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Material flow accounts in the Netherlands, time series 1996-2006

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Remark: The views expressed in this report are the authors' and do not necessarily reflect the opinion of Statistics Netherlands.

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Contents

Introduction

1.1 Background

The development of economy wide material flow accounts (EW-MFA) is given high priority by Eurostat. Development of a legal base for environmental accounts, including a module on MFA, is underway. In 2008 Eurostat provided Statistics Netherlands with a grant to support the compilation of the Dutch EW-MFA for a single year (Delahaye and Nootenboom, 2008). In 2009 Statistics Netherlands received another grant to compile a time series. The current paper presents the outcome of the work done on the EW-MFA time series by Statistics Netherlands.

1.2 Economy wide material flow accounts (EW-MFA)

Economy-wide material flow accounts (EW-MFA) record all materials entering or leaving the national economy. Data from these accounts can be used for analytical studies for particular materials and to compile aggregated material flow and resource productivity indicators.

Policy makers can use MFA to reduce environmental impact by stimulating appropriate dematerialization and material substitution. MFA can also be helpful to show the dependency on other countries for the supply of certain resources. Finally, the physical flows of the MFA could be useful in improving the monetary supply and use tables of the national accounts.

1.3 Objectives

Objectives of this survey are to compile an EW-MFA time series for the Netherlands. The newly developed time series should:

- Give insights to flows of different kind of materials between the Dutch economy and foreign economies and between the Dutch economy and the environment for the years 1996-2006.
- Be compatible with SEEA (United Nations, 2003).
- Be compatible with the Eurostat compilation guide and questionnaire.

2. Methodology

The methodology used to compile the time series is described in the paper "Economy-wide material flow accounts in the Netherlands" (Delahaye and Nootenboom, 2008). Overall, the used methodology is according to the

compilation guidelines for reporting to the Eurostat questionnaire (Eurostat, 2009). However, our methodology deviates from the Eurostat guidelines in their estimation of the imports and exports. Contrary to the Eurostat guidelines, physical data from the international trade statistics is not used directly as input. Instead Statistics Netherlands derives price information per commodity from the international trade statistics. This price information in combination with monetary data from the national accounts provides the required physical data. There are two reasons for this approach. Firstly, the quality standard of the Dutch physical international trade data was not high enough. Secondly, this approach insures MFA that are fully consistent with the monetary data in the national accounts.

Deviations from the methodology used in Delahaye and Nootenboom (2008) due to changes in the available data are described below.

2.1 Data availability in time

A long time series is important as it gives more opportunity for analysis and a better picture in structural changes of material flows. In this paper a time series was compiled from 1996 until 2006. International data on trade for the years preceding 1996 was not available in a format that allows MFA compilation according to the method used in later years. Therefore it was decided to compile a MFA time series starting from 1996.

In 2001 a revision of the Dutch National accounts took place. As a result, revised monetary data on the required commodity level of detail was not available for the years 1996 until 2001. To overcome this problem, revised data was disaggregated on the bases of unrevised data.

The commodity classification used by the national accounts from the year 2006 and onwards are more aggregated than previous years. As a result, developments in time of the imports and exports for a few of the commodities can no longer be obtained from the data. For the MFA classification in the Eurostat questionnaire, the commodity aggregation has only minor consequences. The main consequence is the inability to distinguish limestone and gypsum any longer. Next year an attempt will be made to fix the problem (see chapter on future work).

2.2 Data check

After the preliminary time series for imports and exports were compiled the data was checked for omissions and inconsistencies. Firstly, the monetary values of the time series were checked with the monetary values in the National accounts. For the years 1996-2000 some monetary data was lacking

for re-exports extra Europe. This is a result of National accounts revision that took place in 2001. The problem was solved by taking re-exports intra and extra Europe together. As a result for the years 1996-2000 only the total re-exports are estimated.

Secondly, omissions of physical data were investigated. It turned out that for some years, some commodities were missing in the international trade data. As a result no price information, and subsequently no physical flows, could be derived. Missing price information was filled in on the basis of prices from adjacent years or price indexes from the national accounts. After new price information was obtained, missing physical data were estimated.

Thirdly, commodity import and export prices were checked for inconsistencies over time. If prices showed extreme values for certain years, and if this had a large effect on the estimated physical amounts of a particularly group of commodities, prices were adjusted according to the method described above.

3. Results

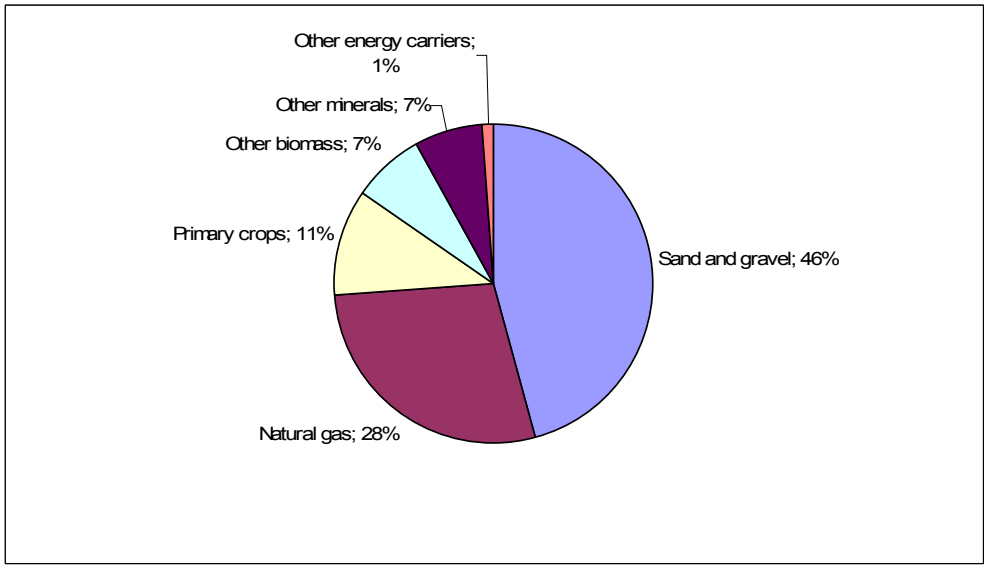
This section consists op two parts. First, the Dutch EW-MFA for 2006 will be briefly discussed. The emphasize will be on biomass flows. The second part discusses developments of the EW-MFA in time. The annexes show the data as reported to Eurostat.

3.1 Dutch EW-MFA in 2006

3.1.1 Extraction

Domestic extraction in the Netherlands is, for a large part, determined by gravel, sand and soil (214 billion kilo in 2006). Around 80 percent of the sand and gravel is used for infrastructural projects to raise roads and houses or to strengthen dikes. The extraction of natural gas accounts for 28 percent of the total extraction. This is due to the exploitation of the substantial natural gas reserves of the Netherlands.

1: Domestic extraction (total of 214 billion Kg), Netherlands, 2006.

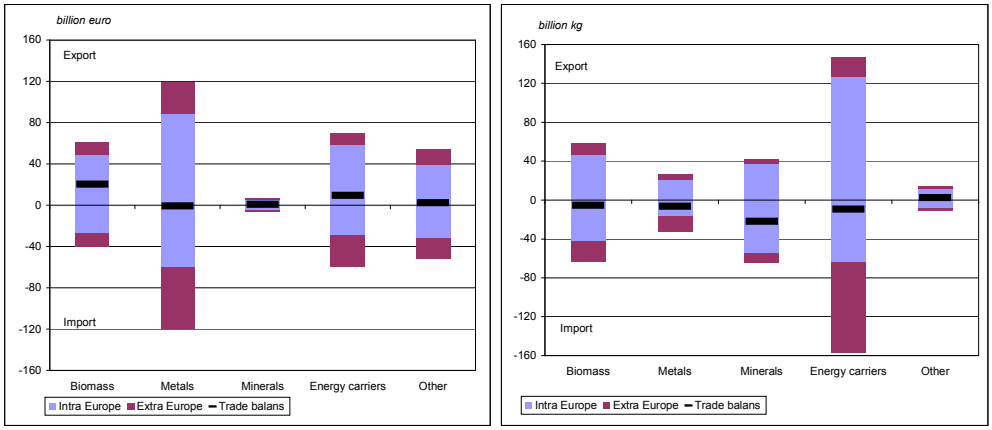


3.1.2 Physical and monetary imports and exports

Figure 2 shows the monetary (left hand side) and physical (right hand side) imports (-) and exports (+) for five groups of materials. A distinction is made between flows from and to European countries (intra Europe) and between flows from and to non-European countries (extra Europe). The monetary amounts of imports and exports of metal and metal products are the largest whereas the physical amounts are relative small. This is due to high price of metal products like electronics. In monetary terms the Netherlands has a trade surplus. This surplus is for a large part due to biomass products like vegetables, flowers but also cigarettes.

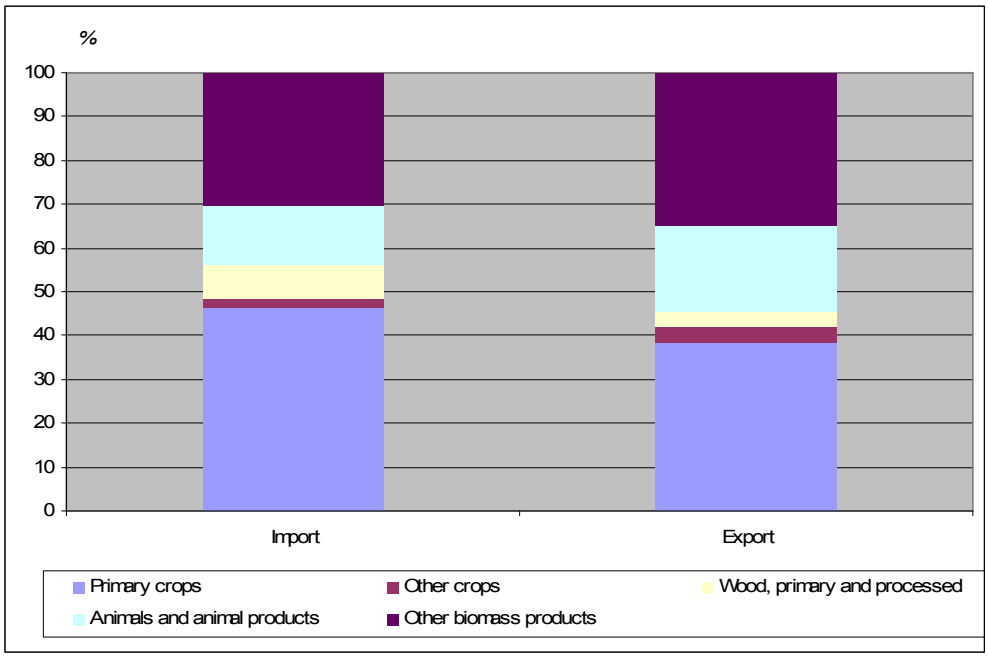
The physical amounts of imports and exports are dominated by energy carriers. Energy carriers are mainly imported from outside Europe. Almost all coal and most of the crude oil come from outside Europe. Exports of energy carriers are destined for the European market and consist mainly of petroleum products and natural gas. Almost all material groups show a trade deficit.

2: Monetary (left hand side) and physical (right hand side) intra- and extra-European imports and exports for groups of materials Netherlands, 2006.



To elaborate on the difference in material composition between imports and exports a closer look is taken at biomass flows. Physical imports and exports consist for the most part of primary crops. Primary crops are processed and non-processed crops that are not directly used as animal feed (in the next paragraph we take a closer look at primary crops).The difference between the imports and exports of animals and animal products is due to the large export of domestic produced animal products.

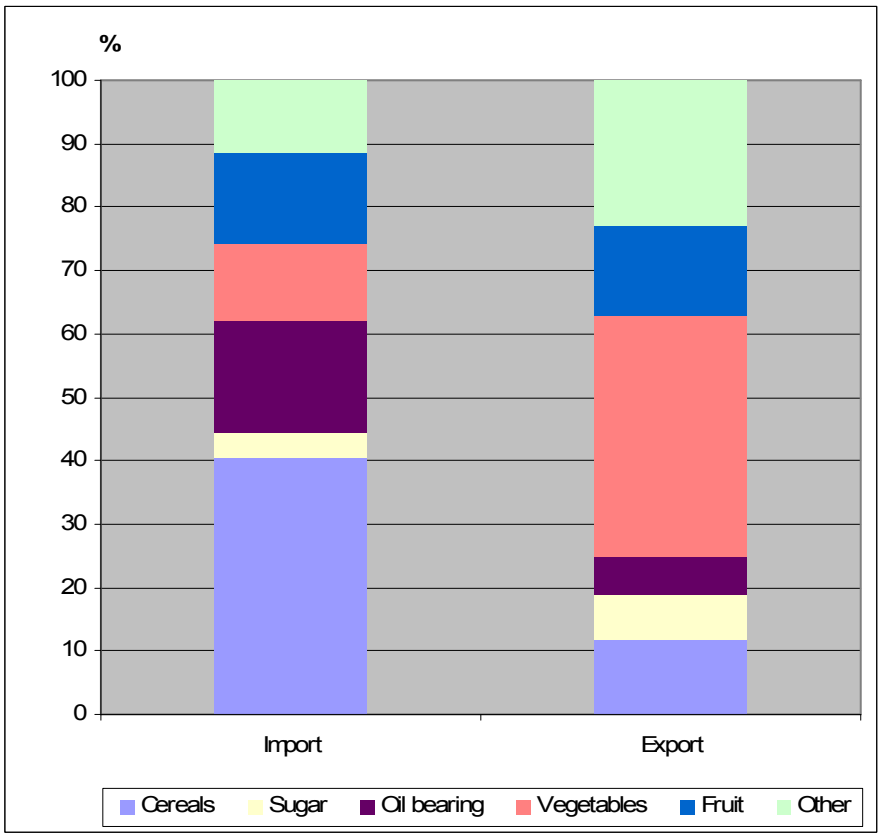
3: Share in import and export of different types of biomass Netherlands, 2006.



Considering primary crops, the composition differs between imports and exports. Imported primary crops consist for 40 percent of cereals. The import of oil bearing crops, especially soybeans (81 percent), is also relatively large. Soybeans come from outside Europe and are mainly processed into animal

feed. The physical export of primary biomass consists mainly of vegetables and products made from potatoes.

4: Compilation of primary crops imports and exports Netherlands, 2006



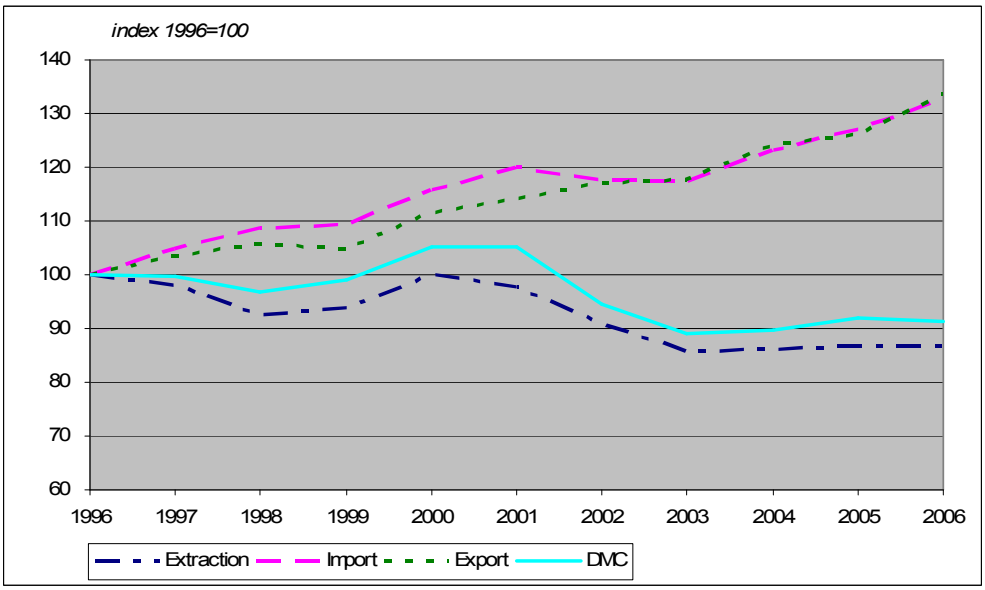
3.2 Dutch EW-MFA, 1996-2006

Domestic material consumption (DMC) is calculated by adding the imports and extraction and subtracting the exports. From 1996 until 2006 the DMC has decreased with 9 percent. A decreasing DMC suggests dematerialization of the Dutch economy. Although at first site this appears to be a favourable development, from an environmental point of view it is important to know what kind of materials have determined this development. A favourable development in terms of weight does not have to be a favourable development in terms of environmental impacts (Bruyn *et al.*, 2006).

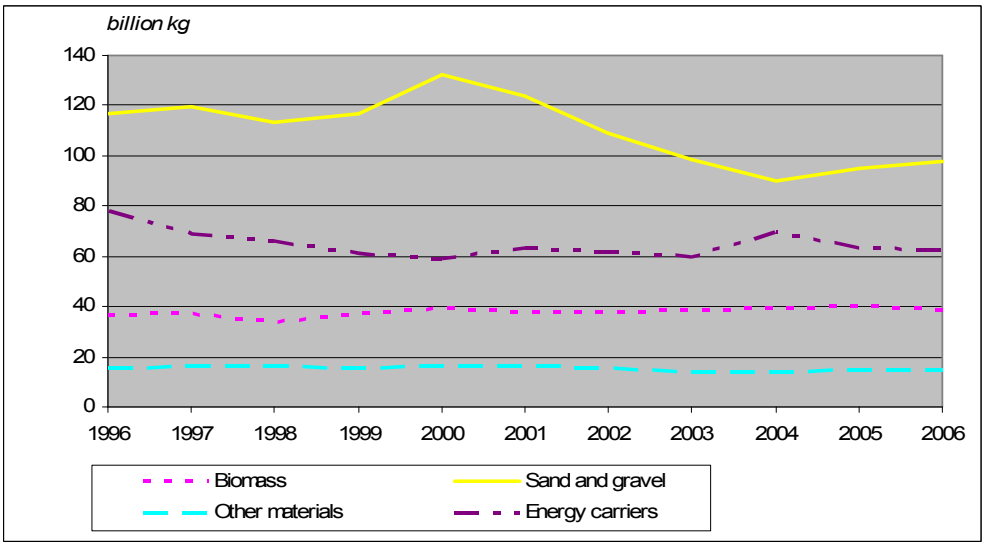
In the last couple of years the total amounts of imports and exports are almost equal. As a result, change in DMC over time is determined by the extraction of materials. In turn, extraction is dominated by sand and gravel. Around 2000 a peak can be observed. In this period there was a large demand for sand used for infrastructural works like the construction of two high-speed-rail-links. From 2008 onwards an increase in the amount of extracted sand is

expected as a result of the expansion of the Rotterdam harbour. The dependency of the DMC indicator of a single material (sand in this case) makes its use for policy makers difficult.

5 Material consumption broken down into import, export and extraction



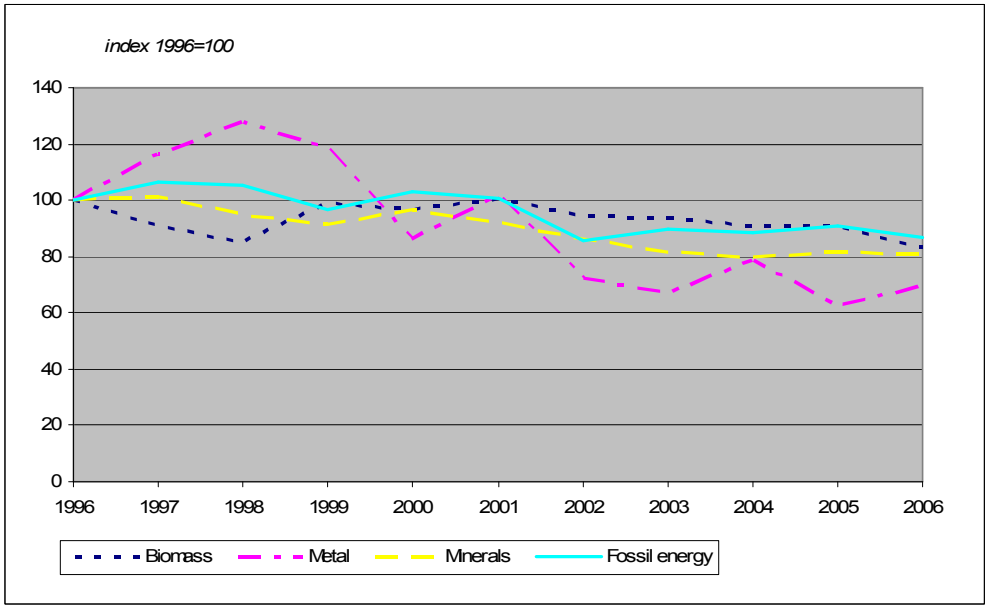
6 Extraction for different materials in time.



Domestic material consumption divided by an indicator for economic growth results in an estimate of the material intensity of an economy. In figure 7 the material intensity for individual material categories is determined by dividing the DMC per material category by value added of the major users of these materials. In the Netherlands the material intensity between 1996 and 2006

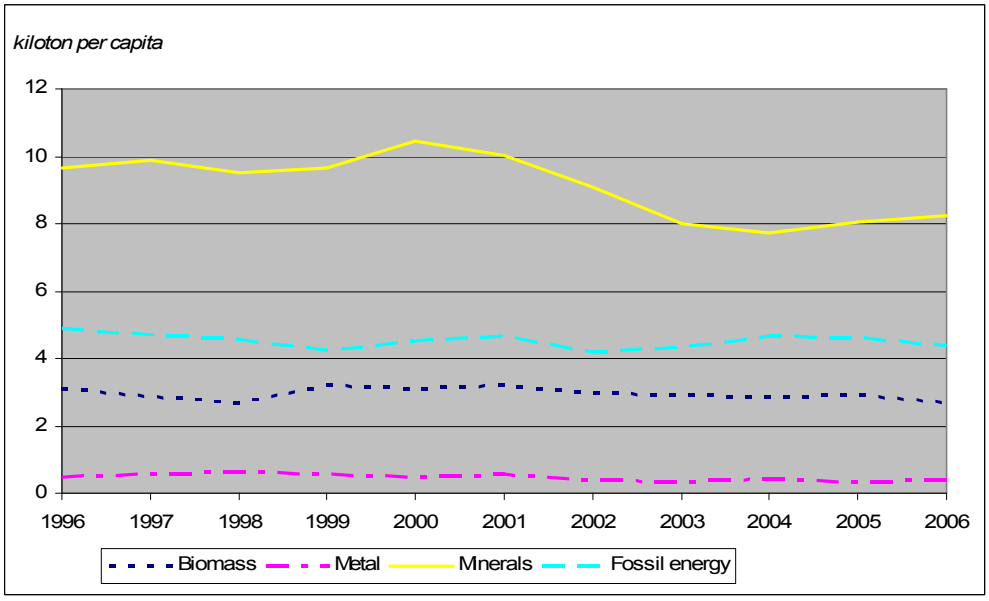
has decreased for all four material categories (biomass, metals, non-metal minerals, fossil energy carriers).

7 Material intensity for different material categories



Material use per capita decreases from 18 tonnes in 1996 to 15,5 tonnes in 2006. The largest decrease per capita can be observed for the non-metal minerals. The other material categories do not change very much over time. A comparison between European countries (e.g. Weisz *et al.*, 2006; Eurostat, 2009b) shows that the Netherlands has one of the lowest DMCs of biomass. The DMC of biomass for Finland, the highest of Europe, is more than three times as high. Finland uses a lot of wood for, among others, the construction of houses. Ireland is also ranked high because of the relative large live stock. For the production of one kilo of meat sometimes 10 kilos of vegetable biomass is needed (Weisz *et al.*, 2006). Domestic extraction of this vegetable biomass will result in a high DMC. However, if end products of biomass, like feed or meat products, are imported the effect on the DMC is much less. The latter is the case in the Netherlands.

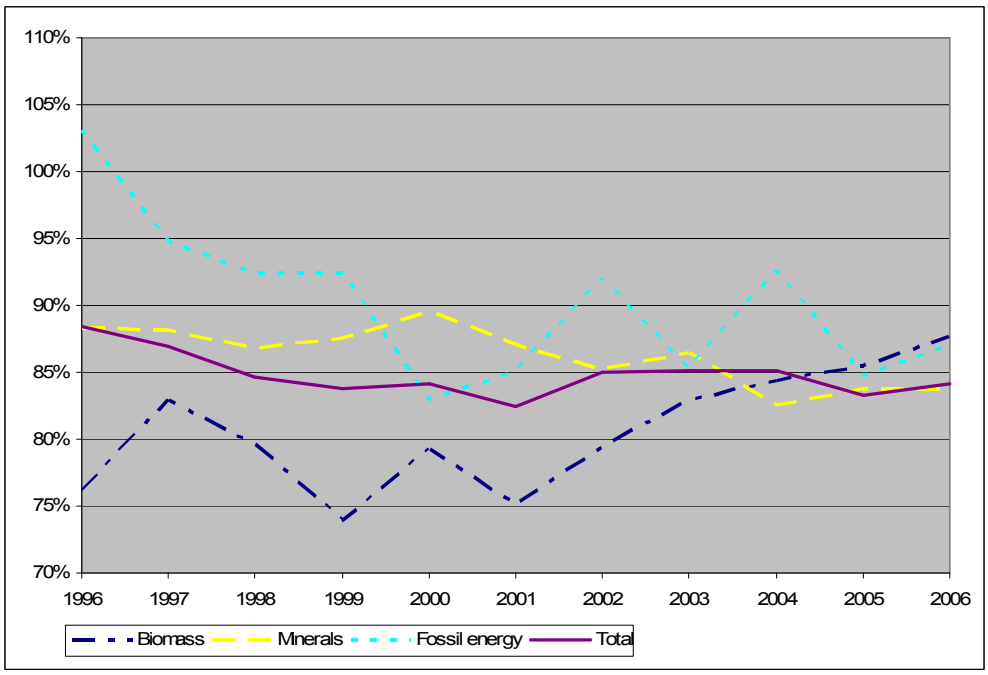
8 Domestic material consumption per capita



Foreign dependency of materials can be determined by estimating the amount of DMC that can be covered by domestic extraction. When DMC equals the amount of domestic extraction, self-supporting of the Netherlands can be assumed[1]. For the total amount of materials, the Netherlands are for around 85 percent self-supporting. The Netherlands are fully dependent on foreign countries in the supply of metals. For the other material categories we are to some extent dependent on foreign countries. Considering biomass this may seem remarkable as agriculture is widely practised in the Netherlands. The Netherlands are especially dependent on particularly types of biomass, like soybeans that are processed into feed. We are for 87 percent dependent of foreign countries of our cereals. Due to lack of commercial exploited forests we also have to import most of our wood (82 percent dependency). The Netherlands is self-supporting regarding to potatoes, sugar beets and fish.

9 Percentage the Netherlands is self-supporting

[1] Here the assumption is made that all commodities within a material class can be replaced with each other.



4. Future developments

4.1 Complying with the level of detail presented in the questionnaire

The method used in this paper to estimate imports and exports has a severe drawback: the EW-MFA questionnaire demands more detail than is available from the commodity classification in the national accounts. This is in particularly the case for metals. Zinc, lead and tin can not be distinguished from "other metals". A recent aggregation of commodities in the national accounts also made it impossible to distinct "limestone and gypsum" for the year 2006 and onwards. The level of detail presented in the Eurostat questionnaire is required for the newly developed environmental accounts legal base. Therefore, next year Statistics Netherlands will attempt to estimate the level of detail that is required by the questionnaire using additional data sources.

4.2 Long time series

Analyses of EW-MFA becomes more interesting if long time series are available. Structural changes in material use will become more apparent and will provide information on issues like dematerialization and material substitution. The institute of social ecology in Vienna and CML in Leiden have collected material flow data that goes back to the 70s of last century.

Although, materials are estimated on an aggregated level, it would be interesting to see if we could use this data to extent the time series in the paper back to the 70s.

4.3 Raw Material Equivalents (RME)

Currently Eurostat uses the DMC as a structural development indicator (SDI) for resource use/productivity in Europe. However, the DMC is estimated using the import and export of products in different stages of processing. To develop a more accurate indicator for resource use/productivity all products must be converted into Raw Material Equivalents (RME). Based on the outcome of projects undertaken by countries, Eurostat strategy is to develop a DMC resource indicator for RME. Hopefully in the near future, Statistics Netherlands will be able to look into estimating imports and exports in RME.

4.4 Implications of SNA 2008

In SNA 2008 under "B. New features and the role of the System of National Accounts" - "Globalization and related issues" the following can be read:

"The application of the principle of change in ownership of goods has been made universal, resulting in changes to the recording of merchanting[2] and of goods sent for processing, both abroad and within the domestic economy, and then returned to the owner. These changes have shifted the focus away from the physical movements of goods to the impact on the economies of the owner of the products and the processor. As a result, they are consistent with international financial transactions that are increasingly important in a globalized economy."

Thus, in the future national accounts, no gross physical import and export flows will be recorded for goods send for processing. However, the international trade statistics will probably still record these gross flows. Therefore the above statement has mayor implications for the compilation of the EW-MFA. Firstly, EW-MFA compiled according to the Eurostat guidelines, and thus using physical trade statistics, are not consistent with the national accounts any longer. Secondly, because the Dutch EW-MFA is consistent with the monetary data in the national accounts, for some materials it will no longer be possible to maintain a consistent time series after the SNA 2008 is implemented. At Statistics Netherlands we will investigate the consequences of these new SNA rules and how to deal with them.

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[2] "Merchanting" is a process whereby a unit in economy X purchases goods from economy Y for sale in economy Z. The goods legally change ownership but do not physically enter the economy where the owner is resident.

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Annex 1, Overview Material flow accounts Netherlands

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
	billion kg										
MATERIAL SUPPLY											
EXTRACTION	247	242	229	231	247	241	224	211	213	214	214
Biomass	37	37	34	37	39	38	38	39	39	40	39
Primary crops	20	21	19	21	24	22	23	24	24	25	23
Other crops	16	15	14	15	15	15	14	14	14	15	14
Other biomass	1	1	1	1	1	1	1	1	1	1	1
Non-metal minerals	132	135	129	133	148	140	124	112	104	110	113
Sand and gravel	27	28	27	27	28	25	20	20	17	18	18
Excavated soil	90	91	86	90	105	99	89	79	72	77	80
Other non-metal minerals	15	16	16	16	16	16	15	14	14	15	15
Fossil energy carriers	78	69	66	61	59	63	62	60	70	64	63
Natural gas	75	66	63	59	56	61	59	57	67	61	60
Other fossil energy carriers	3	3	3	3	3	3	3	3	3	3	3
IMPORT	248	260	270	271	287	298	292	291	305	315	328
Biomass, primary and processed	53	51	53	58	58	62	60	59	62	64	64
Primary crops	27	27	27	29	29	32	30	27	29	29	30
Other crops	2	2	2	2	3	2	2	2	2	1	1
Wood primary and processed	5	5	6	6	6	6	6	6	6	6	5
Live animals and animal products	6	6	6	6	6	7	7	7	8	8	9
Other products of biomass	14	12	13	15	14	15	15	17	18	19	19
Metal, primary and processed	24	27	29	27	27	27	26	26	31	31	33
Iron ores, iron and steel	17	19	19	17	17	18	17	16	21	21	21
Other metals	3	3	4	3	4	4	3	4	4	3	4
Other products of metals	5	5	6	6	6	6	6	6	6	7	7
Non metallic minerals, primary and processed	49	53	55	55	57	60	61	57	60	60	64
Sand and gravel	24	27	27	26	29	31	32	28	31	30	33
Chemical and fertilizer minerals	5	5	5	5	4	4	4	4	4	4	4
Other mining and quarrying products	16	17	18	19	18	19	20	19	20	20	18
Other products of non-metallic minerals	5	5	5	5	5	5	5	5	5	6	9
Fossil energy carriers, primary and processed	115	122	126	124	138	141	137	142	143	150	157
Hard coal	17	20	22	19	23	23	19	22	22	22	24
Petroleum	80	82	83	80	85	87	83	86	89	92	94
Natural gas	6	7	7	9	14	16	20	19	17	20	21
Peat	2	2	2	3	2	2	2	2	2	2	2
Products of fossil energy carriers	10	12	12	13	13	13	13	13	14	15	16
Other materials and waste	6	6	7	7	8	7	8	8	9	9	11
MATERIAL USE											
EXPORT	216	223	228	226	241	246	252	254	268	272	288
Biomass, primary and processed	42	44	45	45	48	49	50	51	55	57	59
Primary crops	17	18	18	17	19	20	20	21	22	22	22
Other crops	2	2	2	3	3	2	2	2	2	2	2
Wood primary and processed	2	2	2	2	2	2	2	2	3	2	2
Live animals and animal products	8	8	9	9	9	10	10	10	10	11	12
Other products of biomass	13	13	14	14	14	14	15	16	18	19	20
Metal, primary and processed	17	18	19	18	20	19	20	20	25	26	26
Iron ores, iron and steel	11	11	11	9	11	11	11	12	14	16	17
Other metals	2	2	2	2	2	2	2	2	2	2	3
Other products of metals	5	5	6	7	6	6	7	6	8	8	7
Non metallic minerals, primary and processed	32	35	35	36	39	39	40	39	38	39	42
Sand and gravel	10	11	9	10	13	14	15	14	12	11	14
Chemical and fertilizer minerals	8	8	9	8	8	8	8	8	8	8	9
Other mining and quarrying products	12	14	15	15	16	16	15	16	16	17	17
Other products of non-metallic minerals	2	2	2	2	2	2	2	2	2	2	3
Fossil energy carriers, primary and processed	117	118	121	119	125	130	131	131	138	139	147
Hard coal	2	4	8	7	10	10	9	8	8	9	12
Petroleum	57	60	60	58	60	59	58	61	63	62	66
Natural gas	39	34	31	30	33	39	42	39	43	42	43
Peat	1	1	1	1	1	1	1	1	1	1	1
Products of fossil energy carriers	18	20	21	22	22	21	22	23	23	25	26
Other materials and waste	8	8	9	9	9	9	11	12	13	12	14

Annex 2, Material extraction in the Netherlands

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
	million kg										
A.1 Biomass	36 665	37 136	33 557	37 178	39 317	38 306	38 026	38 963	39 183	40 446	38 714
A.1.1 Primary crops	19 957	20 772	18 503	20 924	23 805	22 487	22 737	23 505	23 958	24 778	23 273
A.1.1.1 Cereals	1 556	1 329	1 293	1 238	1 666	1 684	1 605	1 666	1 642	1 541	1 461
A.1.1.2 Roots, tubers	5 893	6 433	5 795	6 076	8 919	8 157	8 222	8 106	8 432	9 154	8 782
A.1.1.3 Sugar crops	6 717	6 645	5 177	7 057	6 544	6 170	6 458	6 955	6 674	6 520	5 876
A.1.1.4 Pulses	67	197	176	185	173	227	232	331	363	237	131
A.1.1.5 Nuts	0	0	0	0	0	0	0	0	0	0	0
A.1.1.6 Oil bearing crops	10	10	10	13	10	10	6	7	9	9	15
A.1.1.7 Vegetables	2 525	2 736	2 661	2 676	2 795	2 781	2 812	2 891	3 124	3 561	3 275
A.1.1.8 Fruits	647	752	747	830	841	706	669	737	817	866	839
A.1.1.9 Fibres	20	31	22	30	35	28	34	37	38	37	31
A.1.1.10 Other crops	2 522	2 639	2 622	2 819	2 822	2 724	2 699	2 775	2 859	2 853	2 863
A.1.2 Crop residues (used)	1 674	1 457	1 416	1 400	1 752	1 779	1 649	1 645	1 607	1 548	1 438
A.1.2.1 Straw	1 166	1 009	976	958	1 333	1 390	1 305	1 341	1 304	1 232	1 146
A.1.2.2 Other crop residues	508	448	440	442	419	389	344	304	303	316	292
A.1.3 Fodder crops	7 845	7 707	7 995	8 213	7 917	7 903	7 788	8 776	8 387	8 506	8 252
A.1.3.1 Fodder crops	3 193	3 486	2 883	3 334	2 902	3 091	3 217	3 250	3 298	4 061	3 747
A.1.3.2 Harvested from grassland	4 652	4 221	5 112	4 879	5 015	4 812	4 571	5 526	5 089	4 445	4 505
A.1.4 Grazed biomass	6 175	6 126	4 616	5 596	4 839	5 223	5 011	4 059	4 266	4 609	4 779
A.1.5 Wood	564	655	604	618	615	511	497	624	611	660	659
A.1.5.1 Timber	483	574	505	511	509	421	407	438	425	474	473
A.1.5.2 Wood fuel and other	81	81	99	107	106	90	90	186	186	186	186
A.1.6 Fish capture and other aquatics	450	418	423	427	388	403	344	353	353	346	312
A.1.6.1 Fish catch	449	417	422	426	388	402	344	353	353	345	312
A.1.6.2 Other aquatics	1	1	1	1	1	1	1	1	1	1	1
A.1.7 Hunting and gathering	.	.	.	.	.	.	.	.	.	.	.
A.2 Metal ores (gross ores)	0	0	0	0	0	0	0	0	0	0	0
A.3 Non metalic minerals	132 134	135 384	129 223	132 820	148 205	139 860	124 368	112 328	103 537	109 699	112 620
A.3.1 Ornamental or building stone	0	0	0	0	0	0	0	0	0	0	0
A.3.2 Limestone, gypsum, chalk	1 004	991	1 250	1 599	1 516	1 415	785	1 406	1 515	1 456	1 466
A.3.3 Slate	0	0	0	0	0	0	0	0	0	0	0
A.3.4 Gravel and sand	27 000	28 300	26 600	26 600	27 700	24 600	20 300	19 700	17 400	17 600	18 000
A.3.5 Clays and kaolin	8 700	9 300	9 200	8 600	8 600	8 600	8 400	6 100	6 100	6 800	6 900
A.3.6 Chemical and fertilizer minerals	0	0	0	0	0	0	0	0	0	0	0
A.3.7 Salt	5 530	5 793	5 773	5 621	5 789	5 945	5 983	6 222	6 122	6 443	6 354
A.3.8 Other mining and quarrying	0	0	0	0	0	0	0	0	0	0	0
A.3.9 Excavated soil, only if used	89 900	91 000	86 400	90 400	104 600	99 300	88 900	78 900	72 400	77 400	79 900
A.4 Fossil energy carriers	77 883	69 210	65 919	61 433	59 169	63 319	62 057	60 007	69 969	63 611	62 552
A.4.1 Brown coal	0	0	0	0	0	0	0	0	0	0	0
A.4.2 Hard coal	0	0	0	0	0	0	0	0	0	0	0
A.4.3 Petroleum	3 103	2 930	2 662	2 535	2 351	2 264	3 074	3 076	2 891	2 269	2 022
A.4.4 Natural gas	74 540	66 018	62 972	58 557	56 487	60 637	58 675	56 538	66 637	60 880	59 939
A.4.5 Peat	240	263	285	341	330	418	308	392	441	462	591

Annex 3, Material imports in the Netherlands

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
	million kg										
1 Biomass and biomass products	53 445	51 408	53 495	58 460	57 884	61 571	59 738	58 916	61 785	63 511	63 958
1.1 primary crops	27 292	26 586	27 062	29 226	29 006	31 810	29 520	27 407	28 785	29 080	29 589
1.1.1 Cereals, primary and processed	8 884	9 344	8 917	8 607	8 919	10 565	10 783	9 370	10 577	11 603	11 980
1.1.2 Roots and tubers, primary and processed	2 019	1 639	1 908	1 982	2 033	2 431	2 209	2 174	2 001	2 075	1 842
1.1.3 Sugar crops, primary and processed	1 512	1 583	1 486	1 863	1 612	1 453	1 324	1 216	1 297	1 210	1 202
1.1.4 Pulses, primary and processed	753	636	780	710	449	312	491	227	301	275	235
1.1.5 Nuts, primary and processed	347	339	338	384	392	403	414	492	485	511	782
1.1.6 Oil bearing crops, primary and processed	5 172	5 280	5 956	6 139	6 406	7 280	6 006	5 937	5 515	5 335	5 210
1.1.7 Vegetables, primary and processed	2 787	2 570	2 537	3 214	3 246	3 260	2 352	1 934	2 313	1 538	1 691
1.1.8 Fruits, primary and processed	3 991	3 353	3 207	4 190	3 783	3 780	3 739	3 892	4 115	4 314	4 318
1.1.9 Fibres, primary and processed	130	152	159	183	148	147	123	115	119	124	138
1.1.10 Other crops, primary and processed	1 697	1 689	1 775	1 955	2 018	2 178	2 077	2 050	2 063	2 096	2 190
1.2 Crop residues	1 796	1 172	1 352	1 424	2 445	1 917	1 999	1 670	1 441	1 252	1 276
1.2.2 Other crop residues	1 796	1 172	1 352	1 424	2 445	1 917	1 999	1 670	1 441	1 252	1 276
1.3 Fodder crops incl grassland harvest	440	392	304	407	335	299	230	233	325	227	167
1.3.1 Fodder crops	440	392	304	407	335	299	230	233	325	227	167
1.3.2 Biomass harvested from grassland	0	0	0	0	0	0	0	0	0	0	0
1.5 Wood primary and processed	4 725	5 111	5 880	6 000	6 039	5 802	5 587	5 553	5 939	5 713	4 894
1.5.1 Timber, primary and processed	4 092	4 259	4 826	4 913	5 199	4 752	4 632	4 603	5 047	4 654	4 082
1.5.2 Wood fuel , primary and processed	633	852	1 054	1 087	841	1 050	955	949	892	1 059	812
1.6 Fish capture, primary and processed	505	592	581	648	656	696	752	754	735	805	828
1.8 Live animals, meat and meat products	5 163	5 309	5 514	5 711	5 571	6 248	6 633	6 618	6 899	7 483	7 939
1.8.1 Live animals other than in B 1.6.	357	358	332	370	377	447	525	333	466	530	542
1.8.2 Meat and meat preparations	733	811	839	934	1 037	1 097	1 183	1 253	1 312	1 357	1 686
1.8.3 Dairy products, birds eggs, and honey	2 305	2 306	2 178	2 263	2 243	2 307	2 272	2 379	2 355	2 304	2 308
1.8.4 Other products from animals	1 768	1 835	2 165	2 143	1 914	2 398	2 652	2 653	2 766	3 292	3 404
1.9 Products mainly from biomass	13 524	12 247	12 802	15 045	13 833	14 799	15 018	16 680	17 661	18 953	19 265
2 Metal ores and concentrates, processed metals	24 280	26 924	28 609	27 312	27 276	27 400	26 000	25 631	31 193	31 194	32 654
2.1 Iron ores and concentrates, iron and steel	16 840	18 941	19 186	17 345	17 378	17 633	16 615	15 842	21 113	21 098	21 459
2.2 non-ferrous metal ores, processed metals	2 792	3 066	3 532	3 494	3 544	3 540	3 458	3 610	3 670	3 310	3 989
2.2.1 Copper	277	343	351	373	361	354	343	379	380	356	416
2.2.2 Nickel	.	.	.	.	.	.	.	.	.	.	.
2.2.3 Lead	.	.	.	.	.	.	.	.	.	.	.
2.2.4 Zinc	153	146	178	182	200	193	208	241	228	188	256
2.2.5 Tin	.	.	.	.	.	.	.	.	.	.	.
2.2.6 Gold, silverand other precious metals	0	6	1	2	1	2	4	3	2	2	0
2.2.7 Aluminium	1 579	1 817	2 051	2 022	1 988	1 938	1 962	1 883	1 776	1 780	2 002
2.2.8 Uranium and thorium	.	.	.	.	.	.	.	.	.	.	.
2.2.9 Other metals	783	754	952	916	994	1 053	940	1 104	1 284	985	1 315
2.3 Products mainly from metals	4 648	4 917	5 891	6 472	6 354	6 227	5 927	6 179	6 410	6 785	7 205
3 Non metalic minerals primary and processed	49 348	52 899	54 588	54 614	56 564	59 846	61 268	56 804	60 063	60 473	63 963
3.1 Ornamental or building stone	3 615	3 937	5 013	5 511	5 091	5 950	6 065	4 506	5 324	4 646	4 511
3.2 Limestone, gypsum, chalk, and dolomite	1 387	1 405	1 407	1 566	1 543	1 764	1 406	1 777	1 440	1 710	.
3.3 Slate	.	.	.	.	.	.	.	.	.	.	.
3.4 Gravel and sand	23 663	26 724	26 537	25 613	29 292	31 316	32 408	28 255	31 164	30 443	33 042
3.5 Clays and kaolin	2 360	2 107	2 143	2 198	2 088	2 640	1 980	2 082	2 399	2 367	2 056
3.6 Chemical and fertilizer minerals	4 959	4 659	4 897	4 843	4 295	3 649	3 835	4 249	3 821	4 060	3 874
3.7 Salt	555	551	390	514	515	492	532	737	637	763	1 217
3.8 Other mining and quarrying products n.e.	8 186	8 759	9 462	9 352	8 689	8 640	9 887	9 823	9 937	10 969	9 895
3.9 Excavated soil, only if used	0	0	0	0	0	0	0	0	0	0	0
3.10 Products mainly from non-metalic minerals	4 623	4 757	4 740	5 016	5 052	5 396	5 155	5 375	5 342	5 515	9 368
4 Fossil energy carriers, primary and processed	114 682	122 160	126 263	123 566	137 519	141 373	136 927	141 638	143 212	150 267	156 686
4.1 Brown coal incl. oil shale and tar sands	0	0	0	0	0	0	0	0	0	0	0
4.2 Hard coal	16 857	20 335	22 211	19 006	22 586	23 369	19 450	21 504	21 660	22 431	23 515
4.3 Petroleum	79 712	81 586	82 514	80 349	85 248	86 583	83 117	86 481	89 439	91 618	94 418
4.4 Natural gas	5 821	6 630	6 864	9 088	13 848	16 404	19 538	18 738	16 516	19 593	20 987
4.5 Peat	1 907	2 103	2 419	2 541	2 417	2 186	1 849	1 889	1 874	1 694	1 773
4.6 Products mainly from fossil energy carriers	10 385	11 506	12 253	12 582	13 420	12 830	12 973	13 026	13 723	14 931	15 992
5 Other products	5 921	5 928	6 581	6 884	7 776	7 041	7 546	7 709	8 342	8 943	10 350
6 Waste imported for final treatment and disposal	307	304	310	403	329	409	463	471	620	526	870

Annex 4, Material exports in the Netherlands

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
	million kg										
1 Biomass and biomass products	41 943	43 749	44 933	45 315	47 573	48 856	49 868	50 909	54 558	56 660	58 517
1.1 primary crops	16 931	18 094	18 005	17 349	19 183	20 495	19 967	20 665	21 538	22 165	22 300
1.1.1 Cereals, primary and processed	2 165	2 271	2 029	2 063	2 407	2 417	2 243	2 198	2 595	2 644	2 596
1.1.2 Roots and tubers, primary and processed	2 970	3 309	3 337	2 985	3 794	4 016	3 988	3 750	3 664	3 630	3 689
1.1.3 Sugar crops, primary and processed	1 292	1 426	1 400	1 223	1 432	1 650	1 594	1 469	1 542	1 646	1 642
1.1.4 Pulses, primary and processed	68	83	99	91	68	71	67	56	57	46	38
1.1.5 Nuts, primary and processed	245	257	219	243	223	263	211	248	247	338	544
1.1.6 Oil bearing crops, primary and processed	504	742	1 298	1 290	1 117	1 458	1 400	1 410	1 484	1 255	1 313
1.1.7 Vegetables, primary and processed	3 801	4 166	4 036	2 752	3 995	4 294	4 401	4 737	4 797	4 737	4 739
1.1.8 Fruits, primary and processed	3 119	2 964	2 489	3 013	2 732	2 631	2 453	2 809	2 997	3 352	3 175
1.1.9 Fibres, primary and processed	61	63	70	77	68	40	48	48	48	45	57
1.1.10 Other crops, primary and processed	2 707	2 814	3 030	3 613	3 345	3 654	3 561	3 940	4 105	4 473	4 507
1.2 Crop residues	1 671	2 080	1 899	2 422	2 660	2 321	2 339	2 176	2 337	2 230	2 287
1.2.2 Other crop residues	1 671	2 080	1 899	2 422	2 660	2 321	2 339	2 176	2 337	2 230	2 287
1.3 Fodder crops incl grassland harvest	306	284	269	532	659	139	106	117	153	131	56
1.3.1 Fodder crops	306	284	269	532	659	139	106	117	153	131	56
1.3.2 Biomass harvested from grassland	0	0	0	0	0	0	0	0	0	0	0
1.5 Wood primary and processed	1 667	1 881	1 985	2 348	2 052	1 961	2 189	2 227	2 574	2 348	1 973
1.5.1 Timber, primary and processed	1 087	1 067	1 090	1 192	1 313	1 206	1 433	1 361	1 742	1 531	1 226
1.5.2 Wood fuel , primary and processed	579	814	895	1 156	739	755	756	866	831	817	748
1.6 Fish capture, primary and processed	822	828	840	685	804	866	778	870	953	966	998
1.8 Live animals, meat and meat products	7 516	7 445	8 092	8 237	8 537	9 046	9 068	8 803	9 329	9 647	10 619
1.8.1 Live animals other than in B 1.6.	672	236	347	462	397	621	651	605	687	745	892
1.8.2 Meat and meat preparations	2 500	2 553	2 781	2 588	2 907	2 959	3 105	2 907	3 022	3 144	3 410
1.8.3 Dairy products, birds eggs, and honey	2 695	2 745	2 856	2 971	3 258	3 227	2 988	3 060	3 261	3 264	3 293
1.8.4 Other products from animals	1 649	1 911	2 107	2 216	1 976	2 239	2 323	2 230	2 360	2 493	3 024
1.9 Products mainly from biomass	13 031	13 138	13 843	13 742	13 678	14 028	15 421	16 052	17 673	19 173	20 285
2 Metal ores and concentrates, processed metals	17 022	18 322	18 888	18 172	19 510	18 726	20 223	20 316	24 516	25 768	26 302
2.1 Iron ores and concentrates, iron and steel	10 629	11 338	10 620	9 136	10 979	10 694	11 243	11 601	14 206	15 742	16 880
2.2 non-ferrous metal ores, processed metals	1 786	2 017	2 242	2 172	2 262	2 322	2 150	2 398	2 455	2 368	2 851
2.2.1 Copper	285	258	282	278	324	280	275	284	290	274	397
2.2.2 Nickel	.	.	.	.	.	.	.	.	.	.	.
2.2.3 Lead	.	.	.	.	.	.	.	.	.	.	.
2.2.4 Zinc	186	187	275	264	251	215	236	323	313	262	242
2.2.5 Tin	.	.	.	.	.	.	.	.	.	.	.
2.2.6 Gold, silverand other precious metals	1	2	2	3	3	22	21	11	14	13	0
2.2.7 Aluminium	1 032	1 221	1 287	1 246	1 365	1 362	1 243	1 385	1 266	1 277	1 516
2.2.8 Uranium and thorium	.	.	.	.	.	.	.	.	.	.	.
2.2.9 Other metals	282	349	396	380	319	443	376	395	572	542	696
2.3 Products mainly from metals	4 608	4 966	6 026	6 864	6 269	5 710	6 830	6 317	7 855	7 658	6 571
3 Non metalic minerals primary and processed	31 911	34 684	34 964	35 725	39 219	39 139	39 722	39 286	38 223	39 186	42 194
3.1 Ornamental or building stone	304	310	279	545	927	709	587	459	512	602	488
3.2 Limestone, gypsum, chalk, and dolomite	31	61	63	46	66	46	50	84	69	69	.
3.3 Slate	.	.	.	.	.	.	.	.	.	.	.
3.4 Gravel and sand	9 963	10 936	9 482	9 736	12 924	13 811	15 267	13 547	12 324	11 419	13 777
3.5 Clays and kaolin	1 590	1 578	1 554	1 539	1 365	1 915	1 447	1 471	1 636	1 449	1 196
3.6 Chemical and fertilizer minerals	7 995	8 008	8 564	8 375	8 474	7 589	7 512	8 020	8 047	8 396	9 155
3.7 Salt	2 382	3 110	3 732	3 280	3 313	4 884	4 809	4 682	4 700	5 865	5 450
3.8 Other mining and quarrying products n.e.	7 871	8 691	9 141	9 728	9 862	8 107	8 075	9 006	8 792	9 384	9 491
3.9 Excavated soil, only if used	0	0	0	0	0	0	0	0	0	0	0
3.10 Products mainly from non-metalic minerals	1 775	1 989	2 149	2 476	2 287	2 078	1 974	2 017	2 144	2 002	2 636
4 Fossil energy carriers, primary and processed	116 965	118 300	120 866	118 581	125 344	130 331	131 491	131 291	137 600	138 851	147 382
4.1 Brown coal incl. oil shale and tar sands	0	0	0	0	0	0	0	0	0	0	0
4.2 Hard coal	2 368	3 537	7 998	7 306	9 562	9 741	8 568	7 954	8 370	9 340	11 634
4.3 Petroleum	56 668	59 503	59 758	57 518	59 824	59 228	57 628	60 648	62 701	61 588	66 185
4.4 Natural gas	38 971	34 018	31 074	30 482	33 146	39 312	42 009	38 547	42 643	42 437	43 160
4.5 Peat	937	993	867	892	800	970	1 022	1 128	969	879	839
4.6 Products mainly from fossil energy carriers	18 021	20 249	21 169	22 383	22 012	21 080	22 264	23 014	22 918	24 607	25 563
5 Other products	6 178	6 344	6 777	6 644	7 191	6 406	7 361	8 378	8 513	8 621	9 745
6 Waste imported for final treatment and disposal	1 728	1 903	1 883	2 011	2 229	2 605	3 719	3 974	4 607	3 118	3 936

Annex 5, Aggregated EW-MFA indicators for the Netherlands

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
	billion kg										
Domestic extraction (used) (DE)	247	242	229	231	247	241	224	211	213	214	214
Imports	248	260	270	271	287	298	292	291	305	315	328
Exports	216	223	228	226	241	246	252	254	268	272	288
Direct material input (DMI)	495	501	499	503	534	539	516	502	518	529	542
Domestic material consumption (DMC)	279	278	270	276	293	293	264	248	250	256	254