



Intelligent Energy  Europe



Energy Efficiency Policies and Measures in Slovenia

Monitoring of Energy Efficiency in EU 27, Norway and Croatia (ODYSSEE-MURE)

Jožef Stefan Institute – Energy efficiency Centre

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1 Executive Summary

- The average growth of gross domestic products (GDP) was 4.4%/year in the period from 1997 to 2007. The average growth of private consumption was lower (3.5%/year) but the growth of value added (VA) of industry was higher (5.1%/year) in the same period. The growth of GDP was the highest in the last years (2004-2007). The private consumption increased for 41% in 2007 in comparison to 1997. The VA of industry was higher for 64% in 2007 than in 1997.
- The final energy consumption increased in industry and transport within the period 1997-2007 for 29% and 17%, and decreased for 14% in the tertiary sector in the same period. The highest growth in energy consumption was in transport in the period between 2000 and 2007. This increase reflects the increase in the transit transport through Slovenia and “fuel tourism” as results of the lower price of vehicle fuels in Slovenia in comparison to the price in neighbour countries.
- The Slovenian National Assembly (Parliament) adopted different documents (strategies, legally acts) regarding the energy policy including the security, reliability and sustainability of energy supply and consumption. The adopted energy – environment strategies and legal acts are: Resolution on the Strategy of Use and Supply of Energy in Slovenia -1996, Energy Act - 1999 and its amending in 2004, 2006 and 2008, Resolution on the National Energy Programme (ReNEP) - 2004, Control of the Pollution Act - 1993.
- The targets of Slovenian policy are to improve the energy efficiency for 10% by 2010 as for 2004 in industry, building, transport and service sectors, and for 15% in the public sector.
- The budget expenditure for implementation of energy efficiency policy and utilization of renewable energy sources increase from 1.9 million Euros in 2000 to 11.7 million Euros in 2007.
- The primary and final energy intensity is decreased for 26% and 29% in the period from 1997 to 2007. The average decrease of primary and final energy intensity in the period from 1997 and 2007 was 2.2%/year and 3.4%/year. The energy intensity of Slovenia (0,25 koe/EUR₂₀₀₀) is higher than the average of EU 27 (0,17 koe/EUR₂₀₀₀) for about 50%.
- The energy efficiency in Slovenia, measured by energy efficiency index ODEX has improved in the period from 1997 to 2007 for 15.5% or 1.9%/year. The improvement of energy efficiency in Slovenia was higher than the energy efficiency of EU-27 average, which was 10.0% or 1.2%/year.

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- The improvement of energy efficiency, measured by energy efficiency index ODEX in the period from 1997 to 2007 was 17.7% or 2.1%/year for industry, 11.1% or 1.3%/year for households and 16.3% or 2.0%/year for transport.
- The direct CO₂-emissions per capita have decreased for 3.6% (-0.4%/year) for the period from 1997 to 2007 and the total CO₂-emissions (direct and indirect /emissions caused by electricity) per capita have decreased for t 2.5% (-0.3%/year) for the same period. The CO₂-emissions (direct and total) intensity measured by kCO₂/EUR2000 has decreased for about 36% (-4%/year) for the period from 1997 to 2006.
- The intensity of implementation of energy efficiency measures increase in the next period for all sectors according to the obligations from the EU Directives about the improvement of energy efficiency, promotion of renewable energy sources and decrease of emissions of greenhouse gasses. The first National energy efficiency action plan of Slovenia includes 22 instruments for implementation of different energy efficiency measures in all sectors.
- The targets of the NEEAP are to achieve cumulative savings of at least 4261 GWh or 9% of the final energy consumption in Slovenia under the Directive 2006/32/EC. The necessary public fund for implementation of all measures in NEEAP is estimated at 380 EUR millions.

2 The Background to Energy Efficiency

2.1 Overall economic context

The trend of economic development in Slovenia was positive in the period from 1997 to 2007. The average growth of gross domestic products (GDP) was 4.4%/year in the period from 1997 to 2007. The average growth of private consumption was lower (3.5%/year) but the growth of value added (VA) of industry was higher (5.1%/year) in the same period as is shown in Table 1.

Table 1: Growth of GDP, private consumption and VA of industry in Slovenia in %/year for the period 1997-2007

	2000/1997	2001/2003	2004/2007	1997/2007
GDP	4,4%	3,4%	5,7%	4,4%
Private consumption	3,2%	2,6%	4,9%	3,5%
VA of Industry	4,4%	4,9%	6,9%	5,1%

The GDP of Slovenia in 2007 amounted to 29226 M€₂₀₀₀ which presents 154% of GDP in 1997. The growth of GDP was highest in the last years (2004-2007) as is shown in Figure 1. The private consumption increased for 41% in 2007 in comparison to 1997. The VA of industry was higher for 64% in 2007 than in 1997. The trend of economic growth is shown in Figure 1.

Energy Efficiency Policies and Measures in Slovenia in 2007

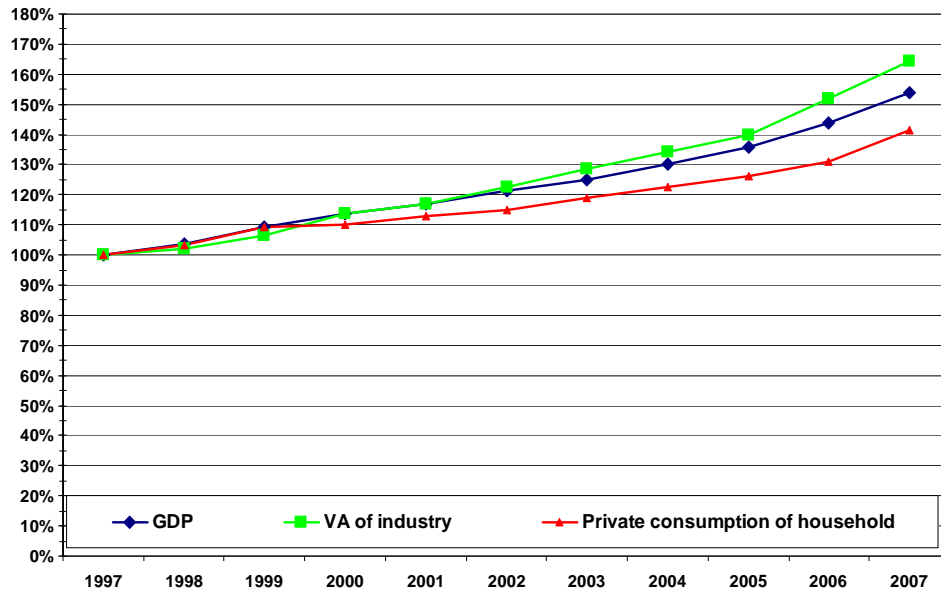


Figure 1: Trends of macro-economic developments in Slovenia: 1997-2007

2.2 Energy consumption trends: by fuel and by sector

The total final energy consumption in industry, transport, households and tertiary sectors in Slovenia was 4.875 Mtoe in 2007. The growth of final energy consumption in 2007 was 8.8% in comparison to 1997. The average growth was 0.84%/year within the period from 1997 to 2007, but the highest growth (1.52%/year) was in the period from 1998 to 2004. The main increase was in biomass (5.2%/year) followed by electricity (3.0%/year) and gas (1.7%/year) as is shown in Figure 2 and Figure 3.

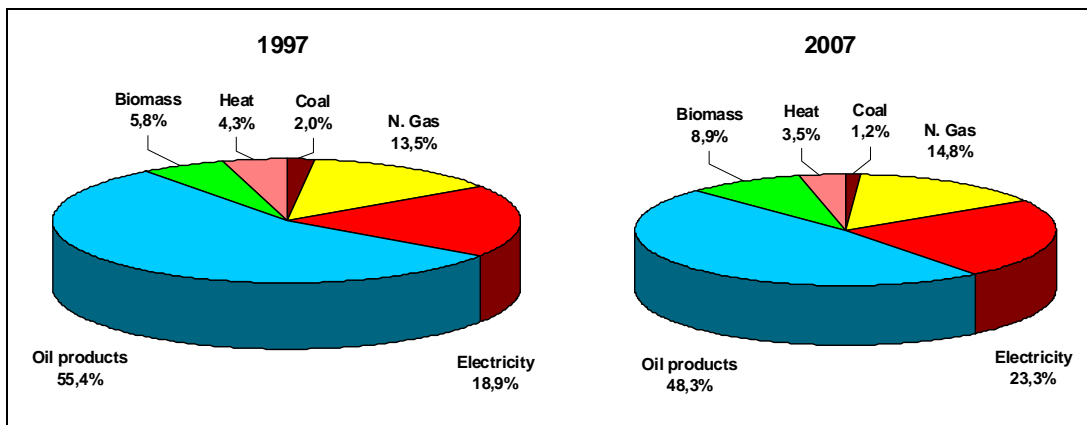


Figure 2: Structure of final energy consumption in Slovenia in 1997 and 2007

Energy Efficiency Policies and Measures in Slovenia in 2007

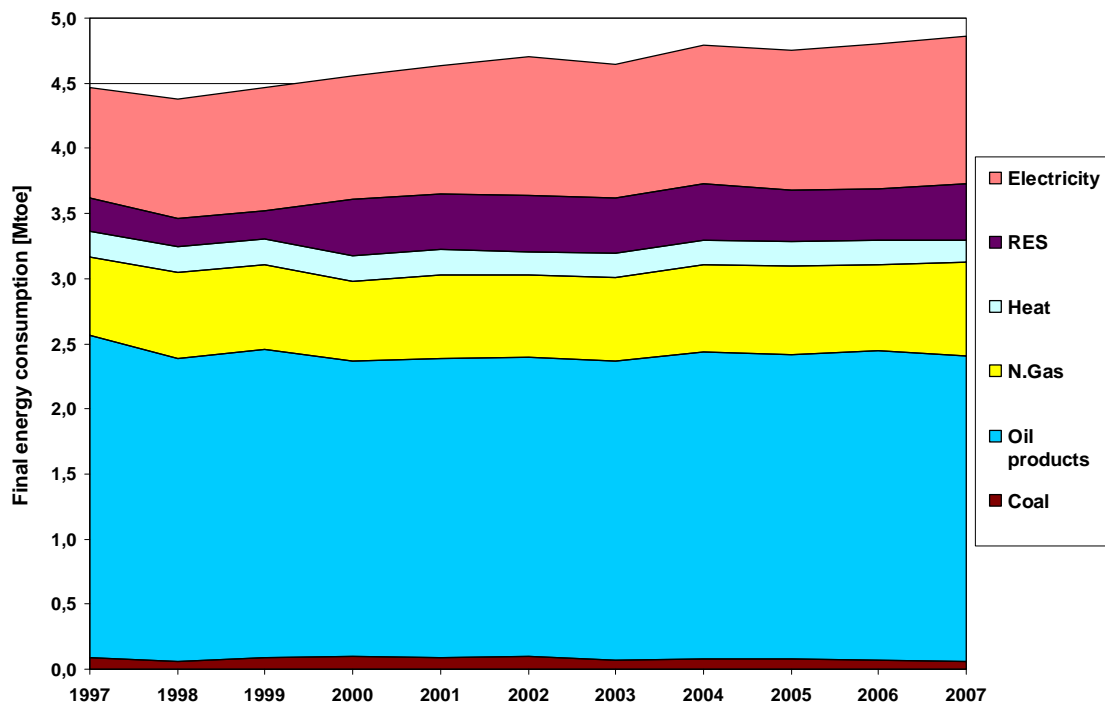


Figure 3: Structure of final energy consumption by energy types in Slovenia

The final energy consumption increased within the period 1997-2007 for 29% and 17% in industry and transport and decreased for 14% in the tertiary sector in the same period. The highest growth in energy consumption was in transport in the period between 2000 and 2007. This increase reflects the increase in the transit transport through Slovenia and “fuel tourism” as results of the lower price of vehicle fuels in Slovenia in comparison to the price in neighbour countries.

Structure of final energy consumption by sectors in Slovenia for the period 1997-2007 is shown in Figure 4.

Energy Efficiency Policies and Measures in Slovenia in 2007

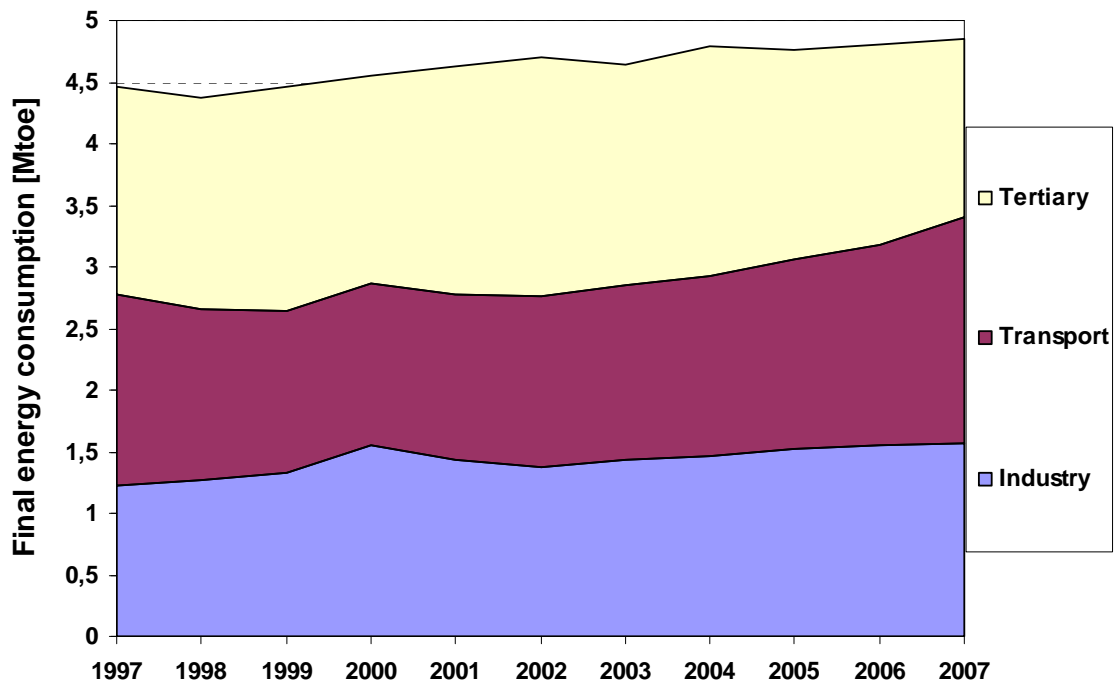


Figure 4: Final energy consumption in Slovenia by sectors

2.3 The policy background to energy efficiency

The historical chronology of activities of Slovenia in the field of energy efficiency goes back to the first year after the independence when the Slovenian government put its efforts into seeking an energy policy to replace the former supply oriented approach. In this way the first substantial budgetary allocations for energy efficiency and renewable energy resources were allocated in the new state budget for 1991.

The Slovenian National Assembly (Parliament) adopted different documents (strategies, laws) regarding the energy policy including the security, reliability and sustainability of energy supply and consumption. The adopted energy – environment strategies/acts are:

- “Resolution on the Strategy of Use and Supply of Energy in Slovenia”, January 1996,
- “Energy Act”, September 1999 and its amending in 2004, 2006 and 2008,
- “Resolution on National Energy Programme (ReNEP)”, April 2004,
- Control of Pollution Act”, 1993.

Resolution on the Strategy of Use and Supply of Energy in Slovenia

The Resolution on the Strategy of Use and Supply of Energy in Slovenia (ReSROE) is the valid policy document, providing a broad range of priorities; both on supply and demand sides. The main declared energy efficiency goals of ReSROE are:

- to improve overall energy efficiency by 2% per year,
- to substantially increase the share of renewable resources in the primary energy,
- to double the “qualified production of electricity” by 2010,
- however the role of supply companies in promotion of energy efficiency or other demand side management (DSM) measures are not explicitly mentioned in ReSROE.

The Resolution (ReSROE) does not include a defined action programme and the necessary steps and measures to achieve the goals presented in the strategy.

The Energy Act

The Energy Act adopted by the Slovenian National Assembly (Parliament) in September 1999 (which has resulted in the liberalization of the Slovene energy markets) and its amending in 2004, 2006 and 2008 directly addresses energy efficiency and renewable energy resources with the following clauses:

- efficient use of energy and encouraging the use of renewable energy resources are the constituent parts of energy policy,
- preference of energy efficiency and renewable energy sources options over supply options,
- the energy policy with energy efficiency measures and utilization of renewable energy sources contribute to reduction of greenhouse gas emissions,
- local communities adopt a local energy concept/plan with which future energy supply, energy efficiency measures, combined heat and power production and utilization of RES are defined every at least 10 years,
- focus on actions that will reduce CO₂ and NO emissions,
- mandatory sourcing of a share of energy demand from renewable sources may be decreed by the government based on the national energy programme,
- advantages for “qualified producers” of electricity,
- effectiveness of EE and RES activities are to be evaluated, the evaluation procedure is to be defined by the minister, responsible for energy,

- suppliers may include cost for EE and RES promotion or subsidisation in their price calculation, on approval by the Ministry,
- The state shall promote the efficient use of energy through programmes of education, information, public announcements, energy consulting, promotion of energy surveys, promotion of local energy plans, preparation of standards and technical regulations, fiscal measures, financial incentives and other forms of incentives,
- Minimum efficiency standards and labelling for products, including buildings.

The Energy Law sets the main energy policy directions, including also the criterion of sustainable development, and calls for preparation of a National Energy Programme (NEP). The Law amendment of 2007 obligates the government to prepare a new National energy programme before the end of 2009.

Local communities shall implement programmes promoting energy efficiency within the framework of the National Energy Programme in the areas within their competence through the preparation of local energy concepts.

The law amending the Energy Act in 2007 additionally requires implementation (obligatory) of energy efficiency measures and utilization of RES in buildings.

According to the Energy act, the Slovenian government adopted different regulations supporting the energy efficiency:

- Rules on the distribution and calculation of costs of heat in residential and other buildings with more than one consumer,
- Rules on the allocation of funds for the promotion of efficient use of energy and utilization of renewable energy sources,
- Rules on minimum energy efficiency requirements for hot-water boilers fired with liquid or gaseous fuels, refrigerators, ballasts for fluorescent lighting,
- Orders and Rules on energy labelling of household electrical appliances (refrigerators, freezers, washing machines, dishwashers, dryers, lamps, air-conditions,
- Rules on efficient use of energy in buildings, which substitutes the Rules on thermal insulation and efficient energy use in buildings from 2002.

Resolution on National Energy Programme (ReNEP)

The Resolution on National Energy Programme (ReNEP) [9] is a very important document adopted by the National assembly in April 2004, as it defines the long-term development goals, orientation of energy supply, energy systems and mechanisms for stimulation of the use of renewable energy sources (RES).

The targets of Slovenian policy defined in the Resolution on National Energy Programme (ReNEP) are to:

- improve the energy efficiency by 2010 as for 2004:
- in industry and service sectors for 10%,
- in buildings for 10%,
- in public sector for 15% and
- in transport for 10%.
- double share of electricity production in CHP,
- increase the share of RES in primary energy balance to 12% in 2010:
- increasing heat supply from RES from 22% in 2002 to 25% in 2010,
- increasing electricity from RES from 32% in 2002 to 33,6% in 2010,
- achieving 2% share of biofuels for transport at the end of 2005.

According to the obligation of the Energy Act, a new or a second "National Energy Programme" has to be adopted in the early months of 2010.

Control of Pollution Act

The Act stimulates the energy efficiency measures and utilization of renewable energy sources and defines establishment of Eco Fund (Slovenian Environmental Public Fund) as a financial institution for the purpose of providing loans at favourable interest rates for investments in the field of environmental protection.

Department of Efficient Energy Use and Use of Renewable Energy Sources

In 1995 the government established the Agency for Efficient Energy Use (AURE) as a body responsible for implementation of energy efficiency policy and utilization of renewable energy sources. After the last reorganization of the

government in 2005, the Agency (AURE) became a body¹ (Department of Efficient Energy Use and Use of Renewable Energy Sources) within the Ministry of the Environment, and Spatial Planning (MESP).

The Environmental Fund of the Republic of Slovenia (Eco Fund)

The Environmental Fund of the Republic of Slovenia (Eco Fund²), public fund, was established³ in 2005 and it is the legal successor of the Environmental Development Fund of the Republic of Slovenia (1995-2005). Eco Fund is the biggest financial institution dedicated to the promotion of environmental investments in the Republic of Slovenia. On the basis of the new Environment Protection Act, the new name has been in use since 1 January 2005.

The principal activity of the Eco Fund is lending of soft loans for various investments in environment protection at interest rates lower than market rates, which is enabled by the Fund's interest-free public finance sources. By way of favorable lending and at the same time ensuring a certain amount of contribution of own investment funds by those burdening the environment, the Fund contributes to an increased scope of environment protection projects realized throughout Slovenia.

Eco Fund is responsible for implementing most of the activities of the former AURE.

The activities of Eco Fund in the field of energy efficiency and utilization of renewable energy sources are:

- subsidize energy audits of institutions, enterprises and outhouses buildings,
- subsidize manufacturing investment documentation for projects of energy efficiency, use of renewable energy sources and combined production of heat and electricity(CHP),
- support local energy concepts,
- fiscal incentives for implementing energy efficiency in households,
- fiscal incentives for investment in renewable energy in households,
- fiscal incentives to enterprises and entrepreneurs for investment in renewable energy,
- fiscal incentives for implementing energy efficiency and use of renewable energy sources in the public sector and

¹ The Department of Efficient Energy Use and Use of Renewable Energy Sources is under the European Affairs and Investments Directorate within the Ministry of the Environment, and Spatial Planning.

² Eco Fund: Slovenian Environmental Public Fund (<http://www.ekosklad.si/index.html>)

³ The Slovenian Parliament also adopted the "Control of Pollution Act" in 1993. The "Control of Pollution Act stimulates the energy efficiency measures and utilization of renewable energy sources and defines establishment of Eco Fund (Slovenian Environmental Public Fund) as a financial institution for the purpose of providing loans at favourable interest rates for investments in the field of environmental protection.

Energy Efficiency Policies and Measures in Slovenia in 2007

- co-funding information, training and promotional activities for energy efficiency and renewable energy.

The annual budget for financing of energy efficiency programmes and utilization of RES in Slovenia in the period from 2000 to 2007 is presented in the Table 2.

Table 2: Public financing from the budget and loans of Eco Fund for programmes stimulating energy efficiency and utilization of RES for period from 2000 to 2007

	Public Financing (from budget) ⁴	Soft loans Eco-fund ⁵	Total
	[1000 EUR]		
2000	1.196	705	1.901
2001	1.297	320	1.617
2002	1.103	3.054	4.157
2003	1.142	2.150	3.292
2004	1.127	237	1.364
2005	885	7.510	8.395
2006	833	10.083	10.916
2007	956	10.772	11.728

Sources: Ministry of the Environment and Spatial Planning and Eco Fund

⁴ Source: Ministry of the Environment and Spatial Planning.

⁵ Source: Eko Fund.

3 Overall Assessment of Energy Efficiency Trends

3.1 Overall trends in energy intensity

The energy intensity indicator presents the relation between the energy consumption and gross domestic products. The primary energy intensity of Slovenia was 251 ktoe/M€00 in 2007 which is lower for about 26% than the intensity in 1997 (340 ktoe/M€00). The decrease of final energy⁶ intensity was more than 29% in the same period: from 235 ktoe/M€00 in 1997 to 166 ktoe/M€00 in 2007.

The trend of primary and final energy intensity decreased in the period between 2000 and 2007 in average for 2.2%/year or 3.4%/year (Figure 5).

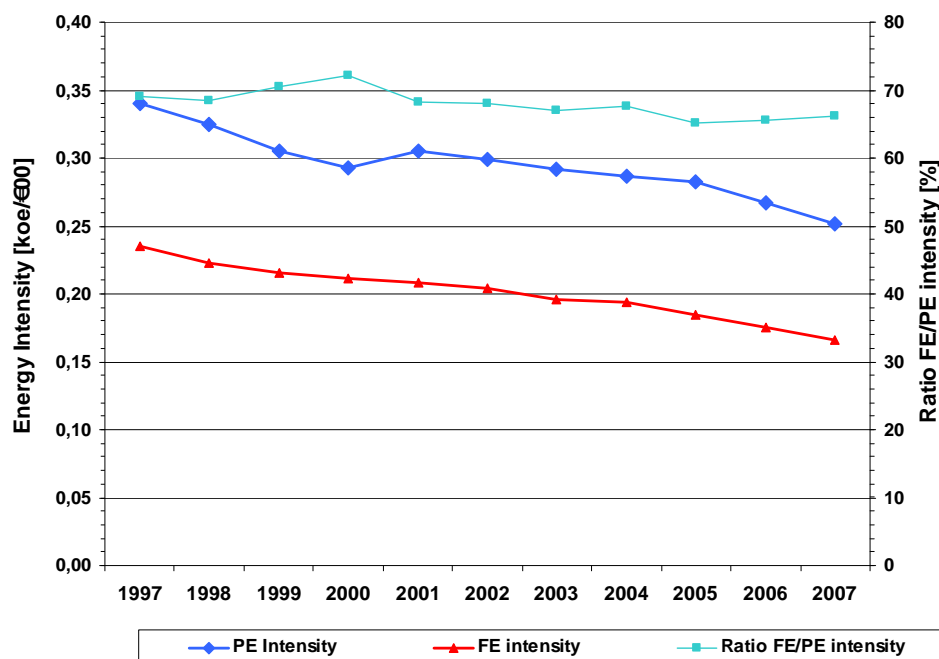


Figure 5: Final and primary energy intensity in Slovenia

The energy intensity of Slovenia (251 ktoe/M€00) is higher than the average of EU 27 (177 ktoe/M€00) for about 50%.

⁶ Final energy consumption of end use sectors: industry, transport and tertiary sector.

Energy Efficiency Policies and Measures in Slovenia in 2007

The energy intensity is lower when we take in consideration the impact of climate corrections and at purchasing power parities (ppp, 2005) as is shown in Figure 6.

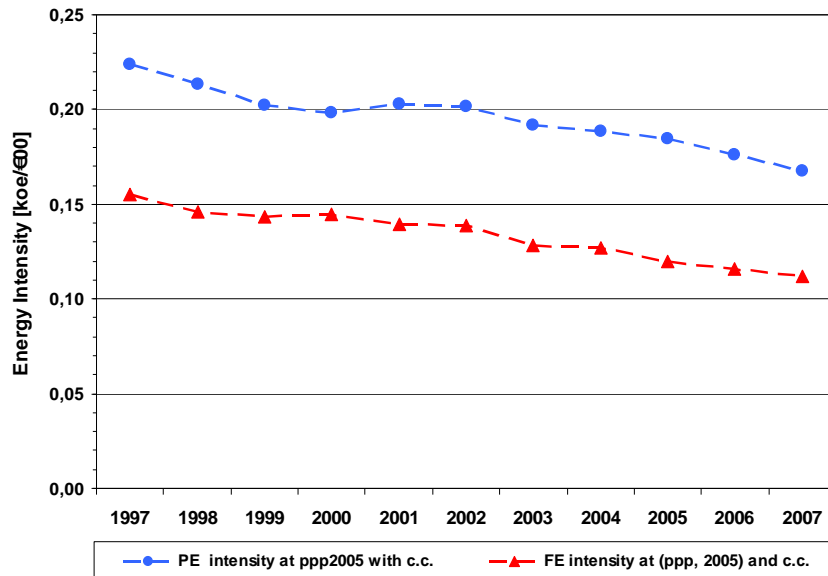


Figure 6: Final and primary energy intensity with climate change and at ppp. 2005 in Slovenia

The variation in final energy intensity and the impact of structure change for the period from 2000 to 2007 is shown in Figure 7. The impact of structure change is positive (more than 0 for the period) and its impact is negative.

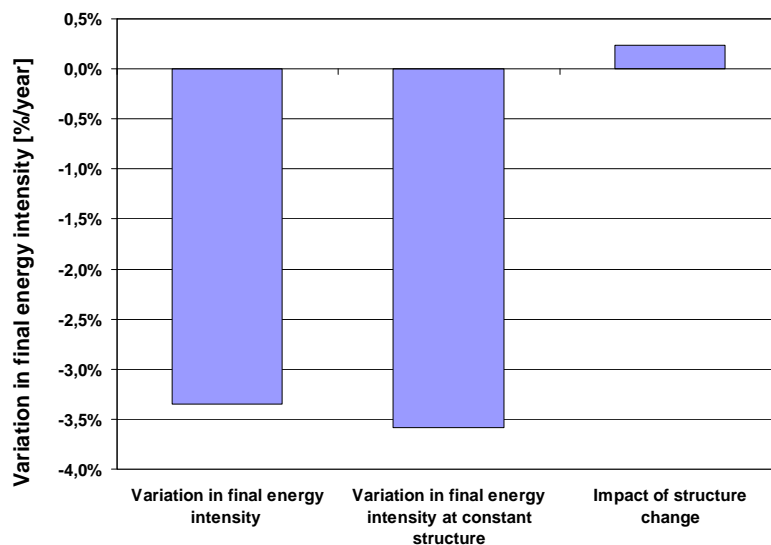


Figure 7: Variation in energy intensity for the period 2000/2007 in Slovenia

The impact of structure change at adjusted economic structure and at ppp, 2005 is shown in Figure 8.

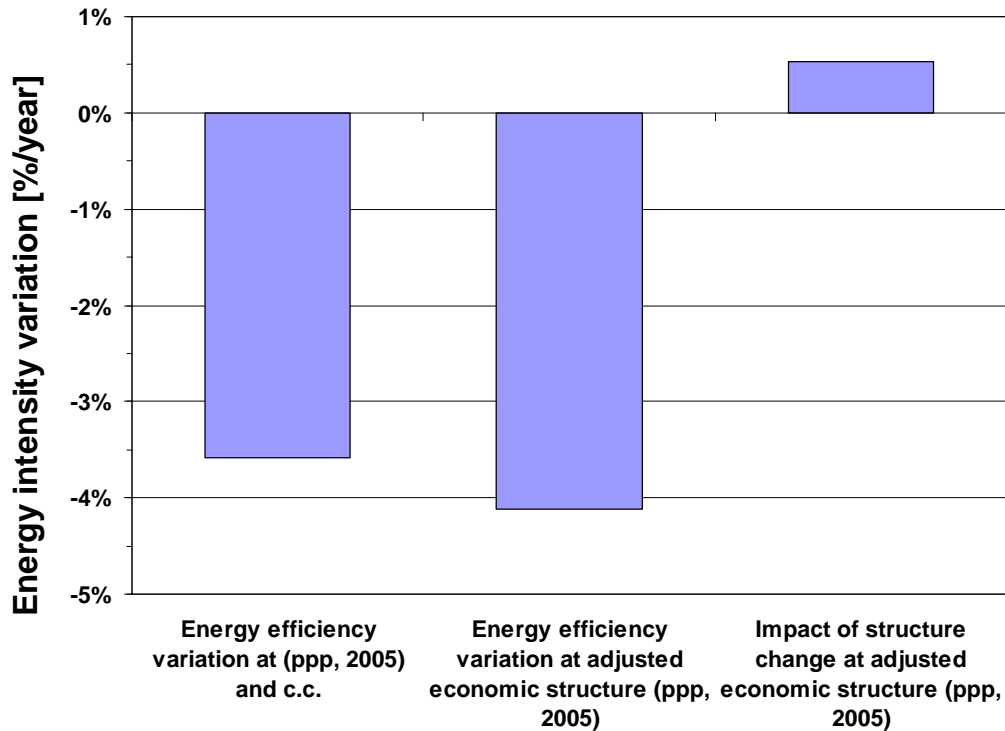


Figure 8: Variation in energy intensity with climate correction at ppp, 2005 and impact of structure change for the period 2000/2007 in Slovenia

3.2 Industry

The total final energy consumption of manufacturing industry in Slovenia has increased from 1217 ktoe in 1997 to 1535 ktoe in 2007 or for 26,2% (Figure 9). The average increase in final energy consumption of manufacturing industry in the period 1997-2007 was 2.4%/year.

The increase of energy consumption was in paper, wood, rubber and plastic, non ferrous metals, metallic and chemicals manufacturing industries. There was a decrease in energy consumption of textiles, due to a move of textile production to other countries. The trends of final energy consumption in industrial branches are shown in Figure 10.

Energy Efficiency Policies and Measures in Slovenia in 2007

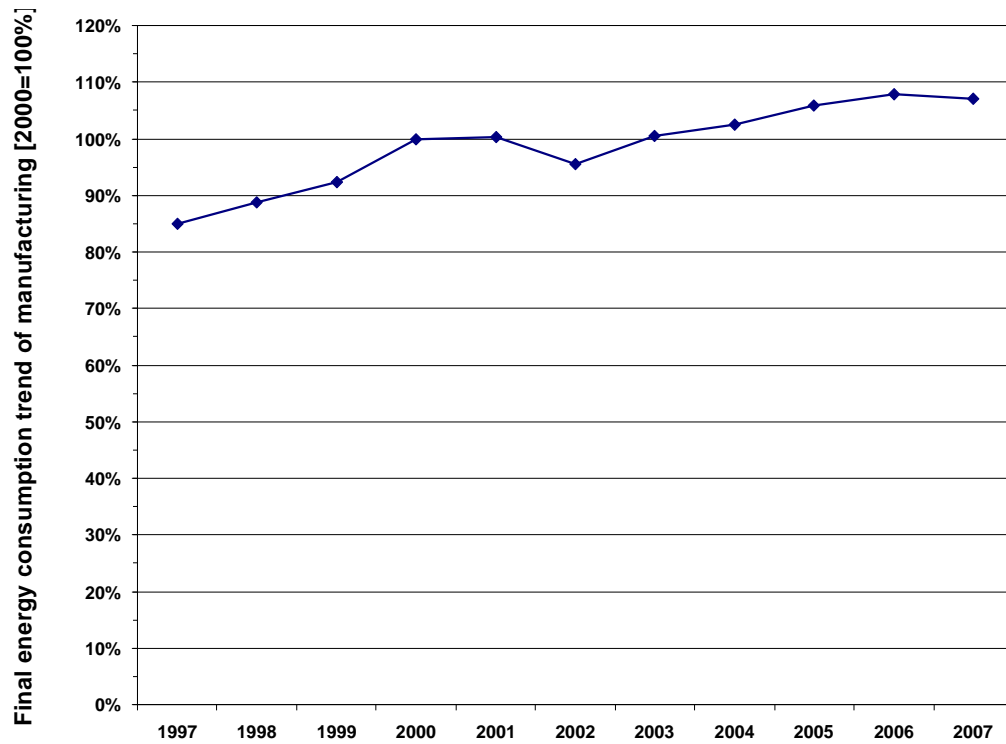


Figure 9: Trend of final energy consumption of industry in Slovenia (1997-2007)

The final energy consumption of industrial branches in Slovenia is shown in Figure 11.

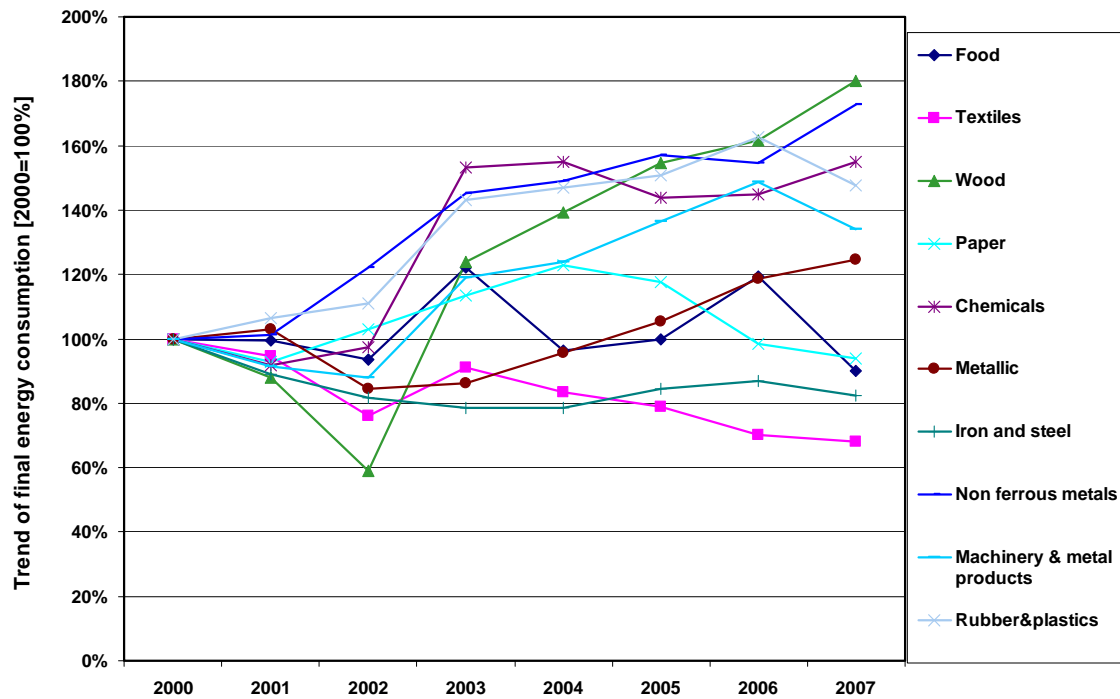


Figure 10: Trend of final energy consumption of industrial branches in Slovenia

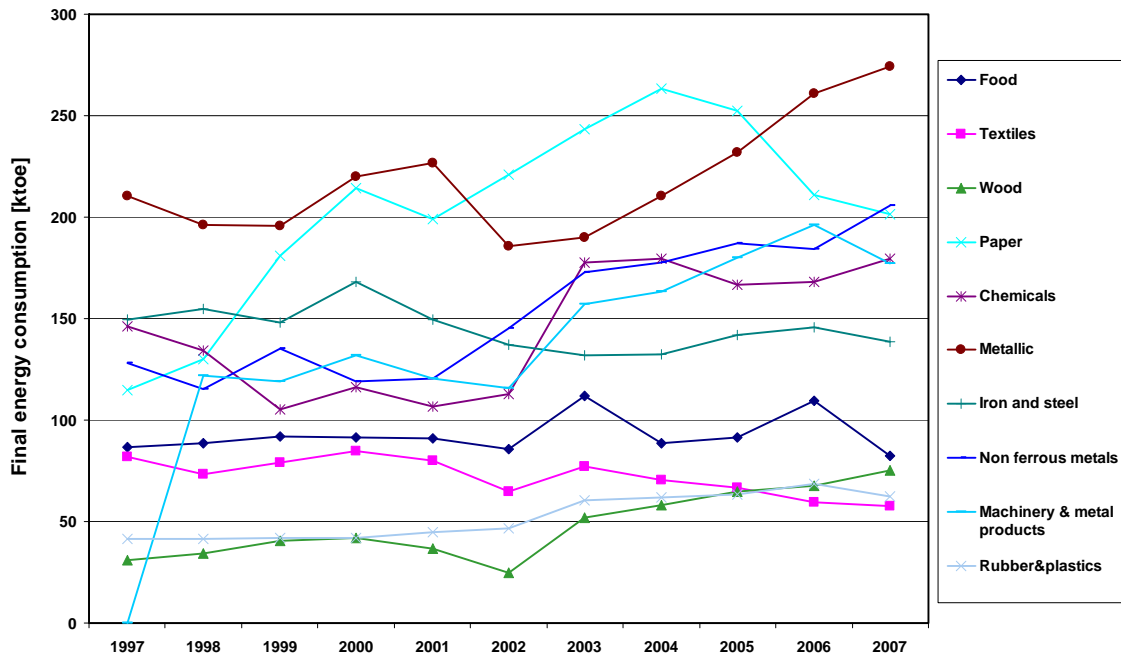


Figure 11: The final energy consumption of industrial branches in Slovenia

The specific energy consumption of steel and paper production depends on accuracy of statistical data. The data about the energy consumption of steel and paper in Slovenia was less corrected in the period before 2003. The trend of specific consumption of steel and paper was falling after 2003 as is shown in Figure 12.

Energy Efficiency Policies and Measures in Slovenia in 2007

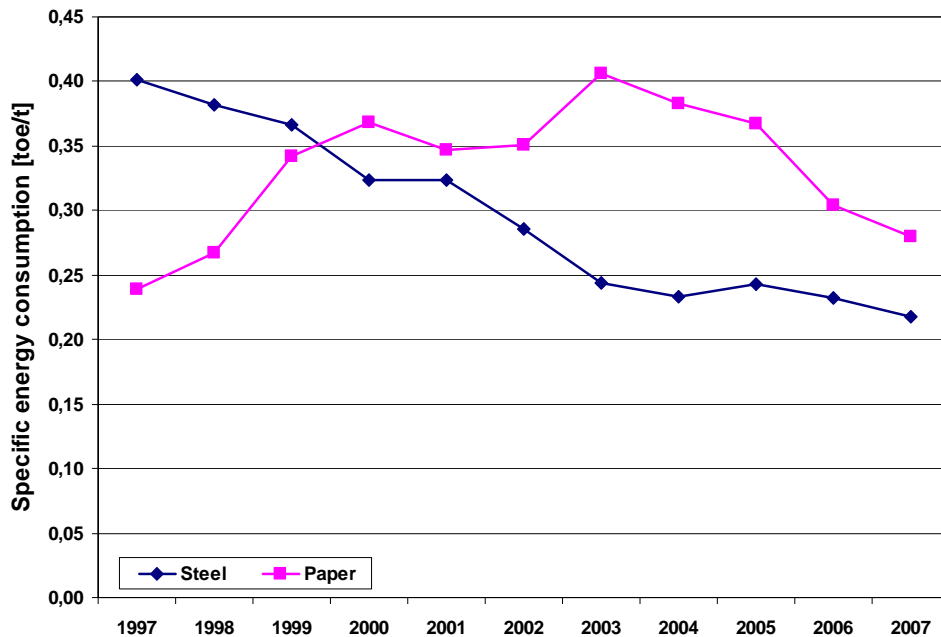


Figure 12: Specific energy consumption of steel and paper production in Slovenia

The improvement of specific energy consumption in paper industry is a result of different measures and stopped production of cellulose.

The decrease of specific energy consumption of steel is a result of implementation of energy efficiency measures and increase of the exploitation of steel production capacities (furnaces).

The growth of steel production at the same production capacities contributes to improve the energy efficiency in industry.

3.3 Households

The growth of final energy consumption in households was in the period from 1997 to 2003 followed by a decrease in energy consumption as is shown in Figure 13.

The increase of energy consumption was a result of an increase in the number of households appliances.

Energy Efficiency Policies and Measures in Slovenia in 2007

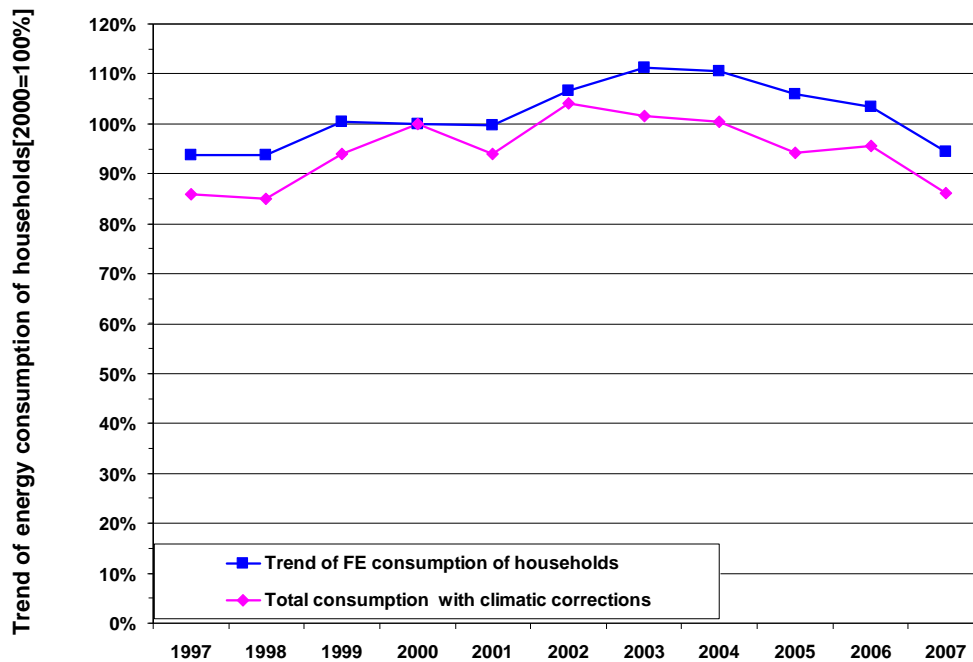


Figure 13: Trend of final energy consumption of households in Slovenia (1997-2007)

The structure of energy consumption in household for 1997, 2003 and 2007 is shown in Figure 14. The change of energy consumption structure shows stopped use of coal, reduced use of oil and increased use of biomass, gas and electricity consumption.

The data about the consumption of wood biomass in households are estimated and are unchanged from 2002 onwards⁷ (Figure 14). These data do not reflect the real situation, where the wood consumption is increased as results of increasing of fuel oil and gas prices and financial support (subsidies) of their use for heating. Unrealistic data of wood consumption have impact on real assessment of energy efficiency in households.

⁷ The data about the wood biomass consumption increased from 6.456 TJ in 1999 to 15.000 TJ in 2000 and then decreased to 13.573 TJ from 2002 onwards.

Energy Efficiency Policies and Measures in Slovenia in 2007

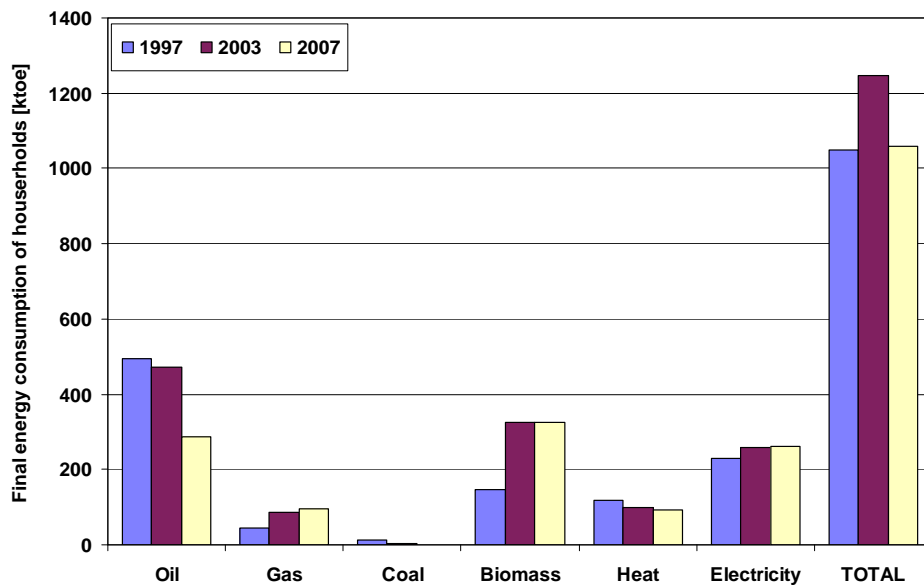


Figure 14: Structure of final energy consumption of households in Slovenia

There was replacement of coal and oil with wood biomass and gas.

The main increase in household's appliances happened in the period from 1997 to 2007 by 12% of refrigerators, 7% of independent freezers, 11% of washing machines, 140% of dishwashers and 12% of TV sets.

3.4 Services

The trend of final energy consumption in sector of service activities (including agricultural) shows increase in the period from 1997 to 2002 followed by decreased consumption in the period from 2002 to 2007 (Figure 15). The number of employment has increased by 28% through the observed period.

Energy Efficiency Policies and Measures in Slovenia in 2007

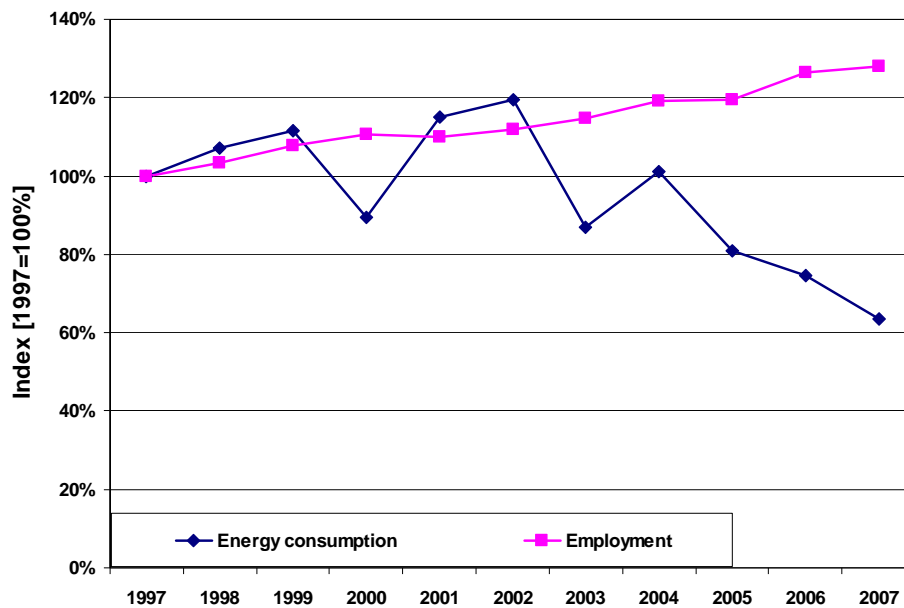


Figure 15: Index of final energy consumption and number of employment of service sector in Slovenia

The improvement of final energy unit consumption per employment was higher than the improvement of unit electricity consumption per employment for all period as is shown in **Error! Reference source not found.**

Table 3: Variation of unit energy consumption per employment in service sector

	2007/2002	2007/2004	2007/1997
Variation of electricity unit consumption per employment	-6,5%	-3,9%	-0,8%
Variation of energy unit consumption by employment with climatic corrections	-15,4%	-16,4%	-6,8%

The indicators for energy consumption by employment in service sector decreased rapidly in the last five years as is shown in Figure 16.

Energy Efficiency Policies and Measures in Slovenia in 2007

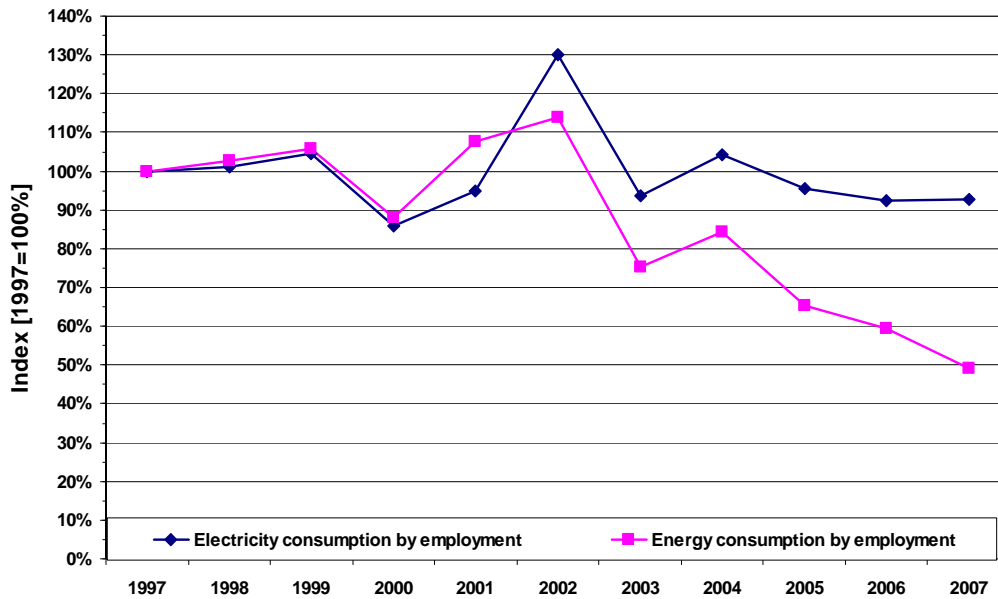


Figure 16: Index of electricity and final energy consumption by employment of service sector in Slovenia

3.5 Transport

Energy consumption in transport sector has increased for all the observed period. There is an increase as a result of an increase in the stock of cars and other vehicles, but there is also an increase of fuel consumption for consumers from neighbour countries and transit. Slovenia has in this period lower price of fuels than the other neighbour and other EU countries. Fuel consumption of foreign vehicles and border trade (fuel tourism) was estimated based on the model evaluation of fuel consumption in road transport (cars, buses, trucks and light vehicles).

The increase of energy consumption in transport achieves 40% in 2007 in comparison to 2000 as is shown in Figure 17. The fuel consumption of foreign vehicles and border trade was also higher in the period before 2000 (Figure 17).

Energy Efficiency Policies and Measures in Slovenia in 2007

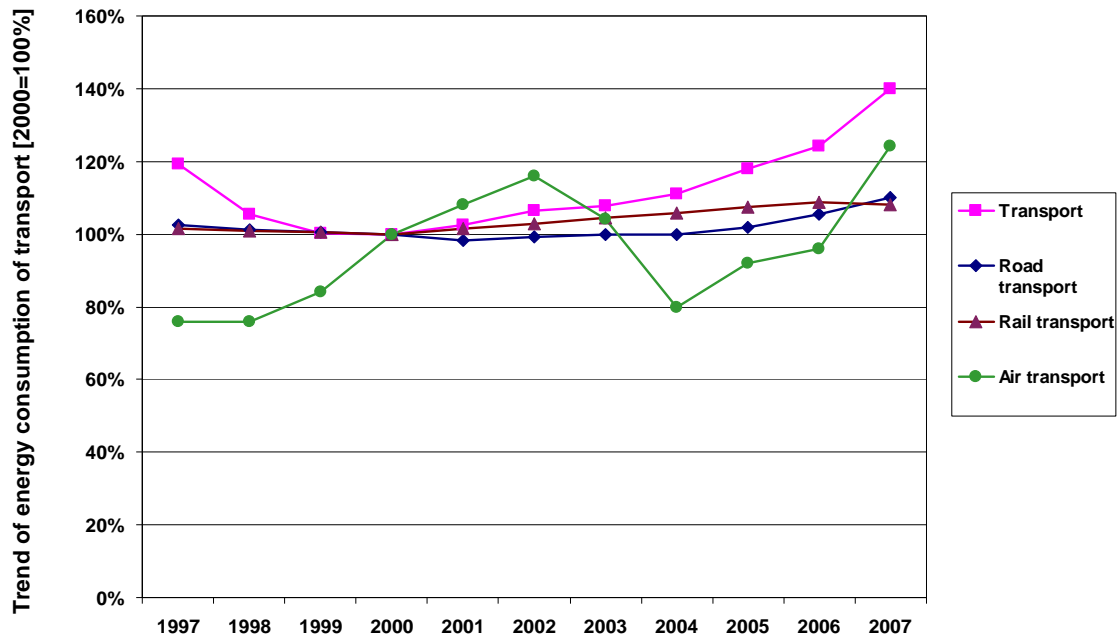


Figure 17: Trend of final energy consumption of transport in Slovenia (1997-2007)

The trend of unit consumption per car equivalent is shown in Figure 18. The annual sales of new vehicles (car, motorcycles, buses, trucks) in car equivalent were more than 8% in average.

The trend of “gross” unit consumption per car equivalent⁸ shows increase of the fuel consumption by car equivalent in the period between 2000 and 2007 (Figure 18). The increase of unit consumption per car equivalent considering gross road energy consumption proves existential of considerable share of fuel consumption of foreign vehicles and boarder trade.

⁸ (fuel consumption of road transport including fuel consumption of foreign vehicles and border trade)

Energy Efficiency Policies and Measures in Slovenia in 2007

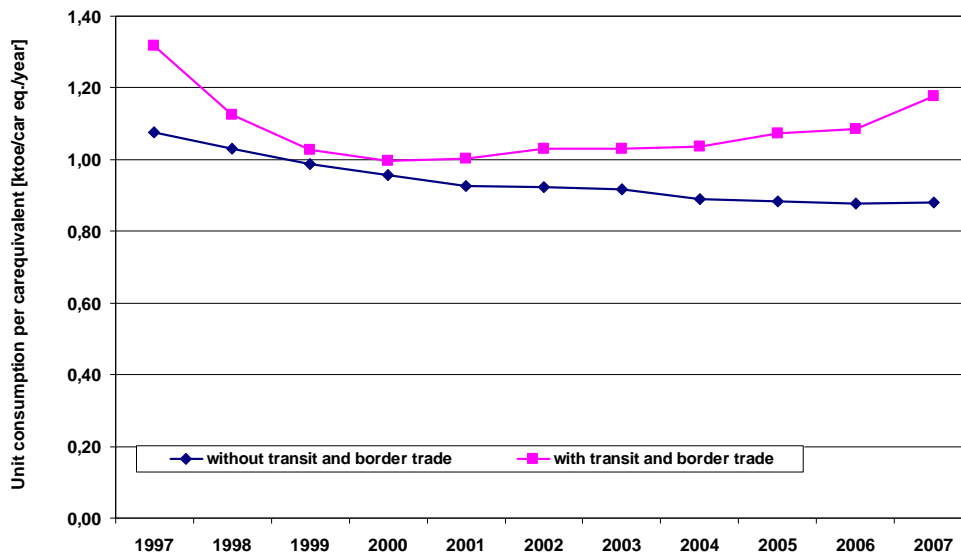


Figure 18: Unit energy consumption per car equivalent in Slovenia (1997-2007)

The trend of public transport of passengers in train and buses goes in different direction. The passenger transport in train has increased for 32% or 2.3%/year meanwhile the passenger transport in buses decreased for 63% or -9.4%/year in the period 1997-2007 as is shown in Figure 19.

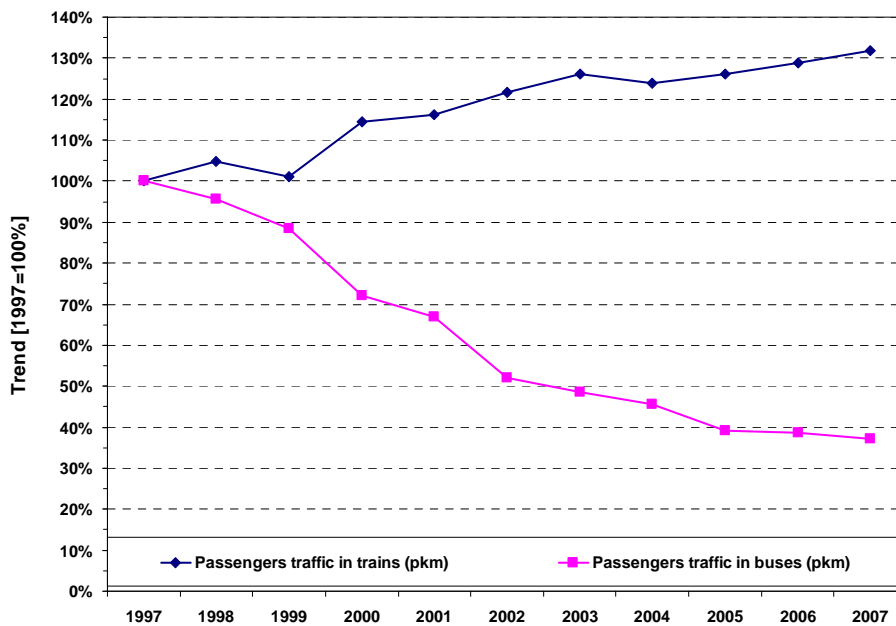


Figure 19: Trends of passengers transport in public transport Slovenia (1997-2007)

The improvement of unit consumption of rail good transport was 16% or in average 1.7%/year in the period from 1997 to 2007, as is shown in Figure 20.

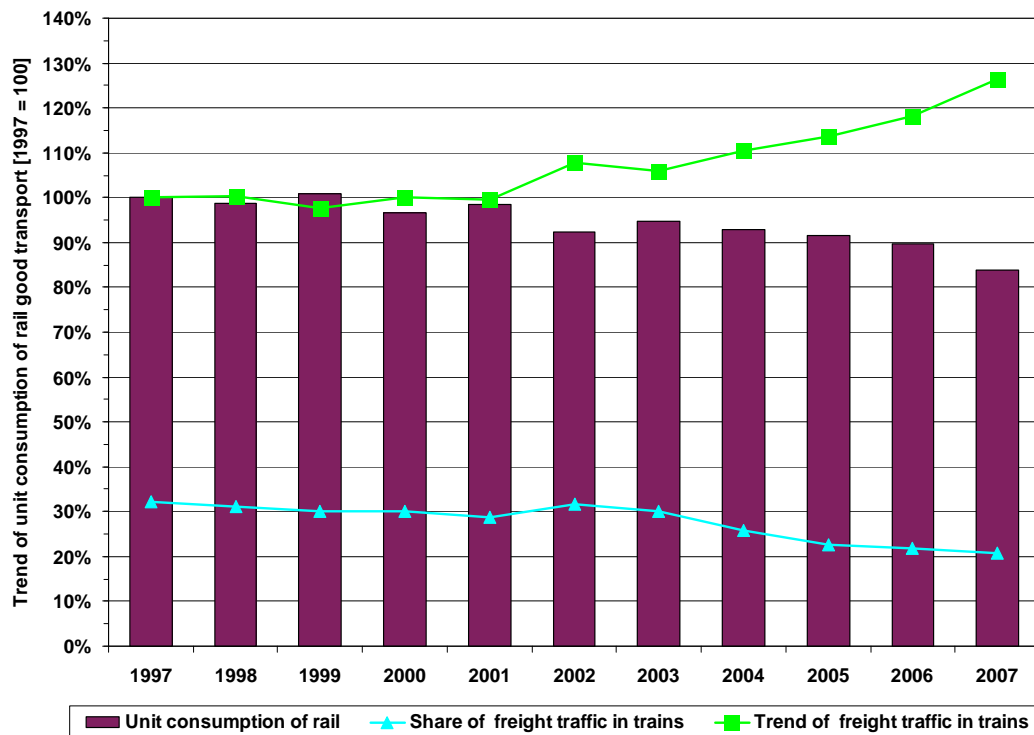


Figure 20: Trends of rail good transport in Slovenia

The share of good train transport in the domestic good transport (road and train good transport) has decreased for 11% (-4.3%/year) and the transport of goods increased for 26% (2.4%/year) in 2007 in comparison to 1997 (Figure 20).

3.6 Assessment of energy efficiency/savings through ODEX: total and by sector

The energy efficiency in Slovenia, measured by energy efficiency index ODEX has improved in the period from 1997 to 2007 for 15.5% or 1.9%/year. The improvement of energy efficiency in Slovenia was higher than the energy efficiency of EU-27 average, which was 10.0% or 1.2%/year. Figure 21 shows the improvement of energy efficiency of Slovenia and EU-27 in the period from 1998 to 2007.

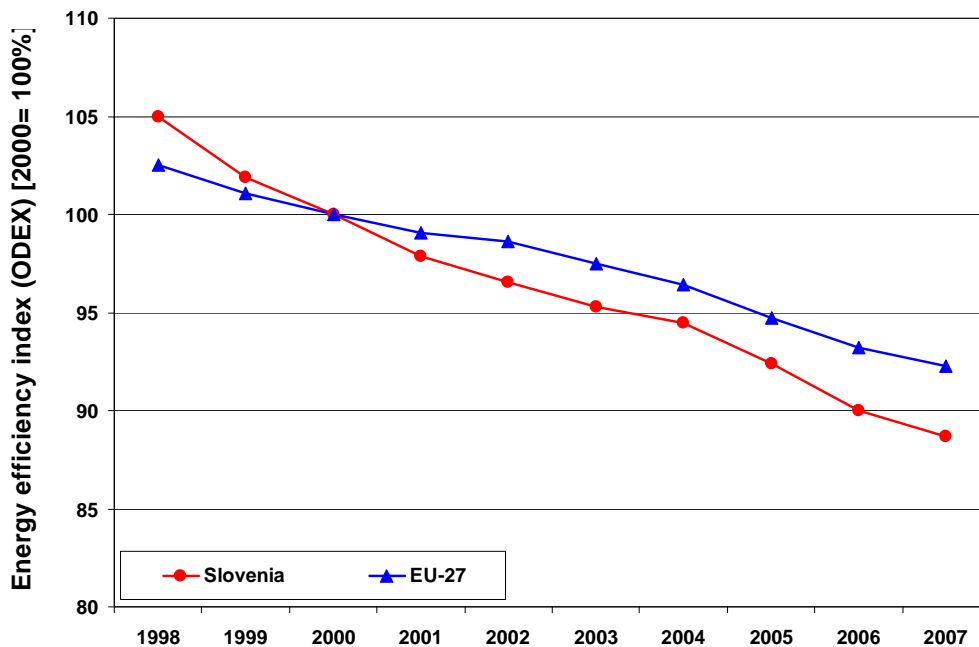


Figure 21: Energy efficiency index of Slovenia and EU 27 (1998-2007)

The energy efficiency of industry in Slovenia, measured by energy efficiency index ODEX has improved in the period from 1997 to 2007 for 17.7% or 2.1%/year (Figure 22).

Energy Efficiency Policies and Measures in Slovenia in 2007

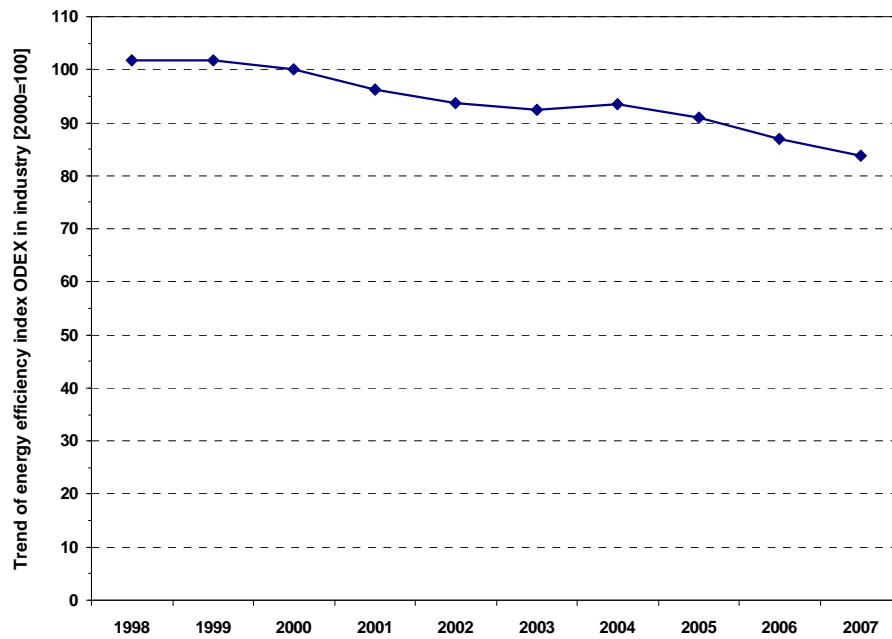


Figure 22: Energy efficiency index of industry in Slovenia (1998-2007)

The energy efficiency of households in Slovenia, measured by energy efficiency index ODEX has improved in the period from 1997 to 2007 for 11.1% or 1.3%/year (Figure 23).

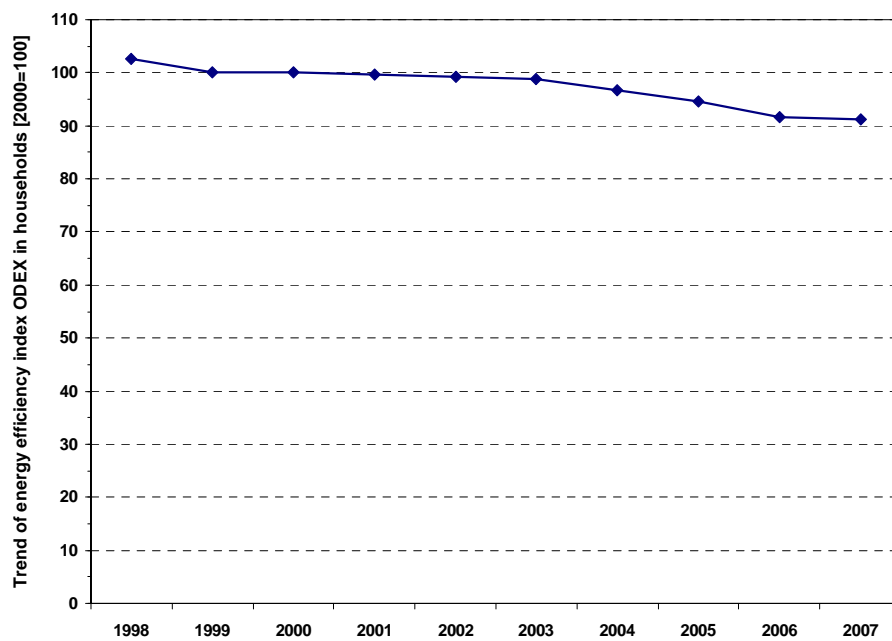


Figure 23: Energy efficiency index of households in Slovenia (1998-2007)

The energy efficiency of transport in Slovenia, measured by energy efficiency index ODEX has improved in the period from 1997 to 2007 for 16.3% or 2.0%/year (Figure 24).

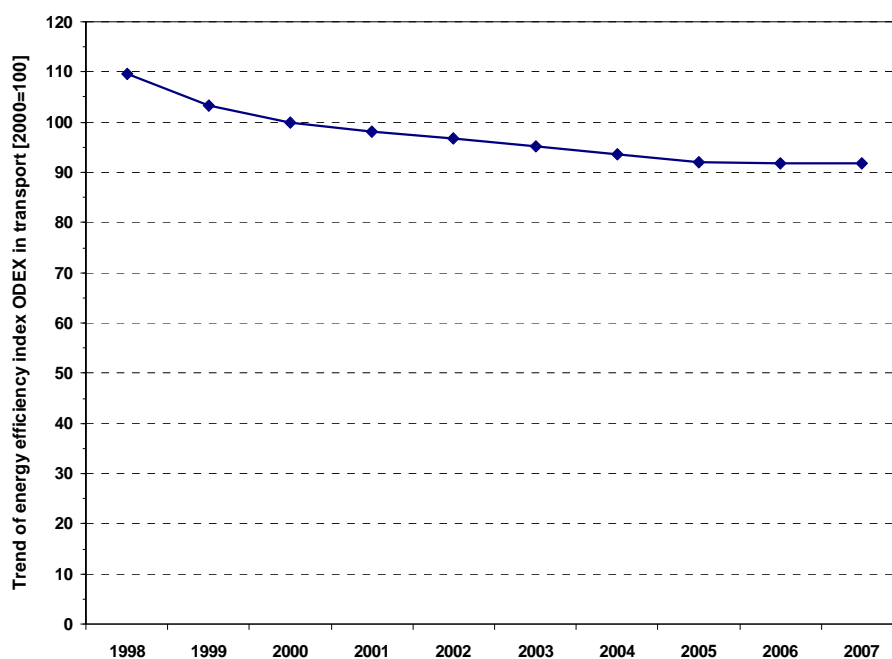


Figure 24: Energy efficiency index of transport in Slovenia (1998-2007)

3.7 **CO₂-emissions trends: total and by sector; role of fuels substitutions and of energy efficiency**

The direct and total (direct and indirect⁹) CO₂ emissions follow the energy consumption and the structure of used fuels. The CO₂ emission per capita (with and without climate corrections) was slowly increased after 2000 as is shown in Figure 25.

⁹ Direct CO₂ emissions are emissions by fuel (fossil fuels) consumptions. Indirect CO₂ emissions are emissions of electricity and district heating generation.

Energy Efficiency Policies and Measures in Slovenia in 2007

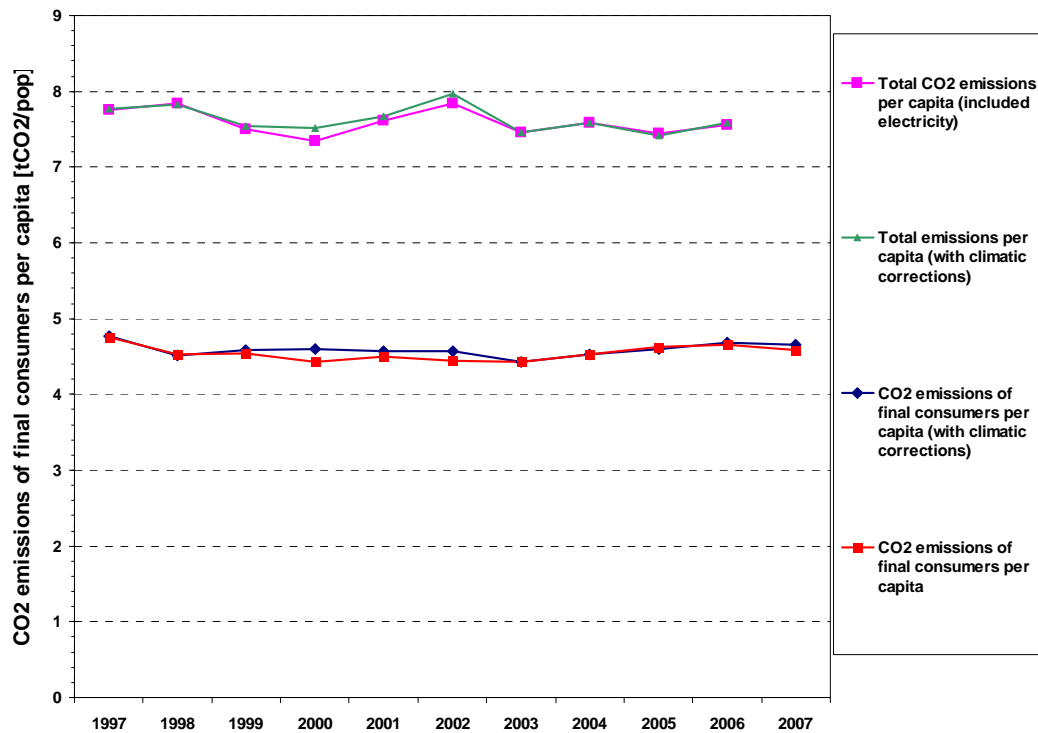


Figure 25: Trend of the direct and total CO₂ emissions per capita without and with climatic corrections in Slovenia (1997-2007)

The direct CO₂-emissions (generated by fossil fuels consumption) per capita has decreased for 3.6% (-0.4%/year) for the period from 1997 to 2007 and the total CO₂-emissions (direct and indirect /emission caused by electricity) per capita have decreased for t 2.5% (-0.3%/year) for the same period as is shown in Table 4. The changing of CO2 emissions (direct and total) with climate corrections was lower (Table 4).

Table 4: Changing of the CO₂-emissions per capita in Slovenia (1997-2007)

	2007/1997	2007-1997	2000-1997	2007-2000
	%	%/year	%/year	%/year
Direct CO ₂ -emissions per capita	-3,6%	-0,4%	-2,4%	0,5%
Direct CO ₂ -emissions per capita with climatic corrections	-2,3%	-0,2%	-1,3%	0,2%
Total (direct and indirect) CO ₂ -emissions per capita	-2,5%	-0,3%	-1,8%	0,5%
Total (direct and indirect) CO ₂ -emissions per capita with climatic corrections	-2,4%	-0,3%	-1,1%	0,2%

The trend of CO₂-emissions (direct and total) intensity measured by kCO₂/EUR₂₀₀₀ is shown in Figure 26.

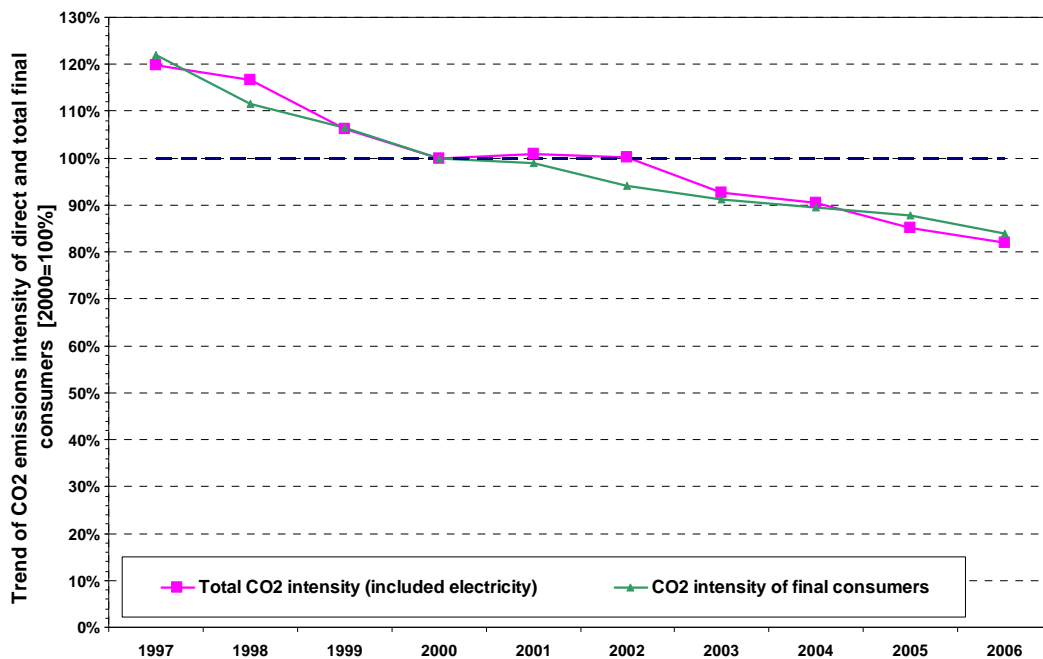


Figure 26: Trend of the direct and total CO₂ emissions intensity in Slovenia (1997-2006)

The CO₂-emissions (direct and total) intensity measured by kCO₂/EUR₂₀₀₀ has decreased for about 36% (-4%/year) for the period from 1997 to 2006 (Table 5).

Energy Efficiency Policies and Measures in Slovenia in 2007

The decrease of CO₂-emissions intensity in average was higher in the period from 1997 to 2000 than the period after 2000 as is shown in Table 5.

Table 5: Variation of the CO₂-emissions intensity in Slovenia (1997-2006)

	2007/1997	1997-1997	2000-1997	2006-2000
	%	%/year	%/year	%/year
CO ₂ intensity of final consumers	-36,3%	-4,4%	-6,4%	-2,9%
CO ₂ intensity of total final consumers with climatic corrections	-35,4%	-4,3%	-5,3%	-3,4%
Total CO ₂ intensity	-31,5%	-4,1%	-5,8%	-3,2%
Total CO ₂ intensity (included electricity and climatic corrections)	-31,5%	-4,1%	-5,2%	-3,6%

4 Energy efficiency measures

4.1 Recent Energy Efficiency Measures

The Department of Efficient Energy Use and Use of Renewable Energy Sources within the Ministry of the Environment, and Spatial Planning and Eco Fund are responsible for the implementation of the energy efficiency measures in all sectors. The Energy act, Resolution on the National energy program and Control of Pollution Act are the main legal documents for implementation of energy efficiency and utilization of renewable energy sources in Slovenia. The description of the energy efficiency measures and policies in Slovenia is available on the MURE database for all final energy consumers.

Residential Sector

The government supported the implementation of energy efficiency measures in residential sector by special actions in the previous years.

The more effective recent energy efficiency measures in residential sector are mainly focused on the improvement of building performance: overall heat (thermal) insulation of building shells and more efficient heating systems.

The indirect energy efficiency measures are the measures about the energy labelling of household appliances, energy efficiency requirements for domestic appliances.

The main focus of activities in the field of energy efficiency in residential sector in the previous years was on the subsidies of the thermal insulation of building shells and replacement of windows and glass. The government offers also subsidies for space heating system and heating of sanitary water using renewable energy sources (biomass heating boilers, heat pumps, thermal solar systems).

The important results of current energy efficiency measures in the residential sector are financial stimulation for energy efficiency of heating systems, renovation (energy sanitation) of old buildings and sustainable building of new buildings. The financial stimulation measures for buildings include thermal insulation of shells and lofts, replacement of windows, building new low energy and passive solar buildings. The financial stimulation measures for heating systems include replacement of boilers with lower efficiency and unsuitable capacity with new efficient boilers, installation of heating systems on renewable energy sources (wood biomass boilers with high efficiency, combinations of heat pumps and thermal solar systems, geothermal heat pumps).

Measures include also financial stimulation (subsidy) for investment in utilization of renewable energy sources in households like photovoltaic. The adopted different regulation about the efficient use of energy and share of renewables of building energy supply of new buildings (Rules on efficient use of energy in buildings), obligatory calculation of costs of heat in multifamily buildings (Rules on the distribution and calculation of costs of heat in residential and other buildings with more than one consumer) affect the energy efficiency in the residential sector.

Transport Sector

The activities concerning the energy efficiency in the transport sector in the previous years was limited to the information on fuel economy and CO₂ emissions of new passenger cars and financial stimulation (subsidy) for purchase of electrical or hybrid (electrical and fossil fuel motors) vehicles.

The new EE measures in transport are more oriented to energy efficiency. The new energy efficiency measures include promotion and competitiveness of public transport, promotion of sustainable freight transport, increase of energy efficiency of road motor vehicles, purchase of environment friendly trucks and construction of cycle paths and promotion of cycling.

The instruments to achieve the promotion and competitiveness of public transport include the following instruments:

- financial incentives and stimulative subsidising of public transport,
- promotion, awareness-raising and provision of information on the advantages of public transport,
- fiscal instruments for restricting private car access to city centers.

The financial energy efficiency measure of public road transport is in relation to the number of passenger kilometers travelled (PKM) and not to the number of kilometers driven on a specific route. The measures required introduction of unified (combined) tickets, price accessibility, harmonisation of timetables, increase in accessibility, frequency, punctuality, speed and quality of public transport routes, increase in car-park charges, establishment of intermodal terminals and information centers.

The measures for promotion and sustainable freight transport include financial incentives for the establishment of intermodality and an increase in rail freight transport and fiscal instruments for road freight transport

The measures to increase energy efficiency of road motor vehicles include direct subsidies from the budget for promotional and education activities, and taxes on private vehicles. The proportionate taxation of private and freight vehicles and buses is in relation to environmental standards (EURO) and the energy efficiency of vehicles (specific emissions of CO₂/km),

The measures for construction of cycle paths and promotion of cycling include financial incentives for the construction of cycle paths and support facilities, elimination of obstacles to the admission of bicycles on trains and buses, and financing of promotional and education activities. The target is construction of 500 km of cycle paths and other cycling infrastructure.

Industrial Sector

Energy efficiency measures in industry focused on improvement of efficient use of energy in industrial companies by stimulation of investments in energy efficiency and efficient electricity use.

Financial stimulation for energy efficiency renovation and sustainable building of new buildings are measures for stimulation of energy sanitation of old buildings and for building of new low energy and solar passive residential buildings. The energy sanitation of old buildings includes thermal insulation of buildings and replacement of un-energy efficient windows. The financial stimulation is designed to support the investment in new over standard energy efficient building.

Rules on the allocation of funds for the promotion of efficient use of energy and utilization of renewable energy sources are defining the criteria and measures on the allocation of budget funds for the promotion of efficient use of energy and utilization of renewable energy sources. The fund is formed for stimulation (subsidy) of the implementation of energy audits, feasibility studies, investment and project documentation for energy efficiency projects and utilization of renewable energy sources (RES).

The stimulation (subsidy) of the implementation of energy audits is limited to 2.5% of the proposed investment in EE, and utilization of RES. The eligible companies for these subsidies are small or medium enterprises.

Tertiary Sector

Energy efficiency measures in tertiary sector focused on improvement of efficient use of electricity and stimulation of investments in energy efficiency in buildings by improvement of system heating, *air-condition systems* and sanitation and renovation of building.

Instruments for stimulation of energy sanitation of old buildings and for building of new low energy and solar passive residential buildings are presented.

The energy sanitation of old buildings includes thermal insulation of buildings and replacement of un-energy efficient windows. The financial stimulation is designed to support the investment in new over standard energy efficient building (building of new low energy buildings, building of new passive solar buildings).

Cross-cutting measures

The energy use management programmes for end-consumers (DSM) presents an important measures to achieve high energy efficiency in residential and tertiary sectors and in small and medium-sized companies in the manufacturing industry.

The type of instruments for energy use management programmes for end-consumers (DSM) are:

- obligation to provide a public service on the part of energy companies (distribution network system operator, transmission network system operator),
- implementation on the basis of market principles (energy companies).

The energy use management programmes for end-consumers (DSM) include the following measures by sector:

- for the residential and tertiary sectors,
 - energy-efficient electricity use: household appliances, lighting tertiary sector,
 - energy-efficient electricity use: lighting, ventilation and air-conditioning systems,
- for the industrial sector,
 - efficient electricity use: electrical motor systems, lighting, ventilation and air-conditioning systems, compressed air,
- for all sectors,
 - efficient systems for heating and the preparation of hot water,
 - energy rehabilitation of buildings measures,
 - energy purchase tariffs.
 - formulation of energy sale tariffs that promote efficient energy use and the use of renewable energy sources.

4.2 Patterns and Dynamics of Energy Efficiency Measures

The illustration of energy efficiency measures by sector of activities in database MURE is in “spider graphs”, where are:

- *Coop: Co-operative Measures,*
- *Cros: Cross-cutting with sector-specific characteristics,*
- *Fina: Financial,*
- *Fisc: Fiscal/Tariffs,*
- *Gene: General Energy Efficiency / Climate Change / Renewable Programmes*
- *Info: Information/Education,*
- *Infr: Infrastructure,*
- *Le/I: Legislative/Informative,*
- *Le/N: Legislative/Normative,*
- *Mark: New Market-based Instruments,*
- *Nonc: Non-classified Measure Types,*
- *Soci: Social Planning/Organisation,*

The semi-quantitative impacts of all measures by sectors are in the next sub-chapter (4.4.1)

Residential Sector

The energy efficiency measures in the residential sector continue the successful measures in the previous years. The measures are divided between financial and legal measures (Figure 27).

The obligatory distribution and calculation of actual heat costs presents a measure with high efficient impact on energy consumption because of the influence on the behaviour of consumers.

Energy Efficiency Policies and Measures in Slovenia in 2007

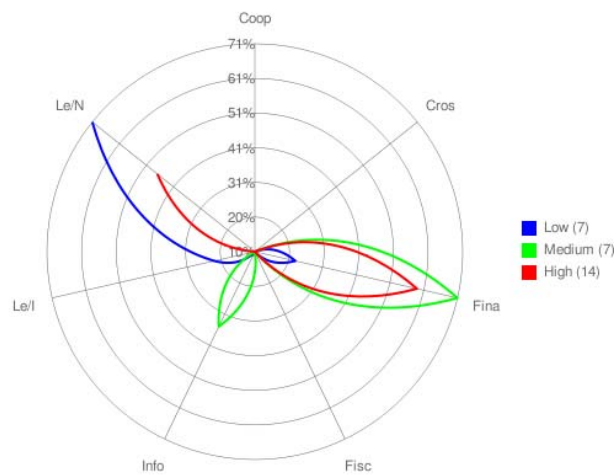


Figure 27: Energy efficiency measure patterns of the residential sector: development of measure by type over quantitative impactt (SLO)

Transport Sector

The energy efficiency measures in the transport sector in the previous years are very poor regarding the increase of public transport (Figure 28). The measures under the National action plan include measures for financial stimulation for the purchase of electrical and hybrid passenger cars and environment friendly trucks.

Energy Efficiency Policies and Measures in Slovenia in 2007

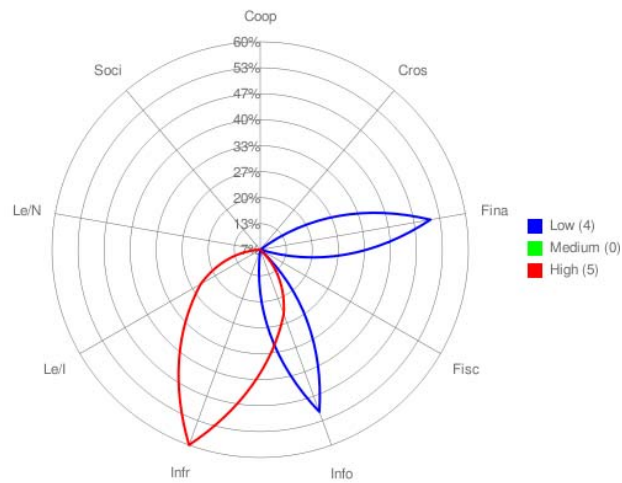


Figure 28: Energy efficiency measure patterns transport sector: development of measure by type over quantitative impact (SLO)

Industrial Sector

The energy efficiency measures in industry continue the successful measures in the previous years. The financial measures are focused on the efficient use of electricity and encouraging the investment in energy efficiency (Figure 29).

Energy Efficiency Policies and Measures in Slovenia in 2007

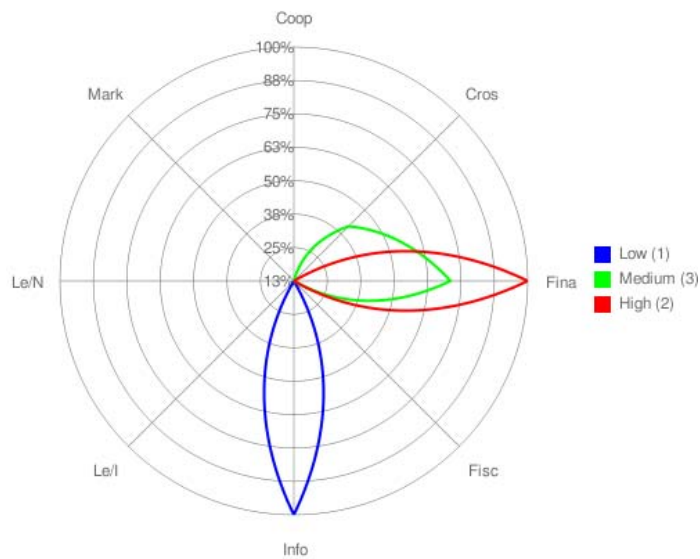


Figure 29: Energy efficiency measure patterns in the industry sector: development of measure by type over quantitative impact (SLO)

Tertiary Sector

The energy efficiency measures in the tertiary sector continue the successful measures in the previous years. The main measures are financial measures (Figure 30). The measures are, like in the residential sector, focused on the improvement of energy performance of buildings. Also there is a financial support for the investment in energy efficiency in service sectors.

Energy Efficiency Policies and Measures in Slovenia in 2007

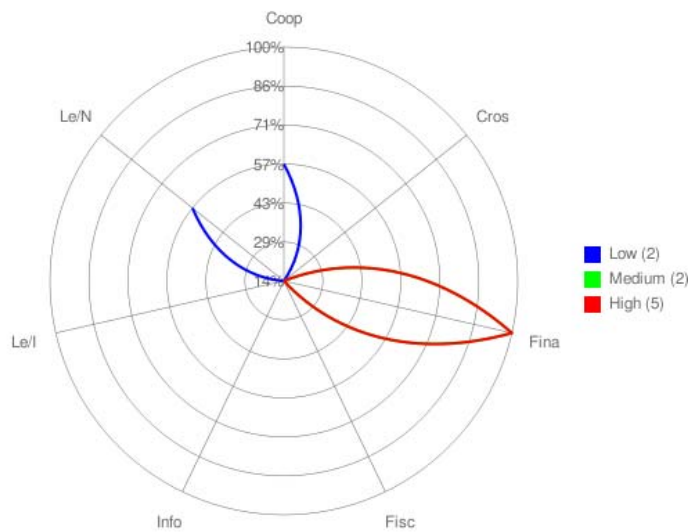


Figure 30: Energy efficiency measure patterns in the tertiary sector: development of measure by type over quantitative impact (SLO)

Cross-cutting measures

Under the cross-cutting measures are all legal Acts, which define the targets and obligatory for all actors to improve the energy efficiency using efficient technologies and implementation of different measures to improve energy efficiency, increase utilization of renewable energy sources and reduce CO₂ emissions (Figure 31).

Energy Efficiency Policies and Measures in Slovenia in 2007

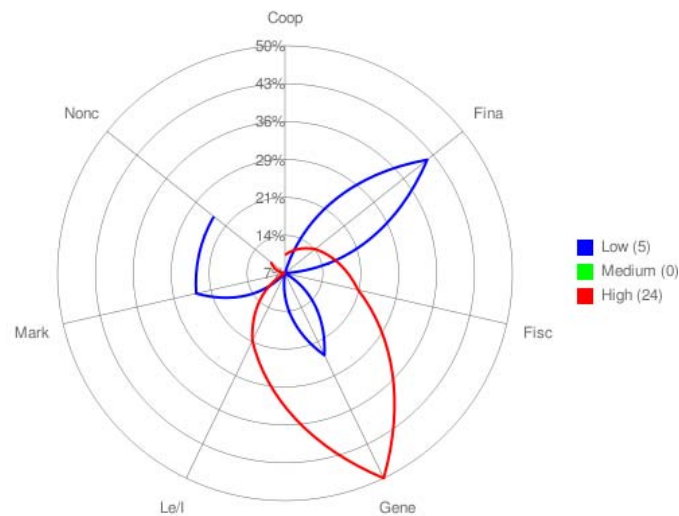


Figure 31: Energy efficiency measure patterns of the general cross-cutting sector: development of measure by type over quantitative impact (SLO)

4.3 Innovative Energy Efficiency Measures

The energy efficiency policy in Slovenia is oriented to the fulfilling of the obligation from different EU Directives and international documents (Kyoto protocol) regarding the improvement of energy efficiency, energy intensity, utilization of renewable energy sources and reduction of greenhouse gasses.

The targets of Slovenian energy efficiency policy are defined in different adopted documents (Energy Act, Resolution on the National energy program, Control of Pollution Act ...) and strategies. The purposes of all energy and environmental policy is to decrease energy dependency, energy intensity and emissions of greenhouse gasses as well as increase of security of energy supply and utilization of renewable energy sources.

The measures have impact on the market of new efficient end user technologies (like households appliances, energy savings lumps...) and increase the installation of heat pumps (water-water, ground-water), wood biomass boilers, solar thermal collectors and photovoltaic in residential and tertiary sectors.

4.4 Energy efficiency measure evaluations

4.4.1 Semi-quantitative Impact Estimates of Energy Efficiency Measures

The semi-quantitative of energy efficiency measures of all sectors are based on the available information from the MURE database. The semi-quantitative of energy efficiency measures in all sectors are shown in Figure 32.

There are 17 measures evaluated as low, 6 measures as medium and 18 measures as high impact.

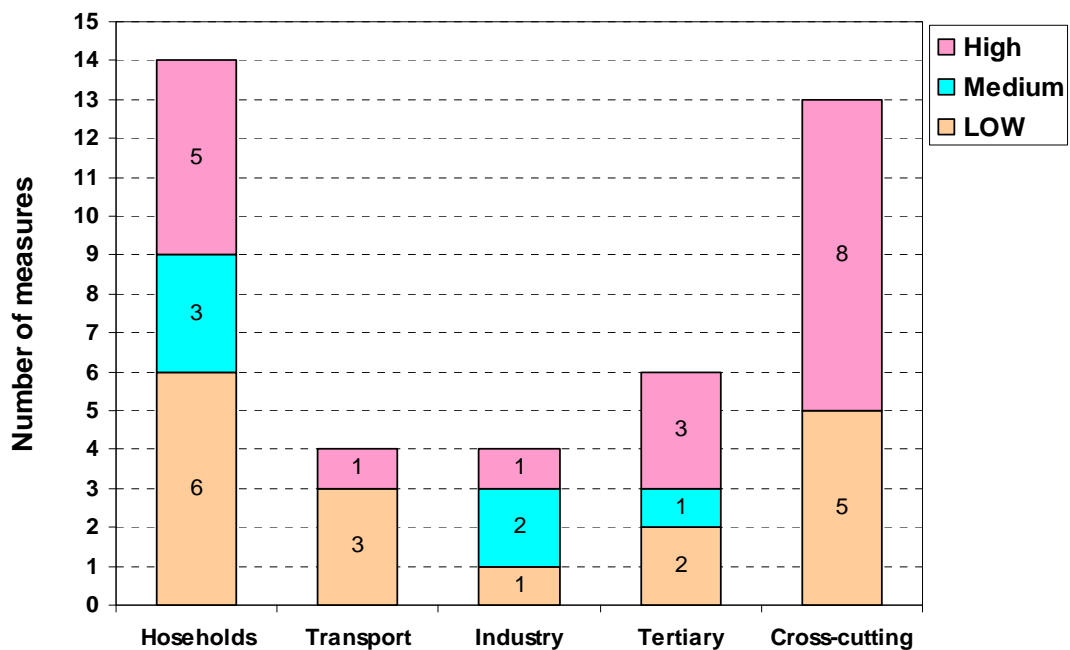


Figure 32: Semi-quantitative impact evaluation by sectors

4.4.2 Lessons from Quantitative Energy Efficiency Measure Evaluations

The quantity evaluation of energy efficiency measures is made for the implemented measures supported by the financial stimulation (subsidy, soft loan...) and the measures of the National energy efficiency action plan.

The bottom-up method is used for evaluation of the energy efficiency and reduction of CO₂ emissions by implemented measures. The assessment of expected energy savings and reduction of CO₂ emissions is an obligation document of every request for financial support.

The body responsible for the implementation of energy efficiency policy (action, program...) yearly reports about the expenditures for implementation of energy efficiency measures and utilization of renewable energy sources.

Methods used for evaluation of the savings of final energy and CO₂ emissions for energy efficiency of renovation and sustainable building of buildings will be described in the next part.

ENERGY EFFICIENCY OF RENOVATION AND SUSTAINABLE BUILDING OF BUILDINGS

1. Case 1-Total renovation of buildings

Savings of final energy:

$$SFE_{\text{total renovation}} = \left(\frac{RHE_{\text{old}}}{\eta_{\text{old}}} - \frac{RHE_{\text{new}}}{\eta_{\text{new}}} \right) \cdot A$$

Where are:

$SFE_{\text{total renovation}}$ – final energy savings of total renovation of building (in KWh),

RHE_{old} – required heat per unit of area for space heating before renovation,

RHE_{new} – required heat per unit of area for space heating after renovation,

η_{old} – annual efficiency of old heating system,

η_{new} – annual efficiency of new heating system,

A – heated area of a building.

Saving of CO₂ emissions:

Calculation of reduction (saving) of CO₂ emissions (Δe_{CO_2}) in (kgCO₂) is:

$$\Delta e_{CO_2} = SFE_{totalrenewatin} \cdot ef_{fuels}$$

Where is:

ef_{fuels} – average emission factor for the period 2000-2007 for the fuel used in households

2. Case 2 - Building of low energy and passive buildings

Savings of final energy:

$$SFE_{LH-PH} = \left(\frac{RHE_{LH-PH} - RHE}{\eta} \right) \cdot A$$

Where are:

SFE_{LH-PH} – saving of final energy caused by building of low energy or passive buildings (in kWh)

PTE_{NH-PH} – required heat per unit of area for space of low energy or passive buildings,

PTE – maximum of required heat per unit of area for space according to the Rules on thermal insulation and efficient energy use in buildings from 2002 (and/or Rules on efficient use of energy in buildings from 2008 (70 kWh/m²/year for buildings built before 2010 and 55 kWh/m²/year for buildings built after 2010),

η – yearly average efficiency of heating system (for heat pump is 1),

A – heated area of a building.

Saving of CO₂ emissions:

Calculation of reduction (saving) of CO₂ emissions (Δe_{CO_2}) in (kgCO₂) is:

$$\Delta e_{CO_2} = SFE_{LH-PH} \cdot ef_{fuels}$$

Where is:

ef_{fuels} – average emission factor for the period 2000-2007 for the fuel used in households

3. Case 3 - Partial renovation of buildings

Savings of final energy:

$$SFE_{\text{partial renovation}} = \frac{(U_{\text{old}} - U_{\text{new}}) \cdot DD \cdot 24 \text{ur}}{\eta} \cdot A$$

Where are:

SFE_{partial renovation} – savings of final energy as results of partial renovation of a building (some component of the shell of a building) in (kWh),

U_{old} – heat transfer of the old element of building shell (windows and doors, facades, etc.).

U_{new} – heat transfer of the new element of building shell (windows and doors, facades, etc.).

DD – degree days (Eurostat – 25 yearly average for Slovenia for 2007 is 3.053 K*day/year)

η – yearly average efficiency of heating system,

A – area of renovated part of the building shell,

U_{old}^{10} – heat transfer of the old constructional element of the building shell (windows and doors, facades, etc.).

Table 1: Value of heat transfer for old constructional elements of the building

constructional element	U_{old} (W/m ² K)
facade	1,2
Floors on the ground	1,5
Cellary wall (adjacent to the ground)	3,0
Pod proti neogrevani kleti Floor against unheated cellar	1,5
Strop proti neogr. podstrešju Ceiling lying under unheated attic	1,0
Oblique roof (un-insulated)	2,5
Flat roof	1,0
Windows, doors	3,0

U_{new} – heat transfer of the renovated constructional element of the building shell (external wall, roof and floor).

The heat transfer of new (renovated) constructional element of a building is calculated by using the next equation:

$$U_{new} = \left(\frac{1}{U_{new}} + \frac{d_{isolation}}{\lambda_{isolation}} \right)^{-1}$$

For the furniture of buildings (windows, doors) the following values are used:

- double-layer insulating glass ($U_{glass}=1,1$): $U_{new}=1,3$ W/m²K
- triple-layer insulating glass ($U_{glass}=0,7$): $U_{new}=0,9$ W/m²K
- door: $U_{new} = 1,5$ W/m²K

¹⁰ Use the standard from the valid standard (from the valid Rules) on the time of built of building.

Energy Efficiency Policies and Measures in Slovenia in 2007

Saving of CO₂ emissions:

Calculation of reduction (saving) of CO₂ emissions (Δe_{CO_2}) in (kgCO₂) is:

$$\Delta e_{\text{CO}_2} = \text{SFE}_{\text{partlyrenewable}} \cdot ef_{\text{fuels}}$$

Where is:

ef_{fuels} – average emission factor for the period 2000-2007 for the fuel used in households

5 National Developments under the EU Energy Efficiency Directive and the 20% Energy Efficiency Target of the EU

The National Energy Efficiency Action Plan 2008–2016 (NEEAP¹¹) was drawn up pursuant to Article 14 of Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services, and repealing Council Directive 93/76/EEC (hereinafter: Directive 2006/32/EC). This is the first of three action plans. The remaining two have to be drawn up in 2011 and 2014.

Directive 2006/32/EC requires that Member States achieve a 9% saving in final energy consumption in the ninth year of application of the Directive (i.e. from 2008 to 2016); earlier activities initiated from 1995, and in special cases from 1991, may also be taken into account.

The average annual use in the most recent five-year statistical period, excluding the use of fuels in installations involved in the greenhouse gas emission allowance trading system, is taken as the starting point for determining the target saving in end-use.

The total average final energy consumption in the 2001–2005 period amounted to 55,356 GWh and 8,008 GWh consumed by installations involved in the greenhouse gas emission allowance trading system. In this period, average annual final energy consumption amounted to 47,349 GWh as is shown in Figure 33.

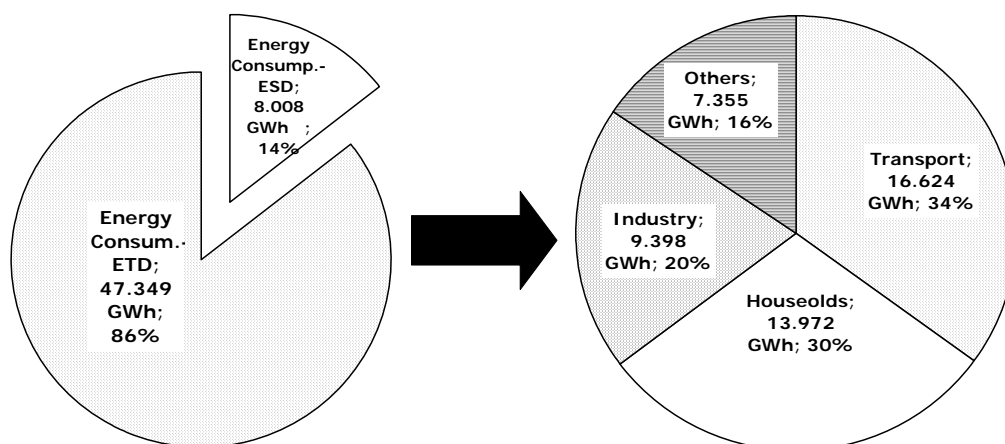


Figure 33: The structure of average final energy consumption under ES Directive.

¹¹ Government of the Republic of Slovenia: National Energy Efficiency Action Plan 2008–2016 (NEEAP), Ljubljana, 31.01.2008

On the basis of the NEEAP, Slovenia is to achieve cumulative savings of at least 9% in relation to the starting point for final energy consumption in the 2008–2016 period, or at least 4,261 GWh. Savings are to be achieved by means of various sectoral-specific, horizontal and multisectoral measures in all sectors (households, general consumption, industry and transport). In actual fact, greater cumulative savings in final energy consumption will be achieved since, under the NEEAP, a range of measures will also be carried out, primarily of a horizontal nature, whose effects will be capable of being clearly evaluated on the basis of a uniform methodology to be drawn up at the EU level.

The NEEAP does not take into account energy savings which are the result of measures to improve energy efficiency carried out in previous years, but not before 1995, and which have long-term effects (so-called earlier activities), since the Action Plan envisages that it will be possible to achieve the targets by implementing the instruments it proposes. Energy savings resulting from the implementation of earlier activities in the 1995–2007 periods will be taken into account only in the event that the targets set out in the NEEAP are not reached.

The NEEAP rests on the implementation of 29 sectoral, multi-sectoral and horizontal instruments that will ensure implementation of the measures proposed in Directive 2006/32/EC, Annex III. A large number of barriers will be removed by these instruments; these barriers are of an institutional, legislative, administrative, economic, financial, personnel nature, and also relate to awareness and information provision, etc.

With the NEEAP (Table 6), the target saving in final energy consumption will, in the 2008–2016 period, amount to at least 4,261 GWh (9% of baseline consumption); in the 2008–2010, savings will amount to 1,184 GWh (2.5% of baseline consumption). Of this, 97% of the energy saving will be made by means of measures for the efficient use of fossil fuels, electricity and district heating, while the remaining 3% will be made by means of measures for the efficient use of renewable energy sources and savings resulting from the introduction of systems for the cogeneration of electricity and heating. With the implementation of the NEEAP, CO₂ emissions will be reduced by 1,147 kt.

The expected energy savings in the public sector after implementation of the NEEAP are 496 GWh. As a consequence, energy costs in this sector will be lower by at least EUR 22 million a year (at current energy prices).

EUR 380 million in public funds will be required for implementation of the NEEAP (Table 6). This sum includes incentives for investment of between 15 and 40%. This means that the average specific costs of public funds should amount to EUR 5.9/MWh of saved final energy consumption and EUR 21.3/tCO₂ of saved greenhouse gas emissions.

The estimated overall investment costs, excluding investments in transport, amount to EUR 999 million. To this end it will be necessary to provide a further EUR 717 million (the remainder of investments, amounting to between 60 and 85%): EUR 534 million in private funds and EUR 183 million in state and local community budget funds earmarked for the rehabilitation of public buildings and similar purposes. The entire cost of the NEEAP is therefore around EUR 1,097 million.

Table 6: Expected annual savings in final energy consumption, required public funds and reduction CO₂ emissions

Sector	Energy savings 2008–2016 [GWh]	Public funds 2008–2016 [EUR millions]	CO ₂ emissions saving 2008–2016 [kt CO ₂]
Residential sector	1165	120	331
Tertiary sector	804	109	221
Industrial sector	840	15	202
Transport sector	721	39	194
Multisectoral measures in general consumption and the industrial sector	700	38	190
Horizontal measures in general consumption and the industrial sector	32	31	9
TOTAL	4261	352	1147
Cost of management and implementing the NEEAP		28	
TOTAL NEEAP costs		380	

Energy Efficiency Policies and Measures in Slovenia in 2007

Annex 1

Energy Efficiency Measure Summary by Country

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Energy Efficiency Policies and Measures in Slovenia in 2007

HOUSEHOLDS

Code	Title	Status	Type	Starting Year	Ending Year	Semi quantitative Impact
SLO1	Energy Efficiency Requirements for Domestic Refrigeration Appliances and their combinations	Ongoing	Legislative/Normative	2002		Low
SLO2	Efficiency Requirements for New Hot-water Boilers fired with Liquid or Gaseous Fuels	Ongoing	Legislative/Informative, Legislative/Normative	2002		Low
SLO3	Minimum Energy Efficiency Requirements for Ballasts for Fluorescent Lighting	Ongoing	Legislative/Normative	2003		Low
SLO12	Energy consulting office network	Ongoing	Financial, Information/Education	1993		Medium
SLO14	Rules on thermal insulation and efficient energy use in buildings	Completed	Legislative/Normative	2002	2008	High
SLO15	Energy labelling of households appliances	Ongoing	Legislative/Normative	2004		Low

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SLO16	Stimulation of the investments in energy efficiency measures in households	Completed	Financial	1996	2007	Medium
SLO18	Stimulation of the investments in utilization of RES in households	Ongoing	Financial	2002	2009	Medium
SLO20	Financial stimulation for energy efficiency renovation and sustainable building of new buildings	Ongoing	Financial	2008	2016	High
SLO21	Financial stimulation for energy efficiency heating systems	Ongoing	Financial	2008	2016	High
SLO22	Financial stimulation for efficient use of electricity	Ongoing	Financial	2008	2016	High
SLO23	Scheme of efficient use of energy for households with low income	Ongoing	Financial	2008	2016	Low
SLO24	Obligatory distribution and calculation of actual heat costs	Ongoing	Legislative/Normative	2005		Low
SLO25	Rules on efficient use of energy in buildings	Ongoing	Legislative/Normative	2008		High

Energy Efficiency Policies and Measures in Slovenia in 2007

TRANSPORT

Code	Title	Status	Type	Starting Year	Ending Year	Semiquantitative Impact
SLO1	Rules on consumer information on fuel economy and CO2 emissions in respect of new passenger cars	Ongoing	Information/Education/Training	2003		Low
SLO2	Resolution on National Programme on Road Traffic Safety	Ongoing	Unknown	2007		Low
SLO3	Promotion and competitiveness of public transport	Ongoing	Information/Education/Training, Infrastructure, Unknown	2008	2016	High
SLO4	Promotion of sustainable freight transport	Ongoing	Infrastructure	2008	2016	High
SLO5	Increase in the energy efficiency of road motor vehicles	Ongoing	Legislative/Informative	2008	2016	High
SLO6	Construction of cycle paths and promotion of cycling	Ongoing	Information/Education/Training	2008	2016	Low
SLO7	Financial support for purchase of electrical or	Ongoing	Financial	2004		Low

Energy Efficiency Policies and Measures in Slovenia in 2007

	hybrid cars or motorcycles					
SLO8	Subsidy for purchase of environment friendly trucks	Unknown	Financial	2009		Low

Energy Efficiency Policies and Measures in Slovenia in 2007

Industry

Code	Title	Status	Type	Starting Year	Ending Year	Semiquantitative Impact
SLO2	Energy audits and feasibility studies subsidies	Ongoing	Financial	2003		Medium
SLO3	Motor Challenge Programme	Proposed (advanced)	Information/Education/Training	2005		Unknown
SLO4	Environmental Tax - voluntary agreement on reducing of CO2 emissions	Ongoing	Cross-cutting with sector-specific characteristics	2005	2009	Medium
SLO5	Financial incentives for efficient electricity use measures	Ongoing	Financial	2008	2016	High

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Energy Efficiency Policies and Measures in Slovenia in 2007

Tertiary

Code	Title	Status	Type	Starting Year	Ending Year	Semiquantitative Impact
SLO1	Third party financing and contracting for efficient energy supply	Ongoing	Co-operative Measures	2001		Low
SLO3	Financial stimulation for energy efficiency heating systems	Ongoing	Financial	2008	2016	High
SLO4	Financial stimulation for energy efficiency renovation and sustainable building of new buildings	Ongoing	Financial	2008	2016	Medium
SLO5	Financial stimulation for efficient use of electricity	Ongoing	Financial	2008	2016	High
SLO6	Programme of energy audits of companies and buildings	Ongoing	Financial	1993	2007	High
SLO7	Rules on the ventilation and air-conditioning of buildings	Ongoing	Legislative/Normative	2002		Low

Energy Efficiency Policies and Measures in Slovenia in 2007

General cross-cutting measures

Code	Title	Status	Type	Starting Year	Ending Year	Semiquantitative Impact
SLO10	Awareness-raising, information, promotional and training programmes, demonstration projects	Ongoing	General Energy Efficiency / Climate Change / Renewable Programmes	2008	2016	Low
SLO12	Excise duties on fuels and electricity	Ongoing	Financial Measures	2008		Low
SLO15	Environmental tax for air pollution caused by CO2 emissions	Ongoing	Financial Measures	1997		Low
SLO16	Exemption from the payment of environmental taxes for air pollution from CO2 emissions	Ongoing	Non-classified Measure Types	2005	2009	Low
SLO1	The Resolution on the National Energy Programme (ReNEP)	Ongoing	General Energy Efficiency / Climate Change / Renewable Programmes	2004		High
SLO2	Ecological Fund of the Republic of Slovenia - ECO-Fund	Ongoing	Financial Measures, General Energy Efficiency / Climate Change / Renewable Programmes	2005		High

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SLO3	National Energy Efficiency Action Plan of Slovenia	Ongoing	General Energy Efficiency / Climate Change / Renewable Programmes	2008	2016	High
SLO4	Energy use management programmes for end-consumers (DSM)	Ongoing	Co-operative Measures, Legislative/Normative Measures	2008	2016	High
SLO5	Contractual reduction in energy costs	Ongoing	Market-based Instruments	2008	2016	Low
SLO6	System of guaranteed electricity purchase prices (Feed-in-Tariff)	Ongoing	Fiscal Measures/Tariffs	2002		High
SLO7	Regulations for the energy performance of non-industrial buildings	Ongoing	Non-classified Measure Types	2002		High
SLO8	Energy Act	Ongoing	Financial Measures, Fiscal Measures/Tariffs, General Energy Efficiency / Climate Change / Renewable Programmes, Legislative/Normative Measures	1999		High
SLO9	Environment Protection Act	Ongoing	General Energy Efficiency / Climate Change / Renewable Programmes	2004		High

Energy Efficiency Policies and Measures in Slovenia in 2007

Annex 2

Country Profile of Slovenia

Energy Efficiency Profile: Slovenia

Energy Efficiency Trends

Overview

The energy efficiency of all economic sectors improved over the period 1998 - 2007. The improvement of energy efficiency in Slovenia was 11% between 2000 in 2007. The improvement of energy efficiency was reached in all sectors: manufacturing, transport and households.

Industry

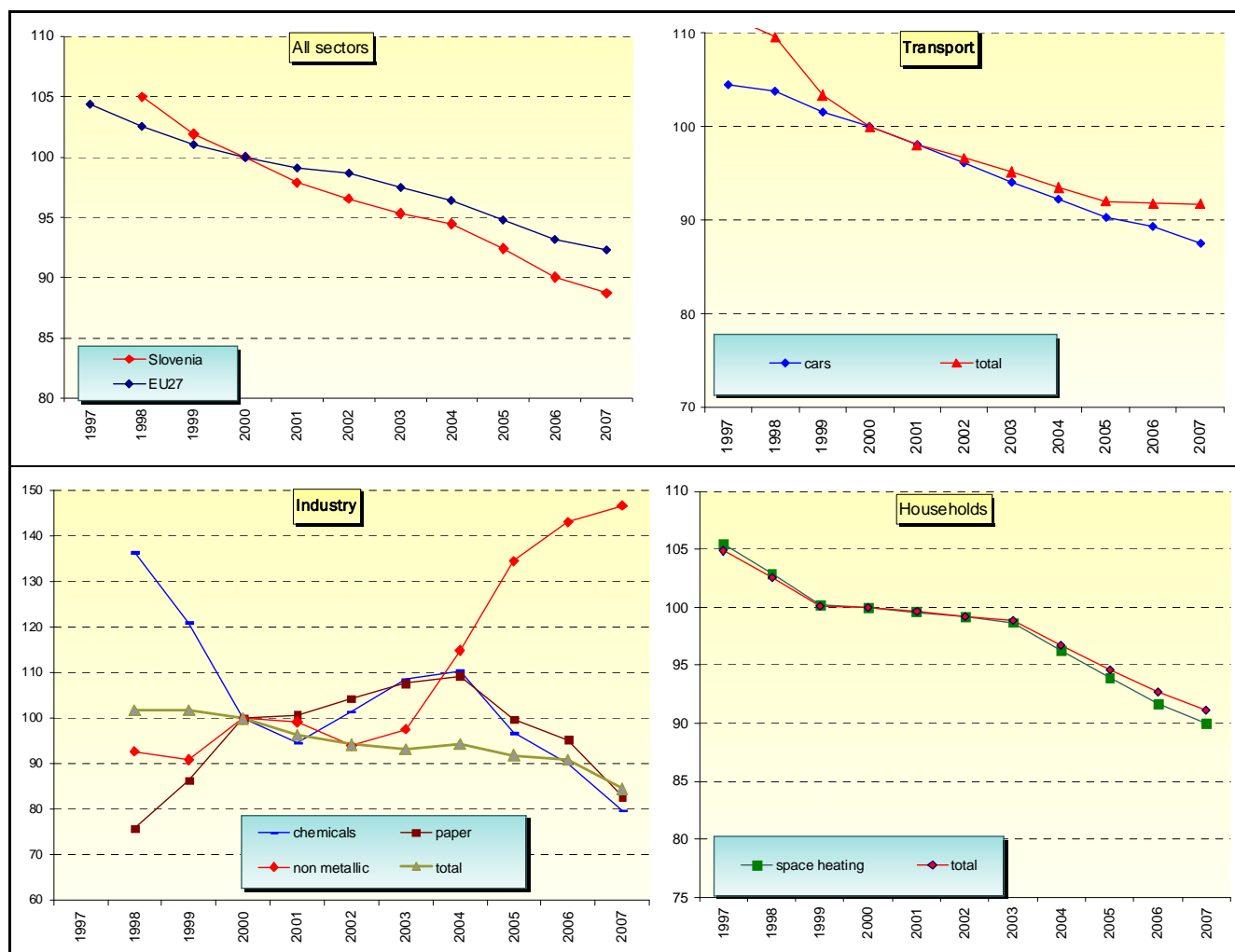
The improvement of energy efficiency in industry was about 16% in 2007 compared to 2000. The energy efficiency in chemicals and paper manufacturing decreased in the period 2000-2004 and then increased for 10% and 5% in comparison to 2000. The worse energy efficiency was in non metallic industry.

Households

The energy efficiency improved over the observed period as a result of the implementation of energy efficiency measures and regulations from 2002 on buildings insulation. The activity on the energy efficiency in households was very intense in order to improve the energy performance of buildings: improvement of insulation (wall, roof and windows) and more efficient heating systems. But the reason behind smaller improvement in energy efficiency overall lay mainly in the high standard of living and change in lifestyle (more household appliances and larger dwellings).

Transport

The improvement of energy efficiency in the transport sector was over 8% in 2007 in comparison to 2000. The energy consumption in transport is still increasing since 1991, but the high consumption between 1994 and 1998 is a result of sale of fuels to consumers from neighbouring countries, due to low prices of fuels in Slovenia. The improvements in consumption of specific cars related to the penetration of new, more efficient cars, was offset by the diffusion of larger cars and the decrease in the number of passengers using public transportation.



Energy Efficiency Policy Measures

Institutions and programmes

The principle tasks of the Agency for Efficient Use of Energy (AURE) (established in 2002) and the Department of Efficient Energy Use and Use of Renewable Energy Sources (from 2005) within the Ministry of Environment and Spatial Planning (MOP-AURE) are the implementation of national programmes for energy efficiency in industry, buildings and transport, stimulation of combined heat and power production (CHP) and utilization of renewable energy sources (RES). The Ecological fund (Eco-fund) is a public financial institution intended for the promotion of environmental investments in Slovenia. Its primary activity is providing favourable loans for investments in energy efficiency measures (EEM) and other ecological projects. Eco-fund supports (subsidizes) feasibility studies and preparation of documentation for projects on energy efficiency, utilization of RES and CHP. Targets of the Slovenian National Energy Programme (adopted in 2004) are to improve the energy efficiency by 2010 in comparison to 2004; in industry and service sectors for 10%, in buildings for 10%, in public sector for 15% and in transport for 10%, and to double the share of electricity production in CHP. The target of the adopted "National Energy Efficiency Action Plan for the Period 2008-2016" is to achieve cumulative savings of at least 9% or at least 4,261 GWh.

Industry

The implementation of different energy efficiency action programmes since 1991 was one of the priorities of AURE: energy audits; feasibility studies; energy consulting for larger companies; providing information; and demonstration of projects.

MOP-AURE organises for major energy consumers in industry various promotional programmes, provides information, energy consultations and yearly award for the best energy efficiency projects.

The MOP-AURE also subsidizes energy audits and feasibility studies for investments in energy efficiency measures and RES. The Eco-fund supports the EEM through loans with favourable interest rates. The reduction of energy consumption also became one of the priorities of management in industry in order to reduce the payment of CO₂ tax.

Households and Services

The implemented energy efficiency programmes in households and service sectors are focused on the improvement of building performance by subsidies, information, education, consulting, feasibility studies and elaboration of municipal energy plans. The regulations on the heat protection and energy efficiency use in buildings are in force since 2002, and for the energy labelling of household appliances since 2001. There are also two decrees, first on the required energy efficiency of hot water boilers on liquid and gas fuels, and second on the requirements for energy efficiency of household refrigerators and freezers.

Transport

The rapid increase of the energy consumption in transport presents a big challenge for Slovenia. Most measures implemented are related to the reduction of greenhouse gas emissions: control of exhaust gas composition and engine adjustment in motor vehicles (2003), the rules on informing consumers of fuel consumption and CO₂ emissions of motor vehicles (2003), promotion of biofuel and discharging biofuel of excise and other taxes. The government is also working on reducing the energy consumption through excise duties on motor fuels.

Energy prices and taxes

The Excise Law defines the excise duty for fuels, especially motor fuels and discharges the bio-fuels of excise taxes. The fuel price in Slovenia is lower than in other EU countries. The CO₂ tax is in force from 1999.

Energy Efficiency Policies and Measures in Slovenia in 2007

Selected Energy Efficiency Measures

Sectors	Title of measures	Since	Energy GWh	CO₂ kt CO₂
Industry	Energy audits subsidies in industry	1991		
Industry	Voluntary agreement on reducing of CO ₂ emissions	1997		
Households	Energy consulting office network - ENSVET	1993		
Households	Rules on thermal insulation and efficient energy use in buildings	2002	15%/a	
Households	Stimulation of the investments in energy efficiency measures in households	1996		
Transport	Promotion of sustainable freight transport	2008	294	79
Service	Energy audits subsidies in service sector	2003		
Horizontal	Eco-fund: subsidies and soft loans for energy efficiency investments and utilization of renewable energy sources	2000		
Horizontal	Resolution of the National Energy Program	2004		