

**Physical indicators as a basis for
estimating energy efficiency developments
in the Dutch industry – update 2007**

Lex Roes, Maarten Neelis, Andrea Ramirez

This study is contracted by the Platform Monitoring Energy Savings via the Policy Studies unit of the Energy research Centre of the Netherlands (ECN) to the Copernicus Institute for Sustainable Development and Innovation.

The empirical part of this research was executed at the Centre for Research of Economic Micro data (CEREM) at Statistics Netherlands (CBS). The views expressed in this report, however, are those of the authors.

Report NWS-E-2007-19
ISBN 978-90-8672-021-7
April 2007

Contact person: Lex Roes
E-mail: a.l.roes@uu.nl

Copernicus Institute for Sustainable Development and Innovation
Department of Science, Technology and Society
Utrecht University
Heidelberglaan 2
3584 CS Utrecht
Phone: +31-30-2537600
Fax: +31-30-2537601

Table of content

Table of content	1
1 Introduction	3
2 Data sources used	5
2.1 Production statistics	5
2.2 Energy statistics	6
3 Results, discussion and conclusions	7
3.1 Changes in product classification / data sources used for 2004 and 2005.....	7
3.2 Changes for 1995 - 2003 compared to the calculations done in 2005.....	8
3.2.1 Energy statistics	8
3.2.2 Production statistics	8
3.3 Overall results, discussion and conclusions	9
3.4 Chemical industry (excluding fertilisers).....	15
3.5 Fertiliser industry	17
3.6 Iron and steel basic metals industry	19
3.7 Food, beverages and tobacco industry	21
3.8 Paper, printing and publishing industry	23
3.9 Building materials industry	24
3.10 Non-ferro, basic metals industry	26
4 References	28
Appendix 1 Corrections for the food, beverages and tobacco industry ...	31

1 Introduction

In 2004, a method was developed for calculating energy efficiency developments in the Dutch manufacturing industry using physical indicators of production. The method and its application to calculate energy efficiency developments in the Dutch manufacturing industry for the time period 1993-2001 is described in a report by Neelis et al. (2004). The method is used as part of the yearly calculation of energy savings in the Netherlands according to the Protocol Monitoring Energy Savings performed by the Platform Monitoring Energy Savings (e.g. Boonekamp et al., 2004). On request of this platform, the calculations done in 2004 have been updated in 2005 for the years 2002 and 2003 (Neelis et al., 2005). In this report, an update is made for the years 2004 and 2005. We present the results of the extended calculations for the years 1995-2005.

In Chapter 2 of this report, we give an overview of data sources that were used in this study. In Chapter 3, we discuss changes compared to the analysis from 2005 and we present the results.

It should be emphasised that in this report, we do not give any background on the method applied for which we refer to the 2004 report. Furthermore, we focus in this report on presenting the results of the calculations and only give minor attention to analysing, explaining and interpreting the results found.

2 Data sources used

2.1 Production statistics

The main sources for production statistics are the production statistics collected by Statistics Netherlands according to the PRODCOM 8-digit product classification. Two databases have been used:

- The PRODCOM database for 1995-2005 at the level of PRODCOM numbers.
- The PRODCOM database for 1995-2005 containing production values at the level of individual companies.

Both databases are confidential and are accessed via the CEREM (Centre for Research of Economic Microdata) framework at Statistics Netherlands. The spreadsheet tool with results is stored at Statistics Netherlands for future use. For some products, production data other than the PRODCOM databases are used. The data sources for 2004 and 2005, the additional years of this analysis compared to the analysis of 2005 are summarised in Table 2.1.

Table 2-1 Non-PRODCOM production statistics used in the calculations

	Year	Source
Iron and steel, basic metals industry		
All products	2004-2005	IISI (2006) ¹
Food, beverages and tobacco industry		
Beef	2004-2005	FAO (2007)
Mutton and Lamb, pigmeat, poultry meat	2004-2005	PVE (2007)
Rendering	2004-2005	FAO (2007)
Dairies, except casein	2004 2005	PZ (2004) PZ (2005)
Casein	2004-2005	Maison-du-lait (2007)
Sugar beet	2004-2005	FAO (2007)
Cocoa beans	2004-2005	Eurostat (2007)
Paper, printing and publishing industry		
All products	2004-2005	VNP (2005)
Building materials industry		
Clinker	2004-2005	Mergelsberg (2007)
Glass	2004-2005	Beerkens (2007)
Bricks & Paving bricks	2004-2005	KNB (2006)
Non-ferro basic metals industry		
Anode production at Pechiney, Vlissingen	2004-2005	Frijlink (2007)

¹ The production of cold rolled products is not reported in the IISI statistical yearbook. For 2003-2005, we therefore assumed the same ratio of cold rolled products vs. hot rolled products as in 2002.

2.2 Energy statistics

The energy statistics for 1995-2005 have recently been updated. We used the updated versions, which were downloaded from www.cbs.nl/statline. For non-energy use in the chemical industry, Neelis (2006b) discovered mistakes in the energy statistics as reported by CBS. In this study, we use the modified time-series according to the corrections described in Neelis (2006b). Since they cover only the period 1995 - 2004, an assumption had to be made for the year 2005. We use the same correction in 2005 as for 2004 (51 PJ).

3 Results, discussion and conclusions

3.1 Changes in product classification / data sources used for 2004 and 2005

In several cases, the data that form the basis of the calculations have changed. In some cases production figures are not reported anymore after a certain year, which requires estimation or the use of different data sources. In some cases, the data sources have changed. Below, the changes compared to the calculations done in 2005 are summarised.

Chemical industry

Plasticizers: Plasticizers used to be reported under PRODCOM number 24664640, but since 2003 they are reported under 24143423 and 24143425.

Food, beverages and tobacco industry

Rendering: The amount of rendered product has been calculated in a manner, similar to previous years (first, we assumed that the total weight of raw material to be rendered per beast is typically: 198 kg (cattle), 21 kg (pig), 14 kg (sheep) and 0.7 kg (poultry). Since, in the Netherlands, it is forbidden to bury fallen stock on farm, these amounts are included in our calculations. Hence, it is assumed that fallen stock represents 10% of the tonnage processed annually. Finally, we assume that rendering is done in a continuous system with cooking and multiple-effect evaporation in added fat). However, in the analysis previously made (2004, 2005) the calculations were based on data published by the Dutch meat association. For the current analysis, however, we have changed the data source since the association stopped publishing detailed slaughtering data (affecting especially our calculations for poultry). In order to assure consistency, we used data published by FAO (2007) in this report for the whole period of analysis. Note that, although the absolute values have changed between the current report and the previous one, changes in the trend reported in that report and this one are found to be insignificant".

Whey powder: In previous calculations, data from Prodzuivel were used for whey powder. From 2004 onwards, however, the production figures are incorrect, due to incomplete reporting by whey powder producers. Therefore, we decided to use PRODCOM data from now on for whey powder. For consistency, we changed all whey powder production figures from previous years according to the data reported by PRODCOM.

Cocoa: Data for 2004 and 2005 were taken from import/export data from Eurostat (2007).

Food for farm animals: The PRODCOM numbers in 2003 and 2004 for this category have become

15711010+15711030.

In 2005 it has become:

15711010+15711033+15711035+15711037+15711039

3.2 Changes for 1995 - 2003 compared to the calculations done in 2005

While processing the data for 2004 and 2005, some changes were also made in the data for 1995-2003 that were used in the 2005 study (Neelis et al., 2005). Below, we describe these changes.

3.2.1 Energy statistics

The energy statistics have been updated for all years for all sectors. As a result, the values for 'realised energy use', which are used to calculate the Energy Efficiency Indicator (EEI), have changed. Therefore, the EEI series calculated this year for 1995-2003 are different from those in 2005.

3.2.2 Production statistics

The PRODCOM data for 2003 that were used in the calculations in 2005 were preliminary. In the meantime, CBS has updated these data. We used the updated 2003 data in our present calculations.

Chemical industry

Based on the detailed analysis by Neelis (2006b), the time series for ethylene for 1995-2003, styrene (DOW) for 2002 and 2003 and Styrene (Shell) for 1995-2003 have been changed. Based on a detailed analysis of the benzene production data, also the benzene production in 2003 has been changed. As a result of these changes and the changes in the energy statistics, the series for the chemical industry are very different compared to the previous study.

Iron and steel basic metals industry

In the 'Steel Statistical Yearbook 2006', the production of crude steel (electric arc furnace) in 2003 has been updated. We apply the updated figure, resulting in a minor change for the iron and steel industry in 2003.

Building materials industry

A small typing error was found in 2003 for paving bricks. We used the correct figure from KNB (2006).

Food industry

Crude and refined oil: Unfortunately, it appeared, that the categories that were taken into account in 2002 and 2003 were not in line with previous years. This error had to be corrected. As a result, production data for 2002 and 2003 changed, but are correct now. The PRODCOM numbers that represent crude and refined oil are listed below:

15411150-15411190-15411210-15411240-15411260-15411310-15411350-15421110-15421120-15421140-15421150-15421160-15421210-15421220-15421230-15421330-15421280-15421350.

Frozen vegetables and fruits: An error was discovered in all years, reported so far: 'vegetables preserved by vinegar' had been taken into account in this category, although it is reported as a separate category as well. It, therefore, had to be removed from 'frozen vegetables and fruits'.

3.3 Overall results, discussion and conclusions

On the next pages, we will summarise the results of our calculations. In Table 3.1 we give an overview of numerical values of the development of the reference energy use in the seven industrial sectors analysed, using 1995 as the base year of analysis (reference energy use = 1). The reference energy use is the development of the energy use assuming frozen energy efficiency. In Table 3.2, we summarise the development of the Energy Efficiency Indicator (EEI) for each sector. This indicator is calculated by dividing the realised energy use (from energy statistics) by the reference energy use, assuming frozen energy efficiency. An EEI below 1 indicates that an industry has become more energy efficient compared to 1995 level; an EEI above 1 indicates that an industry has become less energy efficient compared to 1995 levels. In Table 3.3, we summarise the results for the total of the industries analysed.

In Figures 3.1 to 3.32, we give a graphical representation of the results showing for each industry:

- The development of reference energy use, realised energy use and EEI for non-energy use.
- The development of reference energy use, realised energy use and EEI for fuels/heat use.
- The development of reference energy use, realised energy use and EEI for electricity use.
- The development of reference energy use, realised energy use and EEI for primary energy use (static primary units)¹, excluding non-energy use.²
- The development of reference energy use, realised energy use and EEI for total primary energy use (static primary units).

As stated in the introduction, the focus of this report is on presenting the results of our calculations, rather than on analysing, interpreting and explaining the results. We will therefore only very general discuss the main trends in the results. For the sum of all sectors, the overall reduction in the EEI for total primary energy use between 1995-2005 is 8% (Table 3-3), excluding the chemical industry. This is 1% more efficient than the value calculated in 2005 for the period between 1995 and 2003. At the level of individual sectors, we can conclude, that for the period 2003-2005, the EEI for total primary energy use went down for all sectors (between 1% and 3%), except for the fertiliser industry (EEI went up by 1%) and the chemical industry (EEI up by 11%). The result for the chemical industry is heavily influenced by the development of non-energy use in 2005. It should be stressed, however, that we corrected the non-energy use in the energy statistics in 2005 using the same correction as for 2004 (Section 2.2). The analysis by Neelis (2006a) shows that the actual correction varies significantly from year to year (e.g. between 1995 and 2003 from 33 – 75 PJ). Without further detailed analyses, it is not possible to further study the actual correction in more detail.

¹ Final energy use is converted to primary energy use using static conversion factors of 2.5 for electricity and 1 for fuels/heat and non-energy use. We refer to Neelis et al. (2004) for details regarding the methodology.

² For the food, beverages and tobacco industry and for the paper, printing and publishing industry, the results for primary energy use, excluding non-energy use are not given, because non-energy use is negligible (food, beverages and tobacco industry) or non-existing (paper, printing and publishing) in those industries.

Table 3-1 Overview of development reference energy use

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chemical industry											
Reference use, electricity	1.00	1.01	1.10	1.12	1.13	1.21	1.12	1.25	1.31	1.33	1.29
95% confidence interval, +/-	0.0%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Reference use, fuels/heat	1.00	0.97	1.04	1.05	1.12	1.13	1.21	1.25	1.36	1.33	1.33
95% confidence interval, +/-	0.0%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%
Reference use, non-energy use	1.00	0.96	1.00	1.00	1.06	1.02	1.10	1.16	1.36	1.29	1.30
95% confidence interval, +/-	0.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
Reference use, total primary, excl. non-energy use	1.00	0.98	1.05	1.07	1.12	1.15	1.19	1.25	1.35	1.33	1.32
95% confidence interval, +/-	0.0%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
Reference use, total primary	1.00	0.97	1.03	1.04	1.09	1.09	1.15	1.21	1.35	1.31	1.31
95% confidence interval, +/-	0.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%
Fertiliser industry											
Reference use, electricity	1.00	0.95	1.02	1.02	0.97	1.04	0.99	0.85	0.90	0.87	0.90
95% confidence interval, +/-	0.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Reference use, fuels/heat	1.00	0.95	1.01	1.03	1.02	1.06	0.93	0.88	0.83	0.86	0.86
95% confidence interval, +/-	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
Reference use, non-energy use	1.00	0.99	1.04	1.04	1.03	1.06	0.94	0.89	0.84	0.91	0.91
95% confidence interval, +/-	0.0%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Reference use, total primary, excl. non-energy use	1.00	0.95	1.02	1.02	1.01	1.05	0.94	0.87	0.85	0.86	0.87
95% confidence interval, +/-	0.0%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%
Reference use, total primary	1.00	0.98	1.03	1.04	1.02	1.06	0.94	0.88	0.85	0.89	0.90
95% confidence interval, +/-	0.0%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Iron and Steel, basic metal industry											
Reference use, electricity	1.00	0.98	1.05	1.00	0.96	0.99	1.04	1.08	1.16	1.22	1.21
95% confidence interval, +/-	0.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Reference use, fuels/heat	1.00	1.00	1.07	1.02	0.98	0.97	1.04	1.06	1.15	1.20	1.19
95% confidence interval, +/-	0.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Reference use, non-energy use	1.00	1.00	1.05	1.01	0.96	0.90	0.96	0.97	1.06	1.09	1.09
95% confidence interval, +/-	0.0%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Reference use, total primary, excl. non-energy use	1.00	0.99	1.06	1.02	0.97	0.98	1.04	1.07	1.15	1.21	1.20
95% confidence interval, +/-	0.0%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Reference use, total primary	1.00	1.00	1.06	1.01	0.97	0.94	1.00	1.02	1.10	1.15	1.14
95% confidence interval, +/-	0.0%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Food, beverages and tobacco industry ^{1,2}											
Reference use, electricity	1.00	1.02	1.04	1.07	1.09	1.10	1.07	1.03	1.00	1.01	1.00
95% confidence interval, +/-	0.0%	2.5%	2.5%	4.0%	4.0%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Reference use, fuels/heat	1.00	1.03	1.08	1.10	1.12	1.14	1.17	1.13	1.13	1.08	1.10
95% confidence interval, +/-	0.0%	2.5%	3.0%	3.5%	4.0%	4.0%	4.5%	4.5%	4.5%	4.5%	4.5%
Reference use, non-energy use	1.17	1.16	1.00	1.00	1.33	1.22	1.08	1.13	1.18	1.14	1.14
95% confidence interval, +/-	5.0%	5.0%	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Reference use, total primary, excl. non-energy use	1.00	1.03	1.07	1.09	1.11	1.12	1.13	1.09	1.07	1.05	1.06
95% confidence interval, +/-	0.0%	2.0%	2.5%	3.0%	3.5%	3.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Reference use, total primary	1.00	1.03	1.07	1.09	1.11	1.12	1.13	1.09	1.07	1.05	1.06
95% confidence interval, +/-	0.0%	2.0%	2.5%	3.0%	3.5%	3.5%	4.5%	4.5%	4.5%	4.5%	4.5%

¹ Since non-energy use in the food, beverages and tobacco sector is less than 1% of the primary energy use, the results for total primary reference energy use excluding non-energy use are almost identical to the results including non-energy use.

² Non-energy use figures are relative to 1997 (see chapter 7 of Neelis et al., 2004)

Table 3-1 Overview of development reference energy use (continued)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
	Paper, printing and publishing industry										
Reference use, electricity	1.00	1.00	1.07	1.05	1.08	1.12	1.07	1.10	1.13	1.17	1.17
95% confidence interval, +/-	0.0%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Reference use, fuels/heat	1.00	1.01	1.07	1.07	1.10	1.13	1.07	1.12	1.13	1.16	1.16
95% confidence interval, +/-	0.0%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Reference use, non-energy use	-	-	-	-	-	-	-	-	-	-	-
95% confidence interval, +/-	-	-	-	-	-	-	-	-	-	-	-
Reference use, total primary, excl. non-energy use	-	-	-	-	-	-	-	-	-	-	-
95% confidence interval, +/-	-	-	-	-	-	-	-	-	-	-	-
Reference use, total primary	1.00	1.01	1.07	1.06	1.09	1.12	1.07	1.11	1.13	1.16	1.17
95% confidence interval, +/-	0.0%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
	Building materials industry										
Reference use, electricity	1.00	1.00	1.05	1.10	1.16	1.14	1.11	1.07	1.05	1.05	1.07
95% confidence interval, +/-	0.0%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Reference use, fuels/heat	1.00	0.98	1.02	1.06	1.08	1.08	1.07	1.01	0.99	1.02	1.05
95% confidence interval, +/-	0.0%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Reference use, non-energy use	1.00	0.74	0.88	1.01	1.21	1.10	1.12	1.14	1.01	1.04	1.03
95% confidence interval, +/-	0.0%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Reference use, total primary, excl. non-energy use	1.00	0.98	1.03	1.07	1.11	1.10	1.08	1.03	1.01	1.03	1.05
95% confidence interval, +/-	0.0%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Reference use, total primary	1.00	0.97	1.02	1.07	1.11	1.10	1.08	1.03	1.01	1.03	1.05
95% confidence interval, +/-	0.0%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
	Non-ferro basic metals industry										
Reference use, electricity	1.00	1.04	1.07	1.23	1.28	1.30	1.30	1.41	1.39	1.50	1.54
95% confidence interval, +/-	0.0%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Reference use, fuels/heat	1.00	0.93	0.98	1.09	1.14	1.19	1.17	1.18	1.20	1.26	1.43
95% confidence interval, +/-	0.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Reference use, non-energy use	1.00	0.84	0.86	0.99	1.08	1.09	1.09	1.12	1.04	1.21	1.32
95% confidence interval, +/-	0.0%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Reference use, total primary, excl. non-energy use	1.00	1.03	1.05	1.22	1.26	1.28	1.29	1.38	1.37	1.47	1.53
95% confidence interval, +/-	0.0%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Reference use, total primary	1.00	1.02	1.04	1.20	1.25	1.27	1.28	1.37	1.35	1.45	1.52
95% confidence interval, +/-	0.0%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%

Table 3-2 Overview of development energy efficiency indicator

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chemical industry											
EEl, electricity	1.00	0.97	0.92	0.89	0.85	0.81	0.89	0.84	0.80	0.80	0.83
95% confidence interval, +/-	0.0%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
EEl, fuels/heat	1.00	1.01	0.92	0.88	0.91	0.86	0.82	0.86	0.80	0.85	0.81
95% confidence interval, +/-	0.0%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%	9.5%
EEl, non-energy use	1.00	0.90	0.91	0.90	0.97	1.06	1.11	1.10	1.01	1.08	1.24
95% confidence interval, +/-	0.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
EEl, total primary, excl. non-energy use	1.00	1.00	0.92	0.88	0.89	0.85	0.84	0.85	0.80	0.83	0.81
95% confidence interval, +/-	0.0%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
EEl, total primary	1.00	0.95	0.91	0.89	0.93	0.94	0.96	0.96	0.90	0.95	1.01
95% confidence interval, +/-	0.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%
Fertiliser industry											
EEl, electricity	1.00	1.12	0.93	1.01	0.96	0.85	0.77	0.87	0.85	0.91	0.90
95% confidence interval, +/-	0.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
EEl, fuels/heat	1.00	0.99	0.91	0.94	0.90	0.82	0.74	0.82	0.86	0.88	0.88
95% confidence interval, +/-	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
EEl, non-energy use	1.00	0.96	0.96	0.97	0.97	0.95	0.90	0.91	0.95	0.95	0.96
95% confidence interval, +/-	0.0%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
EEl, total primary, excl. non-energy use	1.00	1.02	0.92	0.96	0.92	0.82	0.75	0.83	0.86	0.89	0.89
95% confidence interval, +/-	0.0%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%	6.5%
EEl, total primary	1.00	0.98	0.94	0.97	0.95	0.91	0.85	0.89	0.92	0.93	0.93
95% confidence interval, +/-	0.0%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Iron and Steel, basic metal industry											
EEl, electricity	1.00	0.98	0.95	0.98	1.01	1.14	1.08	1.02	0.99	0.95	0.97
95% confidence interval, +/-	0.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
EEl, fuels/heat	1.00	1.00	0.95	0.90	0.86	0.88	0.84	0.82	0.76	0.77	0.76
95% confidence interval, +/-	0.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
EEl, non-energy use	1.00	0.99	1.01	1.02	1.02	0.99	1.01	1.01	1.00	0.98	0.97
95% confidence interval, +/-	0.0%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
EEl, total primary, excl. non-energy use	1.00	0.99	0.95	0.93	0.92	0.98	0.92	0.89	0.85	0.84	0.83
95% confidence interval, +/-	0.0%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
EEl, total primary	1.00	0.99	0.98	0.98	0.97	0.99	0.96	0.95	0.92	0.90	0.90
95% confidence interval, +/-	0.0%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Food, beverages and tobacco industry^{1,2}											
EEl, electricity	1.00	1.10	1.06	1.05	1.02	1.02	1.12	1.14	1.16	1.14	1.15
95% confidence interval, +/-	0.0%	2.5%	3.0%	3.5%	4.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
EEl, fuels/heat	1.00	1.07	0.96	0.97	1.00	0.93	0.86	0.91	0.88	0.90	0.87
95% confidence interval, +/-	0.0%	2.5%	3.0%	3.0%	3.5%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
EEl, non-energy use	0.40	0.88	1.00	0.86	0.81	0.84	0.82	0.57	0.81	0.76	0.61
95% confidence interval, +/-	-	-	-	-	-	-	-	-	-	-	-
EEl, total primary, excl. non-energy use	1.00	1.08	1.00	1.00	1.01	0.96	0.96	1.00	0.99	0.99	0.98
95% confidence interval, +/-	0.0%	2.0%	2.5%	2.5%	3.0%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
EEl, total primary	1.00	1.08	1.00	1.00	1.01	0.97	0.97	1.00	0.99	1.00	0.98
95% confidence interval, +/-	0.0%	2.0%	2.5%	2.5%	3.0%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%

¹ Since non-energy use in the food, beverages and tobacco sector is less than 1% of the primary energy use, the results for total primary reference energy use excluding non-energy use are almost identical to the results including non-energy use.

² Non-energy use figures are relative to 1997 (see chapter 7 of Neelis et al., 2004)

Table 3-2 Overview of development energy efficiency indicator (continued)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
	Paper industry, printing and publishing										
EEl, electricity	1.00	1.02	1.03	1.05	1.06	1.06	1.05	1.06	1.01	0.98	0.96
95% confidence interval, +/-	0.0%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
EEl, fuels/heat	1.00	1.11	1.06	1.03	1.00	0.97	0.97	0.93	0.91	0.92	0.90
95% confidence interval, +/-	0.0%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
EEl, non-energy use	-	-	-	-	-	-	-	-	-	-	-
95% confidence interval, +/-	-	-	-	-	-	-	-	-	-	-	-
EEl, total primary, excl. non-energy use	-	-	-	-	-	-	-	-	-	-	-
95% confidence interval, +/-	-	-	-	-	-	-	-	-	-	-	-
EEl, total primary	1.00	1.06	1.04	1.04	1.03	1.02	1.01	1.00	0.96	0.95	0.93
95% confidence interval, +/-	0.0%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
	Building materials industry										
EEl, electricity	1.00	1.07	1.09	1.00	0.98	1.08	1.06	1.05	1.02	0.99	0.98
95% confidence interval, +/-	0.0%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
EEl, fuels/heat	1.00	1.10	1.05	0.96	0.96	0.98	0.97	0.89	0.92	0.91	0.90
95% confidence interval, +/-	0.0%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
EEl, non-energy use	1.00	0.85	0.74	0.45	0.31	0.38	0.29	0.25	0.20	0.29	0.12
95% confidence interval, +/-	0.0%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
EEl, total primary, excl. non-energy use	1.00	1.09	1.06	0.97	0.97	1.01	1.00	0.94	0.95	0.94	0.92
95% confidence interval, +/-	0.0%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
EEl, total primary	1.00	1.08	1.05	0.95	0.93	0.98	0.97	0.91	0.92	0.91	0.89
95% confidence interval, +/-	0.0%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
	Non-ferro basic metals industry										
EEl, electricity	1.00	1.00	1.00	0.96	0.97	1.00	0.97	0.88	0.91	0.92	0.89
95% confidence interval, +/-	0.0%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
EEl, fuels/heat	1.00	1.00	1.03	0.91	0.80	0.84	0.73	0.74	0.73	0.80	0.72
95% confidence interval, +/-	0.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
EEl, non-energy use	1.00	1.01	0.91	0.88	1.08	1.08	1.11	1.19	0.97	0.86	0.78
95% confidence interval, +/-	0.0%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
EEl, total primary, excl. non-energy use	1.00	1.00	1.01	0.96	0.95	0.98	0.94	0.87	0.89	0.91	0.87
95% confidence interval, +/-	0.0%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
EEl, total primary	1.00	1.00	1.00	0.95	0.96	0.98	0.95	0.88	0.89	0.90	0.87
95% confidence interval, +/-	0.0%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%

Table 3-3 Energy efficiency indicator in 2005 for the sum of sectors analysed

	Electricity			Fuels/Heat			Non-energy use			Total primary energy use (excl. non-energy use)			Total primary energy use		
	Reference energy use, 2005 (this study)	Realised energy use, 2005 (NEH)	EEl, 2005	Reference energy use, 2005 (this study)	Realised energy use, 2005 (NEH)	EEl, 2005	Reference energy use, 2005 (this study)	Realised energy use, 2005 (NEH)	EEl, 2005	Reference energy use, 2005 (this study)	Realised energy use, 2005 (NEH)	EEl, 2005	Reference energy use, 2005 (this study)	Realised energy use, 2005 (NEH)	EEl, 2005
	[PJ]	[PJ]		[PJ]	[PJ]		[PJ]	[PJ]		[PJ]	[PJ]		[PJ]	[PJ]	
Chemical industry	51.8	43.1	0.83	356.6	287.5	0.81	627.2	780.4	1.24	486.0	395.3	0.81	1115.1	1128.9	1.01
Fertiliser industry	2.6	2.4	0.90	20.6	18.2	0.88	59.9	57.3	0.96	27.2	24.1	0.89	86.9	81.2	0.93
Iron and steel basic metals industry	11.8	11.4	0.97	39.5	29.9	0.76	64.8	63.1	0.97	68.9	57.5	0.83	133.9	120.4	0.90
Food, beverages and tobacco industry ¹	23.6	27.1	1.15	73.7	64.2	0.87	0.5	0.4	0.81	133.1	131.0	0.98	133.6	131.4	0.98
Paper, printing and publishing industry	15.3	14.6	0.96	31.8	28.7	0.90	-	-	-	70.1	65.2	0.93	70.1	65.2	0.93
Building materials industry	5.5	5.4	0.98	28.2	25.4	0.90	0.3	0.0	0.12	42.1	38.8	0.92	42.3	37.5	0.89
Non-ferro basic metals industry	35.2	31.4	0.89	8.4	6.1	0.72	4.0	3.2	0.78	96.3	83.9	0.87	100.1	86.9	0.87
Total for all sectors	145.9	135.5	0.93	558.9	460.0	0.82	756.6	904.4	1.20	923.6	795.8	0.86	1682.0	1651.4	0.98
Total, excluding the chemical industry	94.1	92.3	0.98	202.3	172.5	0.85	129.4	124.0	0.96	437.6	400.5	0.92	566.9	522.5	0.92

¹ The EEl for non-energy use in the food, beverages and tobacco industry is relative to the year 1997, see Chapter 7 of Neelis et al., 2004 for details

3.4 Chemical industry (excluding fertilisers)

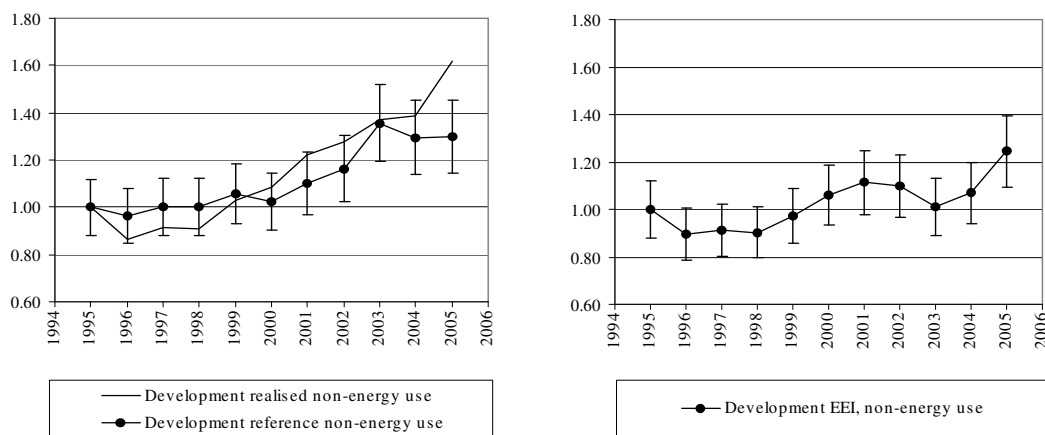


Figure 3-1 Development of reference energy use, realised energy use and energy efficiency indicator for non-energy use in the chemical industry (uncertainty bars in realised use not shown)

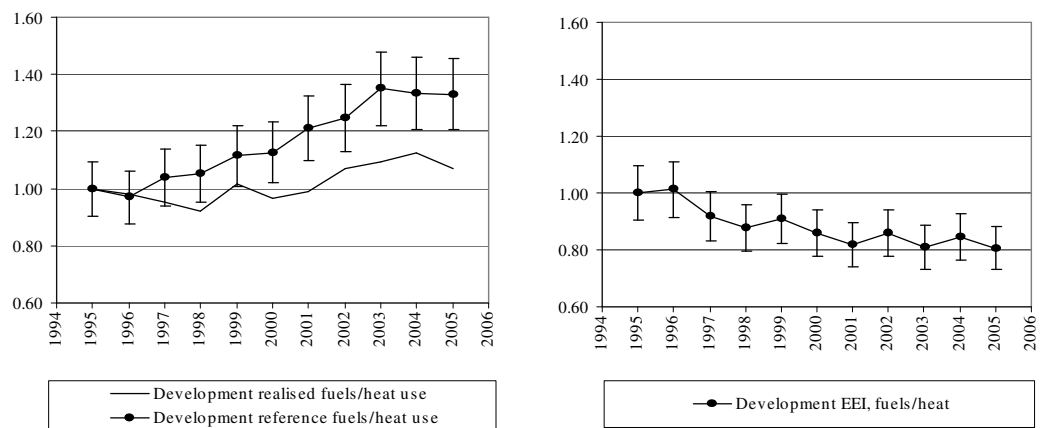


Figure 3-2 Development of reference energy use, realised energy use and energy efficiency indicator for fuels/heat use in the chemical industry (uncertainty bars in realised use not shown)

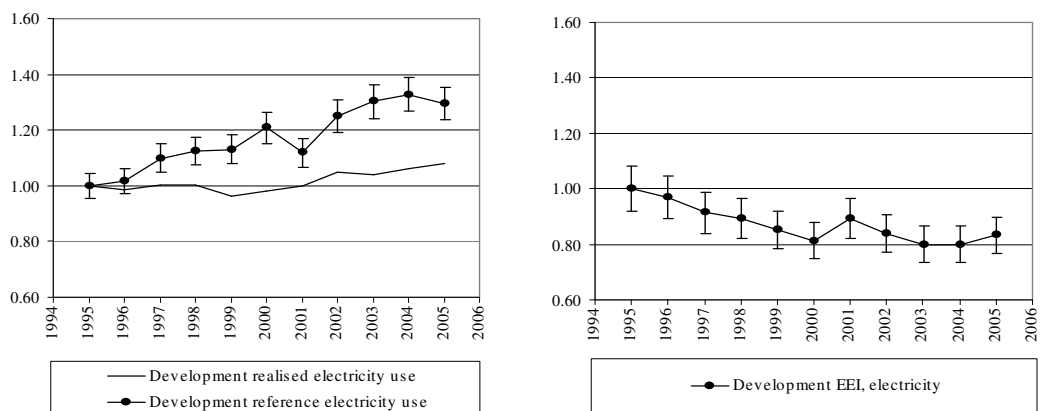


Figure 3-3 Development of reference energy use, realised energy use and energy efficiency indicator for electricity use in the chemical industry (uncertainty bars in realised use not shown)

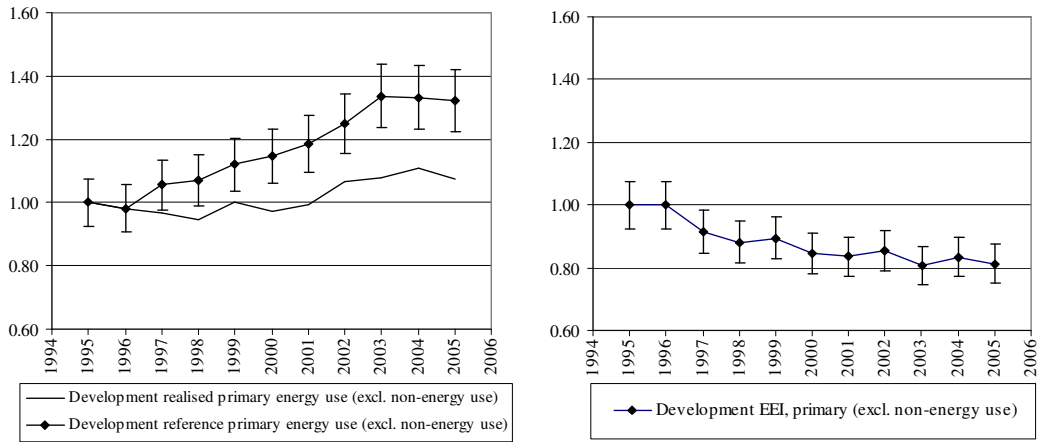


Figure 3-4 Development of reference energy use, realised energy use and energy efficiency indicator for primary energy use (static primary units), excluding non-energy use in the chemical industry (uncertainty bars in realised use not shown)

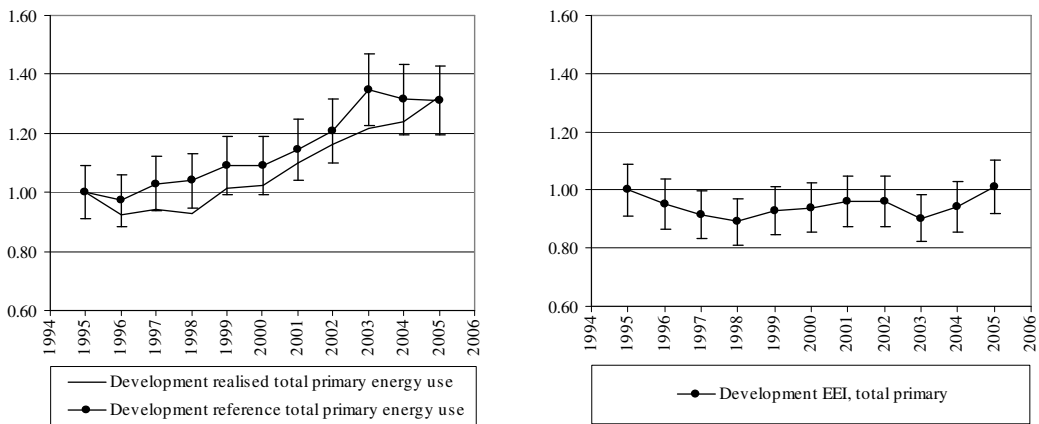


Figure 3-5 Development of reference energy use, realised energy use and energy efficiency indicator for total primary energy use (static primary units) in the chemical industry (uncertainty bars in realised use not shown)

3.5 Fertiliser industry

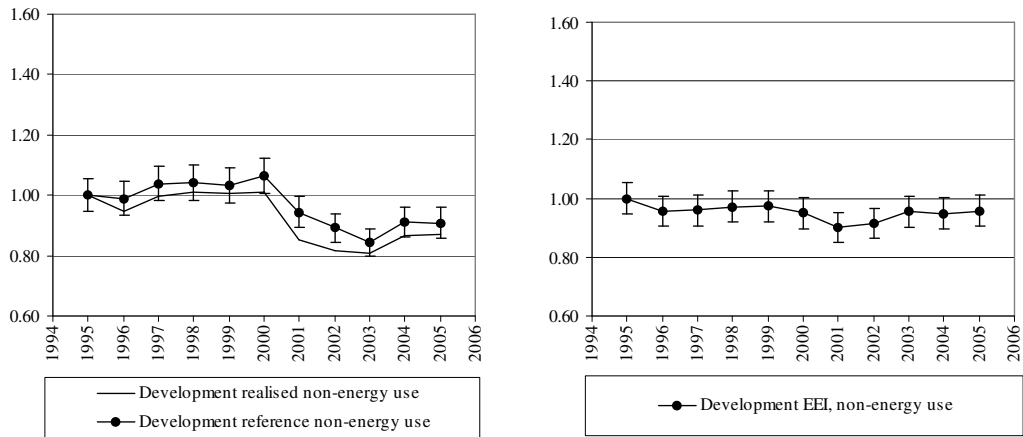


Figure 3-6 Development of reference energy use, realised energy use and energy efficiency indicator for non-energy use in the fertiliser industry (uncertainty bars in realised use not shown)

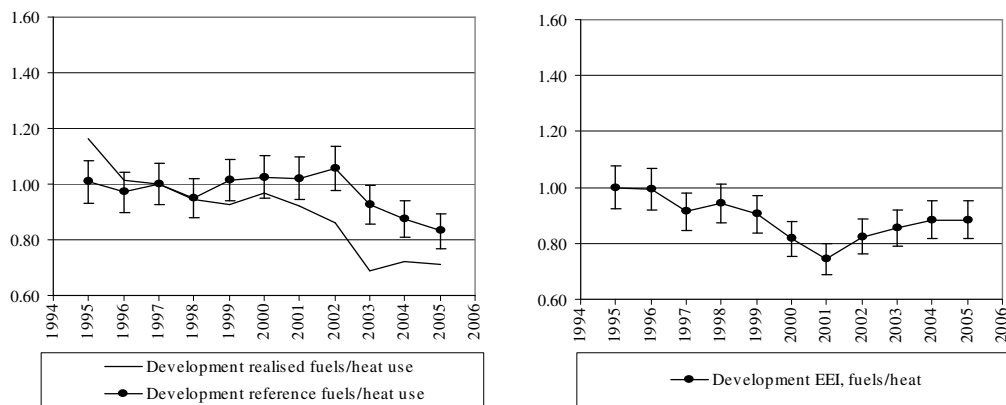


Figure 3-7 Development of reference energy use, realised energy use and energy efficiency indicator for fuels/heat use in the fertiliser industry (uncertainty bars in realised use not shown)

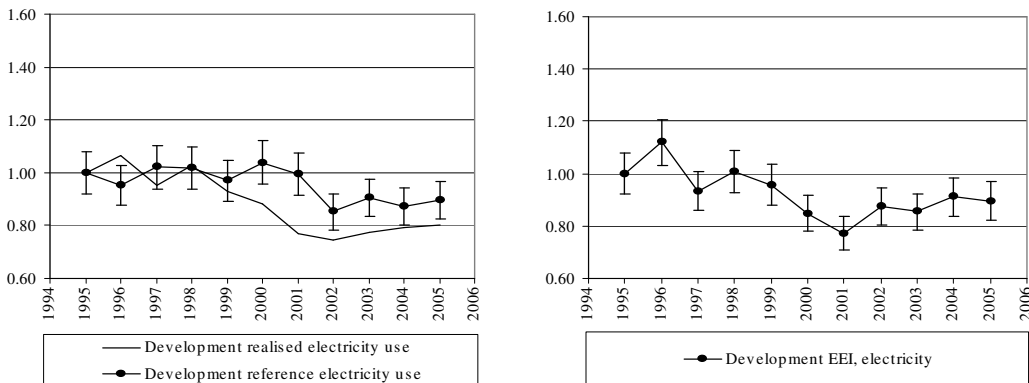


Figure 3-8 Development of reference energy use, realised energy use and energy efficiency indicator for electricity use in the fertiliser industry (uncertainty bars in realised use not shown)

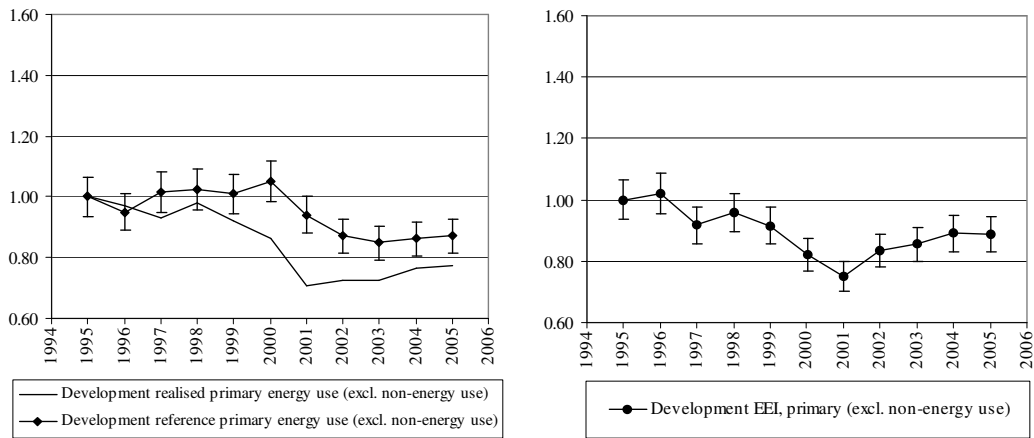


Figure 3-9 Development of reference energy use, realised energy use and energy efficiency indicator for primary energy use (static primary units), excluding non-energy use in the fertiliser industry (uncertainty bars in realised use not shown)

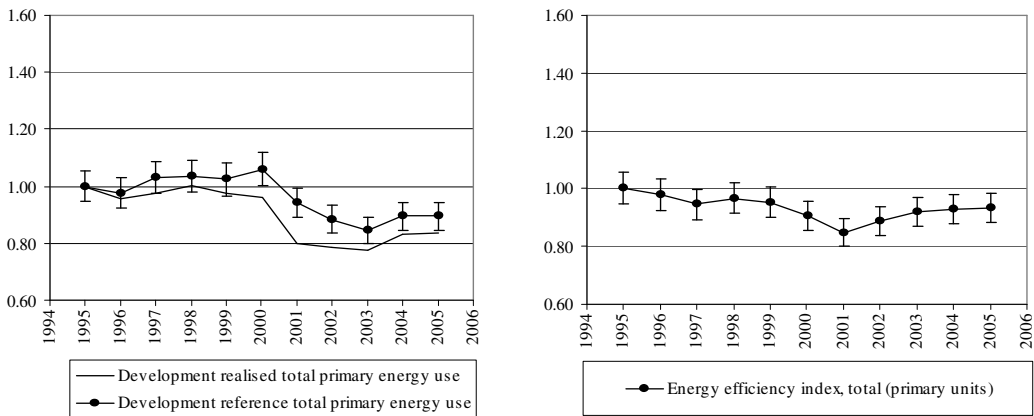


Figure 3-10 Development of reference energy use, realised energy use and energy efficiency indicator for total primary energy use (static primary units) in the fertiliser industry (uncertainty bars in realised use not shown)

3.6 Iron and steel basic metals industry

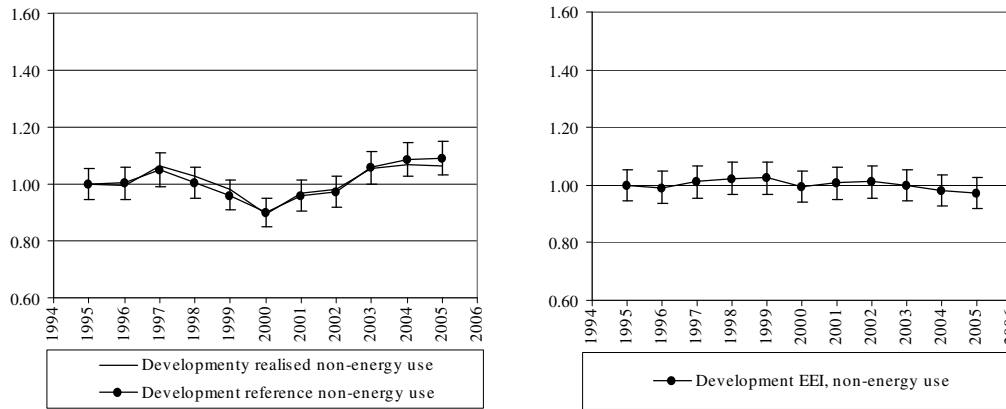


Figure 3-11 Development of reference energy use, realised energy use and energy efficiency indicator for non-energy use in the iron and steel basic metals industry (uncertainty bars in realised use not shown)

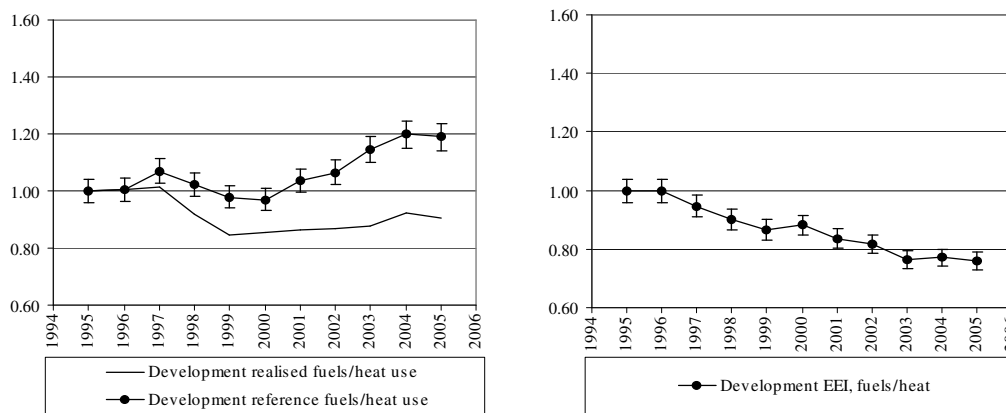


Figure 3-12 Development of reference energy use, realised energy use and energy efficiency indicator for fuels/heat use in the iron and steel basic metals industry (uncertainty bars in realised use not shown)

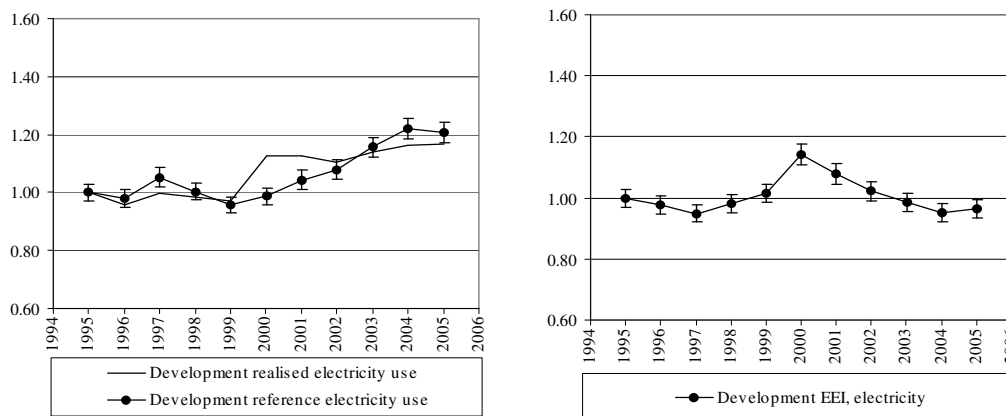


Figure 3-13 Development of reference energy use, realised energy use and energy efficiency indicator for electricity use in the iron and steel basic metals industry (uncertainty bars in realised use not shown)

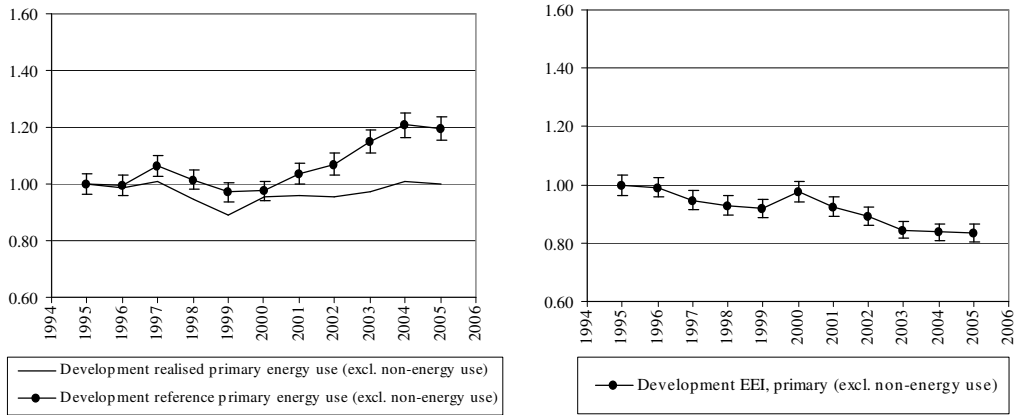


Figure 3-14 Development of reference energy use, realised energy use and energy efficiency indicator for primary energy use (static primary units), excluding non-energy use in the iron and steel basic metals industry (uncertainty bars in realised use not shown)

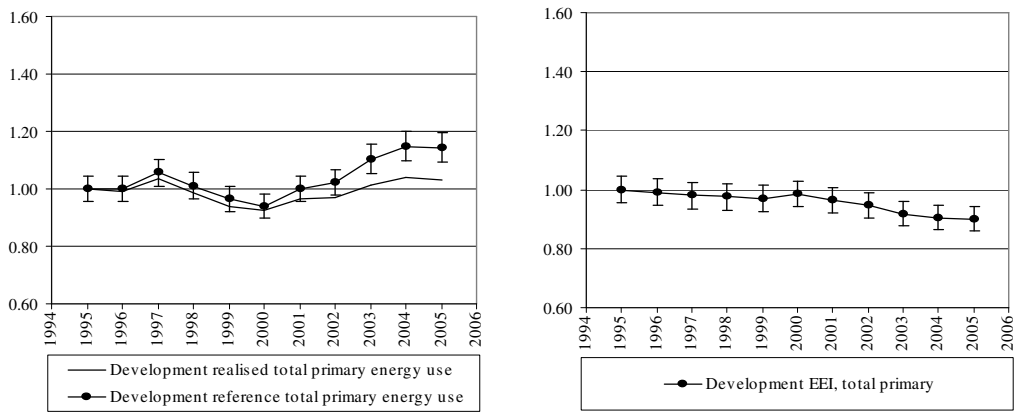


Figure 3-15 Development of reference energy use, realised energy use and energy efficiency indicator for total primary energy use (static primary units) in the iron and steel basic metals industry (uncertainty bars in realised use not shown)

3.7 Food, beverages and tobacco industry

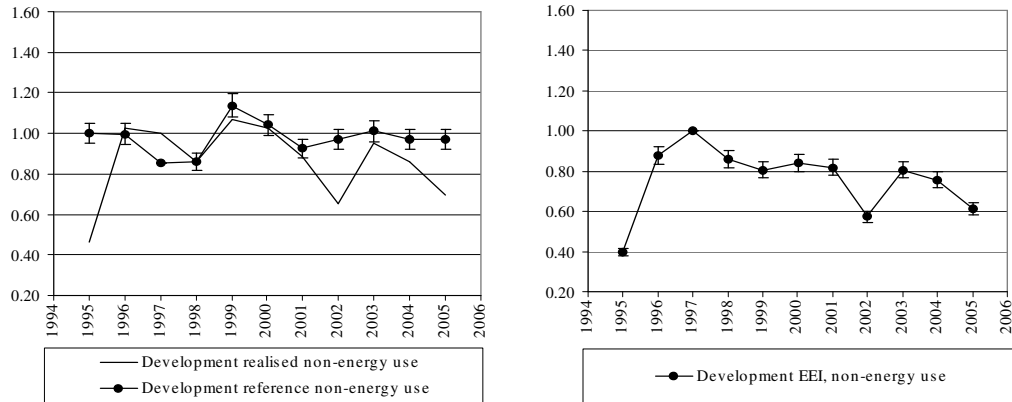


Figure 3-16 Development of reference energy use, realised energy use and energy efficiency indicator for non-energy use in the food, beverages and tobacco industry (uncertainty bars in realised use not shown)

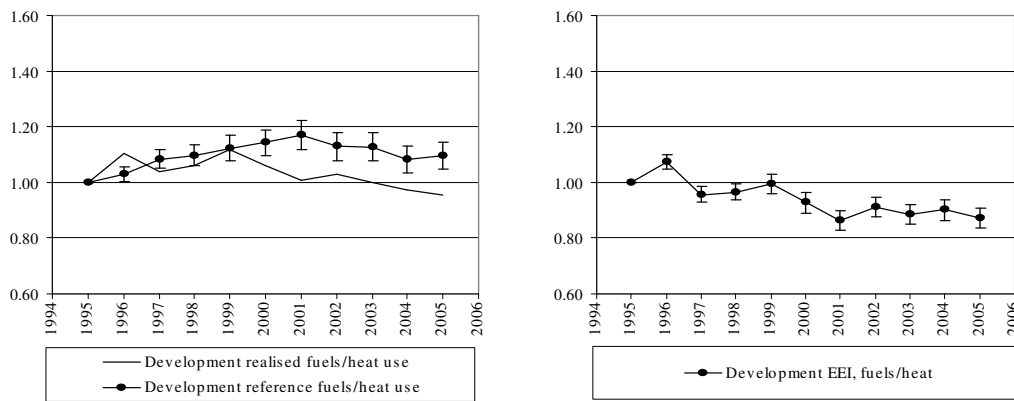


Figure 3-17 Development of reference energy use, realised energy use and energy efficiency indicator for fuels/heat use in the food, beverages and tobacco industry (uncertainty bars in realised use not shown)

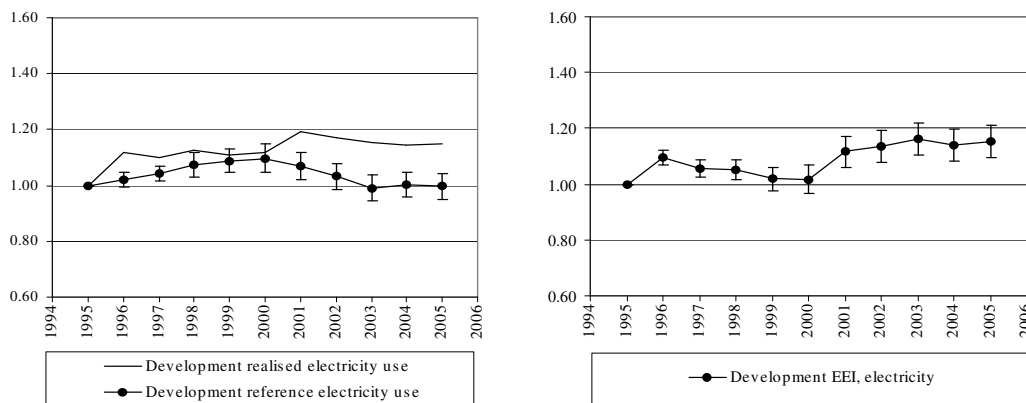


Figure 3-18 Development of reference energy use, realised energy use and energy efficiency indicator for electricity use in the food, beverages and tobacco industry (uncertainty bars in realised use not shown)

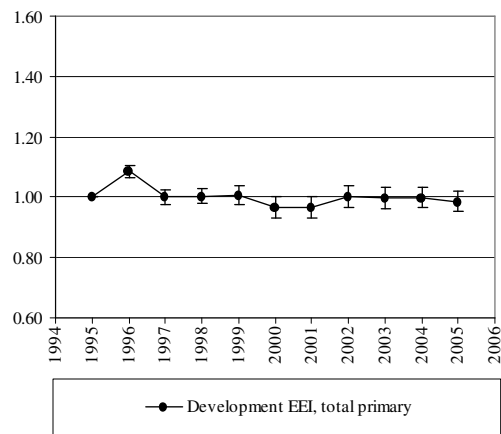
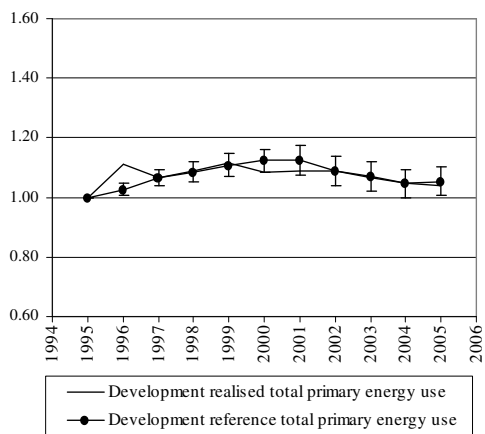


Figure 3-19 Development of reference energy use, realised energy use and energy efficiency indicator for total primary energy use (static primary units) in the food, beverages and tobacco industry (uncertainty bars in realised use not shown)

3.8 Paper, printing and publishing industry

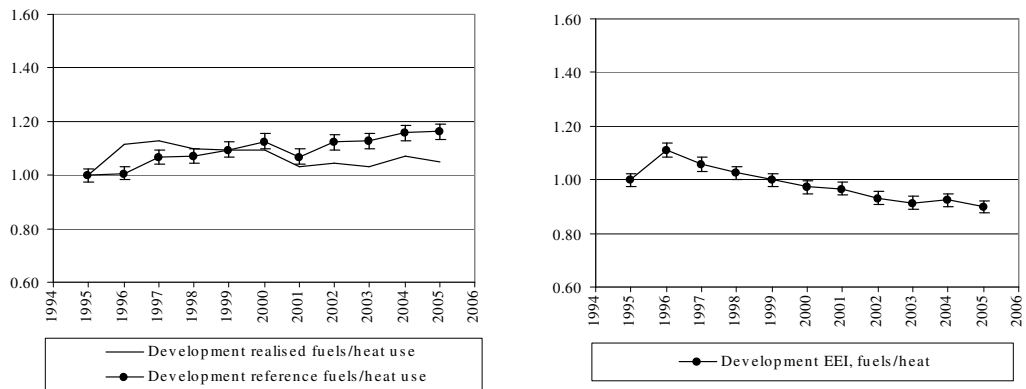


Figure 3-20 Development of reference energy use, realised energy use and energy efficiency indicator for fuels/heat use in the paper, printing and publishing industry (uncertainty bars in realised use not shown)

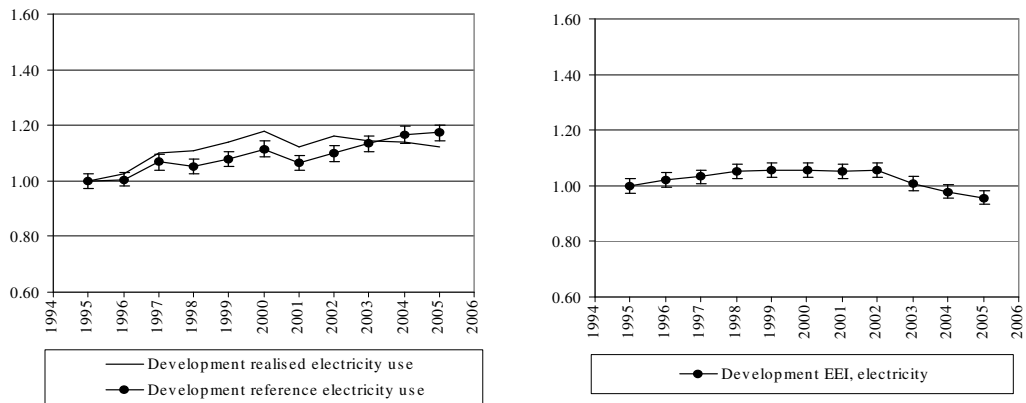


Figure 3-21 Development of reference energy use, realised energy use and energy efficiency indicator for electricity use in the paper, printing and publishing industry (uncertainty bars in realised use not shown)

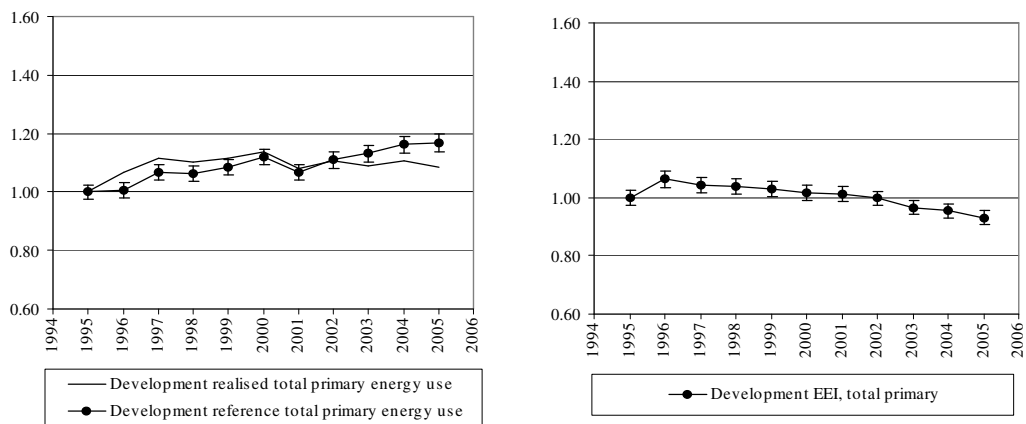


Figure 3-22 Development of reference energy use, realised energy use and energy efficiency indicator for total primary energy use (static primary units) in the paper, printing and publishing industry (uncertainty bars in realised use not shown)

3.9 Building materials industry

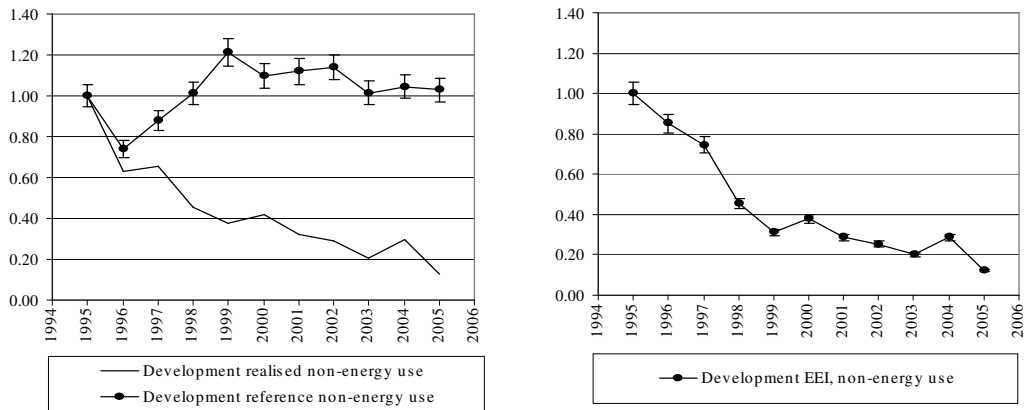


Figure 3-23 Development of reference energy use, realised energy use and energy efficiency indicator for non-energy use in the building materials industry (uncertainty bars in realised use not shown)

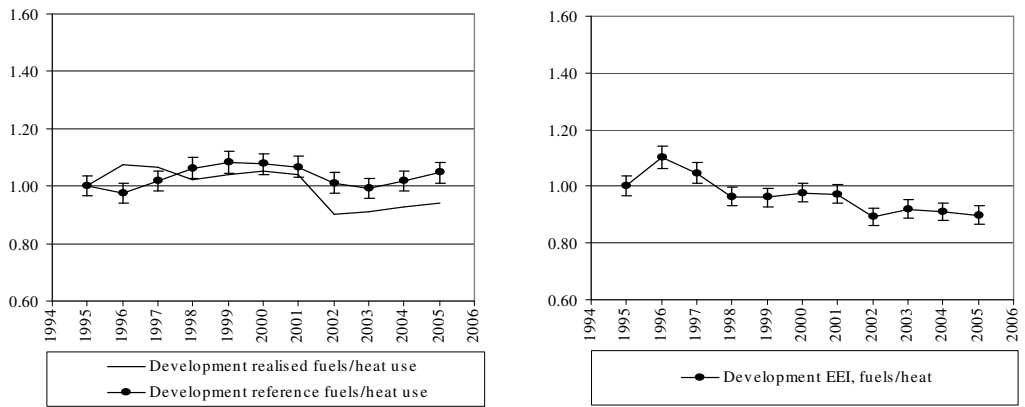


Figure 3-24 Development of reference energy use, realised energy use and energy efficiency indicator for fuels/heat use in the building materials industry (uncertainty bars in realised use not shown)

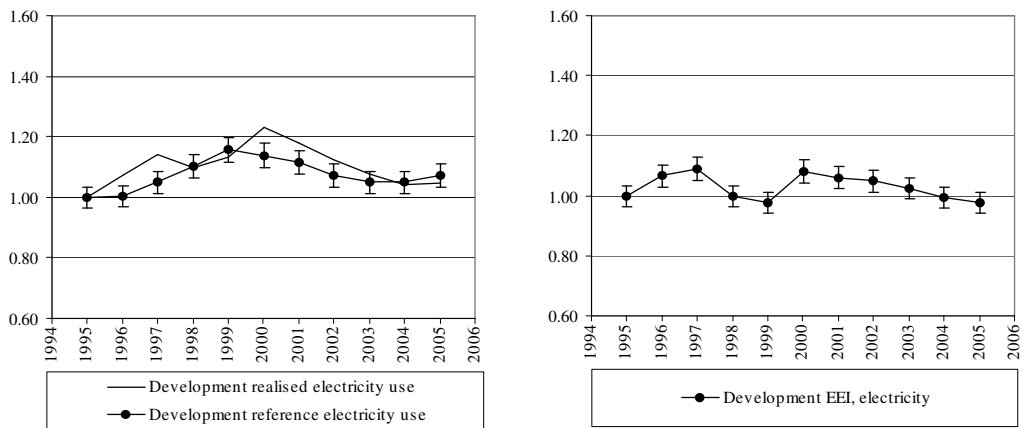


Figure 3-25 Development of reference energy use, realised energy use and energy efficiency indicator for electricity use in the building materials industry (uncertainty bars in realised use not shown)

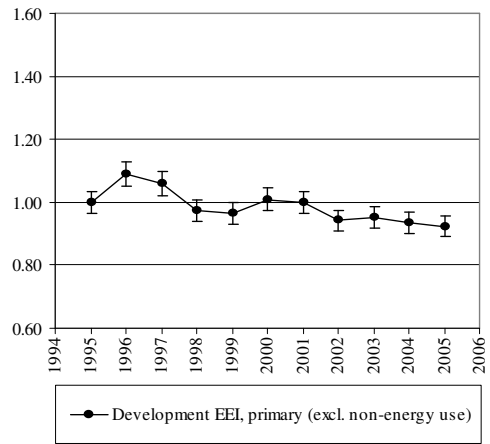
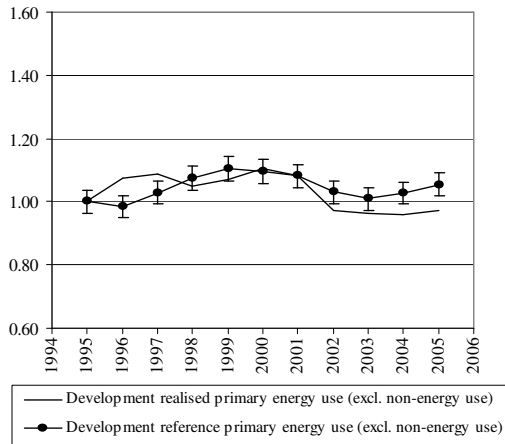


Figure 3-26 Development of reference energy use, realised energy use and energy efficiency indicator for primary energy use (static primary units), excluding non-energy use in the building materials industry (uncertainty bars in realised use not shown)

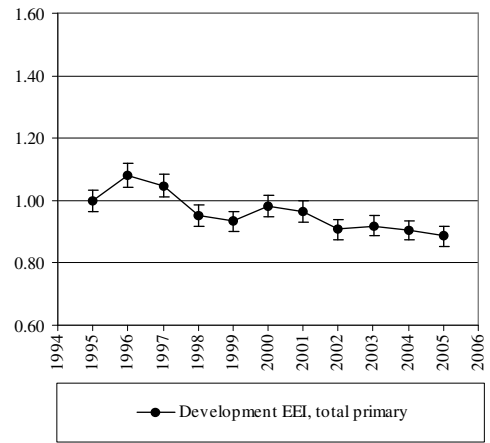
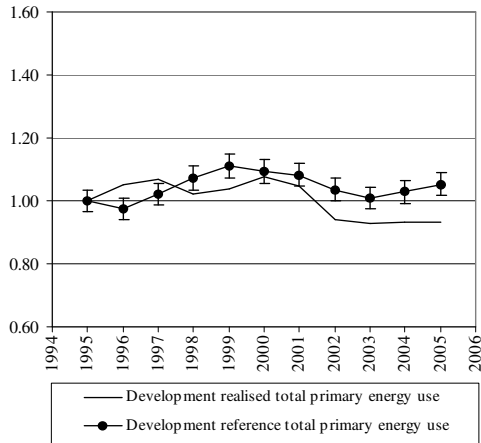


Figure 3-27 Development of reference energy use, realised energy use and energy efficiency indicator for total primary energy use (static primary units) in the building materials industry (uncertainty bars in realised use not shown)

3.10 Non-ferro, basic metals industry

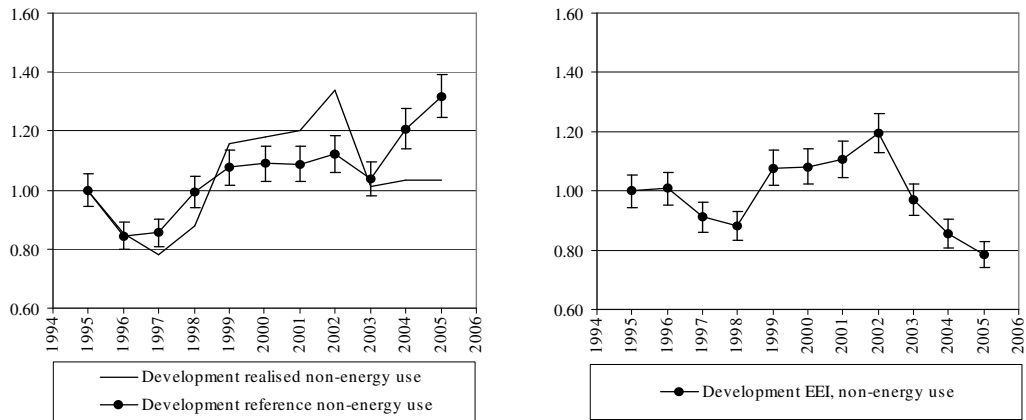


Figure 3-28 Development of reference energy use, realised energy use and energy efficiency indicator for non-energy use in the non-ferro basic metals industry (uncertainty bars in realised use not shown)

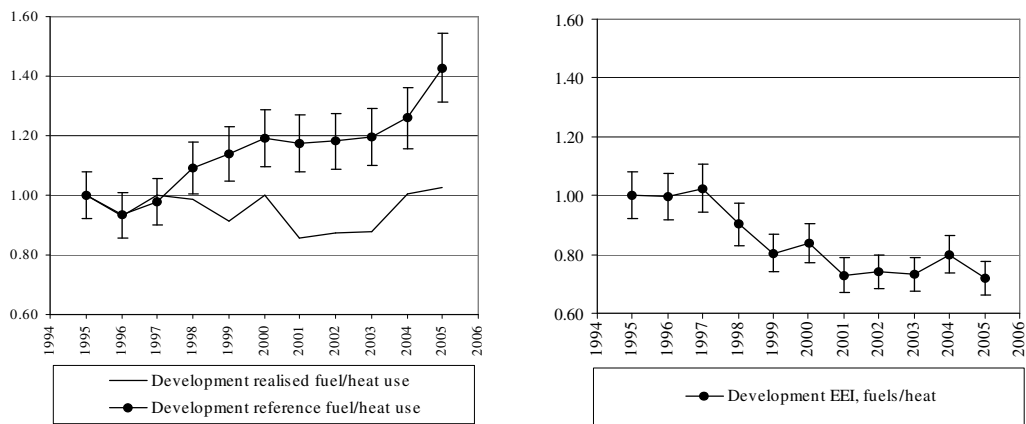


Figure 3-29 Development of reference energy use, realised energy use and energy efficiency indicator for fuels/heat use in the non-ferro basic metals industry (uncertainty bars in realised use not shown)

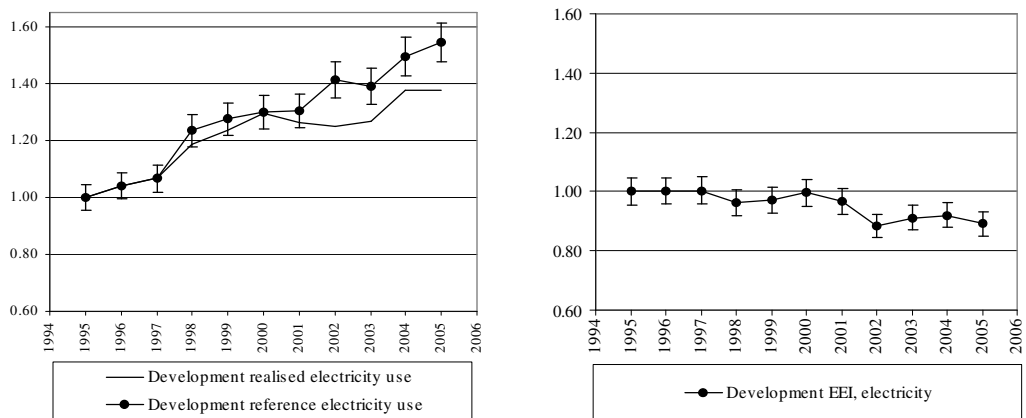


Figure 3-30 Development of reference energy use, realised energy use and energy efficiency indicator for electricity use in the non-ferro basic metals industry (uncertainty bars in realised use not shown)

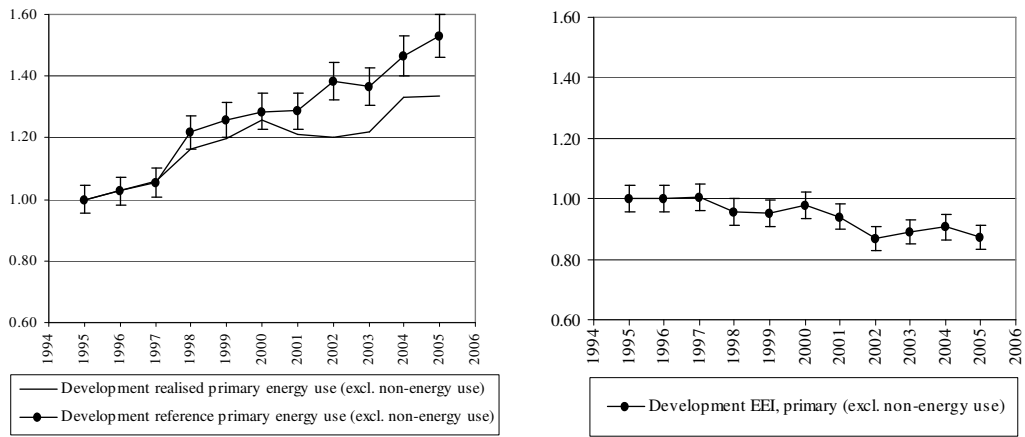


Figure 3-31 Development of reference energy use, realised energy use and energy efficiency indicator for primary energy use (static primary units), excluding non-energy use in the non-ferro basic metals industry (uncertainty bars in realised use not shown)

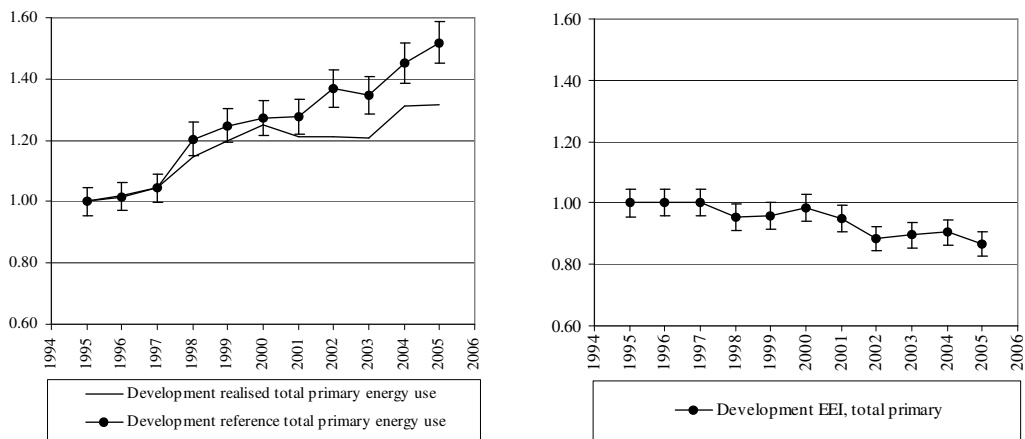


Figure 3-32 Development of reference energy use, realised energy use and energy efficiency indicator for total primary energy use (static primary units) in the non-ferro basic metals industry (uncertainty bars in realised use not shown)

4 References

- Beerkens, R. (2007), *Personal communication on glass production in physical units*, TNO/TPD, Eindhoven, 26 february 2007
- Boonekamp, P.G.M., Gijsen, A. and Vreuls, H.H.J., *Gerealiseerde energiebesparing 1995-2002, conform Protocol Monitoring Energiebesparing*, Energy Research Centre of the Netherlands, Petten
- Carlsson-Kanyama A. and Faist, M. (2001), *Energy use in the food sector: a data survey*, Environmental strategies research group, Stockholm University, Stockholm
- Department of Environment (1997) *Cutting energy cost in the soft drink industry*. Energy consumption guide 65. Action Energy UK. Available online at: <http://www.actionenergy.org.uk>
- Eurostat (2007), *cocoa beans, whole or broken, raw or roasted, External trade statistics, 2007 edition* Eurostat, Luxemburg
- FAO (2007), *FAOSTAT data*. Available online at: <http://faostat.fao.org/faostat>, accessed 01 February, 2007
- Frijlink, H. (2007), *Personal communication on anode production in physical units*, Alcan, Vlissingen, 27 February 2007
- Gonsalves D. (1996), *Energy conservation opportunities at Tanzania Bottlers Dar es Salaam*, Msc Thesis, Eindhoven University of Technology, Faculty of Technology Management, Eindhoven
- Heineken (1999), *Environmental report 1998-1999*, Heineken, Amsterdam
- Hiddink J. (2004) *Personal communication*, Arcadis, Den Bosch
- Hulstotte, J.H.J. and Matthijsen, A.J.C.M. (1995). *Produktie van suiker*, RIVM report 736301110, Bilthoven in: Ministerie van VROM, Ministerie van Verkeer en Waterstaat and RIVM (editors), *Samenwerkingsproject Procesbeschrijvingen Industrie Nederland (SPIN)*
- IISI (2006), *Iron and steel, statistical yearbook 2006*, International Iron and Steel Institute (IISI), Brussels
- IPTS (2003), *Draft reference document on best available technologies in the food, drink and milk industry*, European Commission, Joint Research Centre, Institute for Prospective Technological Studies, Seville, Draft, May 2003
- KNB (2006), *Jaarverslag 2005*, Koninklijk Verbond van Nederlandse Baksteenfabrikanten (KNB), de Steeg
- Loretzon K., Olsson O., Reiners V. and Stadig, M. (1997), *Uthållig livsmedelproduktion: en energi- och miljöstudie med inriktning not kyl, frys- ah helkonservbehandling*, Swedish institute for food and bio-technology, Gothenberg, 1997.
- Maison-du-lait (2007), *caséïnes, production statistics NL* Available online at: <http://www.maison-du-lait.com>, accessed 30 March 2007

- Mergelsberg, P. (2007), *Personal communication on clinker production*, ENCI Maastricht, 1 March 2007
- Molinari R., Gagliardi R., Drioli E., *Methodology for estimating savings of primary energy with membrane operation in industrial processes*, *Desalination* 1995 (100): 125-137
- Neelis, M., Ramirez, A. and Patel, M. (2004), *Physical indicators as a basis for estimating energy efficiency developments in the Dutch industry*, Report NW&S-E-2004-20 Department of Science, Technology and Society, Copernicus Institute for Sustainable Development and Innovation, Utrecht University, Utrecht, August 2004
- Neelis, M., Ramirez, A. and Patel, M (2005), *Physical indicators as a basis for estimating energy efficiency developments in the Dutch industry – update 2005*, Report NW&S-E-2005-50 Department of Science, Technology and Society, Copernicus Institute for Sustainable Development and Innovation, Utrecht University, Utrecht, July 2005
- Neelis (2006a), *De bruikbaarheid van Nederlandse Prodcop en energiestatistieken voor de berekening van CO₂ emissies en energiebesparing in de chemische industrie – vertrouwelijke volledige rapportage*, rapport BSV-2006-01, Centraal Bureau voor de Statistiek (vertrouwelijk)
- Neelis (2006b), *De bruikbaarheid van Nederlandse Prodcop en energiestatistieken voor de berekening van CO₂ emissies en energiebesparing in de chemische industrie – openbare samenvatting*, Report NW&S-E-2006-7, Department of Science, Technology and Society, Copernicus Institute for Sustainable Development and Innovation, Utrecht University, Utrecht, June 2006
- Nielsen P.H., Nielsen A.M., Weidema B.P., Dalgaard R. and Halberg N. (2003) *LCA food database* Available online at: <http://www.lcafood.dk/database> .
- Pontoppidan O., Hansen P. (2001). *Renere teknologi på svine-og kreaturslagterier*. Resume rapport (Cleaner technology in the poultry and cattle-slaughtering branch. Summary report). Environmental project No. 9, Danish EPA 2001 (in Danish). Available online at: <http://www.mst.dk/udgiv/publikationer/2000/87-7944-306-0/html/>
- PZ (2007), *Statistisch Jaaroverzicht 2004*, Productschap Zuivel, Zoetermeer Available online at: <http://www.prodzuivel.nl> , accessed 01 February 2007
- PZ (2007), *Statistisch Jaaroverzicht 2005*, Productschap Zuivel, Zoetermeer Available online at: <http://www.prodzuivel.nl> , accessed 01 February 2007
- Statistics Netherlands (2003), *De Nederlandse Energie Huishouding (NEH), jaarcijfers, 1993-2002*, obtained via a personal communication with W. Tinbergen, Statistics Netherlands, Voorburg, 15 september 2003
- Statistics Netherlands (2004), *De Nederlandse Energie Huishouding (NEH), jaarcijfers, 2003*, obtained via a personal communication with L. Pleijzier, Statistics Netherlands, Voorburg, 23 June 2004
- Statistics Netherlands (2005), *Personal communication by phone with H. van der Bosch*, Statistics Netherlands, Heerlen, 29 April 2005
- Suijkerbuijk, M.A.W., van Oosterhout C.J.M. and Hoogenkamp, A.W.H.M. (1995) *Slachterijen en vleeswaren industrie*, RIVM report 773006173, Bilthoven in: Ministerie van VROM,

Ministerie van Verkeer en Waterstaat and RIVM (editors), Samenwerkingsproject
Procesbeschrijvingen Industrie Nederland (SPIN)

VNP (2005), *Annual report 2005*, Vereniging van Nederlandse Papier- en Kartonfabrieken (VNP),
Hoofddorp

Appendix 1 Corrections for the food, beverages and tobacco industry

In Appendix 1 of the 2005 report, a table on specific energy consumption (SEC) values by product in the food, beverages and tobacco industry is listed. An overview of the data sources is given as well. We found some mistakes, however, regarding the PRODCOM numbers to be used and some references that don't apply anymore. Partly, these mistakes have been addressed in paragraph 3.1. In this appendix, we summarize the changes (Table A1-1).

Table A1-1 Corrections in data sources compared to the 2005 analysis.

Product	Origin production data
Meat	
Beef	FAO statistics
Sheep	PVE
Rendering	Calculation based on FAO statistics
Fruit and vegetables	
Frozen vegetables and fruits	PRODCOM: 15331100+15331440+15332100
Crude and refined oil	
Crude oil + refined oil	PRODCOM: 15411150+15411190+15411210+15411240+ 15411260+15411310+15411350+15421110+ 15421120+15421140+15421150+15421160+ 15421210+15421220+15421230+15421330+ 15421280+15421350
Dairies	
Casein	Maison-du-lait
Lactose	PRODCOM: 15515400
Whey powder	PRODCOM: 15515533
Prepared animal feeds	
For farm animals	PRODCOM: 15711010+15711033+15711035+15711037+15711039
For pets	PRODCOM: 15721030+15721060+15721033+15721035
Cocoa	
Cocoa beans	Eurostat statistics
Coffee	
Extracts of coffee solid form	PRODCOM: 15861230