe)	203156	153496	191800	239225	276632	297591
Industry	99141	57368	66744	82860	95175	102053
energy intensive industries	57308	37465	41473	49276	54892	57936
other industrial sectors	41835	19805	25272	33585	40283	44117
Residential	47199	45152	54360	65981	74046	78441
Tertiary	30195	23988	29994	39205	46877	51259
Transport	26619	26985	40698	51176	60535	65838
Final Energy Demand by fuel (koe)						
Solids	48251	22827	18673	16280	14865	14404
Oil	46531	40683	56426	70018	79505	84628
Gas	46622	33474	46037	60906	71779	77992
Electricity	27656	24220	32802	46132	57973	64920
Heat (from CHP and distric heating)	31075	22485	24028	27766	32237	34761
Other	3021	9803	13814	18118	20276	21457
Energy intensity (toe/MEUR'00)	877.5	600.0	453.5	354.7	284.7	256.7
Oil intensity (t/MEUR'00)	207.4	136.8	113.0	87.3	70.3	63.2
Natural gas intensity (t/MEUR'00)	234495	155477	138268	123897	95048	83321
Solid fossil fuels intensity (t/MEUR'00)	1271.7	782.7	477.3	295.3	209.0	178.4
Gross Inl. Cons./Capita (toe/inhabitant)	3.0	2.4	2.8	3.5	4.0	4.3
Total fossil CO₂ Emissions (Mt of CO₂)	934.3	663.5	740.3	818.3	857.6	880.0
Power generation/district heating	459.3	340.6	364.9	379.1	375.6	373.9
Energy branch	23.9	26.9	20.98	18.9	14.3	12.4
Industry	214.6	121.2	134.6	156.9	168.9	175.2
Residential	96.8	58	66.2	74.7	78	79.7
Tertiary	64.9	40.2	39.8	47.8	56.1	60.8
Transport	74.7	76.6	114.1	141.1	164.7	177.9
CO₂ Emissions Index (1990=100)	100	71	79	88	92	94
Other emissions						
SO _x (1000 t)	10813	4244	2549	1566	983	787
NO _x (1000 t)	3583	2125	1887	1307	1025	908
NH ₃ (1000 t)	1488	790	820	839	865	878
NMVOC (1000 t)	2791	1981	1618	1256	1000	892
CH ₄ (1000 t)		5630	5844	5979	6064	6090
PM _{2.5} (1000 t)		585	535	473	425	403

	1990	2000	2010	2020	2030	2035
Gross Value Added (in 000 MEuro'00)	334.1	367.8	558.6	845.7	1168.4	1376.3
Industry	84.1	94.4	157.5	241.2	326	379.6
iron and steel	4	3.7	4.6	5.3	5.9	6.2
non ferrous metals	0.8	1	1.4	1.7	1.9	2.0
chemicals	6.8	6.8	11.4	19.9	29.2	35.0
petrochemicals, fertilisers and others	5.3	3.7	5	7.5	10.4	12.2
pharmaceuticals and cosmetics	1.4	2.9	6.2	12.4	18.6	22.8
non metallic minerals	5	5.7	9.5	14.5	18.8	21.4
paper, pulp, printing	5.6	6.1	10	14.7	18.5	20.8
paper and pulp production	3.1	2	2.9	3.9	4.4	4.7
printing and publishing	2.5	3.8	7.1	11	14.2	16.1
food, drink, tobacco	14.7	19.9	34.8	52.3	70.3	81.5
textiles and leather	10	8	9.9	12.1	14.2	15.4
engineering	27.3	31.9	54.9	86.7	120.3	141.7
other industries	9.6	11.3	21.2	33.9	47.1	55.5
Construction	25.5	22.6	30.4	50	70.2	83.2
Services	164.9	203.7	311.9	480.7	681.4	812.3
market services	39.9	50.2	82.1	131	189.8	228.5
non-market services	57.1	59.9	78.2	106.6	137.6	156.3
trade	67.8	93.5	151.7	243.1	354.2	427.5
Agriculture	31	24.8	34	43.1	52.6	58.1
Energy sector	28.9	22.6	24.7	30.7	38.5	43.1

ANNEX II

Baseline macroeconomic scenarios for each EU-27 country

AUSTRIA

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	7.7	8.0	8.3	8.4	8.5	8.6
GDP (in 000 MEUR'00)	163.5	210.4	254.6	309.0	353.9	379.4
Energy intensity (toe/MEUR'00)	152.0	135.3	136.3	117.9	102.1	95.2
Gross Inl. Cons./Capita (toe/inhabitant)	3.2	3.6	4.2	4.3	4.2	4.2
Primary Production (ktoe)	8170	9501	11217	10667	10775	11053
Solids	643	293	260	58		
Oil	1247	1072	850	200		
Natural gas	1097	1533	1600	1000	600	464
Nuclear						
Renewable energy sources	5183	6603	8507	9409	10175	10589
Net Imports (ktoe)	16929	18871	23488	25763	25357	25266
Solids	3112	3048	3508	3654	3925	4064
Oil	9413	10688	12141	12727	11458	10896
Natural gas	4443	5253	7529	9247	9913	10265
Electricity	-40	-118	310	135	61	41
Gross Inland Consumption (ktoe)	24859	28460	34706	36430	36131	36132
Solids	4042	3588	3768	3712	3925	4044
Oil	10489	11868	12991	12927	11458	10787
Natural gas	5184	6519	9129	10247	10513	10672
Nuclear						
Electricity	-40	-118	310	135	61	41
Renewable energy forms	5183	6603	8507	9409	10175	10589
Oil intensity (t/MEUR'00)	63.0	55.4	50.1	41.1	31.8	27.9
Natural gas intensity (t/MEUR'00)	38354.7	37480.6	43374.7	40115.3	35935.0	34027.7
Solid fossil fuels intensity (t/MEUR'00)	53.6	35.8	30.1	23.7	21.3	20.2
Final Energy Demand by sector (ktoe)	18651	22470	28343	30237	30335	30399
Industry	5691	7084	9282	9911	10081	10173
energy intensive industries	3556	4506	5328	5470	5390	5363
other industrial sectors	2135	2578	3954	4441	4691	4809
Residential	5832	6472	8156	8440	8279	8197
Tertiary	2524	2881	3912	4492	4844	5041
Transport	4603	6033	6993	7394	7131	6990
Final Energy Demand by fuel (koe)						
Solids	1143	726	682	560	486	452
Oil	7897	9414	11111	11366	10670	10337
Gas	2962	4086	5259	5824	6162	6340
Electricity	3669	4454	6360	7226	7701	7923
Heat (from CHP and district heating)	1088	1782	2222	2482	2547	2582
Other	1893	2007	2708	2778	2770	2766
CO2 Emissions (Mt of CO2)	52	56.7	66.6	68	65.3	64.0
Power generation/district heating	12.8	12.4	14.5	14.6	14.0	13.7
Energy branch	3.2	2.6	2.6	2.3	2.0	1.8
Industry	9.8	11.7	15.7	16.3	16.1	16.0
Residential	10.1	9.6	10.7	10.5	9.9	9.6
Tertiary	3.4	3.3	3.8	4.3	4.5	4.6
Transport	12.7	17.2	19.3	20.0	18.8	18.2
CO2 Emissions Index (1990=100)	100.0	109.0	128.1	130.7	125.4	

Demographic and Economic Assumptions

	2.6	2.5	2.4	2.3	2.2	2.2
Average household size (persons)	2.6	2.5	2.4	2.3	2.2	2.2
Gross Value Added (in 000 MEuro'00)	146.2	189.1	229.7	279.5	320.7	335.8
Industry	29.5	38.4	49.7	60.8	70	74.5
iron and steel	1.4	1.7	2.1	2.2	2.3	2.3
non ferrous metals	0.5	0.7	1.1	1.5	1.8	2.0
chemicals	1.7	2.5	3.5	4.5	5.4	5.9
petrochemicals, fertilisers and others	1.1	1.4	1.8	2.1	2.4	2.5
pharmaceuticals and cosmetics	0.5	1.1	1.7	2.4	3	3.4
non metallic minerals	2.3	2.3	2.7	3.2	3.5	3.7
paper, pulp, printing	2.7	3.9	4.4	5.2	5.8	6.1
paper and pulp production	1.3	1.9	1.9	2.1	2.3	2.4
printing and publishing	1.4	2	2.4	3	3.5	3.8
food, drink, tobacco	3.3	4.5	5.1	6.2	7	7.5
textiles and leather	2.3	1.9	1.8	1.7	1.7	1.7
engineering	11.1	15	21.1	26.6	31.4	34.2
other industries	4.3	6	8	9.8	11.1	11.1
Construction	10.4	14.2	16.2	19	21.3	22.6
Services	96.8	124.6	148.9	182.3	210	218.2
market services	27.9	38.7	47.2	58.3	68.4	74.0
non-market services	33.2	39.5	42.6	49.9	54.6	57.1
trade	35.7	46.3	59.1	74.2	87	87.0
Agriculture	4.3	4.9	5.8	6.7	7.3	7.6
Energy sector	5.1	7.1	9	10.8	12.2	12.9

BELGIUM

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	10.0	10.2	10.6	10.8	11.0	11.1
GDP (in 000 MEUR'00)	100.1	247.9	302.9	370.1	431.7	465.1
Energy intensity (toe/MEUR'00)	236.2	230.6	199.3	157.4	128.2	115.9
Gross Inl. Cons./Capita (toe/inhabitant)	4.7	5.6	5.7	5.4	5.0	4.9
Primary Production (ktoe)	12528	13471	14461	11267	2895	3212
Solids	1085	191				
Oil						
Natural gas	10	2				
Nuclear	10707	12422	12926	8914		
Renewable energy sources	727	856	1534	2353	2895	3212
Net Imports (ktoe)	38857	48547	51785	53288	58971	64096
Solids	9492	7566	6390	5267	11227	16420
Oil	21468	27331	29230	28733	27822	27407
Natural gas	8217	13278	15547	18840	19598	19993
Electricity	-320	372	618	448	325	276
Gross Inland Consumption (ktoe)	47257	57168	60367	58253	55336	60665
Solids	10244	8200	6390	5267	11227	16420
Oil	17730	21949	23351	22430	21291	20764
Natural gas	8169	13369	15547	18840	19598	19993
Nuclear	10707	12422	12926	8914		
Electricity	-320	372	618	448	325	276
Renewable energy forms	727	856	1534	2353	2895	3212
Oil intensity (t/MEUR'00)	173.9	87.0	75.7	59.5	48.4	43.8
Natural gas intensity (t/MEUR'00)	98720.2	65237.0	62089.6	61579.1	54916.3	52004.3
Solid fossil fuels intensity (t/MEUR'00)	221.8	69.4	42.9	28.1	49.9	66.7
Final Energy Demand by sector (ktoe)	31355	37055	39971	41208	40942	40858
Industry	11944	13769	13991	14093	13833	13723
energy intensive industries	9288	10195	9627	9365	8811	8550
other industrial sectors	2656	3573	4364	4728	5021	5173
Residential	8337	9465	10314	10324	10018	9869
Tertiary	3370	4158	4850	5455	5782	5958
Transport	7704	9662	10817	11336	11309	11309
Final Energy Demand by fuel (koe)						
Solids	3783	3373	2454	2145	1913	1809
Oil	14734	16038	17517	17012	16102	15696
Gas	6993	9615	10266	11013	11266	11374
Electricity	4986	6667	7825	8606	9052	9276
Heat (from CHP and distric heating)	566	1046	1387	1556	1634	1674
Other	293	316	521	876	975	1029
CO2 Emissions (Mt of CO2)	105.9	114.7	115.9	117.3	139.4	158.8
Power generation/distric heating	22.4	23.5	23.4	26.2	51.8	73.0
Energy branch	5.3	5.3	4.7	4.5	4.2	4.1
Industry	29.3	29.1	26.0	24.9	23.5	22.8
Residential	18.7	20.0	20.8	19.8	18.3	17.6
Tertiary	7.5	8.2	9.4	10.1	10.3	10.4
Transport	22.6	28.6	31.5	31.9	31.3	31.0
CO2 Emissions Index (1990=100)	100.0	1078.3	109.5	110.8	131.6	

Demographic and Economic Assumptions

	2.6	2.4	2.3	2.2	2.1	2.1
Average household size (persons)	2.6	2.4	2.3	2.2	2.1	2.1
Gross Value Added (in 000 MEuro'00)	188	229.1	278	336.6	390.2	420.5
Industry	39.8	46.4	53.4	62.5	71.5	76.7
iron and steel	3.6	2.6	2.7	2.8	2.8	2.8
non ferrous metals	1.1	1	1.3	1.4	1.5	1.5
chemicals	6.2	9.6	12.2	14.9	17.6	19.2
petrochemicals, fertilisers and others	4.1	6.1	7.1	7.9	8.4	8.7
pharmaceuticals and cosmetics	2	3.4	5.1	6.9	9.2	10.6
non metallic minerals	2.1	2.1	2.1	2.5	2.7	2.8
paper, pulp, printing	2.9	3.3	3.9	4.7	5.3	5.8
paper and pulp production	1.6	1.2	1.4	1.6	1.8	1.9
printing and publishing	1.3	2.1	2.6	3.1	3.6	3.9
food, drink, tobacco	5.2	5.1	6.1	7	7.8	8.2
textiles and leather	2.7	2.6	2.2	2.2	2.2	2.2
engineering	12.8	16.2	18.3	21.6	25.1	27.0
other industries	3.2	3.8	4.5	5.5	6.5	7.1
Construction	10.1	11.6	13.1	15	16.7	17.6
Services	128.6	158.9	199.9	246.4	288.4	312.0
market services	44.1	62.7	78.1	96.9	115.2	125.3
non-market services	45	52.3	64	75.4	81.2	84.1
trade	39.6	44	57.7	74	92	102.6
Agriculture	2.6	3.7	3.7	4	4.1	4.2
Energy sector	7	8.5	7.9	8.8	9.6	10.0

BULGARIA

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	8.7	8.2	7.4	6.8	6.2	5.9
GDP (in 000 MEUR'00)	16.3	13.7	23.4	39.8	61.1	75.8
Energy intensity (toe/MEUR'00)	1717.5	1335.0	819.6	592.2	449.2	391.8
Gross Inl. Cons./Capita (toe/inhabitant)	3.2	2.2	2.6	3.5	4.5	5.0
Primary Production (ktoe)	9136	9840	9228	10218	12398	14279
Solids	5121	4310	4392	4272	3372	3002
Oil	60	42	41	41	41	41
Natural gas	11	11	237	169	122	104
Nuclear	3783	4689	3286	4072	6945	9077
Renewable energy sources	161	788	1273	1664	1918	2056
Net Imports (ktoe)	17823	8409	10034	13515	15252	16189
Solids	3527	2258	2787	3097	3133	3149
Oil	8540	4081	5508	7027	8173	8805
Natural gas	5340	2468	2285	3864	4355	4623
Electricity	326	-397	-546	-473	-409	-387
Gross Inland Consumption (ktoe)	27961	18296	19141	23570	27452	30211
Solids	8706	6417	7178	7369	6505	6124
Oil	9589	4160	5428	6905	8016	8636
Natural gas	5395	2639	2521	4033	4477	4705
Nuclear	3783	4689	3286	4072	6945	9077
Electricity	326	-397	-546	-473	-409	-387
Renewable energy forms	161	788	1273	1664	1918	2056
Oil intensity (t/MEUR'00)	577.7	298.2	227.8	170.4	128.8	111.9
Natural gas intensity (t/MEUR'00)	400382.6	233018.4	130325.2	122579.1	88637.4	75114.1
Solid fossil fuels intensity (t/MEUR'00)	1699.9	1449.2	923.4	542.6	304.0	227.8
Final Energy Demand by sector (ktoe)	16041	8519	10890	14773	18154	20142
Industry	8966	3580	3926	5298	6760	7650
energy intensive industries	5579	2667	2910	3746	4527	4974
other industrial sectors	3387	813	1016	1552	2232	2677
Residential	2228	2165	2369	3014	3471	3721
Tertiary	2372	957	1187	1633	2032	2266
Transport	2476	1817	3407	4828	5892	6505
Final Energy Demand by fuel (koe)						
Solids	1477	860	862	945	1227	1392
Oil	4923	2980	4518	6197	7314	7940
Gas	2066	1137	1289	2139	2981	3517
Electricity	3033	2075	2382	3192	4087	4615
Heat (from CHP and distric heating)	4543	912	1063	1383	1414	1425
Other		555	776	916	1132	1253
CO2 Emissions (Mt of CO2)	72.3	41.5	48.4	56.8	57.2	58.6
Power generation/district heating	44.8	24.6	26.6	27.4	22.3	20.2
Energy branch	1.6	1.2	1.5	1.8	1.0	0.7
Industry	11.2	8.0	8.1	10.5	13.3	15.0
Residential	3.0	1.2	1.1	1.6	2.2	2.6
Tertiary	4.7	1.2	1.4	1.8	2.0	2.1
Transport	6.9	5.2	9.8	13.8	16.5	18.0
CO2 Emissions Index (1990=100)	100.0	57.3	66.9	78.5	79.1	

Demographic and Economic Assumptions

	2.9	2.6	2.3	2.1	1.9	1.8
Average household size (persons)	2.9	2.6	2.3	2.1	1.9	1.8
Gross Value Added (in 000 MEuro'00)	18.3	12.5	21.2	36.3	55.8	68.9
Industry	4.1	2.3	4	7.3	11.8	15.2
iron and steel	0.4	0.2	0.3	0.4	0.5	0.6
non ferrous metals	0.2	0.1	0.1	0.1	0.1	0.1
chemicals	0.5	0.3	0.6	1.2	2.1	2.8
petrochemicals, fertilisers and others	0.4	0.1	0.2	0.3	0.6	0.8
pharmaceuticals and cosmetics	0.1	0.1	0.4	0.9	1.5	2.0
non metallic minerals	0.1	0.1	0.2	0.3	0.5	0.6
paper, pulp, printing	0.1	0.1	0.2	0.4	0.7	0.9
paper and pulp production	0.1			0.1	0.1	0.1
printing and publishing		0.1	0.2	0.3	0.6	0.8
food, drink, tobacco	0.3	0.5	0.9	1.6	2.5	3.1
textiles and leather	0.1	0.3	0.5	0.7	0.9	1.0
engineering	0.8	0.5	1.1	2.1	3.7	4.9
other industries	1.6	0.1	0.3	0.5	0.9	1.1
Construction	0.5	0.5	0.8	1.5	2.5	2.5
Services	7.1	6.8	12.3	21	32.1	39.8
market services	3.7	2.4	4.2	7	10.5	12.8
non-market services	1	1.7	3	4.8	7	8.4
trade	2.4	2.6	5.1	9.2	14.7	18.6
Agriculture	5.6	1.6	1.7	2.2	2.7	3.0
Energy sector	1	1.4	2.4	4.2	6.7	8.4

CYPRUS

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	0.6	0.7	0.8	0.9	0.9	0.9
GDP (in 000 MEUR'00)	6.3	9.9	14.2	19.9	24.9	27.9
Energy intensity (toe/MEUR'00)	286.1	240.7	206.9	163.7	127.1	112.0
Gross Inl. Cons./Capita (toe/inhabitant)	3.1	3.4	3.7	3.8	3.4	3.3
Primary Production (ktoe)	6	45	112	177	213	234
Solids						
Oil						
Natural gas						
Nuclear						
Renewable energy sources	6	45	112	177	213	234
Net Imports (ktoe)	1927	2537	3009	3269	3149	3086
Solids	68	36	22	16	15	14
Oil	1859	2502	2986	3253	3134	3072
Natural gas						
Electricity						
Gross Inland Consumption (ktoe)	1816	2382	2932	3256	3172	3134
Solids	60	35	22	16	15	14
Oil	1750	2302	2798	3063	2944	2886
Natural gas						
Nuclear						
Electricity						
Renewable energy forms	6	45	112	177	213	234
Oil intensity (t/MEUR'00)	272.8	228.4	193.5	151.2	116.1	101.6
Natural gas intensity (t/MEUR'00)						
Solid fossil fuels intensity (t/MEUR'00)	20.6	7.4	3.2	1.6	1.2	1.0
Final Energy Demand by sector (ktoe)	1264	1634	1994	2168	2041	1989
Industry	417	437	480	514	521	527
energy intensive industries	220	220	216	205	185	176
other industrial sectors	197	217	264	309	336	351
Residential	120	219	290	340	357	366
Tertiary	82	127	219	250	258	262
Transport	645	852	1005	1065	904	834
Final Energy Demand by fuel (koe)						
Solids	76	35	2	16	15	14
Oil	1032	1296	1475	1557	1381	1303
Gas						
Electricity	151	258	419	505	546	569
Heat (from CHP and distric heating)			4	6	6	6
Other	6	45	73	84	92	97
CO2 Emissions (Mt of CO2)	5.4	6.9	8.3	9	8.6	8.4
Power generation/district heating	1.9	2.8	3.6	4.0	4.2	4.3
Energy branch	0.1	0.1	0.2	0.2	0.2	0.2
Industry	1.3	1.3	1.3	1.4	1.4	1.4
Residential	0.2	0.2	0.2	0.2	0.2	0.2
Tertiary						
Transport	1.9	2.5	3.0	3.1	2.6	2.4
CO2 Emissions Index (1990=100)	100.0	217.3	152.9	165.6	158.6	

Demographic and Economic Assumptions

	1990	2000	2010	2020	2030	2035
Average household size (persons)	4.6	4.7	4.5	4.5	4.6	4.6
Gross Value Added (in 000 MEuro'00)	5.9	9.3	13.4	19	23.8	26.7
Industry	0.7	0.9	1.2	1.7	2.1	2.4
iron and steel						
non ferrous metals						
chemicals		0.1	0.1	0.1	0.1	0.1
petrochemicals, fertilisers and others						
pharmaceuticals and cosmetics		0.1	0.1	0.1	0.1	0.1
non metallic minerals	0.1	0.1	0.2	0.2	0.3	0.3
paper, pulp, printing		0.1	0.1	0.1	0.1	0.1
paper and pulp production						
printing and publishing		0.1	0.1	0.1	0.1	0.1
food, drink, tobacco	0.2	0.3	0.4	0.6	0.7	0.8
textiles and leather	0.2	0.1	0.1	0.1	0.1	0.1
engineering	0.1	0.1	0.2	0.3	0.5	0.6
other industries	0.1	0.2	0.2	0.3	0.3	0.3
Construction	0.8	0.6	1	1.5	1.8	2.0
Services	3.9	7.1	10.3	14.7	18.7	21.0
market services	1.1	2.1	3.4	4.9	6.3	7.1
non-market services	1.1	1.9	2.9	4	4.8	5.3
trade	1.7	3.1	4.1	5.8	7.5	8.6
Agriculture	0.3	0.4	0.5	0.6	0.7	0.7
Energy sector	0.2	0.3	0.4	0.5	0.6	0.6

CZECH REPUBLIC

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	10.4	10.3	10.1	9.9	9.7	9.6
GDP (in 000 MEUR'00)	59.0	60.4	84.3	117.1	147.3	165.0
Energy intensity (toe/MEUR'00)	801.1	664.9	553.7	407.0	351.2	325.6
Gross Inl. Cons./Capita (toe/inhabitant)	4.6	3.9	4.6	4.8	5.3	5.6
Primary Production (ktoe)	38321	29636	31132	26794	25706	25749
Solids	34700	25001	21319	16088	12397	10867
Oil	50	179	200	200	200	200
Natural gas	201	169	200	244	200	181
Nuclear	3246	3506	7481	7722	9966	11331
Renewable energy sources	124	781	1933	2540	2943	3170
Net Imports (ktoe)	7674	9297	15558	20876	26042	28541
Solids	-5641	-4751	-1615	-202	2969	4271
Oil	8589	7428	8939	10399	11570	12221
Natural gas	4786	7482	9638	11779	13201	13943
Electricity	-60	-861	-1404	-1100	-1698	-1893
Gross Inland Consumption (ktoe)	47247	40155	46690	47670	51749	54332
Solids	29897	21644	19704	15886	15367	15138
Oil	8791	7585	9139	10599	11770	12432
Natural gas	5248	7500	9838	12023	13401	14154
Nuclear	3246	3506	7481	7722	9966	11331
Electricity	-60	-861	-1404	-1100	-1698	-1893
Renewable energy forms	124	781	1933	2540	2943	3170
Oil intensity (t/MEUR'00)	146.3	123.3	106.5	88.9	78.5	74.0
Natural gas intensity (t/MEUR'00)	107600.2	150208.9	141172.7	124201.6	110054.0	103748.9
Solid fossil fuels intensity (t/MEUR'00)	1612.8	1108.7	703.6	397.6	297.9	258.6
Final Energy Demand by sector (ktoe)	36678	25375	29243	33214	35791	37155
Industry	20058	11848	12215	13603	14329	14698
energy intensive industries	8719	6999	7338	7754	7861	7900
other industrial sectors	11339	4849	4877	5849	6468	6798
Residential	8254	5260	6637	7271	7716	7950
Tertiary	5561	4134	4667	5505	6243	6659
Transport	2804	4133	5723	6835	7503	7847
Final Energy Demand by fuel (koe)						
Solids	17841	5238	3905	3341	2024	1555
Oil	5876	5345	6659	7914	8858	9273
Gas	5146	6442	8129	9758	11285	12051
Electricity	4142	4243	5337	6499	7545	8057
Heat (from CHP and distric heating)	3672	3885	4290	4510	4710	4761
Other		220	922	1192	1371	1457
CO2 Emissions (Mt of CO2)	154	117.2	120.3	113.4	117.4	119.6
Power generation/district heating	48.8	62.0	64.0	52.1	55.1	56.8
Energy branch	2.3	2.2	1.0	0.7	0.6	0.5
Industry	57.3	27.0	26.3	28.1	27.4	27.1
Residential	24.0	7.9	9.1	9.1	8.6	8.3
Tertiary	14.1	6.5	4.4	5.1	5.6	5.9
Transport	7.5	11.5	15.6	18.4	20.0	20.9
CO2 Emissions Index (1990=100)	100.0	76.1	78.1	73.7	76.2	

Demographic and Economic Assumptions

	2.9	2.6	2.4	2.3	2.3	2.3
Average household size (persons)	2.9	2.6	2.4	2.3	2.3	2.3
Gross Value Added (in 000 MEuro'00)	53.1	56.6	77.3	105	130.4	145.4
Industry	13	15.2	24	32.6	40.3	44.8
iron and steel	0.6	0.8	1	1.1	1.1	1.1
non ferrous metals	0.1	0.1	0.2	0.2	0.2	0.2
chemicals	1.3	1	1.3	1.9	2.7	3.2
petrochemicals, fertilisers and others	1.1	0.8	0.9	1.2	1.5	1.7
pharmaceuticals and cosmetics	0.2	0.3	0.4	0.8	1.2	1.5
non metallic minerals	0.9	1.3	1.9	2.7	3.3	3.7
paper, pulp, printing	1.5	0.9	1.2	1.6	2	2.2
paper and pulp production	1	0.4	0.5	0.7	0.8	0.9
printing and publishing	0.6	0.4	0.7	1	1.2	1.3
food, drink, tobacco	1.4	1.8	2.9	4	5.1	5.7
textiles and leather	2	1	0.9	0.9	0.9	0.9
engineering	3.6	6.4	11	15.1	18.6	20.6
other industries	1.6	1.8	3.6	5.1	6.4	7.1
Construction	6.5	3	3.3	4.7	5.8	6.4
Services	24.1	31.6	43.3	60.3	76.2	85.7
market services	8.4	9.6	14.8	21.3	26.8	30.0
non-market services	6.9	7.7	9	11.5	14.2	15.8
trade	8.8	14.2	19.5	27.5	35.3	39.9
Agriculture	1.9	2.9	2.8	3.1	3.3	3.4
Energy sector	7.7	3.9	3.9	4.4	4.8	5.0

DENMARK

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	5.1	5.3	5.5	5.5	5.6	5.6
GDP (in 000 MEUR'00)	136.3	171.6	202.2	235.2	269.2	288.6
Energy intensity (toe/MEUR'00)	131.5	114.6	98.1	85.3	72.5	66.9
Gross Inl. Cons./Capita (toe/inhabitant)	3.5	3.7	3.6	3.6	3.5	3.4
Primary Production (ktoe)	10082	27656	30587	28914	22759	20313
Solids						
Oil	6114	18142	19070	17751	13252	11439
Natural gas	2770	7411	8276	7035	5105	4339
Nuclear						
Renewable energy sources	1198	2103	3241	4129	4402	4536
Net Imports (ktoe)	8626	-7139	-9299	-7311	-1627	-1088
Solids	6215	3784	3357	2796	2297	2087
Oil	2733	-8097	-9253	-8088	-3862	-2941
Natural gas	-928	-2882	-3308	-1727	418	418
Electricity	606	57	-94	-292	-481	-652
Gross Inland Consumption (ktoe)	17933	19666	19848	20068	19516	19225
Solids	6100	4013	3357	2796	2297	2087
Oil	8212	9044	8376	8127	7774	7620
Natural gas	1818	4449	4968	5308	5523	5634
Nuclear						
Electricity	606	57	-94	-292	-481	-652
Renewable energy forms	1198	2103	3241	4129	4402	4536
Oil intensity (t/MEUR'00)	59.2	51.8	40.7	33.9	28.4	25.9
Natural gas intensity (t/MEUR'00)	16135.0	31362.9	29721.6	27300.1	24818.3	23618.4
Solid fossil fuels intensity (t/MEUR'00)	97.0	49.1	33.8	23.5	16.4	13.7
Final Energy Demand by sector (ktoe)	13797	14876	15934	16497	16413	26375
Industry	2714	3215	3109	3044	3061	3069
energy intensive industries	1045	1266	1056	994	948	925
other industrial sectors	1669	1949	2053	2050	2113	2145
Residential	4043	4141	4443	4700	4665	4642
Tertiary	3066	2800	3201	3509	3637	13713
Transport	3974	4720	5181	5244	5051	4951
Final Energy Demand by fuel (koe)						
Solids	402	307	107	68	34	45
Oil	7056	6950	7186	7029	6706	10622
Gas	1159	1676	1766	1934	2084	3437
Electricity	2517	2791	2980	3309	3447	5615
Heat (from CHP and distric heating)	2098	2590	3061	3197	3136	5014
Other	566	563	834	960	1005	1642
CO2 Emissions (Mt of CO2)	51.5	52.3	49	46.8	44.3	43.1
Power generation/distric heating	24.4	24.1	20.6	18.8	17.4	16.7
Energy branch	1.5	2.3	2.3	2.0	1.7	1.6
Industry	5.4	5.3	4.6	4.5	4.5	4.5
Residential	4.9	3.9	3.3	3.3	3.3	3.3
Tertiary	3.6	2.9	3.5	3.7	3.7	3.7
Transport	11.8	13.9	14.7	14.5	13.7	13.4
CO2 Emissions Index (1990=100)	100.0	101.6	95.2	90.9	86.0	

Demographic and Economic Assumptions

	2.3	2.2	2.1	2	1.9	1.9
Average household size (persons)	2.3	2.2	2.1	2	1.9	1.9
Gross Value Added (in 000 MEuro'00)	124.7	154.4	181.6	211	241.3	258.2
Industry	21	24.8	26.5	30.3	34.1	36.2
iron and steel	0.3	0.3	0.3	0.3	0.3	0.3
non ferrous metals	0.1	0.1	0.2	0.3	0.3	0.3
chemicals	1.5	3.6	3.9	4.6	5.3	5.7
petrochemicals,fertilisers and others	0.6	1.1	1.1	1.2	1.3	1.3
pharmaceuticals and cosmetics	0.9	2.5	2.8	3.4	4	4.4
non metallic minerals	1	1.2	1.1	1.3	1.4	1.5
paper, pulp, printing	2.6	2.6	2.4	2.8	3.1	3.3
paper and pulp production	0.9	0.5	0.5	0.6	0.7	0.7
printing and publishing	1.8	2	1.9	2.2	2.4	2.6
food, drink, tobacco	3.9	4	4.6	5.3	6	6.4
textiles and leather	1	0.7	0.5	0.5	0.5	0.5
engineering	7.5	9.1	10.1	11.4	12.9	13.7
other industries	3.1	3.2	3.4	3.8	4.3	4.6
Construction	6.4	7.3	8.4	9.6	10.9	11.6
Services	89.7	111	135.2	158.7	183.4	197.1
market services	30.3	35.9	43.5	51.8	60.8	65.8
non-market services	32.4	37.7	42.9	46.7	49.6	51.1
trade	27	37.4	48.8	60.2	73	80.2
Agriculture	4.2	5.5	5.8	6.2	6.4	6.5
Energy sector	3.5	5.8	5.7	6.3	6.6	6.8

ESTONIA

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	1.6	1.4	1.3	1.2	1.2	1.2
GDP (in 000 MEUR'00)	6.6	5.9	10.3	15.4	20.9	24.3
Energy intensity (toe/MEUR'00)	1492.8	771.5	485.9	365.3	297.1	268.6
Gross Inl. Cons./Capita (toe/inhabitant)	6.3	3.3	3.8	4.5	5.2	5.5
Primary Production (ktoe)	5480	3170	2685	2710	2917	3069
Solids	5020	2667	2096	2005	1897	1841
Oil		2				
Natural gas						
Nuclear						
Renewable energy sources	460	501	589	705	1019	1228
Net Imports (ktoe)	4463	1490	2434	3098	3498	3710
Solids	697	282	132	148	103	86
Oil	3146	626	1365	1649	1957	2129
Natural gas	1222	662	1026	1332	1440	1499
Electricity	-602	-80	-90	-31	-3	-3
Gross Inland Consumption (ktoe)	9883	4572	4986	5635	6203	6560
Solids	5938	2979	2228	2153	2000	1931
Oil	2865	510	1233	1476	1746	1900
Natural gas	1222	662	1026	1332	1440	1499
Nuclear						
Electricity	-602	-80	-90	-31	-3	-3
Renewable energy forms	460	501	589	705	1019	1234
Oil intensity (t/MEUR'00)	426.3	84.9	117.6	94.1	82.0	76.6
Natural gas intensity (t/MEUR'00)	223974.5	135730.5	120498.5	104629.7	83346.5	74455.5
Solid fossil fuels intensity (t/MEUR'00)	2863.5	1562.2	651.1	409.7	273.3	223.6
Final Energy Demand by sector (ktoe)	6002	2368	3201	3904	4495	4824
Industry	2733	535	733	921	1076	1163
energy intensive industries	737	208	251	309	350	373
other industrial sectors	1996	326	483	612	726	790
Residential	1271	928	1100	1240	1341	1396
Tertiary	1159	328	580	709	825	889
Transport	839	577	788	1033	1253	1377
Final Energy Demand by fuel (koe)						
Solids	691	117	96	83	71	66
Oil	1803	748	1028	1269	1488	1610
Gas	439	134	311	442	529	578
Electricity	585	427	677	909	1105	1219
Heat (from CHP and distric heating)	2086	525	642	685	753	787
Other	397	417	448	515	549	565
CO2 Emissions (Mt of CO2)	37.1	13.9	14.5	15.4	15.7	16.0
Power generation/district heating	27.3	10.7	10.3	10.2	9.8	9.6
Energy branch	0.4	0.2				
Industry	4.5	0.8	1.1	1.3	1.4	1.4
Residential	1.2	0.3	0.3	0.3	0.3	0.3
Tertiary	1.2	0.3	0.6	0.7	0.9	1.0
Transport	2.4	1.7	2.2	2.8	3.4	3.7
CO2 Emissions Index (1990=100)	100.0	37.5	39.2	41.6	42.5	

Demographic and Economic Assumptions

	1990	2000	2010	2020	2030	2035
Average household size (persons)	2.6	2.4	2.1	1.9	1.7	1.6
Gross Value Added (in 000 MEuro'00)	6	5.3	9.2	13.8	18.6	21.5
Industry	1.5	1	2.2	3.4	4.6	5.4
iron and steel						
non ferrous metals						
chemicals			0.1	0.2	0.2	0.2
petrochemicals, fertilisers and others			0.1	0.1	0.2	0.2
pharmaceuticals and cosmetics						
non metallic minerals		0.1	0.1	0.2	0.2	0.2
paper, pulp, printing		0.1	0.2	0.3	0.3	0.5
paper and pulp production			0.1	0.1	0.1	0.1
printing and publishing		0.1	0.1	0.2	0.3	0.3
food, drink, tobacco	0.3	0.2	0.3	0.4	0.5	0.6
textiles and leather	0.5	0.1	0.3	0.3	0.3	0.3
engineering	0.2	0.3	0.6	0.9	1.4	1.7
other industries	0.3	0.2	0.7	1.2	1.6	1.9
Construction	0.4	0.4	0.9	1.4	1.8	2.1
Services	2.5	3.4	5.5	8.3	11.4	13.2
market services	0.8	1.1	1.7	2.7	3.8	4.5
non-market services	0.7	0.8	1.1	1.6	2.1	2.4
trade	1	1.5	2.6	4	5.4	6.3
Agriculture	1.2	0.3	0.3	0.3	0.3	0.3
Energy sector	0.4	0.2	0.3	0.4	0.5	0.5

FINLAND

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	5.0	5.2	5.3	5.4	5.4	5.5
GDP (in 000 MEUR'00)	108.1	130.1	163.9	197.4	227.6	244.0
Energy intensity (toe/MEUR'00)	256.6	249.8	242.1	205.6	175.2	161.6
Gross Inl. Cons./Capita (toe/inhabitant)	5.8	6.3	7.5	7.5	7.3	7.2
Primary Production (ktoe)	11970	15016	19409	20457	22896	24255
Solids	1459	1207	1560	1073	1000	965
Oil						
Natural gas						
Nuclear	5006	5799	8873	8927	10649	11643
Renewable energy sources	5505	8010	8976	10458	11248	11647
Net Imports (ktoe)	18031	18542	20974	20813	17621	16588
Solids	4378	3533	4787	3281	1312	828
Oil	10477	10566	11467	11532	10485	10022
Natural gas	2261	3422	4297	5656	5552	5497
Electricity	915	1021	422	343	272	242
Gross Inland Consumption (ktoe)	28699	32508	39699	40596	39862	40065
Solids	5073	5047	6347	4354	2312	1688
Oil	9939	9209	10783	10858	9830	9348
Natural gas	2261	3422	4297	5656	5552	5497
Nuclear	5006	5799	8873	8927	10649	11643
Electricity	915	1021	422	343	272	242
Renewable energy forms	5505	8010	8976	10458	11248	11647
Oil intensity (t/MEUR'00)	90.3	69.5	64.6	54.0	42.4	37.6
Natural gas intensity (t/MEUR'00)	25301.5	31818.1	31714.5	34660.4	29508.6	27252.8
Solid fossil fuels intensity (t/MEUR'00)	101.7	81.4	78.8	43.5	19.5	13.1
Final Energy Demand by sector (ktoe)	21464	24473	27367	28242	27527	27186
Industry	9401	12073	12625	12265	11879	11686
energy intensive industries	7726	10380	10575	10086	9622	9384
other industrial sectors	1675	1694	2050	2179	2257	2303
Residential	5319	4922	5635	6009	6078	6108
Tertiary	2479	3086	4445	5329	5571	5683
Transport	4265	4391	4662	4639	3999	3708
Final Energy Demand by fuel (koe)						
Solids	1428	1022	732	595	483	432
Oil	8056	7834	8927	8973	8098	7656
Gas	1307	1073	1107	1342	1423	1458
Electricity	5068	6487	7847	8654	9042	9174
Heat (from CHP and district heating)	4236	6494	7059	6610	5736	5314
Other	1369	1563	1695	2068	2745	3152
CO2 Emissions (Mt of CO2)	53.1	54.4	64.5	60	48.8	44.8
Power generation/district heating	18.0	21.6	29.6	24.9	18.6	16.1
Energy branch	1.4	1.8	1.9	1.9		
Industry	12.8	11.7	11.6	10.8	9.9	9.5
Residential	6.4	3.5	3.4	3.7	3.6	3.5
Tertiary	2.1	2.9	4.5	5.4	5.5	5.5
Transport	12.5	12.9	13.5	13.1	11.1	10.2
CO2 Emissions Index (1990=100)	100.0	102.4	121.5	112.9	91.8	

Demographic and Economic Assumptions

	2.5	2.3	2.1	2	1.9	1.8
Average household size (persons)	2.5	2.3	2.1	2	1.9	1.8
Gross Value Added (in 000 MEuro'00)	96.3	118	149.6	181.2	209.7	226.0
Industry	21	33.1	41.4	50	56.9	61.0
iron and steel	0.7	1.2	1.5	1.7	1.8	1.9
non ferrous metals	0.3	0.4	0.5	0.6	0.6	0.6
chemicals	1.4	1.8	1.9	2.1	2.2	2.2
petrochemicals, fertilisers and others	1	1.4	1.4	1.4	1.4	1.4
pharmaceuticals and cosmetics	0.3	0.5	0.6	0.8	0.8	0.8
non metallic minerals	0.9	0.8	0.9	1	1.1	1.1
paper, pulp, printing	5.5	7.3	8.4	9.8	11	11.8
paper and pulp production	3.3	5.6	5.9	6.7	7.6	8.1
printing and publishing	2.2	1.7	2.5	3.1	3.5	3.7
food, drink, tobacco	2.2	2.4	3	3.5	3.7	3.8
textiles and leather	0.9	0.6	0.5	0.5	0.5	0.5
engineering	6.6	15.2	20.9	26.6	31.3	34.1
other industries	2.6	3.3	3.7	4.12	4.7	5.0
Construction	6.9	5.2	6.4	6.9	7.3	7.5
Services	61.3	71.5	92.6	114.3	134.9	146.8
market services	17.7	22.7	29.4	36.6	43.8	47.9
non-market services	22.3	23.2	28.4	33.3	37	39.1
trade	21.4	25.6	34.7	44.4	54.2	59.8
Agriculture	4.3	4.9	5.2	5.4	5.5	5.6
Energy sector	2.7	3.3	4	4.6	5	5.2

FRANCE

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	58.2	60.6	61.5	63.6	65.1	65.8
GDP (in 000 MEUR'00)	1180.3	1420.1	1723.1	2113.3	2505.3	2725.6
Energy intensity (toe/MEUR'00)	190.2	182.0	164.0	137.6	112.7	101.9
Gross Inl. Cons./Capita (toe/inhabitant)	3.9	4.3	4.6	4.6	4.3	4.2
Primary Production (ktoe)	108419	131318	137199	150830	138097	133156
Solids	7625	2704	400			
Oil	3491	2472				
Natural gas	2516	1505				
Nuclear	79131	107093	113764	122593	103709	95188
Renewable energy sources	15656	17545	23034	28238	34388	37967
Net Imports (ktoe)	120027	133458	148658	143532	148012	148928
Solids	13004	13201	16633	9454	11506	12704
Oil	86558	90452	98076	96022	94225	93287
Natural gas	24371	35778	39206	42308	43541	44198
Electricity	-3907	-5974	-5257	-4252	-1260	-1260
Gross Inland Consumption (ktoe)	224541	258493	282539	290735	282245	278258
Solids	19955	15677	17033	9454	11506	12704
Oil	87673	88385	94759	92394	90361	89461
Natural gas	26032	35766	39206	42308	43541	44198
Nuclear	79131	107093	113764	122593	103709	95188
Electricity	-3907	-5974	-5257	-4252	-1260	-1260
Renewable energy forms	15656	17545	23034	28238	34388	37967
Oil intensity (t/MEUR'00)	72.9	61.1	54.0	42.9	35.4	32.2
Natural gas intensity (t/MEUR'00)	26680.0	30466.5	27524.1	24217.7	21023.7	19616.0
Solid fossil fuels intensity (t/MEUR'00)	36.6	23.2	20.1	8.8	8.8	8.8
Final Energy Demand by sector (ktoe)	137033	154320	171619	179349	181979	183383
Industry	37914	38763	41453	42691	43155	43389
energy intensive industries	24208	23158	26802	27223	26693	26427
other industrial sectors	13706	15605	14651	15468	16462	16962
Residential	35753	38425	43461	44927	45231	45458
Tertiary	21458	25533	28731	30187	31320	31951
Transport	41908	51599	57973	61544	62273	62585
Final Energy Demand by fuel (koe)						
Solids	8935	5476	4955	4673	4132	3883
Oil	67571	71428	76961	77150	75675	74796
Gas	23232	31083	31708	34900	34740	34682
Electricity	25960	33114	39298	43751	47178	49017
Heat (from CHP and district heating)	1907	3695	5206	5427	6563	7200
Other	9428	9525	13491	13447	13690	13805
CO2 Emissions (Mt of CO2)	352.1	371.6	399.9	370.9	376.9	382.9
Power generation/district heating	40.9	44.9	59.3	24.7	38.6	48.3
Energy branch	16.3	15.8	13.6	12.3	11.7	11.4
Industry	78.3	64.9	62.0	64.2	59.0	56.4
Residential	55.2	54.0	57.6	56.0	53.6	52.5
Tertiary	39.2	41.5	43.6	43.0	43.3	43.5
Transport	122.1	150.6	163.8	170.6	170.7	170.7
CO2 Emissions Index (1990=100)	100.0	105.6	113.6	105.4	107.1	

Demographic and Economic Assumptions

	2.6	2.4	2.2	2.1	1.9	1.8
Average household size (persons)	2.6	2.4	2.2	2.1	1.9	1.8
Gross Value Added (in 000 MEuro'00)	1102.3	1307.6	1574.4	1916	2259.1	2455.1
Industry	196.6	242.4	292.5	358.1	422.2	459.4
iron and steel	6.6	6.2	6.8	7.4	7.8	8.0
non ferrous metals	2.6	3	3.8	4.6	5.4	5.8
chemicals	19.5	29.6	37	46.2	55.1	60.3
petrochemicals, fertilisers and others	10.6	13	15	17.3	19.3	20.4
pharmaceuticals and cosmetics	8.9	16.5	21.9	28.8	35.8	39.9
non metallic minerals	8.4	9.2	10.4	11.5	12.3	12.7
paper, pulp, printing	18.4	19.3	21.2	24.9	27.9	29.5
paper and pulp production	6.8	6	6.2	6.8	7.3	7.6
printing and publishing	11.6	13.3	15.1	18.1	20.6	22.0
food, drink, tobacco	30.2	32.1	36.9	43.5	49.7	53.0
textiles and leather	13.7	10.7	9.6	9.2	9	9.0
engineering	77.1	107.7	137.5	175.8	215.7	239.3
other industries	20.2	24.6	29.4	35	39.3	41.7
Construction	65.3	56.3	60.7	70.3	79.3	84.2
Services	773.9	926.5	1136.5	1393.1	1655.8	1805.6
market services	312.2	364.7	453.8	560.2	671.1	733.7
non-market services	245.5	295.1	369.3	430.1	486	515.9
trade	216.2	266.6	313.4	402.87	498.7	556.0
Agriculture	35.8	41.2	36.4	37.5	39	39.8
Energy sector	30.6	41.3	48.2	57.1	62.9	66.1

GERMANY

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	79.4	82.2	82.8	83.7	81.1	80.3
GDP (in 000 MEUR'00)	1736.6	2030.0	2295.8	2714.9	3007.3	3160.7
Energy intensity (toe/MEUR'00)	205.0	167.6	149.5	120.9	106.9	100.6
Gross Inl. Cons./Capita (toe/inhabitant)	4.5	4.1	4.1	4.0	4.0	4.0
Primary Production (ktoe)	186405	133298	115127	91564	85061	86364
Solids	125040	59535	38633	38616	39907	40509
Oil	3754	3449	2943	2000	1000	707
Natural gas	13731	15800	13500	11000	8500	7489
Nuclear	37674	43750	37570	8098		
Renewable energy sources	6206	10763	22481	31851	35654	37659
Net Imports (ktoe)	166637	204703	230358	239251	239062	241870
Solids	4626	21600	29362	28992	43609	53569
Oil	120126	125975	125731	123336	112104	106610
Natural gas	41817	56865	74721	85987	82462	80826
Electricity	68	263	544	936	887	865
Gross Inland Consumption (ktoe)	356072	340160	343117	328287	321531	324544
Solids	133085	83658	67994	67607	83515	92660
Oil	124040	129873	126306	122809	110511	105095
Natural gas	55000	71853	88221	96987	90962	88266
Nuclear	37674	43750	37570	8098		
Electricity	68	263	544	936	887	865
Renewable energy forms	6206	10763	22481	31851	35654	37659
Oil intensity (t/MEUR'00)	70.1	62.8	54.0	44.4	36.1	32.7
Natural gas intensity (t/MEUR'00)	38311.9	42817.4	46484.6	43214.7	36589.3	33781.6
Solid fossil fuels intensity (t/MEUR'00)	166.1	86.5	60.3	49.2	53.3	55.4
Final Energy Demand by sector (ktoe)	226641	220044	238989	246820	242812	240939
Industry	70063	58901	60005	60893	59159	58303
energy intensive industries	49105	40089	39091	38632	36531	35448
other industrial sectors	20959	18812	20915	22261	22628	22855
Residential	58223	63063	70501	72615	73831	74572
Tertiary	39538	32102	36280	38634	38791	38791
Transport	58817	65978	72202	74679	71031	69273
Final Energy Demand by fuel (koe)						
Solids	37024	9893	7321	6481	5451	4990
Oil	95216	97540	102502	100703	92720	88840
Gas	40387	56846	61204	64632	66313	67149
Electricity	38391	41496	46605	51000	54067	55574
Heat (from CHP and distric heating)	13426	9938	11352	11017	10645	10460
Other	2198	4331	10004	12987	13617	13927
CO2 Emissions (Mt of CO2)	949.8	820.6	790.2	803.4	826.3	841.3
Power generation/distric heating	391.3	325.6	288.7	305.4	354.9	382.3
Energy branch	25.1	24.7	17.8	15.5	13.3	12.3
Industry	151.3	109.0	104.1	102.2	94.8	91.1
Residential	129.8	117.3	123.7	123.0	121.7	121.1
Tertiary	82.4	53.0	56.8	57.4	54.2	52.6
Transport	169.9	190.9	199.1	200.0	187.4	181.8
CO2 Emissions Index (1990=100)	100.0	86.4	83.2	84.6	87.0	

Demographic and Economic Assumptions

	2.4	2.2	2.1	2	1.9	1.9
Average household size (persons)	2.4	2.2	2.1	2	1.9	1.9
Gross Value Added (in 000 MEuro'00)	1617.7	1944.4	2259.6	2713.4	3005.6	3175.7
Industry	412.1	412.5	475	562.1	625	660.3
iron and steel	11.9	10.8	11.7	13.5	14.8	15.5
non ferrous metals	4.5	6	7.7	9.2	10.1	10.6
chemicals	38.7	43.1	53.5	64.8	72.8	77.5
petrochemicals, fertilisers and others	29.2	30.1	34.3	37.4	39	39.8
pharmaceuticals and cosmetics	9.5	13	19.2	27.3	33.8	37.7
non metallic minerals	15.2	17.8	17.8	20	21.7	22.6
paper, pulp, printing	29.9	30.7	30.5	35.6	39.5	41.7
paper and pulp production	9.4	9.6	9.7	10.5	10.8	11.0
printing and publishing	20.5	21	20.8	25.1	28.7	30.8
food, drink, tobacco	32.3	38.8	43	49.4	53.4	55.6
textiles and leather	16.4	9.7	8.2	7.8	7.6	7.5
engineering	224.7	215.1	256.8	308.2	345.9	367.2
other industries	38.4	40.7	45.6	53.6	59.2	62.2
Construction	104.7	105.8	83.3	96.7	102.2	105.3
Services	1029.7	1349.1	1618.9	1964.5	2185.2	2315.3
market services	404.6	590.5	712.5	887.4	1007	1074.2
non-market services	339	402	451.6	506.5	525	540.9
trade	286.1	356.5	454.7	570.7	653.2	700.2
Agriculture	20.4	25.3	27.2	30.2	30.9	31.2
Energy sector	50.8	51.7	55.3	59.9	62.3	63.6

GREECE

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	10.2	10.9	11.3	11.4	11.3	11.3
GDP (in 000 MEUR'00)	97.7	123.2	178.7	241.4	291.8	320.6
Energy intensity (toe/MEUR'00)	227.6	227.9	198.3	161.0	131.0	118.4
Gross Inl. Cons./Capita (toe/inhabitant)	2.2	2.6	3.1	3.4	3.4	3.4
Primary Production (ktoe)	9152	9946	10660	10784	11121	11347
Solids	7077	8222	8679	8010	8101	8142
Oil	832	280	150	100		
Natural gas	138	42	40			
Nuclear						
Renewable energy sources	1105	1403	1791	2673	3020	3206
Net Imports (ktoe)	15374	21982	29019	32874	32216	32041
Solids	988	768	452	792	1257	1581
Oil	14325	19527	24242	25896	24548	23940
Natural gas		1689	4051	5961	6228	6354
Electricity	61	-1	274	225	183	165
Gross Inland Consumption (ktoe)	22245	28076	35434	38870	38232	37950
Solids	8091	9040	9131	8802	9358	9642
Oil	12851	15929	20147	21208	19443	18584
Natural gas	138	1705	4091	5961	6228	6354
Nuclear						
Electricity	61	-1	274	225	183	165
Renewable energy forms	1105	1403	1791	2673	3020	3206
Oil intensity (t/MEUR'00)	129.2	127.0	110.7	86.3	65.4	56.9
Natural gas intensity (t/MEUR'00)	1708.7	16741.1	27693.4	29871.2	25818.7	23973.5
Solid fossil fuels intensity (t/MEUR'00)	179.4	154.0	104.0	72.0	61.5	56.9
Final Energy Demand by sector (ktoe)	14563	18626	24406	27350	27409	27484
Industry	3982	4550	5282	5781	5897	5967
energy intensive industries	2585	2835	2839	2851	2767	2726
other industrial sectors	1397	1715	2443	2931	3130	3241
Residential	3054	4470	6509	7281	7447	7522
Tertiary	1711	2410	3750	4306	4600	4763
Transport	5816	7196	8865	9982	9466	9232
Final Energy Demand by fuel (koe)						
Solids	1070	888	502	309	189	147
Oil	10049	12584	16338	17810	16799	16242
Gas	15	252	868	1239	1746	2068
Electricity	2448	3710	5356	6331	6962	7293
Heat (from CHP and distric heating)	132	276	528	720	798	836
Other	849	916	815	941	915	898
CO2 Emissions (Mt of CO2)	70.9	88.9	104.8	110.1	107.5	106.4
Power generation/district heating	34.3	43.8	48.4	49.0	49.3	49.5
Energy branch	2.0	3.3	3.4	3.6	3.0	2.7
Industry	9.4	9.8	10.2	10.1	10.0	10.0
Residential	4.6	7.4	12.4	13.7	13.2	12.9
Tertiary	3.3	3.4	4.9	5.5	5.6	5.7
Transport	17.2	21.2	25.6	28.3	26.5	25.6
CO2 Emissions Index (1990=100)	100.0	125.4	147.8	155.3	151.7	

Demographic and Economic Assumptions

	3	2.8	2.7	2.6	2.6	2.6
Average household size (persons)	3	2.8	2.7	2.6	2.6	2.6
Gross Value Added (in 000 MEuro'00)	92.8	112	161.7	218	263.6	290.0
Industry	10.3	13	15.8	20.4	23.4	25.1
iron and steel	0.2	0.3	0.6	0.7	0.7	0.7
non ferrous metals	0.6	0.5	0.6	0.7	0.9	1.0
chemicals	0.6	0.9	1.1	1.6	1.9	2.1
petrochemicals, fertilisers and others	0.3	0.4	0.5	0.6	0.7	0.7
pharmaceuticals and cosmetics	0.3	0.5	0.6	0.9	1.2	1.4
non metallic minerals	0.4	1	1.3	1.7	1.9	2.0
paper, pulp, printing	0.7	0.8	0.9	1.1	1.2	1.4
paper and pulp production	0.1	0.1	0.1	0.1	0.1	0.1
printing and publishing	0.6	0.7	0.8	1	1.2	1.3
food, drink, tobacco	2.2	2.9	3.7	5.2	6	6.5
textiles and leather	2.6	2.8	2.9	3	3	3.0
engineering	1	2.2	2.7	3.9	4.9	5.5
other industries	2.1	1.6	1.8	2.4	2.8	3.0
Construction	6.2	7.7	12.8	16.8	19	20.3
Services	61.1	77.5	118.3	164.2	203.1	225.8
market services	18.6	23.3	32.3	46.6	59.8	67.7
non-market services	18.5	20.4	30.7	36	39.5	41.3
trade	24	33.8	55.4	81.6	103.8	116.9
Agriculture	11.4	9.4	9.6	10.8	11.8	12.3
Energy sector	3.9	4.5	5.2	5.8	6.2	6.4

HUNGARY

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	10.4	10.2	10.0	9.7	9.5	9.4
GDP (in 000 MEUR'00)	46.5	50.7	72.7	100.0	127.2	143.2
Energy intensity (toe/MEUR'00)	605.5	492.4	394.4	321.9	271.9	249.6
Gross Inl. Cons./Capita (toe/inhabitant)	2.7	2.4	2.9	3.3	3.6	3.8
Primary Production (ktoe)	13638	11127	10189	10075	12492	14433
Solids	3948	2893	1956	1208	1005	918
Oil	2320	1665	1200	1000	800	716
Natural gas	3812	2475	2200	1900	1700	1609
Nuclear	3544	3658	3606	3587	6229	8219
Renewable energy sources	15	436	1227	2380	2759	2972
Net Imports (ktoe)	14436	14011	18490	22131	22074	22193
Solids	1686	1081	1177	1749	2104	2312
Oil	6621	5352	6204	7060	7608	7917
Natural gas	5170	7283	10556	13081	12259	11896
Electricity	958	296	554	240	104	69
Gross Inland Consumption (ktoe)	28134	24941	28680	32205	34566	36502
Solids	5969	3967	3133	2957	3109	3188
Oil	8734	6927	7404	8060	8408	8578
Natural gas	8913	9657	12756	14981	13959	13477
Nuclear	3544	3658	3606	3587	6229	8219
Electricity	958	296	554	240	104	69
Renewable energy forms	15	436	1227	2380	2759	2972
Oil intensity (t/MEUR'00)	184.5	134.2	100.0	79.2	64.9	58.8
Natural gas intensity (t/MEUR'00)	231868.8	230412.3	212251.8	181222.5	132751.2	113837.4
Solid fossil fuels intensity (t/MEUR'00)	408.5	242.1	129.7	86.7	69.8	62.7
Final Energy Demand by sector (ktoe)	18751	15846	19728	22518	23801	24475
Industry	6520	3538	3952	4379	4587	4701
energy intensive industries	4160	2536	2421	2552	2505	2480
other industrial sectors	2361	1002	1531	1827	2082	2221
Residential	5992	5281	7333	8463	8813	8991
Tertiary	3223	3776	4223	4799	4945	5020
Transport	3015	3251	4220	4876	5457	5764
Final Energy Demand by fuel (koe)						
Solids	2502	792	672	512	429	394
Oil	6000	4174	5345	6042	6492	6721
Gas	5941	6503	7464	7874	7966	8004
Electricity	2717	2531	3598	4992	5701	6080
Heat (from CHP and district heating)	1591	1488	1709	1857	1962	2021
Other		358	939	1240	1250	1256
CO2 Emissions (Mt of CO2)	65.5	53.5	59.6	65.3	64.5	64.2
Power generation/district heating	20.5	21.0	21.7	24.8	22.7	21.7
Energy branch	2.5	1.4	1.7	1.9	2.0	2.0
Industry	14.7	6.4	6.6	7.0	6.9	6.8
Residential	13.6	8.8	11.0	11.4	11.3	11.3
Tertiary	5.7	6.4	6.6	6.7	6.6	6.5
Transport	8.6	9.4	11.8	13.5	15.0	15.8
CO2 Emissions Index (1990=100)	100.0	81.7	91.1	99.7	98.4	

Demographic and Economic Assumptions

	2.6	2.4	2.2	2.1	2	2.0
Average household size (persons)	2.6	2.4	2.2	2.1	2	2.0
Gross Value Added (in 000 MEuro'00)	41.1	44.7	64.5	89	113.3	127.9
Industry	7.4	12	17	22.3	27.4	30.5
iron and steel	0.2	0.2	0.2	0.3	0.3	0.3
non ferrous metals	0.2	0.2	0.3	0.4	0.5	0.5
chemicals	0.6	0.5	0.6	0.8	1	1.1
petrochemicals, fertilisers and others	0.4	0.2	0.2	0.2	0.2	0.2
pharmaceuticals and cosmetics	0.2	0.3	0.4	0.6	0.8	0.9
non metallic minerals	0.4	0.5	0.7	1	1.1	1.2
paper, pulp, printing	0.2	0.7	0.8	1.1	1.3	1.4
paper and pulp production	0.1	0.2	0.3	0.3	0.3	0.3
printing and publishing	0.1	0.4	0.6	0.8	1	1.1
food, drink, tobacco	1.3	1.2	1.3	1.7	2.1	2.4
textiles and leather	1.1	0.7	0.6	0.7	0.7	0.7
engineering	2.6	7.2	11	14.7	18.2	20.3
other industries	0.8	0.9	1.3	1.7	2.2	2.5
Construction	2.1	2.2	4	6.6	8.4	9.5
Services	26.2	26.6	38.1	53.9	70.5	80.6
market services	7.4	8.6	11.9	16.7	22.4	26.0
non-market services	7.8	8.5	11.1	15	19	21.4
trade	11	9.6	15.1	22.2	29.1	33.2
Agriculture	3.6	2.4	4.3	5	5.6	5.9
Energy sector	1.9	1.5	1.1	1.2	1.4	1.5

IRELAND

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	3.5	3.8	4.3	4.8	5.1	5.2
GDP (in 000 MEUR'00)	51.5	103.1	168.5	238.6	301.9	339.9
Energy intensity (toe/MEUR'00)	201.9	137.5	100.3	80.2	63.4	56.4
Gross Inl. Cons./Capita (toe/inhabitant)	3.0	3.7	3.9	4.0	3.8	3.7
Primary Production (ktoe)	3495	2111	2130	2620	2766	3043
Solids	1454	894	538	290	310	321
Oil						
Natural gas	1873	958	874	1000	500	353
Nuclear						
Renewable energy sources	168	258	719	1330	1956	2368
Net Imports (ktoe)	7110	12141	14964	16731	16603	16587
Solids	2100	1696	1765	1686	1395	1267
Oil	5010	7959	9470	10474	10143	9992
Natural gas		2478	3643	4471	4946	5198
Electricity		8	85	100	119	129
Gross Inland Consumption (ktoe)	10398	14173	16898	19132	19131	19282
Solids	3590	2565	2303	1976	1705	1581
Oil	4768	7906	9274	10254	9905	9757
Natural gas	1873	3436	4517	5471	5446	5446
Nuclear						
Electricity		8	85	100	119	129
Renewable energy forms	168	258	719	1330	1956	2368
Oil intensity (t/MEUR'00)	90.9	75.3	54.1	42.2	32.2	28.2
Natural gas intensity (t/MEUR'00)	43994.9	40314.9	32428.1	27737.5	21821.6	19381.4
Solid fossil fuels intensity (t/MEUR'00)	151.0	52.2	27.8	16.4	10.8	8.8
Final Energy Demand by sector (ktoe)	7287	10596	13545	15678	16447	16853
Industry	1765	2351	2305	2666	2945	3092
energy intensive industries	898	1120	740	837	901	933
other industrial sectors	867	1232	1565	1829	2044	2159
Residential	2323	2475	3154	3609	3964	4146
Tertiary	1214	1764	2490	2918	3056	3133
Transport	1985	4005	5595	6485	6482	6482
Final Energy Demand by fuel (koe)						
Solids	1678	530	374	288	569	794
Oil	3874	6894	8736	9690	9482	9320
Gas	560	1186	1635	2041	2196	2258
Electricity	1020	1737	2392	2996	3334	3498
Heat (from CHP and district heating)	46	108	152	211	307	368
Other	108	141	255	453	558	615
CO2 Emissions (Mt of CO2)	30.4	41.2	47	50.4	48.7	47.9
Power generation/district heating	10.4	15.2	15.1	15.0	12.3	11.1
Energy branch	0.2	0.3	0.3	0.4	0.4	0.4
Industry	3.9	4.3	3.9	4.4	5.1	5.5
Residential	7.0	5.7	6.7	7.3	7.9	8.2
Tertiary	3.0	3.8	4.6	5.0	4.9	4.9
Transport	5.9	11.9	16.4	18.4	18.0	17.8
CO2 Emissions Index (1990=100)	100.0	135.5	154.7	166.1	160.2	

Demographic and Economic Assumptions

	3.4	3	2.8	2.7	2.4	2.3
Average household size (persons)						
Gross Value Added (in 000 MEuro'00)	48.7	91.6	148.8	209.1	263.3	294.9
Industry	13.2	35.8	60.8	86.3	107.3	118.9
iron and steel	0.1	0.1				
non ferrous metals	0.1	0.1	0.1	0.1	0.1	0.1
chemicals	2.2	13.1	27.4	38.4	47.2	52.2
petrochemicals, fertilisers and others	1.7	10	19.9	27	32.2	35.2
pharmaceuticals and cosmetics	0.5	3.1	7.5	11.4	14.9	17.0
non metallic minerals	0.4	0.8	1.1	1.5	1.9	2.1
paper, pulp, printing	1.1	4.2	5.7	7.6	9.3	10.2
paper and pulp production	0.2	0.3	0.3	0.4	0.4	0.4
printing and publishing	0.9	3.9	5.4	7.2	8.8	9.8
food, drink, tobacco	4.2	4.9	10.1	14.5	18.2	20.4
textiles and leather	0.5	0.4	0.3	0.3	0.3	-0.2
engineering	3.7	10.8	13.9	21.1	27	30.5
other industries	0.9	1.5	2.1	2.8	3.3	3.6
Construction	1	2.8	5.3	7.4	9.2	10.3
Services	28.7	46.8	75.9	107.9	138.9	157.6
market services	9.8	16.2	25.4	37.4	49.7	57.3
non-market services	10.5	17.3	27.5	36.5	44.2	48.6
trade	8.5	13.2	23	34	45	51.7
Agriculture	4.7	4.7	5	5.3	5.5	5.6
Energy sector	1.1	1.5	1.7	2.2	2.4	2.6

ITALY

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	56.7	57.8	58.6	58.3	57.1	56.5
GDP (in 000 MEUR'00)	995.9	1166.5	1313.2	1604.2	1846.2	1979.1
Energy intensity (toe/MEUR'00)	153.7	147.9	142.0	125.2	110.2	103.2
Gross Inl. Cons./Capita (toe/inhabitant)	2.7	3.0	3.2	3.5	3.6	3.6
Primary Production (ktoe)	25566	27399	30652	29829	33188	35221
Solids	218	4				
Oil	4704	4606	3910	3677	3345	3197
Natural gas	14030	13622	13000	8000	7774	7658
Nuclear						
Renewable energy sources	6614	9167	13741	18151	22069	24366
Net Imports (ktoe)	131949	152587	158797	174169	173415	174007
Solids	13792	13188	15702	21358	28843	33437
Oil	89881	88578	86682	82464	76293	73290
Natural gas	25296	47008	52591	67118	65930	65273
Electricity	2980	3813	3822	3228	2349	2007
Gross Inland Consumption (ktoe)	153032	172477	186530	200894	203407	206212
Solids	14621	12659	15702	21358	28843	33437
Oil	89816	88898	87674	83038	76442	73433
Natural gas	39001	57940	65591	75118	73704	72970
Nuclear						
Electricity	2980	3813	3822	3228	2349	2007
Renewable energy forms	6614	9167	13741	18151	22069	24366
Oil intensity (t/MEUR'00)	88.6	74.8	65.6	50.8	40.7	36.4
Natural gas intensity (t/MEUR'00)	47373.1	60084.9	60420.6	56644.4	48292.9	44601.2
Solid fossil fuels intensity (t/MEUR'00)	31.8	22.8	24.3	26.3	30.0	31.9
Final Energy Demand by sector (ktoe)	110195	126874	137666	147738	150820	152660
Industry	39256	43109	44649	48465	50862	52118
energy intensive industries	26838	26213	25584	26363	26196	26065
other industrial sectors	12418	16895	19065	22102	24666	26053
Residential	30494	28766	30336	35141	39074	41271
Tertiary	7041	13737	18580	20318	19941	19742
Transport	33403	41263	44101	43814	40942	39529
Final Energy Demand by fuel (koe)						
Solids	4205	3470	2946	2863	2488	2482
Oil	53623	56146	58141	57003	53120	51151
Gas	28569	36667	38179	40697	41318	41628
Electricity	18408	23435	29088	35922	41010	43642
Heat (from CHP and distric heating)	4282	5150	5836	6844	8191	8934
Other	1107	2007	3475	4408	4693	4824
CO2 Emissions (Mt of CO2)	384.1	417.5	443.9	476	484.9	490.6
Power generation/district heating	121.2	133.4	151.4	181.8	203.5	214.9
Energy branch	16.9	16.3	17.2	16.6	15.6	15.1
Industry	74.2	71.3	69.4	71.8	69.4	68.4
Residential	65.4	55.7	55.7	59.7	61.5	62.4
Tertiary	9.2	21.0	26.2	25.6	24.0	23.2
Transport	97.1	119.7	123.9	120.5	110.9	106.5
CO2 Emissions Index (1990=100)	100.0	108.7	115.6	123.9	126.3	

Demographic and Economic Assumptions

	2.6	2.4	2.2	2	1.8	1.7
Average household size (persons)	2.6	2.4	2.2	2	1.8	1.7
Gross Value Added (in 000 MEuro'00)	936.3	1098.5	1243.3	1525.8	1760.8	1894.8
Industry	200.3	231.3	239.3	302.1	363	399.3
iron and steel	6.3	5.5	6	6.6	7.1	7.4
non ferrous metals	1.9	2.7	2.8	3.1	3.4	3.5
chemicals	17.2	19.3	20.7	30.5	40.8	47.4
petrochemicals, fertilisers and others	9.1	9.3	8.6	10.6	12.1	13.0
pharmaceuticals and cosmetics	8.1	10	12	19.9	28.7	34.4
non metallic minerals	13.1	15	16.2	17.3	18	18.4
paper, pulp, printing	13.2	16	18.8	27.7	38.3	44.9
paper and pulp production	4.6	5.6	6.3	8.8	11.8	13.7
printing and publishing	8.7	10.3	12.5	18.9	26.4	31.2
food, drink, tobacco	19.7	22.4	27.5	36.8	46	51.5
textiles and leather	29.7	31.5	25.7	24.9	24.8	24.8
engineering	76.6	90.2	90.9	116.2	137.9	150.0
other industries	22.5	28.8	30.8	38.9	46.8	51.4
Construction	54.4	54.5	66	69	71	72.1
Services	621.7	746.6	864.5	1073.3	1238.9	1332.0
market services	218.4	270.9	314.5	403.8	475.3	514.6
non-market services	181.8	199.8	234.3	262.65	278.3	286.7
trade	221.5	275.8	315.7	406.9	485.4	530.7
Agriculture	28.8	34.6	36.1	39.6	41.9	43.2
Energy sector	31.2	31.5	37.4	41.7	45.9	48.2

LATVIA

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	2.7	2.4	2.2	2.1	2.0	2.0
GDP (in 000 MEUR'00)	12.1	8.4	17.0	27.9	39.1	46.2
Energy intensity (toe/MEUR'00)	509.5	437.9	318.7	247.9	200.5	180.3
Gross Inl. Cons./Capita (toe/inhabitant)	2.3	1.6	2.4	3.3	3.9	4.2
Primary Production (ktoe)	437	1079	1690	2166	2288	2347
Solids	51	18	18	27	30	32
Oil						
Natural gas						
Nuclear						
Renewable energy sources	387	1061	1672	2139	2258	2315
Net Imports (ktoe)	5915	2473	3740	4748	5560	6533
Solids	904	63	68	80	503	1262
Oil	2396	1143	1504	1708	1942	2072
Natural gas	2308	1113	1992	2765	2899	2972
Electricity	308	154	176	195	216	227
Gross Inland Consumption (ktoe)	6169	3669	5429	6914	7849	8795
Solids	934	159	86	106	533	1209
Oil	2396	1203	1504	1708	1942	2072
Natural gas	2145	1092	1992	2765	2899	2972
Nuclear						
Electricity	308	154	176	195	216	227
Renewable energy forms	387	1061	1672	2139	2258	2315
Oil intensity (t/MEUR'00)	194.5	140.6	86.9	60.1	48.8	44.0
Natural gas intensity (t/MEUR'00)	214443.7	157258.7	141746.3	119884.3	89689.7	77798.4
Solid fossil fuels intensity (t/MEUR'00)	245.7	58.6	15.2	11.1	38.9	73.8
Final Energy Demand by sector (ktoe)	4798	2898	4580	5871	6667	7108
Industry	868	656	925	1269	1530	1680
energy intensive industries	305	216	282	343	376	393
other industrial sectors	563	440	643	926	1154	1287
Residential	2240	965	1773	2341	2621	2768
Tertiary	554	585	905	1093	1138	1161
Transport	1136	691	977	1168	1378	1499
Final Energy Demand by fuel (koe)						
Solids	610	58	45	30	17	13
Oil	2084	939	1253	1428	1615	1705
Gas	579	329	705	970	1253	1417
Electricity	749	382	682	1141	1498	1711
Heat (from CHP and district heating)	776	590	817	996	1013	1017
Other		600	1079	1304	1271	1245
CO2 Emissions (Mt of CO2)	15.8	6.3	8.9	11.1	13.6	15.2
Power generation/district heating	5.7	2.3	3.3	4.4	5.8	6.7
Energy branch	0.1	0.2	0.1	0.1		
Industry	1.6	1.0	1.7	2.2	2.8	3.2
Residential	4.4	0.3	0.5	0.7	0.7	0.7
Tertiary	0.7	0.5	0.6	0.7	0.6	0.6
Transport	3.3	2.0	2.7	3.1	3.7	4.0
CO2 Emissions Index (1990=100)	100.0	40.1	56.2	69.9	86.1	

Demographic and Economic Assumptions

	2.7	2.6	2.4	2.3	2.2	2.1
Average household size (persons)	2.7	2.6	2.4	2.3	2.2	2.1
Gross Value Added (in 000 MEuro'00)	10.7	7.4	15.1	24.7	34.7	41.2
Industry	3.3	1.4	3.4	5.9	8.3	9.9
iron and steel	0.1	0.1	0.1	0.1	0.1	0.1
non ferrous metals						
chemicals	0.1		0.3	0.5	0.8	1.0
petrochemicals, fertilisers and others	0.1		0.1	0.2	0.3	0.4
pharmaceuticals and cosmetics			0.2	0.3	0.5	0.6
non metallic minerals	0.1		0.1	0.1	0.2	0.2
paper, pulp, printing	0.6	0.1	0.4	0.7	1	1.2
paper and pulp production	0.1				0.1	0.1
printing and publishing	0.4	0.1	0.4	0.7	0.9	1.1
food, drink, tobacco	0.9	0.4	1.2	2.1	3	3.6
textiles and leather	0.5	0.2	0.2	0.3	0.4	0.4
engineering	0.9	0.2	0.4	0.8	1.2	1.5
other industries	0.2	0.4	0.7	1.2	1.6	1.9
Construction	1.9	0.4	1	1.7	2.3	2.7
Services	4.1	4.8	9.6	15.9	22.8	27.2
market services	1.1	1.3	2.6	4.4	6.5	7.9
non-market services	1	1.3	1.9	2.7	3.5	4.0
trade	1.9	2.1	5.2	8.9	12.7	15.2
Agriculture	0.9	0.5	0.7	0.8	0.9	0.9
Energy sector	0.5	0.3	0.4	0.4	0.5	0.5

LITHUANIA

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	3.7	3.5	3.3	3.2	3.1	3.0
GDP (in 000 MEUR'00)	17.3	12.3	23.1	37.2	54.3	65.4
Energy intensity (toe/MEUR'00)	925.9	586.5	305.4	251.6	205.3	185.6
Gross Inl. Cons./Capita (toe/inhabitant)	4.3	2.1	2.1	2.9	3.6	4.0
Primary Production (ktoe)	4455	3169	961	2351	3334	4010
Solids	14	12	4	3	4	4
Oil	12	337	161	180	202	213
Natural gas						
Nuclear	4394	2172		906	1544	2018
Renewable energy sources	36	649	796	1261	1584	1775
Net Imports (ktoe)	11936	4360	6232	7170	7992	8441
Solids	885	87	47	36	349	1082
Oil	7257	2297	2369	2634	2946	3112
Natural gas	4824	2090	3787	4835	5089	5218
Electricity	-1030	-115	29	-335	-392	-970
Gross Inland Consumption (ktoe)	16025	7226	7065	9360	11141	12223
Solids	927	99	51	39	352	1053
Oil	6875	2331	2401	2653	2963	3130
Natural gas	4824	2090	3787	4835	5089	5218
Nuclear	4394	2172		906	1544	2018
Electricity	-1030	-115	29	-335	-392	-970
Renewable energy forms	36	649	796	1261	1584	1775
Oil intensity (t/MEUR'00)	390.3	186.1	102.1	70.0	53.6	47.0
Natural gas intensity (t/MEUR'00)	337312.6	205547.7	198314.6	157226.2	113371.5	96460.1
Solid fossil fuels intensity (t/MEUR'00)	170.5	24.9	6.6	3.1	18.5	45.4
Final Energy Demand by sector (ktoe)	9423	3639	4809	6229	7516	8250
Industry	3229	678	940	1328	1669	1875
energy intensive industries	1574	253	302	408	483	525
other industrial sectors	1656	426	637	920	1187	1350
Residential	1662	1345	1582	2026	2454	2696
Tertiary	2541	568	777	1023	1215	1322
Transport	1990	1048	1510	1852	2177	2357
Final Energy Demand by fuel (koe)						
Solids	852	88	44	36	33	32
Oil	4055	1348	1763	2055	2336	2485
Gas	1483	367	545	833	1092	1245
Electricity	1033	531	848	1257	1618	1835
Heat (from CHP and distric heating)	2000	725	992	1188	1380	1483
Other		579	617	859	1057	1170
CO2 Emissions (Mt of CO2)	32.9	10.2	14.4	17.3	19.8	21.3
Power generation/distric heating	12.1	3.9	6.3	7.5	8.7	9.4
Energy branch	1.6	1.1	1.4	1.5	1.5	1.5
Industry	6.0	1.1	1.3	1.7	1.9	2.0
Residential	2.5	0.5	0.6	0.9	1.2	1.4
Tertiary	4.8	0.5	0.4	0.5	0.6	0.6
Transport	5.8	3.1	4.4	5.1	5.9	6.4
CO2 Emissions Index (1990=100)	100.0	31.1	43.9	52.5	60.3	

Demographic and Economic Assumptions

	2.9	2.8	2.4	2.3	2.1	2.0
Average household size (persons)	2.9	2.8	2.4	2.3	2.1	2.0
Gross Value Added (in 000 MEuro'00)	15.1	11.3	20.8	33.6	49.2	59.7
Industry	3.8	2.3	5.2	8.8	13	15.8
iron and steel						
non ferrous metals						
chemicals	0.2	0.3	0.3	0.6	1.1	1.5
petrochemicals, fertilisers and others	0.1	0.1	0.2	0.3	0.5	0.6
pharmaceuticals and cosmetics		0.1	0.1	0.3	0.6	0.8
non metallic minerals	0.3	0.1	0.2	0.4	0.6	0.7
paper, pulp, printing	0.9	0.2	0.3	0.4	0.5	0.6
paper and pulp production	0.4			0.1	0.1	0.1
printing and publishing	0.5	0.2	0.3	0.4	0.4	0.5
food, drink, tobacco	0.8	0.6	0.9	1.4	2	2.4
textiles and leather	0.6	0.4	0.6	0.7	0.8	0.8
engineering	0.7	0.4	1.3	2.5	3.8	4.7
other industries	0.3	0.4	1.6	2.8	4.2	5.1
Construction	1.5	0.6	1.5	2.6	3.7	4.5
Services	6.1	6.6	11.6	19.1	28.7	35.3
market services	1	1.5	2.6	4.7	7.8	10.1
non-market services	2.4	2	2.5	3.7	5	5.8
trade	2.7	3.1	6.5	10.7	16	19.5
Agriculture	1.4	1.1	1.2	1.3	1.5	1.6
Energy sector	2.3	0.6	1.3	1.8	2.3	2.6

LUXEMBOURG

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	0.4	0.4	0.5	0.5	0.6	0.6
GDP (in 000 MEUR'00)	12.5	21.3	31.7	50.7	64.4	72.5
Energy intensity (toe/MEUR'00)	284.9	170.4	139.6	99.6	81.3	73.5
Gross Inl. Cons./Capita (toe/inhabitant)	9.3	8.3	9.3	9.7	9.2	9.0
Primary Production (ktoe)	47	57	92	233	286	317
Solids						
Oil						
Natural gas						
Nuclear						
Renewable energy sources	47	57	92	233	286	317
Net Imports (ktoe)	3516	3619	4328	4820	4948	5025
Solids	1130	125	37	36	25	21
Oil	1620	2332	2686	2794	2707	2667
Natural gas	430	669	1180	1443	1611	1702
Electricity	336	492	424	548	605	636
Gross Inland Consumption (ktoe)	3551	3627	4420	5054	5234	5342
Solids	1130	125	37	36	25	21
Oil	1609	2283	2686	2794	2707	2667
Natural gas	430	669	1180	1443	1611	1702
Nuclear						
Electricity	336	492	424	548	605	636
Renewable energy forms	47	57	92	233	286	317
Oil intensity (t/MEUR'00)	126.4	105.3	83.2	54.1	41.3	36.1
Natural gas intensity (t/MEUR'00)	41613.1	37994.2	45029.2	34429.4	30260.8	28388.1
Solid fossil fuels intensity (t/MEUR'00)	195.9	12.3	2.4	1.4	0.7	0.5
Final Energy Demand by sector (ktoe)	3325	3534	4208	4811	4968	5060
Industry	1725	944	1126	1512	1676	1769
energy intensive industries	1521	484	491	530	524	521
other industrial sectors	204	459	635	983	1152	1247
Residential	519	596	669	672	670	670
Tertiary	74	118	168	209	249	272
Transport	1007	1877	2245	2418	2373	2349
Final Energy Demand by fuel (koe)						
Solids	752	121	37	36	25	21
Oil	1581	2266	2663	2763	2673	2629
Gas	622	612	822	1086	1209	1275
Electricity	355	491	582	724	816	865
Heat (from CHP and distric heating)		28	52	59	66	70
Other	15	16	52	143	180	201
CO2 Emissions (Mt of CO2)	10.6	8.8	10.9	11.8	11.9	12.6
Power generation/district heating	0.7	0.1	0.8	0.8	0.9	1.0
Energy branch						
Industry	5.7	1.6	1.8	2.5	2.7	2.8
Residential	1.3	1.4	1.5	1.5	1.4	1.4
Tertiary		0.1	0.1	0.2	0.2	0.2
Transport	3.0	5.6	6.6	6.8	6.6	7.2
CO2 Emissions Index (1990=100)	100.0	83.0	102.4	111.0	111.8	

Demographic and Economic Assumptions

	2.7	2.5	2.4	2.2	2.1	2.0
Average household size (persons)	2.7	2.5	2.4	2.2	2.1	2.0
Gross Value Added (in 000 MEuro'00)	12.9	22	32.9	52.5	66.2	74.6
Industry	1.9	2.6	3.5	5.6	7	8.0
iron and steel	0.4	0.5	0.5	0.6	0.6	0.6
non ferrous metals						
chemicals	0.1	0.1	0.2	0.4	0.6	0.7
petrochemicals, fertilisers and others	0.1	0.1	0.2	0.4	0.6	0.7
pharmaceuticals and cosmetics						
non metallic minerals	0.2	0.2	0.3	0.4	0.5	0.6
paper, pulp, printing	0.1	0.2	0.3	0.5	0.6	0.7
paper and pulp production						
printing and publishing	0.1	0.2	0.3	0.5	0.6	0.7
food, drink, tobacco	0.2	0.2	0.2	0.4	0.5	0.6
textiles and leather	0.1	0.2	0.2	0.3	0.3	0.3
engineering	0.6	0.8	1	1.7	2.2	2.5
other industries	0.3	0.5	0.8	1.4	1.8	2.0
Construction	0.9	1.2	2.1	3.1	3.7	4.1
Services	9.8	17.7	26.7	43	54.6	61.6
market services	5	9.1	12.6	20.4	26.3	29.9
non-market services	2.3	3.3	4.7	6.7	7.7	8.3
trade	2.5	5.3	9.4	15.9	20.6	23.4
Agriculture	0.1	0.2	0.1	0.1	0.1	0.1
Energy sector	0.2	0.3	0.5	0.6	0.8	0.9

MALTA

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	0.4	0.4	0.4	0.5	0.5	0.5
GDP (in 000 MEUR'00)	2.6	4.1	4.7	6.6	8.7	10.0
Energy intensity (toe/MEUR'00)	226.3	227.6	228.4	169.1	126.0	108.8
Gross Inl. Cons./Capita (toe/inhabitant)	1.6	2.4	2.5	2.5	2.3	2.2
Primary Production (ktoe)			6	25	38	47
Solids						
Oil						
Natural gas						
Nuclear						
Renewable energy sources			6	25	38	47
Net Imports (ktoe)	611	1231	1352	1361	1313	1288
Solids			3	4	5	6
Oil	611	1231	1349	1357	1308	1282
Natural gas						
Electricity						
Gross Inland Consumption (ktoe)	581	940	1075	1115	1096	1089
Solids			3	4	5	6
Oil	581	940	1066	1086	1052	1036
Natural gas						
Nuclear						
Electricity						
Renewable energy forms			6	25	38	47
Oil intensity (t/MEUR'00)	219.5	225.2	222.7	161.6	118.7	101.9
Natural gas intensity (t/MEUR'00)						
Solid fossil fuels intensity (t/MEUR'00)			1.3	1.2	1.1	1.1
Final Energy Demand by sector (ktoe)	332	522	631	692	666	658
Industry		69	77	89	106	116
energy intensive industries						
other industrial sectors		69	77	89	106	116
Residential	55	82	109	130	141	147
Tertiary	56	52	65	72	80	84
Transport	221	319	380	402	339	311
Final Energy Demand by fuel (koe)						
Solids						
Oil	254	367	431	452	386	355
Gas						
Electricity	78	155	200	238	278	300
Heat (from CHP and distric heating)						
Other				2	3	4
CO2 Emissions (Mt of CO2)	1.8	2.7	3.3	3.3	3.2	3.2
Power generation/district heating	1.0	1.7	2.0	2.0	2.1	2.2
Energy branch						
Industry						
Residential	0.1	0.1	0.1	0.1	0.1	0.1
Tertiary						
Transport	0.7	1.0	1.1	1.2	1.0	0.9
CO2 Emissions Index (1990=100)	100.0	154.4	184.0	187.1	181.6	

Demographic and Economic Assumptions

	1990	2000	2010	2020	2030	2035
Average household size (persons)	3.2	2.9	2.6	2.5	2.3	2.2
Gross Value Added (in 000 MEuro'00)	2.3	3.7	4.2	5.9	7.7	8.7
Industry	0.6	0.8	1.1	1.4	1.9	2.2
iron and steel						
non ferrous metals						
chemicals						
petrochemicals, fertilisers and others						
pharmaceuticals and cosmetics						
non metallic minerals						
paper, pulp, printing						
paper and pulp production						
printing and publishing						
food, drink, tobacco						
textiles and leather						
engineering						
other industries	0.6	0.8	1.1	1.4	1.9	2.2
Construction	0.1	0.1	0.1	0.2	0.2	0.2
Services	1.5	2.6	2.8	4.1	5.4	6.1
market services	0.3	0.7	1.1	1.6	2.2	2.6
non-market services	0.5	1	0.9	1.2	1.4	1.5
trade	0.7	0.9	0.8	1.3	1.7	2.0
Agriculture						
Energy sector	0.1	0.1	0.2	0.2	0.2	0.2

THE NETHERLANDS

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	14.9	15.9	16.7	17.2	17.6	17.8
GDP (in 000 MEUR'00)	302.0	402.3	463.3	555.6	641.9	691.5
Energy intensity (toe/MEUR'00)	221.3	188.1	177.4	153.9	132.7	123.0
Gross Inl. Cons./Capita (toe/inhabitant)	4.5	4.8	4.9	5.0	4.8	4.8
Primary Production (ktoe)	60288	57172	65844	58086	49419	47758
Solids						
Oil	4029	2423	2645	2000	1000	707
Natural gas	54613	51904	59000	50000	39000	34363
Nuclear	881	1013	1044	1086	3451	6164
Renewable energy sources	766	1831	3156	5001	5968	6525
Net Imports (ktoe)	17415	34275	30911	43728	52811	58022
Solids	9546	8166	8240	8730	10169	10955
Oil	30876	41673	40415	41422	42494	43135
Natural gas	-23799	-17191	-19090	-7533	-653	3251
Electricity	792	1626	1346	1110	801	681
Gross Inland Consumption (ktoe)	66841	75655	82163	85527	85189	86854
Solids	9178	7979	8240	8730	10169	10955
Oil	24415	28496	28468	27134	26453	26059
Natural gas	30810	34711	39910	42467	38347	36468
Nuclear	881	1013	1044	1086	3451	6164
Electricity	792	1626	1346	1110	801	684
Renewable energy forms	766	1831	3156	5001	5968	6525
Oil intensity (t/MEUR'00)	79.4	69.6	60.3	48.0	40.5	37.0
Natural gas intensity (t/MEUR'00)	123411.6	104373.1	104205.5	92461.5	72266.2	63794.2
Solid fossil fuels intensity (t/MEUR'00)	65.9	41.6	36.2	31.0	30.4	29.9
Final Energy Demand by sector (ktoe)	43946	51198	57060	61131	62715	63547
Industry	14171	15207	17867	18402	18252	18188
energy intensive industries	10511	10503	12592	12756	12354	12170
other industrial sectors	3659	4703	5275	5647	5899	6018
Residential	9772	10286	11115	12042	12181	12242
Tertiary	9647	11885	12622	13600	14201	14487
Transport	10356	13820	15456	17087	18081	18630
Final Energy Demand by fuel (koe)						
Solids	1709	1294	1401	1309	1169	1101
Oil	12739	16419	17988	18327	18310	18228
Gas	20745	20527	21755	22633	21773	21244
Electricity	6322	8421	9852	11568	12646	13169
Heat (from CHP and district heating)	2138	4225	5405	6098	6711	7023
Other	293	312	659	1195	2106	2782
CO2 Emissions (Mt of CO2)	152	165.5	178.3	183.6	179.1	177.2
Power generation/district heating	44.6	53.7	59.2	62.3	61.3	60.7
Energy branch	13.6	9.6	9.0	8.3	7.4	7.0
Industry	25.5	23.3	26.7	25.6	21.5	19.7
Residential	19.2	18.9	19.4	19.8	19.0	18.6
Tertiary	18.9	19.5	19.4	19.6	19.6	19.6
Transport	30.1	40.5	44.6	48.0	50.3	51.6
CO2 Emissions Index (1990=100)	100.0	108.9	117.3	120.8	117.9	

Demographic and Economic Assumptions

	2.5	2.4	2.2	2	1.9	1.9
Average household size (persons)	2.5	2.4	2.2	2	1.9	1.9
Gross Value Added (in 000 MEuro'00)	283	373.8	429.6	513.8	592.6	636.8
Industry	50.3	62.5	64.7	75	84.3	89.5
iron and steel	1.4	1.3	1.4	1.5	1.5	1.5
non ferrous metals	0.6	0.7	0.8	0.9	0.9	0.9
chemicals	8.4	10.5	12.2	14.2	16	17.0
petrochemicals, fertilisers and others	7.4	8.1	9.1	9.9	10.5	10.8
pharmaceuticals and cosmetics	1	2.5	3.2	4.3	5.5	6.2
non metallic minerals	2.3	2.6	2.5	2.8	3.1	3.3
paper, pulp, printing	6.4	7.9	7.8	9	10.1	10.7
paper and pulp production	1.6	1.8	1.8	2.1	2.3	2.4
printing and publishing	4.7	6.1	5.9	6.9	7.8	8.3
food, drink, tobacco	8.3	11	11.9	13.9	15.7	16.7
textiles and leather	1.6	1.6	1.3	1.3	1.3	1.3
engineering	15.5	19.7	19.5	22.9	25.9	27.6
other industries	5.8	7.2	7.4	8.6	9.8	10.5
Construction	18	19.4	20.2	22.9	25.2	26.5
Services	191.1	265.4	318.2	387.5	453.4	490.4
market services	59	91.5	104.9	127.8	151	164.3
non-market services	69.8	79.6	104.3	124.4	140.6	149.2
trade	62.3	94.3	109.1	135.3	161.8	176.9
Agriculture	9.5	12.1	11.1	11.9	12.5	12.8
Energy sector	14.1	14.5	15.4	16.6	17.2	17.5

POLAND

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	38.1	38.6	37.8	37.1	36.5	36.4
GDP (in 000 MEUR'00)	126.2	180.6	265.4	406.9	564.6	664.1
Energy intensity (toe/MEUR'00)	791.5	499.4	378.9	300.3	238.1	211.9
Gross Inl. Cons./Capita (toe/inhabitant)	2.6	2.3	2.7	3.3	3.7	3.9
Primary Production (ktoe)	99228	79700	70163	70748	74687	80748
Solids	94459	71297	59036	50253	45000	42579
Oil	159	841	750	700	600	556
Natural gas	2378	3313	3200	3000	2700	2568
Nuclear				2983	8977	15540
Renewable energy sources	2232	4250	7177	13812	17409	19505
Net Imports (ktoe)	2238	10134	30782	51931	60263	64920
Solids	-18913	-16309	-6818	-1264	1282	6217
Oil	14468	20384	25834	31223	35237	37403
Natural gas	6773	6607	12555	22459	24587	25714
Electricity	-90	-548	-790	-487	-843	-4412
Gross Inland Consumption (ktoe)	99866	90192	100537	122200	134435	141293
Solids	75405	56357	52219	48989	46282	44910
Oil	13380	20174	26176	31444	35323	37494
Natural gas	8939	9960	15755	25459	27287	28256
Nuclear				2983	8977	15540
Electricity	-90	-548	-790	-487	-843	-4412
Renewable energy forms	2232	4250	7177	13812	17409	19505
Oil intensity (t/MEUR'00)	104.1	109.7	96.9	75.9	61.4	55.4
Natural gas intensity (t/MEUR'00)	85684.2	66713.4	71810.6	75687.6	58463.7	51467.4
Solid fossil fuels intensity (t/MEUR'00)	1901.7	965.5	592.3	352.9	234.1	190.7
Final Energy Demand by sector (ktoe)	59574	57984	67641	85323	99007	106776
Industry	25252	21297	21390	26253	29264	30970
energy intensive industries	16249	14332	13230	15704	16958	17647
other industrial sectors	9003	6965	8160	10549	12306	13322
Residential	18126	17516	19188	24090	28159	30485
Tertiary	8858	9986	13174	18260	22498	24962
Transport	7338	9185	13889	16720	19086	20359
Final Energy Demand by fuel (koe)						
Solids	17066	13728	10080	8309	8191	8145
Oil	9107	15436	21552	27013	30467	32320
Gas	7987	7220	10755	15902	18442	19855
Electricity	8233	8317	10428	15486	20261	23135
Heat (from CHP and distric heating)	15563	9391	9924	11381	13511	14691
Other	1619	3890	4883	7232	8135	8630
CO2 Emissions (Mt of CO2)	332.2	290.3	305.3	329	330.9	332.8
Power generation/district heating	209.3	159.4	168.1	170.6	157.7	151.5
Energy branch	5.8	11.4	6.4	6.4	5.7	5.4
Industry	44.0	46.1	45.3	52.1	55.2	56.9
Residential	33.1	27.9	26.2	28.8	29.8	30.2
Tertiary	19.4	19.7	20.9	26.1	31.8	35.1
Transport	20.5	25.8	38.4	45.0	50.6	53.7
CO2 Emissions Index (1990=100)	100.0	87.4	91.9	99.1	99.6	

Demographic and Economic Assumptions

	3.1	2.8	2.6	2.5	2.4	2.4
Average household size (persons)	3.1	2.8	2.6	2.5	2.4	2.4
Gross Value Added (in 000 MEuro'00)	109.8	154.6	226.6	349.2	485.9	575.1
Industry	25.7	38.2	64.4	101.5	133.6	153.4
iron and steel	1.8	1.4	1.5	1.7	1.9	2.0
non ferrous metals	0.2	0.3	0.4	0.5	0.5	0.5
chemicals	2.4	3	5.1	9.3	12.9	15.0
petrochemicals, fertilisers and others	1.7	1.6	1.9	2.9	3.8	4.3
pharmaceuticals and cosmetics	0.6	1.4	3.2	6.4	9	10.7
non metallic minerals	1.4	2.6	4.5	7.1	9.1	10.3
paper, pulp, printing	1.1	2.8	4.9	7.1	8.4	9.2
paper and pulp production	0.6	0.8	1.2	1.5	1.7	1.8
printing and publishing	0.5	1.9	3.6	5.5	6.7	7.4
food, drink, tobacco	4.7	10	18.7	28.3	36.7	41.7
textiles and leather	2.2	2.6	3.4	4	4.5	4.8
engineering	9.8	10.8	18	31	43.1	50.7
other industries	2.1	4.8	7.9	12.5	16.6	19.2
Construction	8.3	11.3	11.2	18.1	24.9	29.1
Services	60.8	86.2	128.8	203	296.2	358.7
market services	10.2	15.9	24.1	41	63.5	79.1
non-market services	28.5	26.7	32.9	42.9	53	58.8
trade	22.1	43.6	71.8	119.1	179.7	220.7
Agriculture	5.1	8	11.7	15.2	18.3	20.1
Energy sector	9.8	11	10.4	11.4	12.9	13.8

PORTUGAL

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	10.0	10.2	10.7	10.8	10.7	10.6
GDP (in 000 MEUR'00)	87.9	115.5	131.2	172.2	221.3	250.4
Energy intensity (toe/MEUR'00)	192.1	208.6	212.1	179.3	144.5	130.0
Gross Inl. Cons./Capita (toe/inhabitant)	1.7	2.4	2.6	2.9	3.0	3.1
Primary Production (ktoe)	2808	3109	3827	4551	5295	5704
Solids	115					
Oil						
Natural gas						
Nuclear						
Renewable energy sources	2692	3109	3827	4551	5295	5704
Net Imports (ktoe)	15160	21588	24725	27115	27539	28030
Solids	2789	3913	3328	3325	4932	6001
Oil	12367	15556	16308	16916	16279	15956
Natural gas		2039	4978	6782	6251	6005
Electricity	3	80	110	91	75	68
Gross Inland Consumption (ktoe)	16890	24108	27833	30872	31967	32886
Solids	2580	3803	3328	3325	4934	6003
Oil	11614	15083	15589	16122	15412	15106
Natural gas		2034	4978	6782	6251	6005
Nuclear						
Electricity	3	80	110	91	75	68
Renewable energy forms	2692	3109	3827	4551	5295	5704
Oil intensity (t/MEUR'00)	129.8	128.2	116.7	91.9	68.4	59.3
Natural gas intensity (t/MEUR'00)		21303.0	45897.9	47642.7	34169.6	29012.1
Solid fossil fuels intensity (t/MEUR'00)	63.6	69.1	51.6	38.1	42.8	45.3
Final Energy Demand by sector (ktoe)	11650	17258	20168	22958	24281	24974
Industry	4580	5839	5593	6054	6468	6684
energy intensive industries	2667	3365	3328	3538	3684	3758
other industrial sectors	1914	2474	2264	2516	2784	2926
Residential	2290	2804	3942	4905	5386	5633
Tertiary	1052	2098	3329	4045	4246	4353
Transport	3728	6517	7305	7955	8180	8303
Final Energy Demand by fuel (koe)						
Solids	617	465	71	40	25	20
Oil	6683	10276	11535	12243	12167	12103
Gas	103	853	1524	2016	2266	2405
Electricity	2024	3299	4788	6374	7284	7768
Heat (from CHP and distric heating)	672	1084	1165	1344	1582	1712
Other	1551	1280	1085	942	957	966
CO2 Emissions (Mt of CO2)	39	58.2	65	70.7	73.5	75.1
Power generation/district heating	14.8	22.6	25.6	28.2	30.8	32.2
Energy branch	1.5	1.0	1.3	1.3	1.2	1.2
Industry	8.2	10.0	8.3	8.3	8.2	8.1
Residential	1.6	2.0	3.9	5.0	5.3	5.5
Tertiary	1.9	3.2	4.5	5.2	5.1	5.1
Transport	11.0	19.4	21.3	22.7	22.9	23.0
CO2 Emissions Index (1990=100)	100.0	149.0	166.4	181.0	188.3	

Demographic and Economic Assumptions

	3	2.8	2.6	2.5	2.3	2.2
Average household size (persons)	3	2.8	2.6	2.5	2.3	2.2
Gross Value Added (in 000 MEuro'00)	80.7	107.2	123.7	164.6	213.7	243.8
Industry	17.6	21.1	21.6	27.2	33.4	36.9
iron and steel	0.1	0.2	0.2	0.2	0.2	0.2
non ferrous metals	0.1	0.1	0.1	0.2	0.2	0.2
chemicals	1.6	1.3	1.4	1.8	2.4	2.6
petrochemicals, fertilisers and others	1	0.8	0.8	0.9	1	1.1
pharmaceuticals and cosmetics	0.5	0.6	0.6	0.9	1.3	1.6
non metallic minerals	1.2	2	2.1	2.7	3.2	3.5
paper, pulp, printing	1.8	2.5	2.7	3.5	4.4	4.9
paper and pulp production	0.6	1.3	1.4	1.9	2.3	2.5
printing and publishing	1.1	1.3	1.2	1.6	2.1	2.4
food, drink, tobacco	3.3	2.9	3	3.8	4.6	5.1
textiles and leather	4.8	4.2	4	4.6	5.1	5.3
engineering	3	5.3	5.6	7.3	9.3	10.5
other industries	1.8	2.5	2.5	3.2	4	4.5
Construction	5.4	7.3	6.1	7.7	9.6	10.7
Services	50.9	70.7	87.1	118.8	158.5	183.1
market services	12.2	22.5	29.7	42	58.2	68.5
non-market services	18.5	23	27	34.5	42	46.4
trade	20.1	25.2	30.4	42.4	58.3	68.2
Agriculture	4.2	4.4	4.9	6.3	7.2	7.7
Energy sector	2.5	3.6	3.9	4.6	5.1	5.4

ROMANIA

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	23.2	22.4	21.3	20.3	19.2	18.7
GDP (in 000 MEUR'00)	47.9	40.3	74.0	129.3	203.1	254.3
Energy intensity (toe/MEUR'00)	1279.4	917.0	632.2	471.3	343.0	293.0
Gross Inl. Cons./Capita (toe/inhabitant)	2.6	1.7	2.2	3.0	2.6	2.9
Primary Production (ktoe)	41398	28707	32543	34331	35144	35739
Solids	7935	5875	6957	7635	7954	8114
Oil	7946	6338	6205	6172	6164	6164
Natural gas	22911	10968	12490	11008	9822	9294
Nuclear		1407	1475	2982	3555	3887
Renewable energy sources	2606	4118	5417	6534	7649	8281
Net Imports (ktoe)	20352	8099	14235	26609	34509	39235
Solids	2442	1904	2903	6048	8620	10287
Oil	11167	3543	7023	9550	11754	13041
Natural gas	5928	2712	4384	11073	14186	16050
Electricity	815	-60	-75	-62	-51	-144
Gross Inland Consumption (ktoe)	61319	36996	46779	60939	69654	74331
Solids	10145	7752	9860	13683	16575	18211
Oil	18914	10099	13227	15722	17918	19113
Natural gas	28838	13680	16874	22081	24008	24984
Nuclear		1407	1475	2982	3555	3887
Electricity	815	-60	-75	-62	-51	-144
Renewable energy forms	2606	4118	5417	6534	7649	8281
Oil intensity (t/MEUR'00)	387.8	246.1	175.5	119.4	86.6	73.8
Natural gas intensity (t/MEUR'00)	728284.4	410631.6	275840.3	206581.6	142993.9	118839.7
Solid fossil fuels intensity (t/MEUR'00)	674.1	595.2	401.1	310.2	233.0	201.9
Final Energy Demand by sector (ktoe)	33251	22436	32264	43911	54657	61101
Industry	21988	9012	13724	18820	23611	26454
energy intensive industries	17446	6368	9533	12633	15872	17783
other industrial sectors	4542	2644	4192	6188	7739	8671
Residential	4160	8390	9545	11695	12903	13561
Tertiary	2686	1612	2226	3256	4354	5023
Transport	4417	3421	6768	10140	13789	16063
Final Energy Demand by fuel (koe)						
Solids	2673	698	1256	1245	1240	1243
Oil	8098	5603	9609	13191	15976	17593
Gas	17328	6867	10259	14535	18500	20876
Electricity	4314	2916	4894	7372	9763	11233
Heat (from CHP and distric heating)		3570	2683	3454	4494	5146
Other	839	2782	3563	4114	4685	5009
CO2 Emissions (Mt of CO2)	161.4	84.6	112.5	146.3	168.2	181.7
Power generation/distric heating	76.1	40.3	45.7	61.0	68.2	72.0
Energy branch	8.0	7.9	8.3	6.1	3.3	2.4
Industry	50.9	18.3	26.5	33.2	38.4	41.4
Residential	7.5	6.5	10.1	13.3	14.6	15.3
Tertiary	6.7	1.9	2.4	3.5	4.9	5.8
Transport	12.3	9.7	19.5	29.2	38.8	44.8
CO2 Emissions Index (1990=100)	100.0	52.4	69.7	90.6	104.2	

Demographic and Economic Assumptions

	3.3	2.9	2.6	2.5	2.5	2.5
Average household size (persons)	3.3	2.9	2.6	2.5	2.5	2.5
Gross Value Added (in 000 MEuro'00)	44.7	38	67	114.2	177.2	221.6
Industry	15.6	12	20.9	36.1	56.9	71.8
iron and steel	0.5	0.5	0.7	0.8	1	1.1
non ferrous metals						
chemicals	1	0.7	1.7	3.5	5.8	7.4
petrochemicals,fertilisers and others	1	0.4	0.8	1.5	2.3	2.9
pharmaceuticals and cosmetics	0.1	0.2	0.8	2	3.4	4.5
non metallic minerals	1.1	0.5	0.8	1.3	1.9	2.3
paper, pulp, printing	0.4	0.4	0.7	1.2	1.9	2.4
paper and pulp production	0.3	0.1	0.2	0.3	0.4	0.5
printing and publishing	0.1	0.2	0.5	0.9	1.5	1.9
food, drink, tobacco	3.6	4.1	7.1	10.7	15.7	19.0
textiles and leather	1.8	1.8	2.4	3.3	4.3	4.9
engineering	5.7	2.6	4.8	9.8	17.3	22.9
other industries	1.4	1.4	2.8	5.5	9.1	11.7
Construction	2.2	2.3	5	9.4	15.8	20.5
Services	15.8	15.5	28.8	51.1	80.3	100.8
market services	2.4	3.2	9.5	17.4	27.7	34.9
non-market services	3.6	4.6	6.4	11	17.3	21.7
trade	9.8	7.8	13	22.6	35.4	44.3
Agriculture	9.1	6.2	9.2	12.6	16.8	19.4
Energy sector	2.1	2	3.1	5	7.5	9.2

SLOVAKIA

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	5.3	5.4	5.3	5.3	5.2	5.1
GDP (in 000 MEUR'00)	19.1	21.9	34.4	52.5	71.9	84.2
Energy intensity (toe/MEUR'00)	1101.2	750.8	596.7	473.6	386.9	349.7
Gross Inl. Cons./Capita (toe/inhabitant)	4.0	3.1	3.8	4.7	5.4	5.7
Primary Production (ktoe)	5130	5945	6618	7948	8462	8777
Solids	1289	1018	815	828	711	659
Oil	70	54	50	50	50	50
Natural gas	338	121	150	170	189	200
Nuclear	3105	4255	4834	4891	4905	4905
Renewable energy sources	328	498	770	2010	2606	2963
Net Imports (ktoe)	16250	10620	13890	16896	19343	20735
Solids	5970	3430	3967	3746	4913	5613
Oil	4481	2233	3714	4155	4354	4464
Natural gas	5353	5188	6456	9264	10318	10898
Electricity	447	-232	-247	-269	-242	-240
Gross Inland Consumption (ktoe)	20992	16462	20508	24845	27805	29482
Solids	7556	4254	4781	4574	5624	6240
Oil	4468	2436	3764	4205	4404	4515
Natural gas	5088	5251	6606	9434	10508	11099
Nuclear	3105	4255	4834	4891	4905	4905
Electricity	447	-232	-247	-269	-242	-240
Renewable energy forms	328	498	770	2010	2606	2963
Oil intensity (t/MEUR'00)	229.7	109.2	107.5	78.7	60.2	52.7
Natural gas intensity (t/MEUR'00)	322244.2	290047.6	232301.2	217374.2	176792.0	159521.7
Solid fossil fuels intensity (t/MEUR'00)	1259.1	601.0	418.4	255.3	223.4	209.0
Final Energy Demand by sector (ktoe)	15263	9771	13826	17199	19798	21330
Industry	8052	4665	6924	8778	10078	10853
energy intensive industries	1806	2990	4064	4590	4722	4793
other industrial sectors	6246	1676	2860	4188	5356	6060
Residential	2416	2186	3440	4280	4916	5270
Tertiary	3119	1371	1517	2068	2656	3005
Transport	1676	1549	1944	2072	2148	2202
Final Energy Demand by fuel (koe)						
Solids	4296	1152	1683	1764	1628	1562
Oil	3090	1872	2286	2333	2249	2202
Gas	5050	3846	5672	7375	8533	9183
Electricity	2013	1893	2589	3642	4578	5124
Heat (from CHP and distric heating)	648	1008	1368	1693	2345	2756
Other	166	1	227	393	464	504
CO2 Emissions (Mt of CO2)	50	31.9	41.1	46.9	53.2	56.9
Power generation/district heating	8.6	10.8	13.0	14.6	19.2	22.0
Energy branch	1.5	1.3	0.5	0.3	0.1	0.1
Industry	21.9	10.2	15.1	18.2	19.0	19.4
Residential	5.8	3.3	5.6	6.5	7.0	7.3
Tertiary	7.6	2.0	1.5	1.7	2.1	2.3
Transport	4.7	4.4	5.5	5.7	5.8	5.9
CO2 Emissions Index (1990=100)	100.0	63.8	82.3	93.8	106.5	

Demographic and Economic Assumptions

	2.5	2.2	2	1.9	1.8	1.8
Average household size (persons)	2.5	2.2	2	1.9	1.8	1.8
Gross Value Added (in 000 MEuro'00)	20.1	19.6	31.5	47.8	65.4	76.9
Industry	4.9	4.8	8.4	13.2	18.3	21.6
iron and steel	0.3	0.4	0.6	0.7	0.8	0.8
non ferrous metals		0.2	0.3	0.3	0.4	0.4
chemicals	0.6	0.4	0.4	0.6	1	1.2
petrochemicals, fertilisers and others	0.4	0.3	0.3	0.4	0.5	0.6
pharmaceuticals and cosmetics	0.2	0.1	0.1	0.2	0.5	0.7
non metallic minerals	0.4	0.3	0.6	0.9	1.3	1.5
paper, pulp, printing	0.4	0.4	0.7	1.1	1.5	1.7
paper and pulp production	0.3	0.3	0.4	0.5	0.5	0.5
printing and publishing	0.1	0.1	0.3	0.7	1	1.2
food, drink, tobacco	0.8	0.5	0.6	1	1.4	1.7
textiles and leather	0.5	0.4	0.5	0.7	0.9	1.0
engineering	1.2	1.6	3.4	5.6	8	9.6
other industries	0.6	0.6	1.2	2.1	3	3.6
Construction	1.2	0.8	1.3	2.1	2.8	3.2
Services	10	11.8	19.1	29.2	40.6	47.9
market services	2.5	3.3	5.8	9.2	12.8	15.1
non-market services	2.7	3.1	5.4	7.7	10.2	11.7
trade	4.8	5.4	7.9	12.3	17.6	21.1
Agriculture	1.5	1.2	1.6	2.1	2.6	2.9
Energy sector	2.6	1.1	1.1	1.2	1.2	1.2

SLOVENIA

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	2.0	2.0	2.0	2.0	2.0	2.0
GDP (in 000 MEUR'00)	17.2	20.6	29.2	37.1	43.8	47.7
Energy intensity (toe/MEUR'00)	321.0	309.3	259.6	224.9	199.0	187.3
Gross Inl. Cons./Capita (toe/inhabitant)	2.8	3.2	3.8	4.1	4.4	4.5
Primary Production (ktoe)	2902	3084	3222	3029	3232	3362
Solids	1432	1062	1025	676	535	476
Oil	3	1				
Natural gas	20	5	9			
Nuclear	1192	1228	1334	1388	1600	1715
Renewable energy sources	254	788	855	966	1097	1170
Net Imports (ktoe)	2565	3317	4364	5311	5491	5596
Solids	130	245	223	602	723	790
Oil	1797	2409	2675	2866	2977	3037
Natural gas	723	776	1281	1709	1693	1685
Electricity	-85	-114	185	134	98	84
Gross Inland Consumption (ktoe)	5516	6367	7586	8340	8723	8936
Solids	1645	1306	1248	1278	1259	1246
Oil	1747	2377	2675	2866	2977	3037
Natural gas	763	782	1289	1709	1693	1685
Nuclear	1192	1228	1334	1388	1600	1715
Electricity	-85	-114	185	134	98	84
Renewable energy forms	254	788	855	966	1097	1170
Oil intensity (t/MEUR'00)	99.7	113.3	90.0	75.9	66.7	62.6
Natural gas intensity (t/MEUR'00)	53662.1	45921.0	53400.0	55723.6	46757.8	42763.9
Solid fossil fuels intensity (t/MEUR'00)	304.4	196.2	128.7	101.0	82.1	73.7
Final Energy Demand by sector (ktoe)	3375	4660	5618	6283	6746	7001
Industry	1475	1559	2015	2211	2271	2302
energy intensive industries	733	896	1142	1237	1238	1238
other industrial sectors	742	664	873	974	1033	1064
Residential	850	1116	1393	1561	1652	1702
Tertiary	122	671	738	859	971	1031
Transport	928	1313	1472	1652	1852	1966
Final Energy Demand by fuel (koe)						
Solids	243	96	30	15	5	3
Oil	1495	2238	2413	2576	2710	2779
Gas	603	629	908	1078	1198	1266
Electricity	837	905	1367	1642	1817	1910
Heat (from CHP and district heating)	196	391	540	619	655	675
Other		401	360	353	362	368
CO2 Emissions (Mt of CO2)	13.1	14.1	15.3	16.8	17.1	17.3
Power generation/district heating	6.1	5.6	5.9	6.5	6.1	5.9
Energy branch	0.1		0.1	0.1	0.1	0.1
Industry	2.5	2.3	2.6	2.6	2.6	2.6
Residential	1.7	1.3	1.7	2.1	2.3	2.4
Tertiary		1.2	1.0	1.0	1.0	1.0
Transport	2.7	3.8	4.2	4.5	5.0	5.3
CO2 Emissions Index (1990=100)	100.0	108.3	117.4	128.8	130.7	

Demographic and Economic Assumptions

	3.3	3.1	2.8	2.7	2.7	2.7
Average household size (persons)	3.3	3.1	2.8	2.7	2.7	2.7
Gross Value Added (in 000 MEuro'00)	15.2	17.8	25.4	32.1	37.9	41.2
Industry	4.8	5.2	8	10.1	11.8	12.8
iron and steel	0.1	0.1	0.2	0.2	0.2	0.2
non ferrous metals	0.1	0.1	0.1	0.2	0.2	0.2
chemicals	0.1	0.6	1	1.3	1.6	1.8
petrochemicals, fertilisers and others	0.1	0.2	0.3	0.4	0.5	0.5
pharmaceuticals and cosmetics		0.4	0.6	0.9	1.1	1.2
non metallic minerals	0.3	0.2	0.4	0.5	0.6	0.6
paper, pulp, printing	0.4	0.4	0.6	0.8	0.9	1.0
paper and pulp production	0.2	0.2	0.2	0.3	0.3	0.3
printing and publishing	0.2	0.3	0.4	0.5	0.6	0.7
food, drink, tobacco	0.6	0.6	0.9	1.1	1.3	1.4
textiles and leather	0.7	0.5	0.5	0.5	0.5	0.5
engineering	1.8	1.9	3.3	4.2	5	5.5
other industries	0.7	0.7	1.1	1.3	1.5	1.6
Construction	0.9	1.1	1.4	1.9	2.2	2.4
Services	8.2	10.4	14.8	18.9	22.6	24.8
market services	2.4	3.3	4.9	6.6	8	8.8
non-market services	2.5	3.5	4.9	5.7	6.3	6.6
trade	3.3	3.6	5	6.6	8.3	9.3
Agriculture	0.7	0.6	0.5	0.5	0.6	0.6
Energy sector	0.6	0.6	0.7	0.7	0.7	0.7

SPAIN

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	38.9	39.9	44.6	45.6	45.4	45.4
GDP (in 000 MEUR'00)	468.3	610.5	801.8	1040.2	1240.4	1356.1
Energy intensity (toe/MEUR'00)	191.0	202.6	195.6	164.7	142.9	133.2
Gross Inl. Cons./Capita (toe/inhabitant)	2.3	3.1	3.5	3.8	3.9	4.0
Primary Production (ktoe)	33780	32359	36609	44834	50740	54273
Solids	11679	8306	4869	1949	1300	1060
Oil	794	225	250	100		
Natural gas	1273	148	130			
Nuclear	13701	16046	16207	20931	23187	24370
Renewable energy sources	6332	7634	15153	21854	26253	28844
Net Imports (ktoe)	59857	98351	127285	134475	134992	135720
Solids	7038	12636	12179	6464	9478	11476
Oil	49166	69866	79906	85667	84249	83410
Natural gas	3690	15467	34901	42085	41057	40648
Electricity	-36	382	298	259	208	186
Gross Inland Consumption (ktoe)	89457	123712	156853	171361	177267	180896
Solids	18942	21208	17048	8413	10778	12194
Oil	45547	63223	73115	77819	75784	74654
Natural gas	4971	15219	35031	42085	41057	40648
Nuclear	13701	16046	16207	20931	23187	24370
Electricity	-36	382	298	259	208	186
Renewable energy forms	6332	7634	15153	21854	26253	28844
Oil intensity (t/MEUR'00)	95.5	101.7	89.6	73.5	60.0	54.1
Natural gas intensity (t/MEUR'00)	12840.8	30155.9	52851.6	48942.0	40040.3	36258.6
Solid fossil fuels intensity (t/MEUR'00)	87.6	72.9	43.3	16.0	16.7	17.0
Final Energy Demand by sector (ktoe)	57010	80118	106958	120922	124486	126253
Industry	20377	26180	37023	42192	44061	44986
energy intensive industries	13415	17515	23859	26452	26804	26938
other industrial sectors	6961	8665	13164	15740	17257	18048
Residential	9266	11881	16075	17728	16588	16015
Tertiary	5041	9210	11828	13448	14652	15323
Transport	22326	32848	42032	47554	49186	49928
Final Energy Demand by fuel (koe)						
Solids	3519	1597	1658	1530	1201	1061
Oil	33488	45773	54904	59464	58323	57612
Gas	4443	9873	14257	17289	19148	20082
Electricity	10817	16205	25141	29708	32358	33768
Heat (from CHP and distric heating)	1578	3713	5603	6677	7292	7610
Other	3164	2958	5395	6254	6164	6120
CO2 Emissions (Mt of CO2)	201.5	282.7	332.1	324.1	323.1	323.0
Power generation/district heating	64.2	103.4	113.0	85.3	85.9	86.3
Energy branch	11.5	11.9	13.7	13.1	11.8	11.2
Industry	39.5	40.7	52.6	58.1	57.1	56.5
Residential	12.9	16.4	21.0	21.8	18.1	16.5
Tertiary	7.7	12.9	14.2	15.5	16.1	16.4
Transport	65.6	97.3	117.5	130.3	133.9	135.9
CO2 Emissions Index (1990=100)	100.0	140.3	164.8	160.9	130.3	130.3

Demographic and Economic Assumptions

	3.2	2.9	2.7	2.6	2.4	2.3
Average household size (persons)	3.2	2.9	2.7	2.6	2.4	2.3
Gross Value Added (in 000 MEuro'00)	463.5	578.1	750	974.5	1170.5	1282.1
Industry	88.5	108	134.3	176.5	210.3	229.8
iron and steel	3.5	3.3	3.8	4.1	4.2	4.2
non ferrous metals	0.9	1.4	1.9	2.3	2.7	2.9
chemicals	7.6	9.6	13.7	19.7	25	28.2
petrochemicals, fertilisers and others	4.3	5.4	7.5	10.2	11.8	12.7
pharmaceuticals and cosmetics	3.2	4.1	6.1	9.5	13.2	15.5
non metallic minerals	7.2	8.9	11.4	14.7	17.3	18.8
paper, pulp, printing	6.7	9.6	12.4	16.3	19.1	20.7
paper and pulp production	1.9	3.2	4.2	5.5	6.5	7.1
printing and publishing	4.8	6.4	8.2	10.8	12.6	13.6
food, drink, tobacco	14.4	15.7	19.1	24.8	29.5	32.1
textiles and leather	9	8.2	7.5	8.1	8.3	8.4
engineering	29.4	37.8	47.9	64.6	77.9	85.6
other industries	9.9	13.5	16.6	21.9	26.3	28.8
Construction	38.3	45.7	69.1	89.6	106.1	115.4
Services	299	376.9	494.3	646.8	784.7	863.4
market services	89.5	105.5	142.2	189.7	231.8	255.9
non-market services	87.9	116.2	152.5	189.1	222.4	240.8
trade	121.6	155.2	199.7	268	330.5	366.7
Agriculture	22.3	25.1	25.1	28.6	31.4	32.8
Energy sector	15.4	22.4	27.3	33	37.9	40.6

SWEDEN

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	8.6	8.9	9.2	9.6	9.9	10.1
GDP (in 000 MEUR'00)	213.3	259.9	329.1	414.0	484.3	524.3
Energy intensity (toe/MEUR'00)	220.8	185.5	169.0	126.9	96.3	84.0
Gross Inl. Cons./Capita (toe/inhabitant)	5.5	5.4	6.1	5.5	4.7	4.4
Primary Production (ktoe)	29728	30530	35005	27885	19735	20742
Solids	216	230	320			
Oil	3					
Natural gas						
Nuclear	17764	14781	18663	10101		
Renewable energy sources	11745	15519	16022	17784	19735	20742
Net Imports (ktoe)	17866	19096	22147	26312	28625	30247
Solids	2329	2342	2759	6239	8031	9131
Oil	15169	15654	17402	16968	16089	15691
Natural gas	519	698	1951	2894	4135	4935
Electricity	-152	402	35	210	370	490
Gross Inland Consumption (ktoe)	47108	48225	55630	52531	46624	49225
Solids	2677	2443	3079	6239	8031	9131
Oil	14555	14382	15880	15303	14353	13928
Natural gas	519	698	1951	2894	4135	4935
Nuclear	17764	14781	18663	10101		
Electricity	-152	402	35	210	370	490
Renewable energy forms	11745	15519	16022	17784	19735	20742
Oil intensity (t/MEUR'00)	67.0	54.3	47.4	36.3	29.1	26.1
Natural gas intensity (t/MEUR'00)	2943.4	3248.8	7171.3	8456.1	10328.4	11385.8
Solid fossil fuels intensity (t/MEUR'00)	27.2	19.7	19.0	29.8	31.8	32.9
Final Energy Demand by sector (ktoe)	30522	34554	36234	38467	37977	37706
Industry	11869	13631	12885	13760	13646	13584
energy intensive industries	8593	10909	10276	10866	10670	10564
other industrial sectors	3275	2722	2609	2894	2975	3020
Residential	6838	7539	7821	8144	8179	8179
Tertiary	4553	5256	6198	6813	7019	7125
Transport	7263	8127	9330	9750	9134	8819
Final Energy Demand by fuel (koe)						
Solids	1231	1141	1667	1520	1087	915
Oil	11988	12505	12554	12533	11684	11240
Gas	570	651	814	892	1068	1164
Electricity	10348	11068	11823	12947	13442	13666
Heat (from CHP and district heating)	1765	3747	4550	5264	5133	5038
Other	4620	5442	4825	5311	5562	5683
CO2 Emissions (Mt of CO2)	50.4	51.4	56	68.6	76.1	82.1
Power generation/district heating	6.3	5.6	7.6	21.2	32.7	40.6
Energy branch	1.5	1.9	1.9	1.4	1.2	1.1
Industry	11.5	11.5	12.2	10.9	9.4	8.7
Residential	4.8	3.7	2.4	2.0	1.7	1.6
Tertiary	5.6	5.6	5.7	6.3	6.5	6.6
Transport	20.7	23.2	26.3	26.8	24.6	23.5
CO2 Emissions Index (1990=100)	100.0	102.0	111.1	136.2	151.0	

Demographic and Economic Assumptions

	2.2	2.1	2	1.9	1.8	1.8
Average household size (persons)	2.2	2.1	2	1.9	1.8	1.8
Gross Value Added (in 000 MEuro'00)	188.9	236.1	302.7	385.1	453.4	492.5
Industry	34.3	62.4	88.3	115.5	135.5	146.8
iron and steel	1.5	2.2	2.7	2.9	2.9	2.9
non ferrous metals	0.4	0.5	0.6	0.7	0.7	0.7
chemicals	2.4	5.8	9.6	13.1	15.7	17.3
petrochemicals, fertilisers and others	1.4	2.3	2.5	2.8	3	3.1
pharmaceuticals and cosmetics	1	3.4	7.1	10.2	12.7	14.2
non metallic minerals	1.2	1	1.4	1.7	1.9	2.0
paper, pulp, printing	7.4	8.3	9.4	12	13.9	14.9
paper and pulp production	4.1	5.4	5.9	7.3	8.5	9.2
printing and publishing	3.3	2.9	3.5	4.7	5.4	5.8
food, drink, tobacco	2.7	3.5	4.1	5.3	6	6.4
textiles and leather	0.6	0.5	0.5	0.5	0.5	0.5
engineering	14.3	35.5	54.2	72	85.4	92.9
other industries	3.7	5.2	5.9	7.5	8.5	9.1
Construction	10.4	8.6	11.2	14	15.7	16.7
Services	128.5	152.6	189.1	240.6	286.4	312.8
market services	40.7	53.5	64.1	84.3	103.6	114.9
non-market services	51	50.8	61.6	72.2	79.2	82.8
trade	36.8	48.2	63.4	84.1	103.7	115.1
Agriculture	5.8	5.3	6.6	7.2	7.6	7.8
Energy sector	9.9	7.2	7.6	7.9	8.2	8.4

UNITED KINGDOM

Scenario Results

	1990	2000	2010	2020	2030	2035
Population (Million)	57.2	58.6	60.9	62.9	64.4	65.0
GDP (in 000 MEUR'00)	1227.8	1559.6	2031.5	2578.9	3061.6	3330.8
Energy intensity (toe/MEUR'00)	171.9	147.7	118.6	95.1	80.6	74.4
Gross Inl. Cons./Capita (toe/inhabitant)	3.7	3.9	4.0	3.9	3.8	3.8
Primary Production (ktoe)	205508	268701	196817	87976	96700	103307
Solids	54125	18588	13000	10000	8000	7158
Oil	92813	127882	85000	25000	23000	22095
Natural gas	40925	97654	70000	15000	13538	12875
Nuclear	16574	21942	22474	26513	36591	43040
Renewable energy sources	1070	2635	6344	11464	15572	18140
Net Imports (ktoe)	5932	-39031	46285	159341	152296	149113
Solids	9122	14576	26581	21404	21945	22165
Oil	-10396	-45515	-1745	56700	54383	53304
Natural gas	6178	-9310	20564	80553	75522	73283
Electricity	1027	1219	885	684	447	361
Gross Inland Consumption (ktoe)	211082	230427	241009	245189	246829	249717
Solids	64305	35733	39581	31404	29945	29204
Oil	80903	81399	81161	79571	75216	72986
Natural gas	47203	87500	90564	95553	89059	85985
Nuclear	16574	21942	22474	26513	36591	43040
Electricity	1027	1219	885	684	447	361
Renewable energy forms	1070	2635	6344	11464	15572	18140
Oil intensity (t/MEUR'00)	64.7	51.3	39.2	30.3	24.1	21.5
Natural gas intensity (t/MEUR'00)	46506.5	67868.2	53927.5	44821.0	35188.5	31227.9
Solid fossil fuels intensity (t/MEUR'00)	113.5	48.1	39.6	24.0	18.8	16.6
Final Energy Demand by sector (ktoe)	139016	154668	164268	173697	174815	175591
Industry	37031	39166	39573	41328	41158	41163
energy intensive industries	20349	20429	19327	19328	18358	17904
other industrial sectors	16682	18736	20246	22000	22800	23260
Residential	37957	43099	46990	50461	51524	52041
Tertiary	18578	20338	21238	23955	26581	27937
Transport	45451	52066	56467	57953	55552	54450
Final Energy Demand by fuel (koe)						
Solids	12266	5029	3716	2899	2359	2130
Oil	58770	62480	66073	65189	61327	59448
Gas	41348	51415	53500	57955	58387	58621
Electricity	23597	28335	33227	37490	40758	42374
Heat (from CHP and district heating)	2623	6833	6312	7249	8649	9447
Other	412	577	1440	2915	3335	3572
CO2 Emissions (Mt of CO2)	565.3	542.6	566.8	539.4	505.3	490.4
Power generation/district heating	214.6	184.8	206.5	178.2	160.6	152.7
Energy branch	27.2	30.2	22.9	19.4	15.7	14.1
Industry	80.5	67.4	66.6	66.0	60.3	57.6
Residential	77.8	82.0	84.7	87.7	86.7	86.3
Tertiary	32.9	26.4	24.3	26.7	29.1	30.4
Transport	132.4	151.8	161.8	161.4	153.0	149.2
CO2 Emissions Index (1990=100)	100.0	96.0	100.3	95.4	89.4	

Demographic and Economic Assumptions

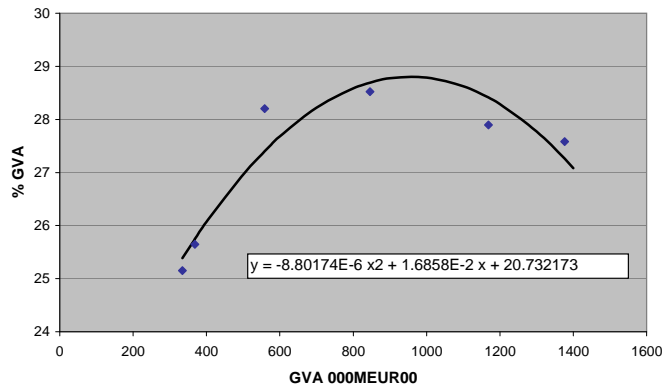
	2.6	2.4	2.1	2	1.9	1.8
Average household size (persons)	2.6	2.4	2.1	2	1.9	1.8
Gross Value Added (in 000 MEuro'00)	1135.5	1439.8	1876.9	2384.1	2831.2	3091.4
Industry	257.7	268.8	272.3	321	358.1	378.4
iron and steel	7.8	4.3	3.8	4	4	4.0
non ferrous metals	4.1	3.1	3	3.4	3.5	3.5
chemicals	24.9	27.1	29	36.7	42.5	45.8
petrochemicals, fertilisers and others	14.8	13.6	11	11.7	12.3	12.6
pharmaceuticals and cosmetics	10.1	13.5	18	25.1	30.2	33.2
non metallic minerals	10.4	9.3	9.1	10.4	11.3	11.8
paper, pulp, printing	29	35.5	36.1	42.4	47	49.5
paper and pulp production	7.4	7.3	6.9	7.7	8.2	8.5
printing and publishing	21.6	28.2	29.2	34.7	38.8	41.0
food, drink, tobacco	31.7	37.4	39.7	47	52.6	55.6
textiles and leather	15.7	10.9	6.4	5.2	4.8	4.6
engineering	109.6	111.9	114.7	133.8	147.7	155.2
other industries	24.7	29.2	30.5	38	44.7	48.4
Construction	67.9	66.4	93.2	115.8	132.6	142.1
Services	743.9	1009	1420.3	1856.8	2249.6	2479.9
market services	266.8	376	577.7	782.1	969.7	1081.2
non-market services	236.5	394.4	363.1	436.2	496.1	529.2
trade	240.6	338.6	479.5	638.5	783.7	869.5
Agriculture	22.4	23.1	23.6	24.1	24.3	24.4
Energy sector	43.6	72.5	67.5	66.4	66.6	66.6

ANNEX III

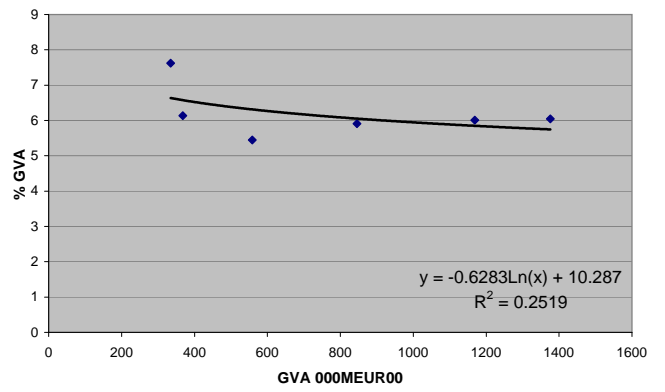
**Regressions for calculating the share
(with respect to the total gross value added) of each economic activity.**

- **EU-old countries**
- **EU-new countries**

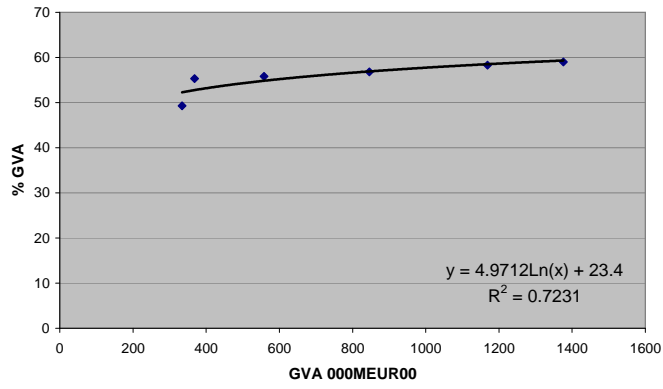
Industry share - EU-old



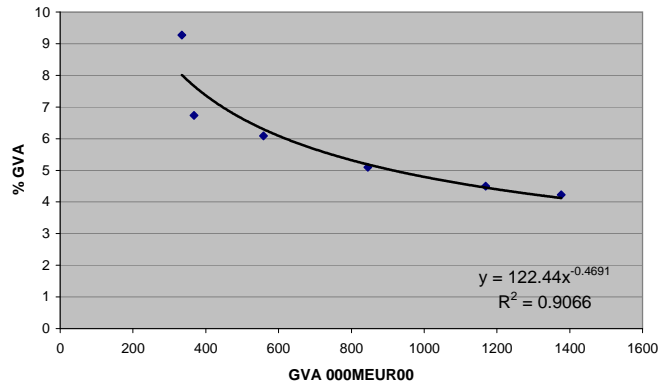
Construction share - EU-old



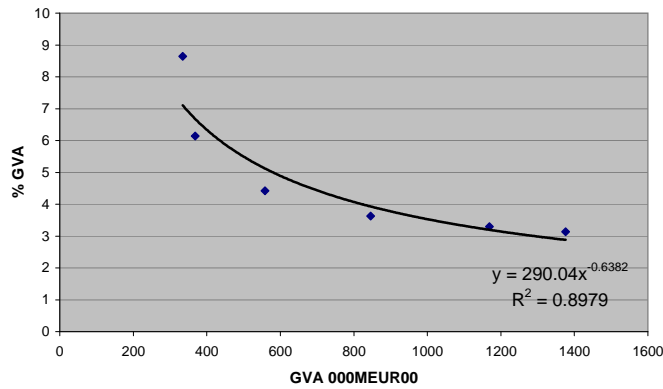
Services share - EU-old



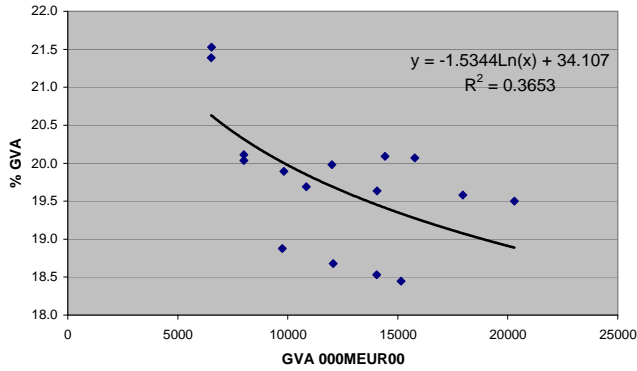
Agriculture share - EU-old



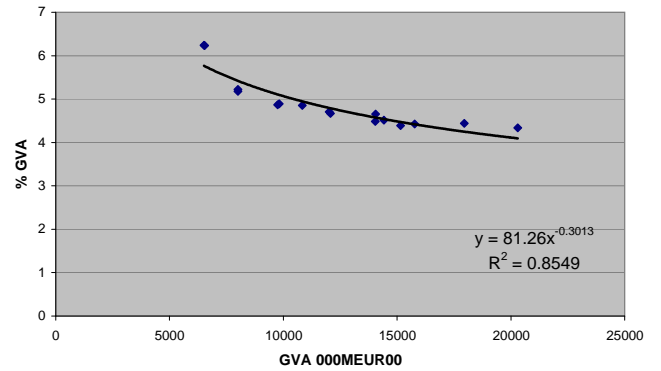
Energy share - EU-old



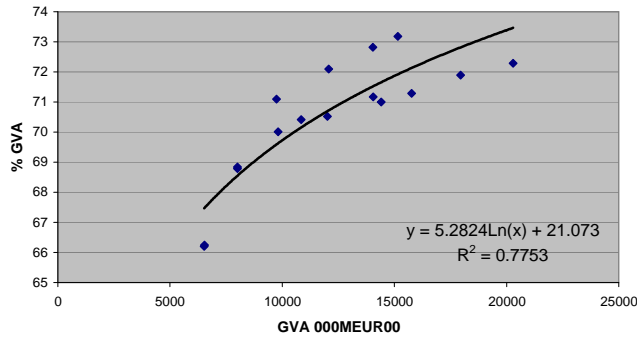
Industry share - EU-new



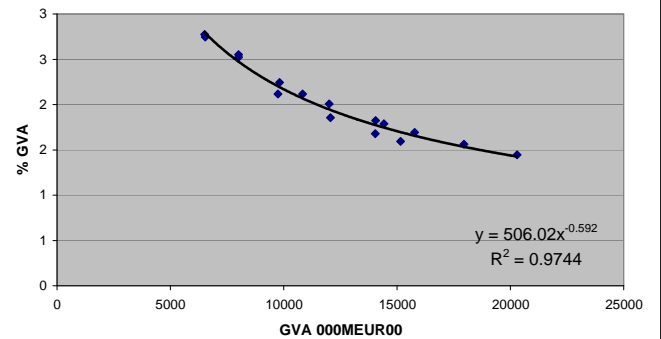
Construction share - EU-new



Services share - EU-new



Agriculture share - EU-new



Energy share - EU-new

