



# Material Flow Accounts (MFA) and Sustainable Use of Natural Resources in Slovenia

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# 1. Introduction

- Natural resources use and efficiency (6<sup>th</sup> Env. Action Program 2001-2010)
- Natural resources use and/or material consumption parameters (system of SD indicators)
- Integrated environmental and economic accounting system – tool for indicators framework
- The objective of the integrated environmental and economic system is to provide detailed description of the relationship environment/economy
- Describe availability of environmental and economic data based in similar accounting standards and concepts
- Data should be expressed in tonnes as material flows

## **Pilot project on MFA – Grant Agreement No**

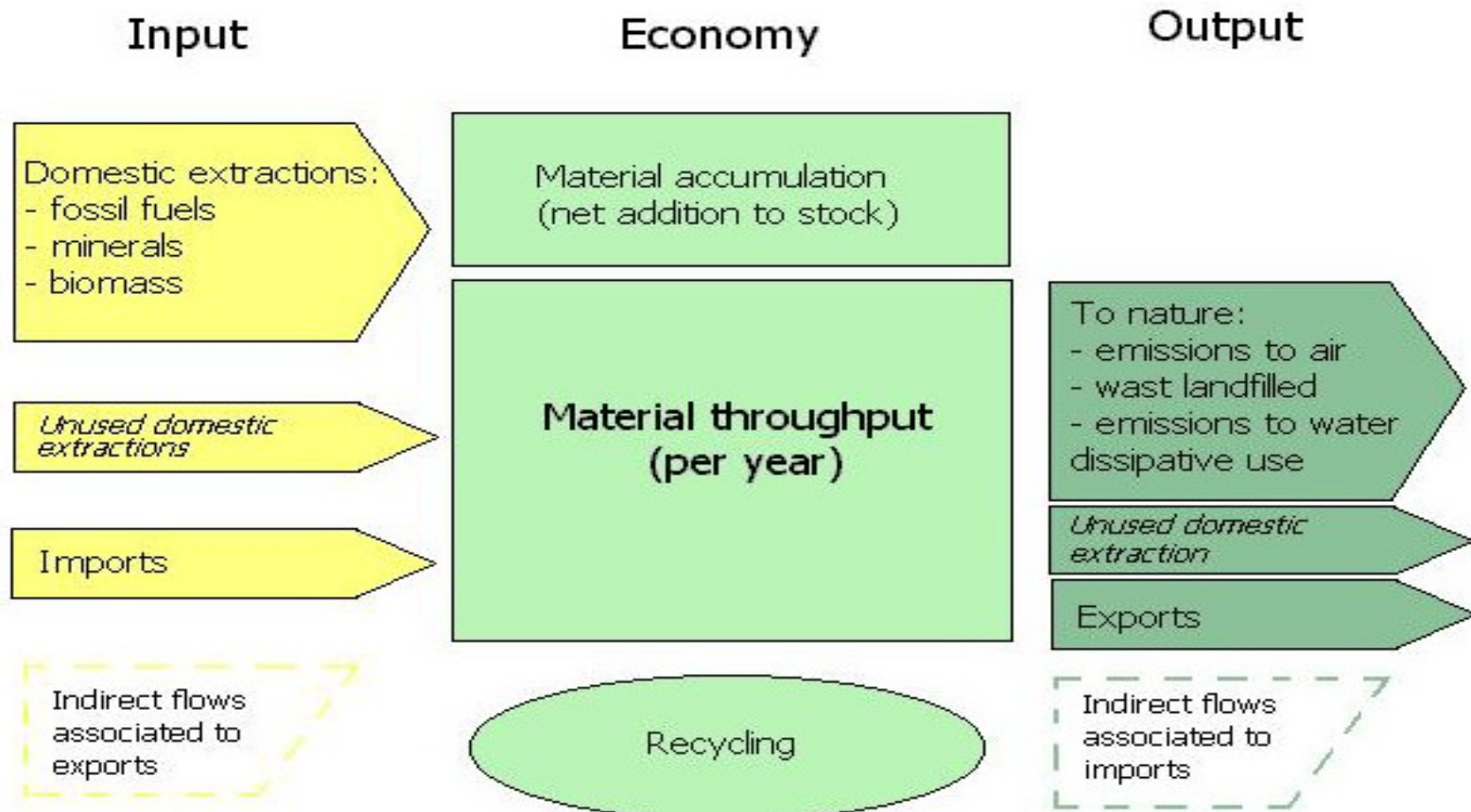
71401.2005.001 – 2005.300 – Environment statistics and accounts –  
Material flow accounts – Eurostat:

- Studying the methodology (recommendation of Eurostat, Total Material Requirement of the EU - Technical Report No 56 by Wuppertal Institute)
- Mapping all the available data sources of domestic extraction, import, export

The aim of the project:

- To develop the input side of MFA for Slovenia
- The years 2000 – 2005
- To find appropriate data sources
- To map all the available data (DE, I, E)
- Two indicators DMI (Direct Material Input) and DMC (Domestic Material Consumption)

## Economy-wide material scheme without water and air Eurostat, 2001a



# Physical material flow statistics

- Use of physical statistics in environmental accounting
- Connecting data on MF to other data in economic sectors
- Reflecting of economic sectors
- To improve and expand the information for policy formation and decision-making
- For these purposes MFA are applied in SEEA and NAMEA frameworks (modelling, input-output approaches, linking MF to information on env. quality and land use)

# Eurostat – Mission Statement

- To provide the EU and the wider global community with a high quality official statistical information service for env. statistics and env. accounts
- To support the definition, implementation and monitoring of EU env. policies



# Environmental Data Centres at Eurostat

- Natural resources
- Products
- Waste

# Annual directors meeting (DIMESA) bring the two networks together

- EEA – EIONET (Ministries and Agencies) and ESS – European Statistical System
- Improve coordination at national level for better planning (annual and multi annual work programmes)

- Technical Arrangement signed in November 2005 for 10 data Centres
- Eurostat is establishing Env. Data Centres for: natural resources, for products IPP, for waste
- Is responsible for streamlining of env. indicators and coordination of data quality issues

## Natural Resources – current situation

- Eurostat is a key actor in MFA methodology development (UN, London group, OECD)
- Data is dispersed over different institutions (difficult to access)
- Lack of commitment (on voluntary basis – comparability, completeness, timeliness)
- Decoupling indicators (env. impact) are proposed

## Data Centre “Natural Resources”

- Improve data availability, comparability and completeness of MFA with harmonised standard tables
- Identification and maintenance of existing information sources
- Maintain network of expertise, assure good communication on methodology and data
- Development work with decoupling indicators
- Follow life cycle thinking approach

## 2. Data sources in Slovenia

Statistical data of SORS, administrative sources, mathematical assumptions

Used domestic extraction:

- Fossil fuels
- Minerals
- Biomass
- Import and export

Production of (fossil fuels + minerals + biomass) = used domestic extraction

## DMI

- Direct Material Input = Used Domestic Extraction (DE) + Physical Imports

## DMC

- Domestic Material Consumption = Direct Material Input - Exports

## **Fossil fuels**

Data of energy statistics (statistical surveys):

- solid fuels
- crude oil
- petroleum products
- natural gas

The energy sector includes fuels and energy, it excludes own use of plants:

- CA activities (mining and quarrying of energy producing materials)
- DF activities (manufacturing of coke, refined petroleum products and nuclear fuel)



# Minerals

Report on Mineral Raw Materials 2005 done by the Slovenian geological Survey:

- Data of raw materials for manufacturing
- Data of raw materials for mining and quarrying
- Data of raw materials for construction

# Biomass

- Agriculture statistics (farm structure survey, agricultural balances) in accordance with the requirements of Eurostat
- Database with aggregated data on SORS's website
- Domestic production in forestry – removals by tree species (The Slovenian Forestry Service)
- Data of hunting (not yet included, only number of animals available)

# Import and Export

- External trade statistics (customs declaration reported by the custom Administration of RS monthly)

After the accession to the EU:

- Intrastat (relating to the trading of goods between MS)
- Extrastat (relating to the trading of goods with non-MS – observation unit is export and import shipment of goods)

## External trade statistics covers

- General trade system (statistical territory coincides with its economic territory)
- Special trade system (statistical territory comprises only a particular part of the economic territory)

In Slovenia we monitor external trade statistics according to the special trade system – beside regular import and export transactions also inward and outward processing and processing carried out in customs free trade zones are included. Temporary imports/exports of goods are not included.

### 3. Table structure for the DMI and DMC of Slovenia

Domestic extraction DE (used):

- Fossil fuels (domestic lignite, domestic brown coal, crude oil, natural gas)
- Minerals (industrial minerals, construction minerals)
- Biomass (from agriculture, from forestry, from fishing, from hunting)

# Constructive minerals

- Brick clay
- Limestone
- Tonalit
- Other natural stones
- Natural stones - total
- Marl, limestone for cement
- Dolomite
- Silicates
- Technical minerals – total
- Sand and gravel

# Industrial minerals

- Bentonit
- Calcite
- Flint stone
- Kaolin/cornish stone
- Chalk
- Tuff-pozzuolana
- Chert
- Ceramic clay

# Biomass from agriculture

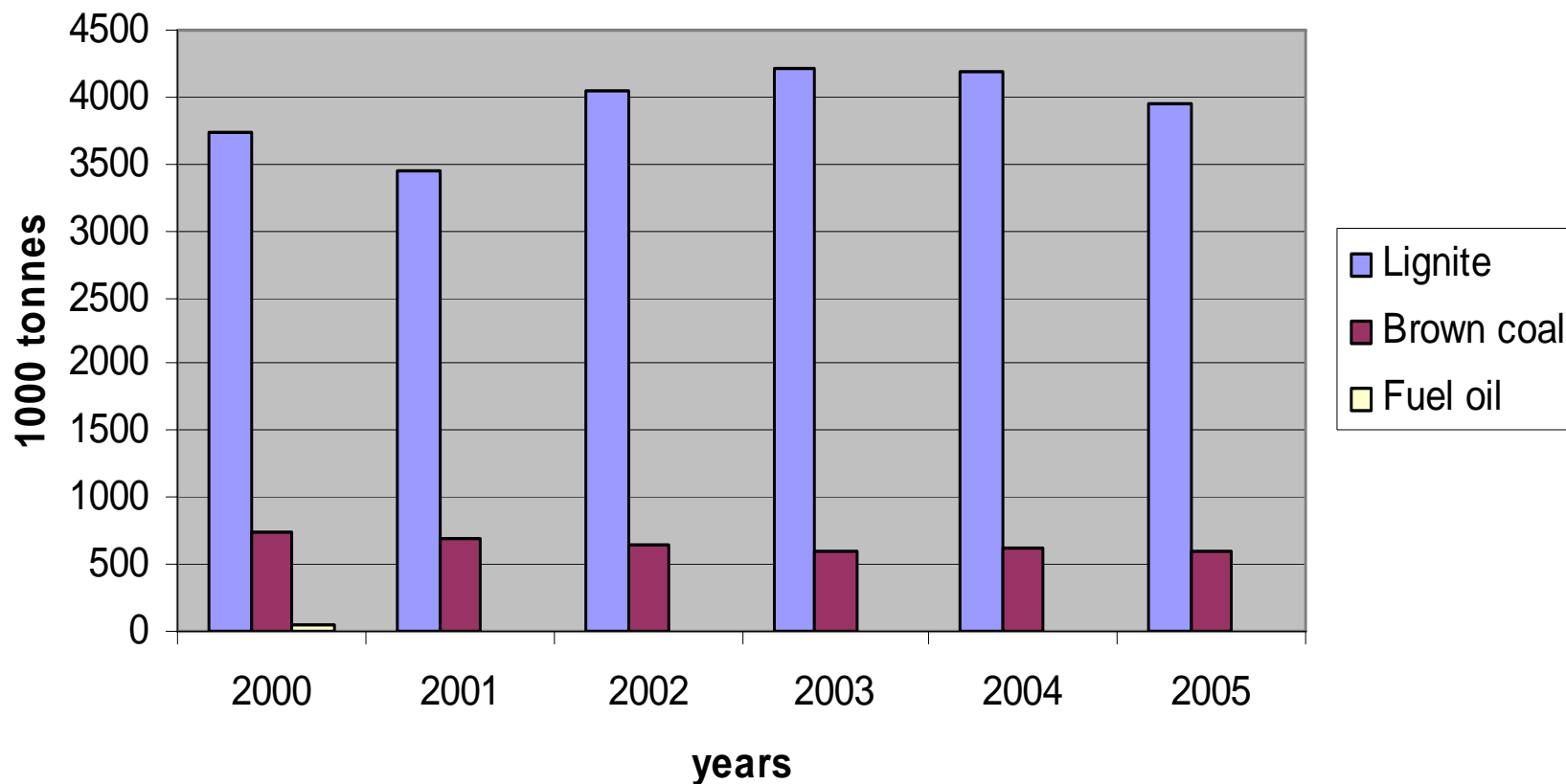
- Reported by harvest statistics (cereals, roots and tubers...)
- Other fodder and harvest inputs (hay from lasting grassland, grass and grass mixtures...)
- Biomass from forestry (conifers roundwood, non-conifers roundwood)
- Biomass from fishing (marine fishing, aquaculture, angling)
- Biomass from hunting



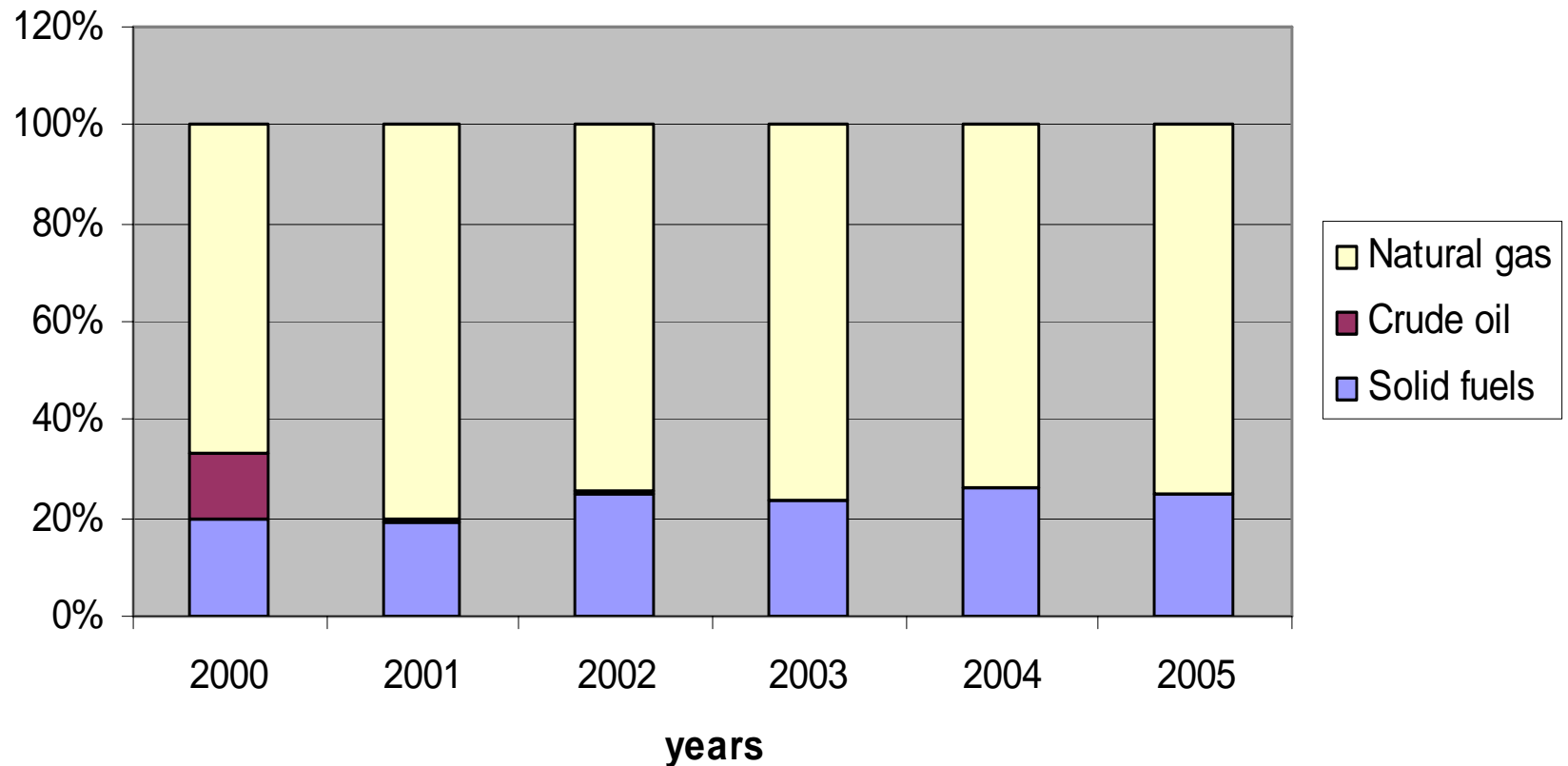
## 4. Results

- Data for the period 2000 – 2005
- DMI, DMC

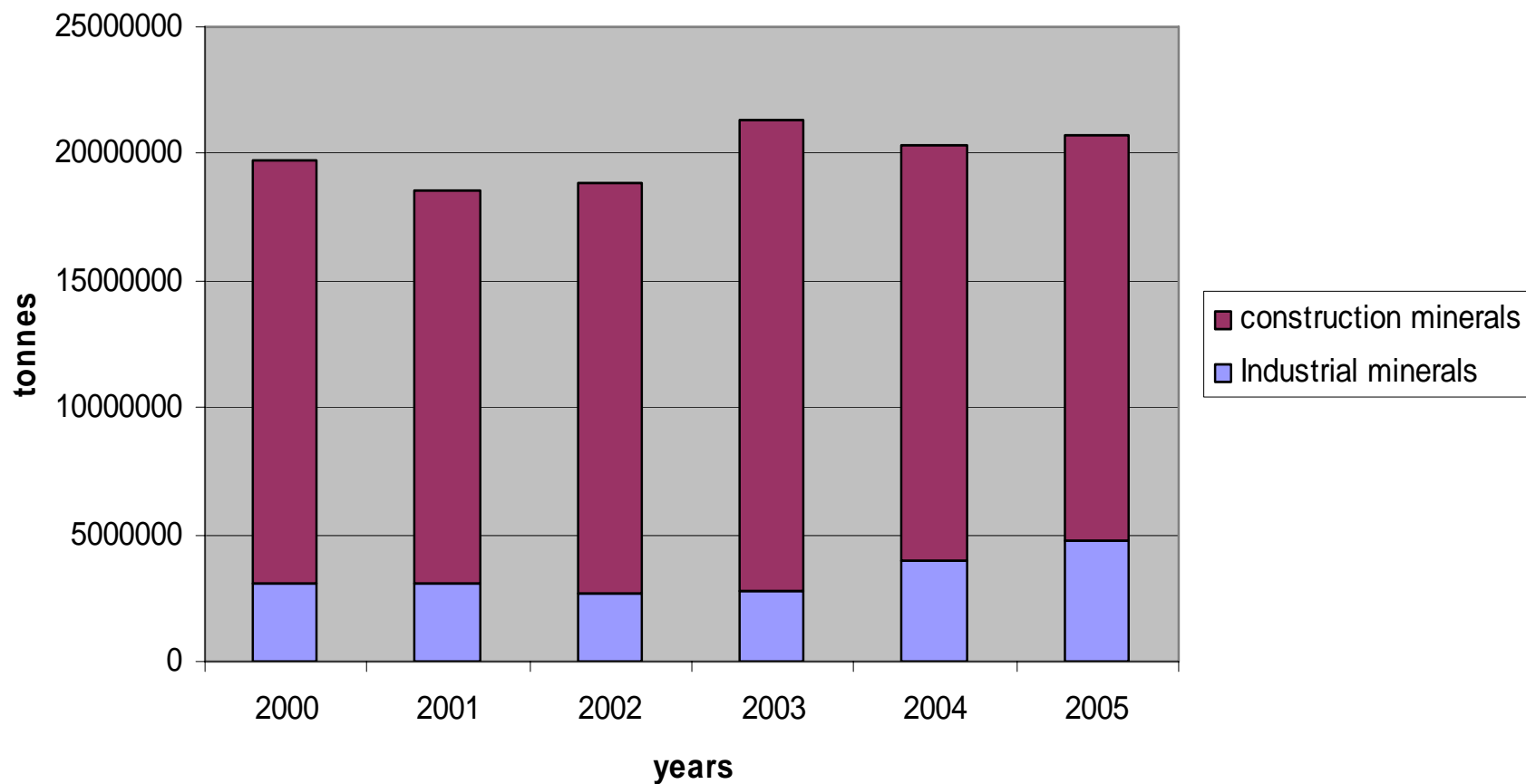
## Domestic extraction of solid fuels and fuel oil



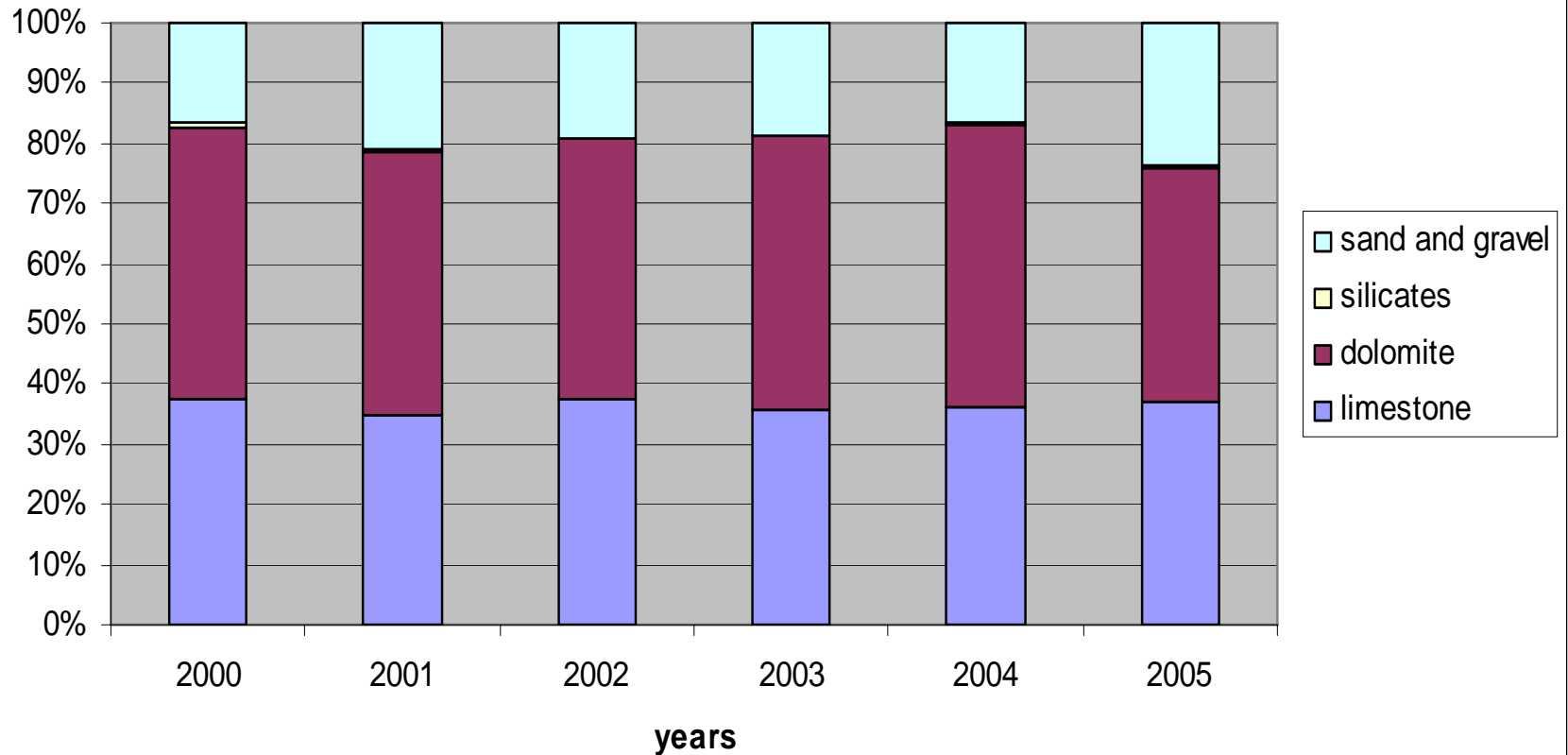
## Composition of imported fossil fuels, Slovenia, 2000 - 2005



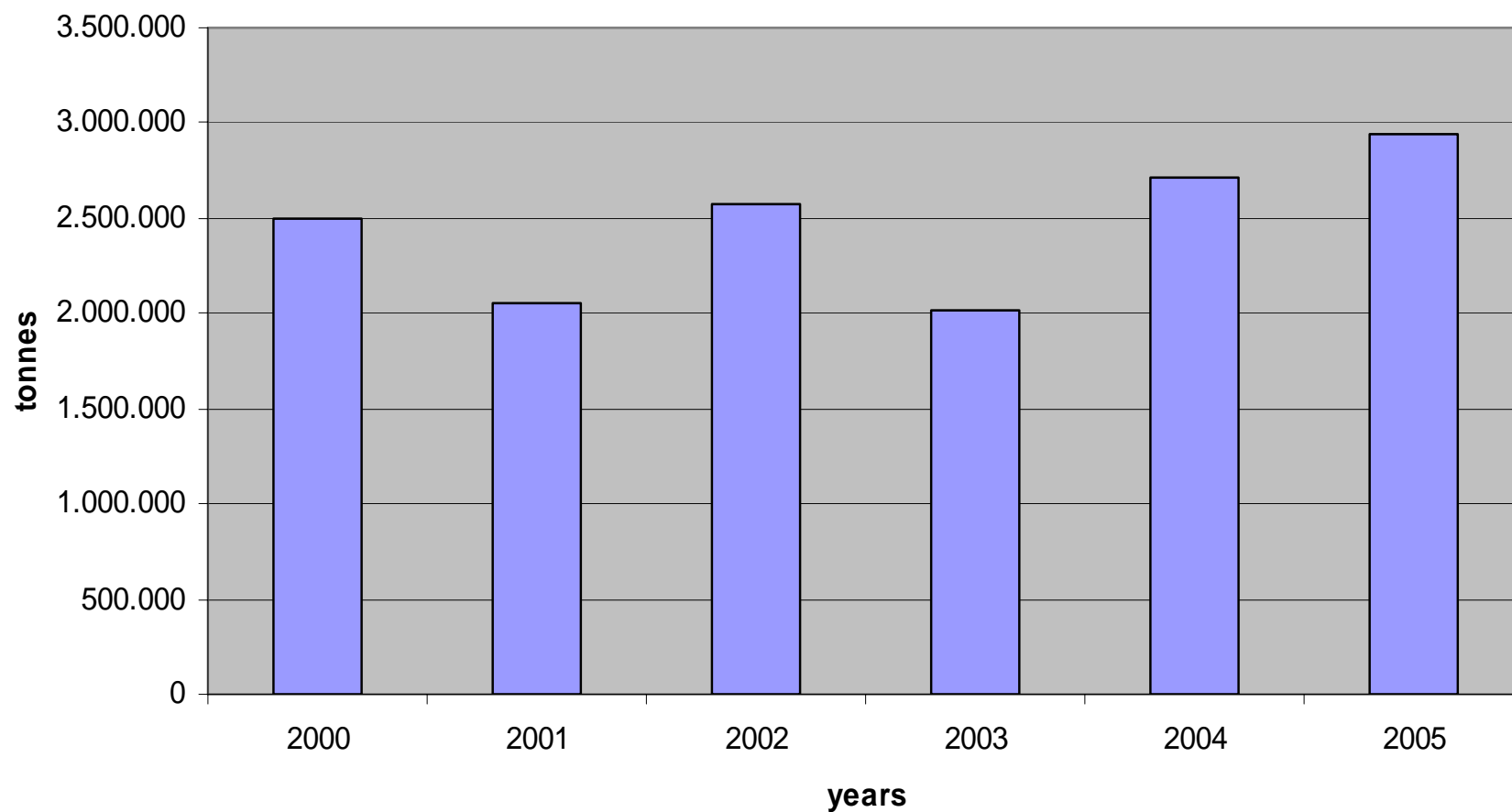
## Domestic extraction of minerals, Slovenia, 2000 - 2005

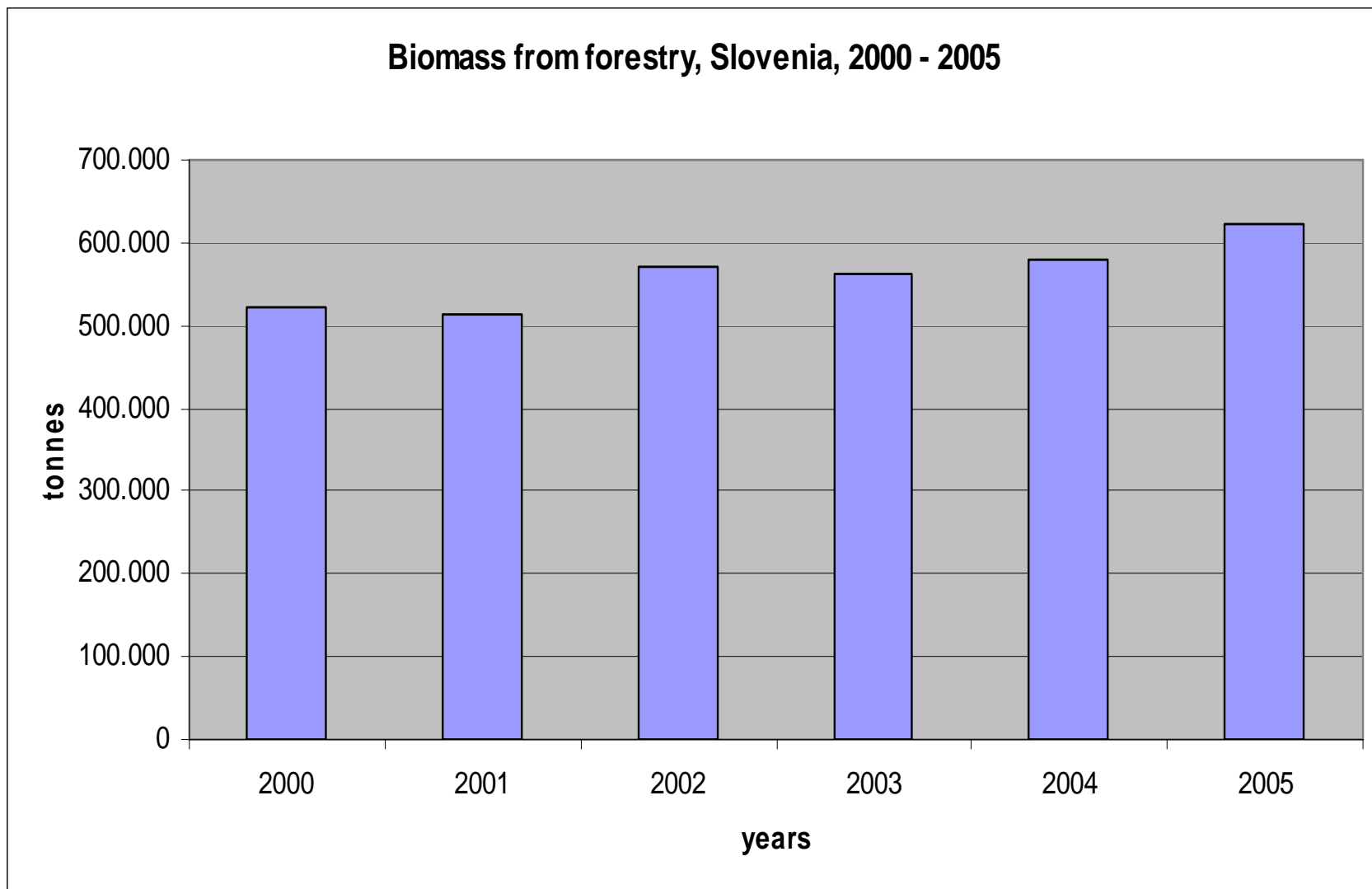


## Composition of domestically extracted construction minerals, Slovenia, 2000 - 2005

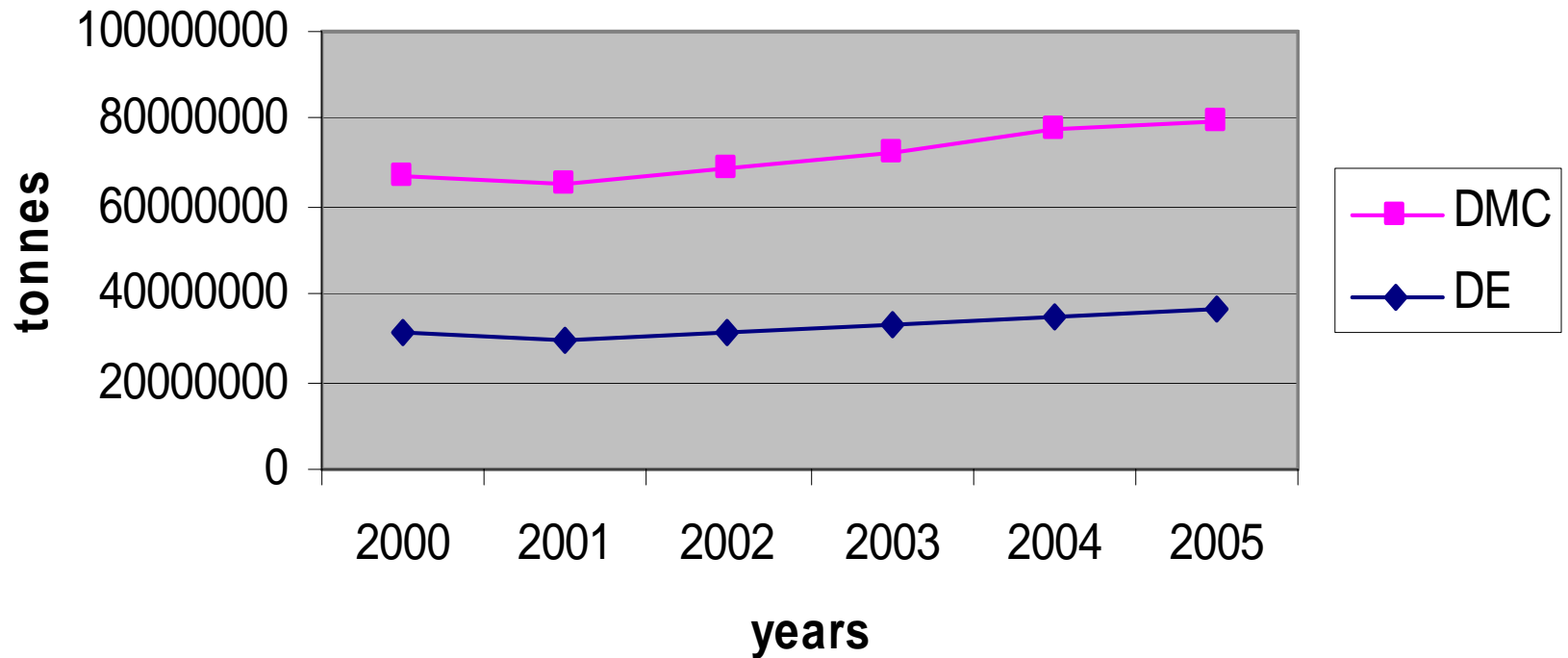


## Biomass from agriculture, Slovenia, 2000 - 2005



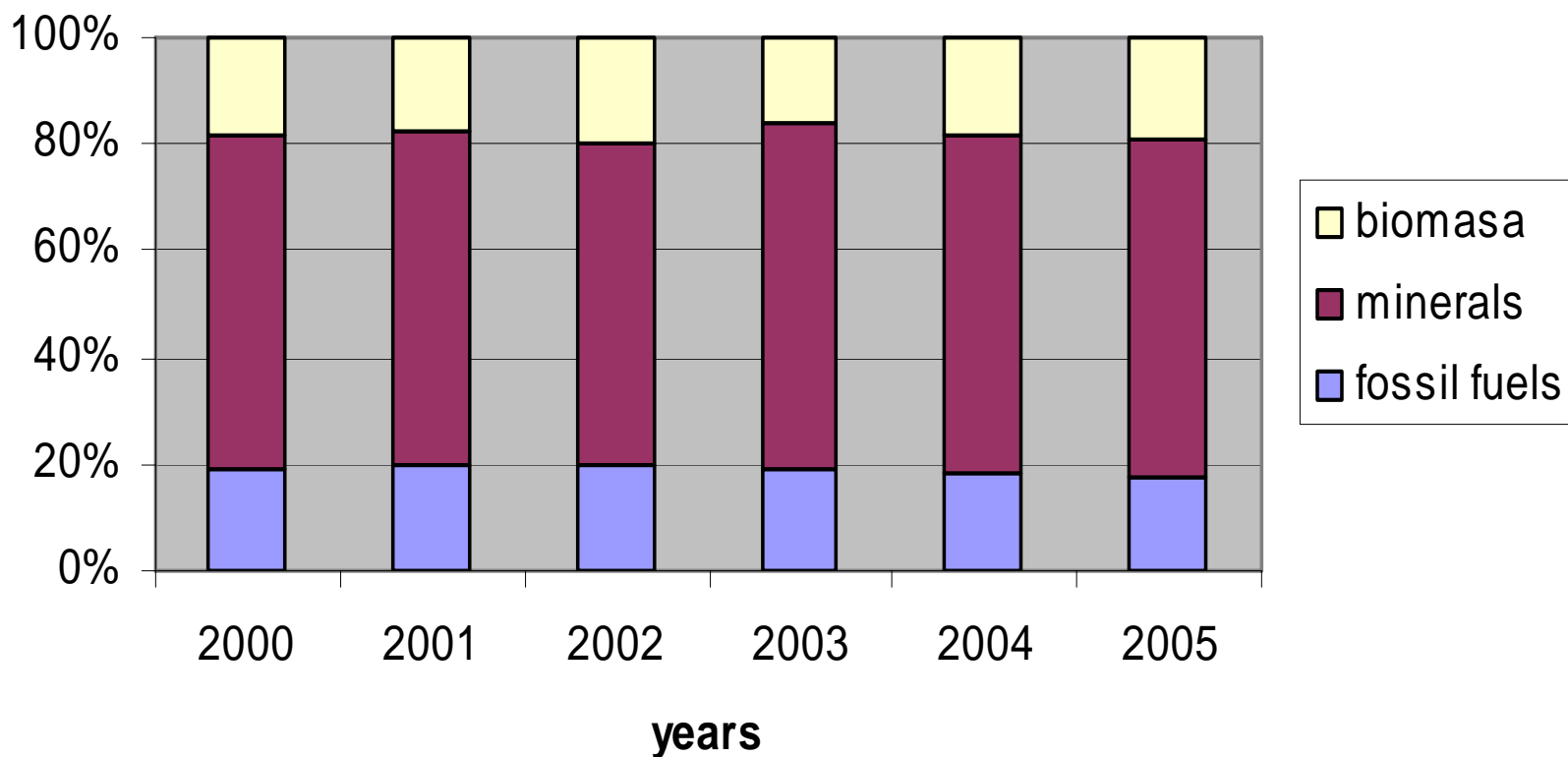


## Development of DE and DMC, Slovenia, 2000 - 2005

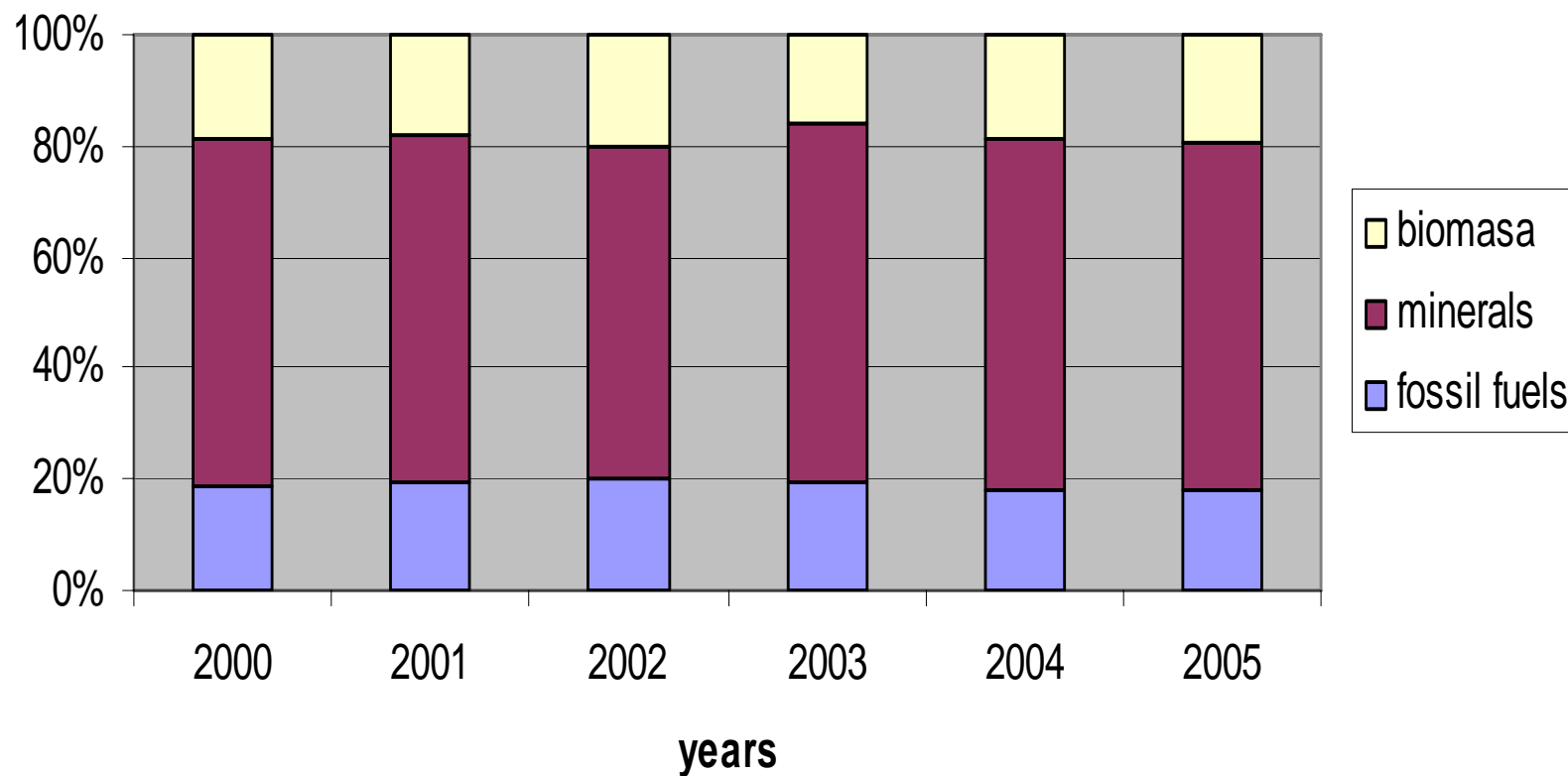




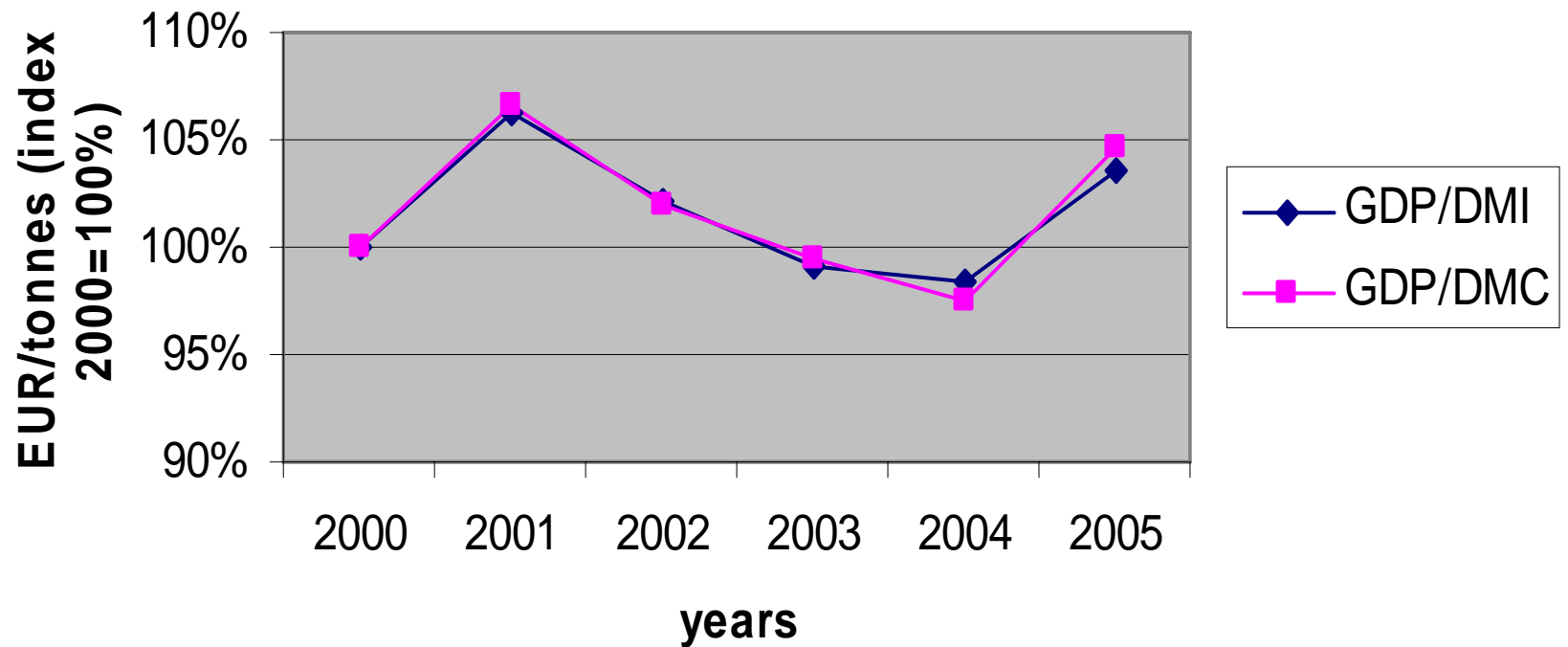
## Composition of DMI



## Composition of DMC, Slovenia, 2000 - 2005



## Different resources productivities, Slovenia, 2000 - 2005



## 5. Conclusions

- Data sources (Statistical Office, Hunting Association, Slovenian Geological Survey, FAO, Eurostat)
- Availability of data was not 100 % sufficient, mathematical approximation was made
- No meeting or study visit was possible in 2006
- Future work – extended time series 1992 – 2006, to calculate the TMR (total material requirements with hidden and indirect flows) indicator
- Development of comparability of MFA indicators at international level
- Participation in regional conference, workshop, meeting, study visit, bilateral coordination