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Economic indicators for the Dutch

# Environmental Goods and Services Sector

## Time series data for 1995-2009

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**April 2012**

Remark: The views expressed in this report are those of the author and do not necessarily reflect the opinion of Statistics Netherlands. The author would like to thank Sjoerd Schenau for useful comments and suggestions.

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Economic indicators for the Dutch

# Environmental Goods and Services Sector

# Chapter 1 Introduction

In order to reduce environmental pressure, resource depletion and resource deterioration, environmental measures are becoming more and more stringent. The economic consequences of environmental measures and environmental concerns are of great interest to policymakers. They approach these topics from two perspectives. On one hand, the interest focuses on the financial burden of the polluting sectors. These sectors have to invest in pollution abatement control in order to comply with environmental regulation. On the other hand, policy makers want information on enterprises that produce goods and services that measure, prevent, limit, minimise or correct environmental damage, resource depletion and resource deterioration. All these enterprises belong to the so called Environmental Goods and Services Sector (EGSS). These two approaches are generally referred to as the *demand and supply side* of the 'environmental market'.

Statistics Netherlands already collects extensive (but not complete) data on environmental protection expenditure from the perspective of the *demand side*. However, the *supply side* of the EGSS did lack in overall data coverage for a long time. Therefore data regarding employment, production and value added, and data on the structure and the competitiveness of the EGSS are needed now. In this way, the economic significance of the sector can be quantified. This study summarizes the compilation of data for the EGSS accounts, by analysing employment, value added and production of environmental protection activities and resource management activities.

In 2006, Statistics Netherlands carried out a pilot study on the EGSS (CBS, 2006). In this particular pilot study Statistics Netherlands focused mainly on activities belonging to the Environmental Protection group. In 2008, in another project (CBS, 2008a), Statistics Netherlands explored the activities that belong to the Resource Management group, which is also an important section of the Environmental Goods and Services sector. Statistics Netherlands, commissioned by the European Community, continued the research on the EGSS in 2009. The 2009 project bundles the two former studies and makes use of the methods and concepts developed in these two former studies. The goal of the 2009 assignment was to present consistent and over time comparable data for all activities belonging to the Dutch EGSS in the period 1995-2007.

This report is once more an update of the 2009 project. Data is available for the years 1995 until 2009 for the economic variables employment, value added and production. Data presented in this paper can also be downloaded via the website of Statistics Netherlands (statline)

This paper is set up as follows. In chapter two, the definitions and the general methods used are shortly discussed. In chapter three, the position of the Dutch Environmental Goods and Services Sector in the Dutch economy is presented. In chapter 4, the different activities of the Dutch EGSS are discussed in more detail. Scope issues and methods to compile figures are discussed in detail per activity in chapter 4. Chapter 5 will conclude and presents some recommendations for future work.

# Chapter 2 Definitions and methods

According to the definition used in the handbook on the EGSS (European Commission-Eurostat, 2009) the Environmental Goods and Services Sector consists of a heterogeneous set of producers of technologies, goods and services that:

- Measure, control, restore, prevent, treat, minimise, research and sensitise environmental damages to air, water and soil as well as problems related to waste, noise, biodiversity and landscapes. This includes 'cleaner' technologies, goods and services that prevent or minimise pollution.
- Measure, control, restore, prevent, minimise, research and sensitise resource depletion. This results mainly in resource-efficient technologies, goods and services that minimise the use of natural resources.

Following the nomenclature used in the SERIEE and SEEA, environmental technologies and products comprise environmental specific services, connected products, adapted goods, end-of-pipe technologies and integrated technologies. Following the SERIEE, the SEEA and the Environmental Industry OECD/Eurostat Manual (OECD, 1999), these environmental technologies and products can be classified in two main categories:

- Environmental Protection (EP), which includes technologies and products of both a preventive or remedial nature such as for the prevention, reduction, elimination and treatment of air emissions, waste and wastewater, soil and groundwater contamination, noise and vibration as well as radiation, the prevention, reduction and elimination of soil erosion and salinity as well as other kinds of degradation, the preservation of biodiversity and landscapes as well as the monitoring and control of the quality of the environmental media and waste.
- Resource Management (RM), which comprises technologies and products to manage and/or conserve the stock of natural resources against depletion phenomena including both preventive and restoration activities as well as the monitoring and control of the levels and uses of natural resource stocks.

The Environmental Protection group and the Resource Management group consist of different environmental domains. These are summarized in table 2.1.

| | | |
|---|---|---|
| **Environmental protection group** | *CEPA 1* | Protection of ambient air and climate |
| | *CEPA 2* | Wastewater management |
| | *CEPA 3* | Waste management |
| | *CEPA 4* | Protection and remediation of soil, groundwater and surface water |
| | *CEPA 5* | Noise and vibration abatement |
| | *CEPA 6* | Protection of biodiversity and landscape |
| | *CEPA 7* | Protection against radiation |
| | *CEPA 8* | Research and development |
| | *CEPA 9* | Other environmental protection activities |
| **Resource management group** | *CReMA 10* | Management of waters |
| | *CReMA 11* | Management of forest resource |
| | | 11 A: Management of forest areas |
| | | 11 B: Minimisation of the intake of forest resources |
| | *CReMA 12* | Management of wild flora and fauna |
| | *CReMA 13* | Management of energy resources |
| | | 13 A: Production of energy from renewable sources |
| | | 13 B: Heat/energy saving and management |
| | | 13 C: Minimisation of the intake of fossil resources as raw material for uses other than energy production |
| | *CReMA 14* | Management of minerals |
| | *CReMA 15* | Research and development |
| | *CReMA 16* | Other natural resource management activities |

*Table 2.1- Environmental domains in the Environmental Protection Group and Resource Management Group*

The EGSS consists of primary, secondary and ancillary activities (see for more information: Data Collection Handbook on Environmental Goods and Services Sector). In this study the primary and secondary activities are put together and the ancillary activities are presented as a separate item.

Starting point in collecting and compiling economic statistics for the EGSS is information on producers and suppliers of environmental related goods and services. From several statistical sources both inside and outside Statistics Netherlands information has been retrieved, for example the national accounts, environmental statistics, energy statistics, PRODCOM statistics, the business register, branch associations, reports from government institutions, etcetera. This project makes use of the methodologies and concepts developed in the two former studies of Statistics Netherlands on the EGSS (CBS, 2006 and CBS, 2008a). These methodologies and concepts are shortly discussed per activity in chapter four.

# Chapter 3 Results for the EGSS

### Stagnation in EGSS due to financial and economic crisis

The economy of the EGSS has come to a halt due to the financial crisis and the economic recession in 2009. Value added in current prices decreased by 1.9 percent in 2009 compared to 2008[1]. Production in current prices has decreased too. Employment, on the other hand, has increased with two percent.

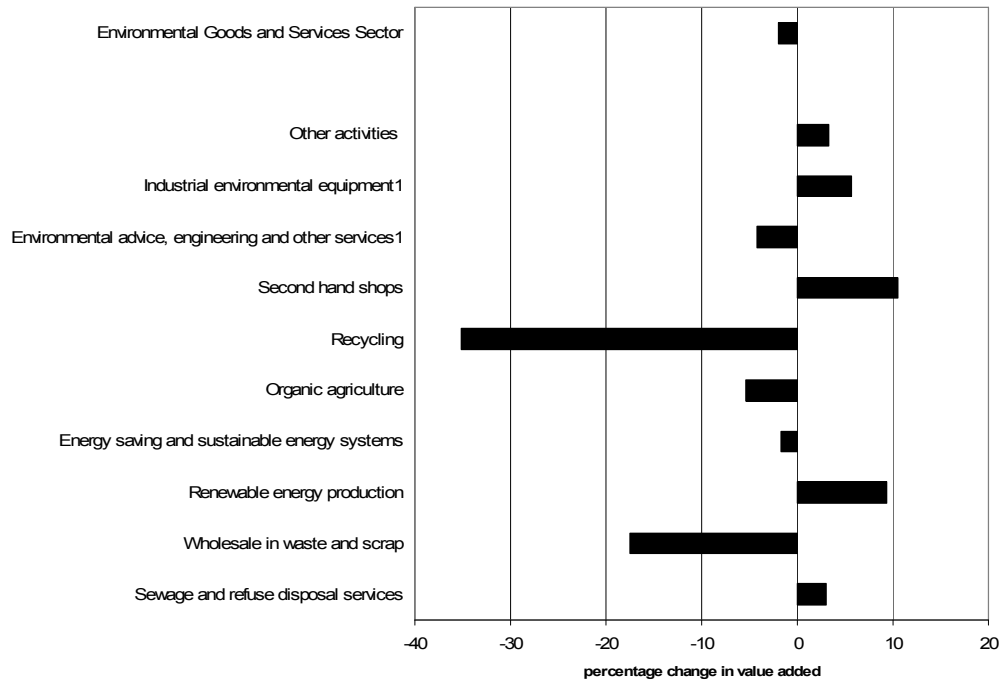


*Figure 3.1- Change in value added for different activities in EGSS, 2008-2009*

Looking in more detail at the EGSS (see figure 3.1) one can see that recycling has been hit very hard in 2009. Value added decreased by 35 percent. The recycling industry received less waste in 2009 than in 2008, so this industry was not able to recycle as much waste as in previous years. Less supply of waste by other industries led to a decrease in recycling activity.

Value added also decreased in the industry 'wholesale in waste and scrap'. Consumers and companies spent less money on durable goods. Especially big purchases, like new and second hand cars decreased in 2009. Consumers decided to postpone these expenditures. Wholesale in waste and scrap sold fewer second hand cars and traded less in waste metals both because of a lack of supply of materials and because of a lack of demand. Their role as an intermediate between sellers and buyers became under pressure due to the difficult market circumstances. Environmental advice, engineering and other services[2] also showed a slight decrease in value added in 2009 compared to 2008. Although they increased production slightly, intermediate consumption increased more, so value added

[1] One should be careful in drawing too strong conclusions from data on developments in economic variables in 2008-2009. Due to the set up of a new system for production statistics, first implemented for the reporting year 2009, the economic figures presented for certain activities in 2009 may not be completely comparable with the corresponding 2008 values. Complete comparability can therefore not been guaranteed.

[2] Not related to energy saving and sustainable energy systems

decreased. Value added of organic agriculture also decreased in 2009[3]. Growth in the production area of organic agriculture had not been spectacular over the last previous years and this was also the case in 2009 (plus 2.7 percent). Price developments in agriculture in 2009 were very unfavourable for farmers in general. This is one of the reasons why value added became under pressure in 2009. Organic products are also imported from foreign countries: in between 250-300 million euro in 2007(LEI, 2009). Imports of organic products have not been taken into account.

The activities 'sewage and refusal disposal services' and 'renewable energy production' grew in 2009. Sewage and refusal disposal services are not that much influenced by economic fluctuations. Waste and wastewater produced by households and industries still needs to be disposed and cleaned. More renewable energy was produced in 2009 compared to 2008, especially due to more combustion of biomass in energy facilities, more wind energy production and more waste incineration. Second hand shops were able to increase their value added in 2009. Eye catching is the fact that production of second hand shops, excluding sales of antiques, increased in 2009 compared to 2008. Second hand retail trade of commodities increased, possibly due to the crisis where households have become more economical and spent more money on second hand goods and less on new ones (substitution effect).

**Many activities contribute to value added EGSS**

The EGSS contributed 13.2 billion euro to the Dutch gross domestic product and 137,000full-time equivalents (FTE) to employment in 2009. Total production value equalled 32.4 billion euro (see figure 6.4.2).

| | Production | | Value added | | Employment | |
|---|---|---|---|---|---|---|
| | 1995 | 2009 | 1995 | 2009 | 1995 | 2009 |
| ***Activities*** | *billion euro* | | | | *FTE (x1000)* | |
| Sewage and refuse disposal services | 3.8 | 9.2 | 1.5 | 3.4 | 20.7 | 28.0 |
| Wholesale in waste and scrap | 1.5 | 2.3 | 1.2 | 2.0 | 4.8 | 4.7 |
| Environmental related inspection and control | 0.0 | 0.2 | 0.0 | 0.1 | 0.1 | 2.4 |
| Government governance related to the environment | 0.7 | 1.6 | 0.4 | 0.7 | 6.9 | 8.1 |
| Organisations and associations on the environment | 0.0 | 0.2 | 0.0 | 0.1 | 0.9 | 1.9 |
| Internal environmental activities at companies | 1.3 | 1.4 | 0.6 | 0.6 | 10.5 | 5.1 |
| Renewable energy production | 0.1 | 1.0 | 0.1 | 0.6 | 0.4 | 2.3 |
| Insulation activities[1] | 3.2 | 5.0 | 1.3 | 2.1 | 27.6 | 32.6 |
| Organic agriculture | 0.1 | 0.9 | 0.1 | 0.3 | 0.9 | 2.3 |
| Recycling | 0.3 | 0.9 | 0.1 | 0.2 | 1.4 | 2.9 |
| Second hand shops | 0.1 | 0.3 | 0.0 | 0.1 | 2.1 | 5.1 |
| Water quantity control by waterboards | 0.5 | 1.2 | 0.3 | 0.6 | 3.6 | 3.8 |
| Energy saving and sustainable energy systems | 1.7 | 3.8 | 0.5 | 1.1 | 8.2 | 15.4 |
| Environmental advice, engineering and other services[2] | 0.6 | 2.2 | 0.3 | 0.9 | 5.5 | 12.5 |
| Industrial environmental equipment[2] | 0.9 | 1.3 | 0.3 | 0.4 | 4.2 | 6.3 |
| Environmental technical construction[2] | 0.3 | 0.9 | 0.1 | 0.2 | 1.4 | 3.2 |
| Environmental related education | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.4 |
| **Total Environmental Goods and Services Sector** | 15.1 | 32.4 | 6.6 | 13.2 | 99.9 | 137.0 |

[1] including installation of heating, ventilation, and air conditioning systems
[2] not related to energy saving and sustainable energy systems

*Figure 3.2-The Environmental Goods and Services Sector in the Netherlands, 2009*

The Dutch EGSS consists of companies and institutions participating in various activities. Traditional environmental activities like sewage and refuse disposal services play a significant role. About 25 percent of all value added of the EGSS is generated in this industry (see figure 3.2). Wholesale trade in waste and scrap is also an important player in the sector. The remainder of total value added is generated by a variety of different activities. For example, recycling companies contribute 1 percent to

[3] It is assumed that price developments in production and intermediate consumption of total agriculture are representative for organic agriculture.

total value added of the EGSS just like second hand shops selling used goods. Environmental activities carried out by government bodies still play an important role. Activities related to water quantity management and other management tasks of the government account for approximately 10 percent of total value added.

An important component of the EGSS is the sustainable energy sector. The sustainable energy sector – which cuts across all industries of the Standard Industrial Classification (NACE) – consists of companies and institutions that physically produce renewable energy, as well as companies active in the value chains that come before it. Apart from renewable energy, the sustainable energy sector also includes companies and institutions that focus on energy saving activities. The sustainable energy sector in 2009 was responsible for 13 percent of total value added created in the EGSS. Producers active in energy saving and sustainable energy systems (pre-exploitation phase) were responsible for 8 percent of total value added and producers of renewable energy (exploitation phase) were responsible for 5 percent of total value added. In 2011 an in depth study has been conducted on the sustainable energy sector. See box 1 for more information.

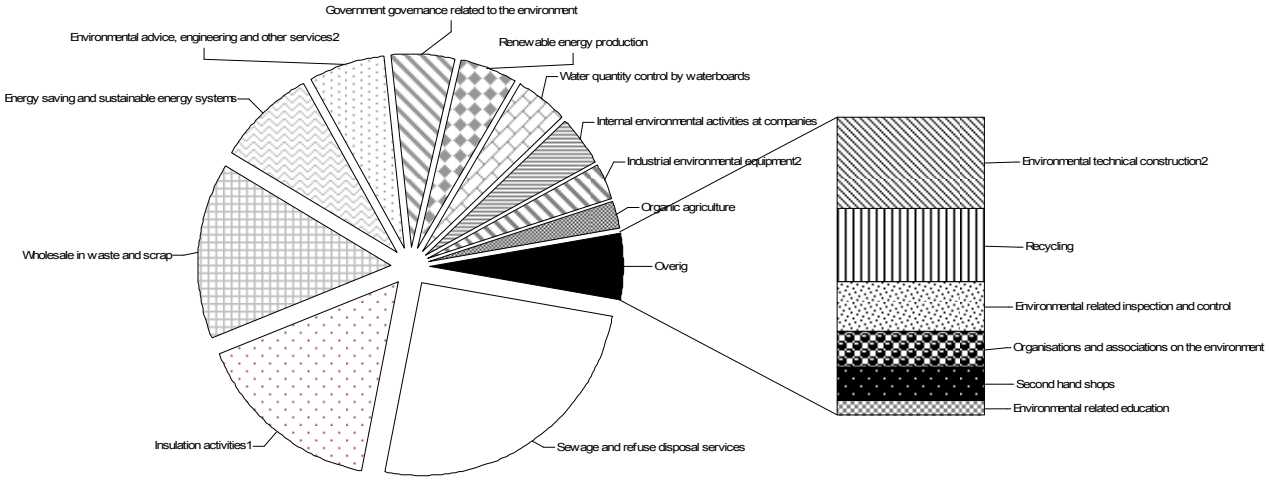


*Figure 3.3-Distribution of value added EGSS over different activities, 2009*

**Box 1- a study on the sustainable energy sector**

On 10 June 2011 the study 'Economische radar duurzame energiesector' (in English: Economic radar for the sustainable energy sector) was published at the website of Statistics Netherlands (in Dutch). This study was commissioned by the Ministry of Economic Affairs, Agriculture and Innovation. The sustainable energy sector is part of the environmental goods and service sector, and consists of all companies and institutions that physically produce renewable energy (exploitation phase) as well as companies active in the value chains that come before it (pre-exploitation phase). Apart from renewable energy, the sustainable energy sector also includes companies and institutions that focus on energy saving activities.

There is a lot of interest for this particular sector because energy supply and consumption have been changing in recent years. In the near future, the demand and supply of sustainable energy will become increasingly important. Secondly, newly developed energy systems have little or no dependence on fossil fuels. Thirdly, sustainable energy contributes to securing supplies, diversification of energy supply, the reduction of greenhouse gas emissions and the creation of green jobs.

Strength of the methods used is that these are based on data already available at Statistics Netherlands in combination with expert knowledge from outside Statistics Netherlands. Therefore no additional administrative burden on business proceeding from this study. In addition, the concepts used are consistent with those used in the national accounts. This

means that figures for the sustainable energy sector are comparable with the key macroeconomic indicators such as GDP and total employment.

Aim of this study was to set up a consistent economic monitoring system for the sustainable energy sector, benchmarking one year (2008) and to provide recommendations on key issues for the further development of the economic radar. These key issues include timely reactions to current issues with figures of other knowledge institutes and/or the associations, monitoring international investments, analysing ownership constructions and map developments in the use of fossil fuels in the economy.

This study describes the key indicators that were developed on the basis of the data available at Statistics Netherlands. Economic indicators were determined for various parts of the sustainable energy sector: value added, production, employment, exports, imports, investments and innovation. The sustainable energy sector is broken down into 16 product profiles and 7 process profiles. The various product profiles are 'solar PV', 'solar CSP', 'solar thermal energy', 'bio gas', 'bio mass (solid) & waste', 'bio fuels', 'bio refining', 'wind on land', 'wind at sea', 'heat & geo thermal energy', 'energy from water', 'energy saving', 'electric transport', 'smart grids', 'hydrogen technology' and 'CO2 capture and storage'. The process profiles are 'R&D', 'consultancy', 'transport', 'preparation/raw material production', 'supply, assembly and construction', 'production of energy carriers', 'installation and maintenance'. In this study we determined economic figures for these different profiles.

The physical data about the production of renewable energy (Protocol monitoring renewable energy[4]) and the data derived from the 'Economic radar for the sustainable energy sector' can be very valuable in supplementing each other.

A few results of the study:

**Indicators for the sustainable energy sector**

box 1. Indicators for the sustainable energy sector, 2008

| | |
|---|---|
| *Economic key indicators (rounded)* | |
| Production (million euro | 5 160 |
| Value added (million euro) | 1 710 |
| Employment (labour volume in FTEs) | 17 300 |
| *Innovation aspects pre-exploitation phase* | |
| R&D as a percentage of production (%) | 4% |
| Percentage innovators (%) | 54% |
| *International trade* | |
| exports (million euro) | 1 806 |
| imports (million euro) | 2 232 |
| *Investments pre-exploitation phase (million euro* | 234 |

Share of sustainable energy sector in Dutch GDP was about 0.32 percent in 2008. Its share in total production is 0.45 percent and in total employment 0.25 percent. This is because the sustainable energy sector is relatively capital intensive. The sustainable energy sector employs relatively few people who each contribute quite a lot to the value added and production in the Netherlands with the help of the capital invested. Both production and value added per unit of labour volume in the sustainable energy sector exceed that of the economy as a whole.

Total export of goods by companies in the sustainable energy sector had a value of 1,806 million euro in 2008. The products 'solar PV' and 'energy saving' are mostly exported by wholesale and manufacturing. Bio fuels are mainly exported by wholesale. The total import of the sustainable energy sector is 2,232 million euro. The imports consist mainly of bio fuels from the rest of the world. A part of these bio fuels and biomass is sold on the domestic market, but an even larger part is re-exported. Also the product profile wind on land has a large share of imports, mainly due to the import of turbines from Germany and Denmark. Exploitation subsidies aiming to increase the share of sustainable energy in 2020 stimulate these imports. The sector as a whole had a negative balance of trade in 2008.

Approximately 54 percent of the large and medium-sized companies in the pre-exploitation phase of the sustainable energy sector, with 10 or more employees, indicated in the period 2006-2008 that they introduced new products or services (product innovation) or started using new methods (process innovation). About 30 percent of the companies indicated that they applied for a patent in the period 2006-2008. Spending on in-house R&D, by large and medium-sized companies in the pre-exploitation phase, averaged 3.9 percent of the production value. In comparison, spending on in-house R&D in the total Dutch economy averages about 1 percent.

The Rijnmond region houses most companies in the pre-exploitation phase. The proximity of the port of Rotterdam undoubtedly plays a major role especially for wholesale in the sector. The value added of a company in Rijnmond is on

[4] This protocol has been set-up in order to determine the share of renewable energy production in the Netherlands. The protocol prescribes the definition of renewable energy. Statistics Netherlands uses this protocol in order to compile statistics on renewable energy production.

average relatively small. There also seems to be a cluster of companies in the south east of the province Noord- Brabant belonging to the sustainable energy sector. The traditionally strong presence of electrical engineering and the technical university play a key role in this. There are also many companies close to the technical universities of Delft and Twente. Furthermore, the province of Limburg houses many sustainable energy companies. These companies play a large role in the total Dutch value added. In Limburg the pre-exploitation phase of the sustainable energy sector is best represented in the regional economy (mainly solar energy). About half a percent (measured in value added) of the economy is formed by these companies.

*The study can be found on the website by clicking on the links.*

*Dutch report:http://www.cbs.nl/NR/rdonlyres/4B1C4BCB-CE97-482B-A8EB-7B9EA402E3B4/0/2011economischeradarduurzameenergiesector.pdf*

*English report (only summary): http://www.cbs.nl/NR/rdonlyres/01A2777A-BAA8-47A6-B0B9-AAC8A7A155AA/0/2011managementsummaryeconomicradarsustainableenergysector.pdf*

**Relative contribution of EGSS to GDP is quite stable over time**

With a contribution of 13.2 billion euro to the gross domestic product (GDP) in 2009, the Dutch EGSS accounted for 2.32 percent of total GDP. In 2008 this share was equal to 2.27 percent (see figure 3.4). The decline in value added of the EGSS was smaller than the decline in GDP of the total economy, so relatively the EGSS has become more important for the Dutch economy. Generally speaking, this share remained more or less stable in the period 1995-2009, although one could discern an upward trend from 2005 onwards. With regard to employment, in terms of full-time equivalents, the EGSS had a share of 2.03 percent in total employment in the Netherlands in 2009. The relative contribution of the EGSS to total employment has increased quite convincingly over time.

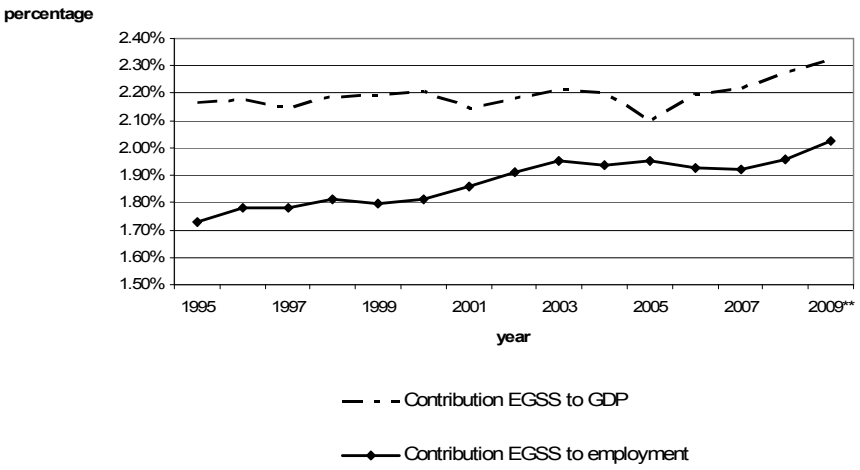


*Figure 3.4-Contribution of EGSS to GDP and employment, time series (1995-2009)*

# Chapter 4 Specification of EGSS activities

In chapter four, all Dutch activities in the scope of the definition of the Environmental Goods and Services Sector are shortly introduced and discussed. For every activity figures on employment, value added and production are presented for the years 1995 until 2009.

## Paragraph 4.1 Private environmental services

| Concept | Method |
|---|---|
| **Private environmental services**<br>This activity includes: - Collection and treatment of household and industrial waste which intended use is not in industrial processes but only for removal resulting in a product that has little or no value.<br>This division also includes:<br>- Street sweeping, snow removal and the like;<br>- Remediation of contaminated soil and contaminated water.<br><br>This division does not include:<br>- Processing of waste and scrap and articles into secondary raw materials.<br>- Removal of asbestos in homes and buildings;<br>- Wholesale (purchase and sale) in waste and scrap, including the collecting, sorting, packaging, trade, etc.<br><br>The activities are executed in the private part of the economy. | Making basically use of already existing statistics (NACE 37/38//39).<br><br>National accounts totals are used here. Distribution to environmental domains (waste, wastewater, etc) has been done with use of Business Statistics data and Environmental Statistics data |

The activities of 'private environmental services' are categorised into several environmental domains. Activities belonging to environmental services are treatment of wastewater, collection of waste, treatment of waste and clean-up of soil pollution (including removal of asbestos). Using statistical information of the Environmental Statistics with respect to distribution issues and economic information of the National accounts, employment, value added and production for the various environmental domains have been estimated.

*Waste management increasingly important for revenues of private environmental services*

Private environmental services mainly deal with cleaning services and the treatment of solid waste produced by households and companies. Only a small part of the activities is dedicated to the treatment of wastewater and soil management. In terms of value added in the period 1995-2009, private environmental services have grown by more than 190 percent. The industry employs in 2009 15 800 fte's, a growth of nearly 60 percent since 1995. The growth in value added can partly be explained by the privatisation of the waste branch in the Netherlands and the growth of waste production in general. Also the prices paid by consumers for environmental services have increased in the years 1995-2009.

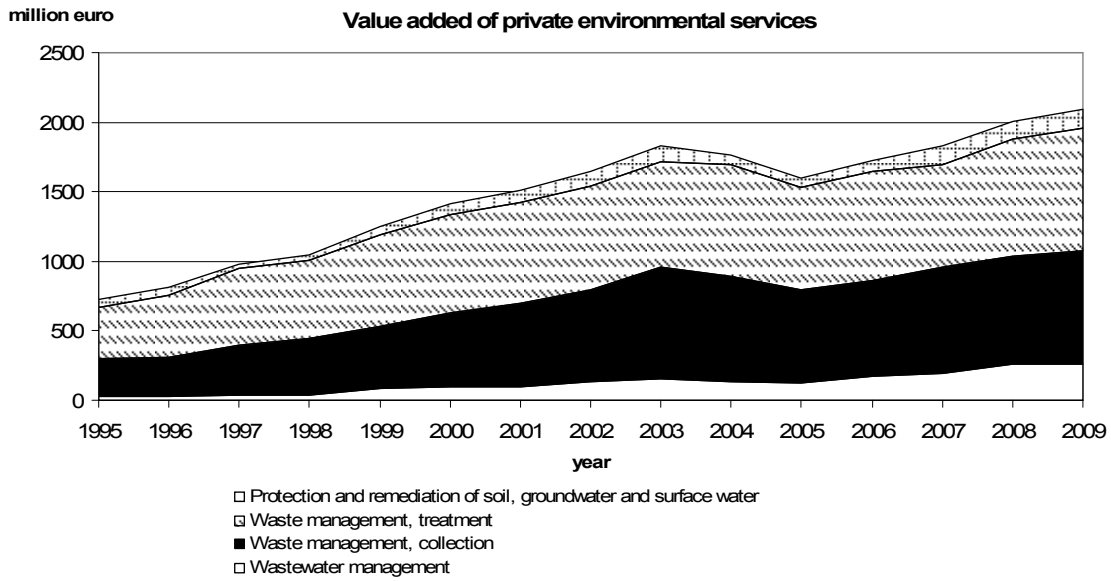


*Figure 4.1- Value added of private environmental services, environmental domains*

## Paragraph 4.2 Public environmental services

| Concept | Method |
|---|---|
| **Public environmental services**<br>This activity includes: - Collection and treatment of household and industrial waste which intended use is not in industrial processes but only for removal resulting in a product that has little or no value.<br>This division also includes:<br>- Street sweeping, snow removal and the like;<br>- Remediation of contaminated soil and contaminated water.<br><br>This division does not include:<br>- Processing of waste and scrap and articles into secondary raw materials.<br>- Removal of asbestos in homes and buildings;<br>- Wholesale (purchase and sale) in waste and scrap, including the collecting, sorting, packaging, trade, etc.<br><br>The activities are executed in the public part of the economy. | Making basically use of already existing statistics (NACE 37/38//39).<br><br>National accounts totals are used here. Distribution to environmental domains has been done with use of Environmental Statistics data. |

Although many actors on the waste and wastewater market operate under private law, still a large part is carried out by government bodies. Large municipalities for example choose to keep their own cleansing departments. There are also a lot of co-operative arrangements between smaller municipalities, for example a waste collection service. These arrangements are part of the public sector and belong to the public environmental services. Statistics related to government bodies engaged in waste management, wastewater management and protection and remediation of soil are compiled by the Environmental Statistics department of Statistics Netherlands. The National accounts (sector accounts) provide information on value added, employment and production for the public part of the industry 'environmental services'. This information is combined with the already mentioned information of the environmental statistics to make a proper breakdown to environmental domains.

*Treatment of wastewater most important domain for public environmental services*

The activities of public environmental services are executed by municipalities, water boards and the central government. Public government bodies are mainly engaged in treatment of wastewater (purification) and treatment of solid waste (incineration and land filling). The water boards are responsible for the purification of wastewater, while the municipalities are dealing with a large part of waste treatment. Value added of this sector has grown with nearby 60 percent in the period 1995-2009. Value added was in 2009 equal to nearby 1.3 billion euro. Employment in this sector fluctuated a little bit between 10 and 12 thousand man-years and is thereby stable. Waste management is increasingly carried out in the private sector of the environmental services while wastewater management more and more belongs to the public environmental services.

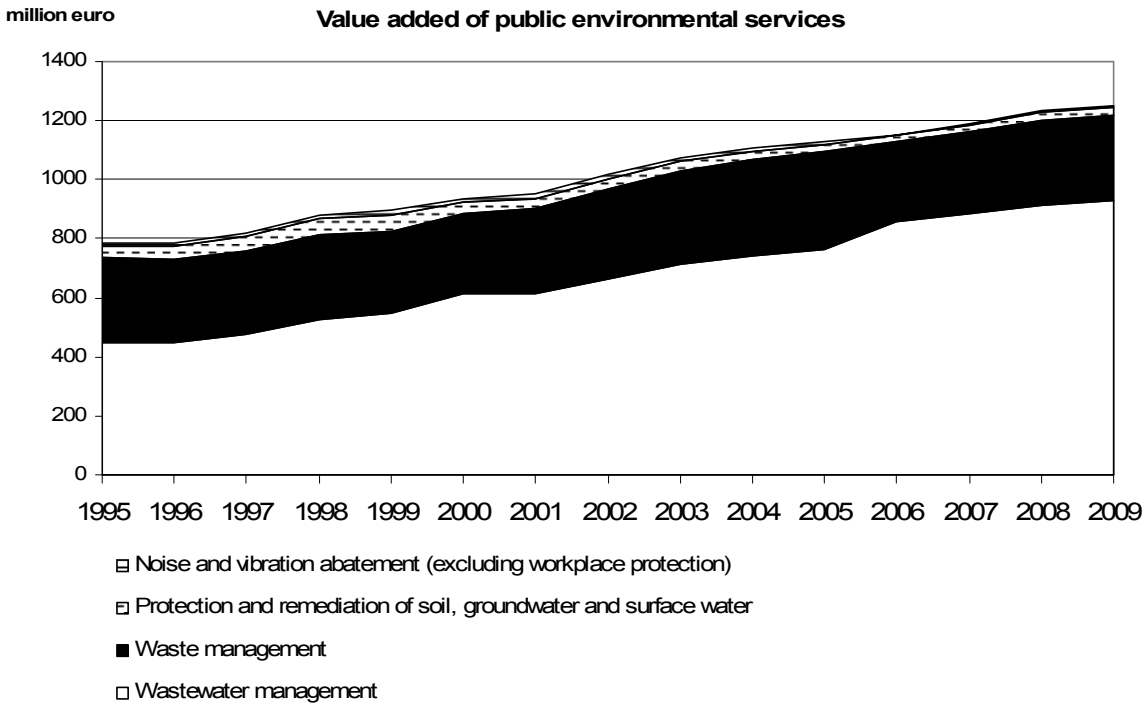


*Figure 4.2- Value added of public environmental services, environmental domains*

## Paragraph 4.3 Production of renewable energy

| Concept | Method |
|---|---|
| **Renewable energy production**<br>This activity includes the production of physical renewable energy (exploitation phase). This energy is divided into:<br>- Flow energy;<br>- Energy from waste.<br><br>Flow Energy includes electricity from wind, hydro or solar energy and heat produced by solar collectors or heat pumps. Energy from waste includes heat generated in incineration, heat generated by combustion of wood and gas produced by the fermentation of organic material. | Many data on physical renewable energy production is already available in the Netherlands (CBS, 2008b). The EGSS statistic is a monetary statistic, so the physical data is transformed into monetary data. Production is estimated by multiplying reasonable prices with the physical data on production. Value added is equal to production minus intermediate consumption. Intermediate consumption is based upon physical production data and external expert information (CBS, 2011a, 2011b). Employment is modelled based upon physical production data and capacity. |

Production of renewable energy belongs to the EGSS. The definition of the EGSS states that cleaner technologies, products and services that reduce environmental risk and minimise pollution and resource use should be included. The production of renewable energy prevents resource use because renewable energy is a substitute for fossil fuels. Examples of renewable energy are green electricity, green heat, bio fuels and green gas (biogas). These products avoid the use of natural resources, thereby preventing resource depletion. Renewable energy can be produced in many different ways. Examples are wind energy, solar energy, biomass use for electricity production, incineration of waste, etcetera. Many data on physical renewable energy production are available in the Netherlands (CBS, 2008b). The EGSS statistic is a monetary statistic, so the physical data is transformed into monetary data.

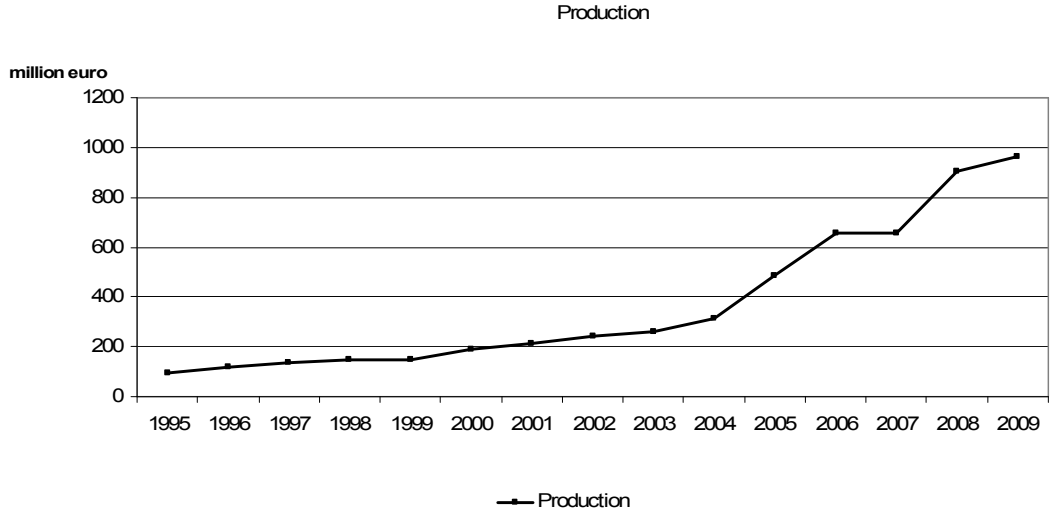


*Figure 4.3- Gross production of renewable energy, including households*

In monetary terms, the production of renewable energy is in 2009 almost 10 times larger than in 1995. The net production, the production designated for third parties, was in 2009 equal to nearby 740 million euro. Produced renewable energy is also internally used by the same company. This internal production was in 2009 almost equal to 230 million euro[5]. For example, the wood industry and the construction material industry produce heat by burning biomass. This heat is used in their own production process. The food and beverage industry turn biomass into heat and they produce electricity of released biogas. The sum of net and internal production is equal to almost 970 million euro which is equal to the gross production of renewable energy. The increase in gross production is partly due to more sustainable energy applications, but is also the result of increasing energy prices. The energy companies (59 percent), the environmental services (16 percent) and agriculture (19 percent) are responsible for the largest part of total net renewable energy production.

## Paragraph 4.4 Environmental consultancy, engineering and other environmental services, environmental related construction activities, environmental industrial equipment and energy systems and energy saving (excluding insulation)

| Concept | Method |
|---|---|
| -**Environmental consultancy, engineering and other environmental services.**<br>Environmental advice aimed at environmental protection and | A lot of environmental specific activities are scattered over different NACE categories. A database of relevant companies has been |

[5] Households produce renewable energy for internal use worth approximately 45 million euro. This production is included in the figure 10 but is not included in the table 2 because households are not included in the EGSS so far.

| | |
|---|---|
| resource management, environmental engineering aimed at environment protection and resource management, other services for the benefit of the environment and other services for the benefit of natural resources. Among these activities are only activities which are produced by the ***services*** industry. Activities aimed at renewable energy production and energy conservation are not included. | compiled in order compile statistics. Branch associations have been helpful in compiling this database. These companies are coupled with the economic data bank of Statistics Netherlands. With use of micro-analysis statistics for this activity have been compiled. |
| **-Environmental related construction activities**<br>Activities aimed at producing construction products for the benefit of the environment and management of natural resources. Among these activities are only activities which are produced by the ***construction*** industry. Activities aimed at renewable energy production and energy conservation are not included. | A lot of environmental specific activities are scattered over different NACE categories. A database of relevant companies has been compiled in order compile statistics. Branch associations have been helpful in compiling this database. These companies are coupled with the economic data bank of Statistics Netherlands. With use of micro-analysis statistics for this activity have been compiled. |
| **-Environmental industrial equipment**<br>Activities aimed at producing environmental industrial equipment for the benefit of the environment and management of natural resources. Among these activities are only activities which are produced by ***manufacturing***. Activities aimed at renewable energy production and energy conservation are not included. | A lot of environmental specific activities are scattered over different NACE categories. A database of relevant companies has been compiled in order compile statistics. Branch associations have been helpful in compiling this database. These companies are coupled with the economic data bank of Statistics Netherlands. With use of micro-analysis statistics for this activity have been compiled. |
| **Energy systems and energy saving (excluding insulation)**<br>This class includes activities related to the production of renewable energy systems and consists of companies and institutions active in the production of energy-saving products and technologies. These companies and institutions are engaged in value chains that come before the exploitation phase of renewable energy production. This division includes: - The production of renewable energy systems; - R & D focused on renewable energy technologies; - Installation related to renewable energy systems; - Consultancy activities related to renewable energy. Production of renewable energy itself (= exploitation phase) and insulation work are explicitly not included in this class. | A lot of environmental specific activities are scattered over different NACE categories. A database of relevant companies has been compiled in order compile statistics. Branch associations have been helpful in compiling this database. These companies are coupled with the economic data bank of Statistics Netherlands. With use of micro-analysis statistics for this activity have been compiled. |

The great part of the Environmental Goods and Services Sector can be estimated by making use of existing statistics. However, a lot of environmental specific activities are scattered over different NACE categories. In this paragraph, activities of the Environmental Goods and Services Sector which cannot be estimated with use of existing statistics are described. Examples are environmental advice and engineering (environmental specific services), but also the production of environmental equipment which is produced in manufacturing is very hard to identify in existing statistics. Another group of environmental related technologies and connected environmental goods are also falling under the EGSS scope. In 2009 Statistics Netherlands has made an effort to gather information on companies engaged in these 'hard to find' areas of the EGSS.

In the EGSS market operate many small actors and some big companies. A list of companies participating in the EGSS market is compiled by using data from various organisations such as the yellow pages and various branch associations. Most of these companies carrying out 'environmental related activities do this as a core activity while others carry out environmental activities as a

secondary activity. So far, it has been very difficult to determine on company-level if a particular environmental related activity is a principal activity or a secondary activity of a particular company. For very small companies it is assumed that the activities carried out are principal activities. In these cases, the entire economic value is taken into account. For large companies it is often the case that not all activities are related to environmental protection and/or resource management. In this project an attempt has been made to account for only those activities related to environmental protection and resource management on micro level. These 'environmental shares' on micro levels are based upon expert guesses.

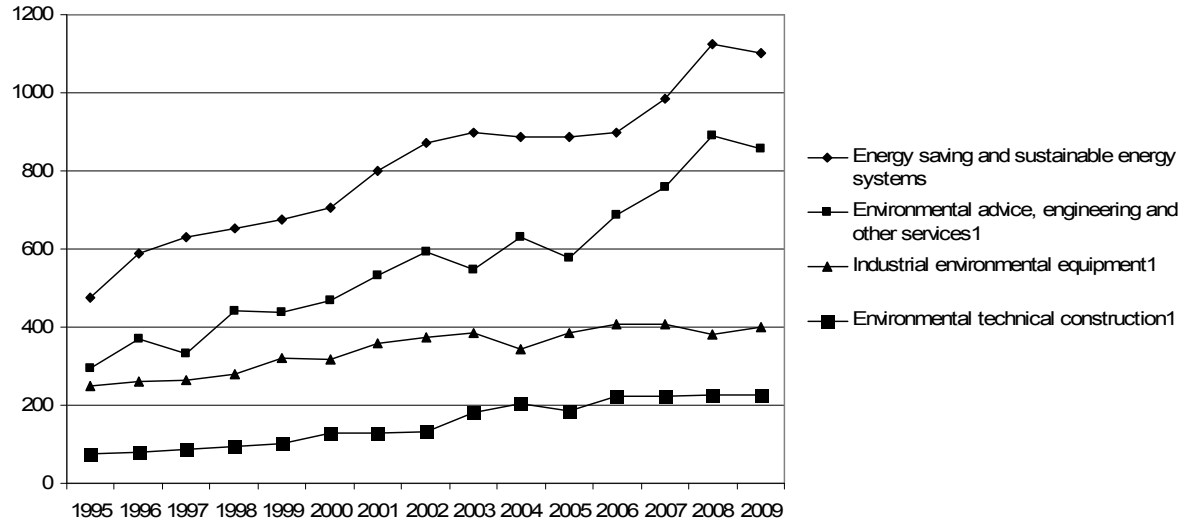


*Figure 4.4- Value added figures for Environmental advice, engineering and other services, industrial environmental equipment, energy saving and sustainable energy systems*

*Growth in employment related to environmental advice, engineering and other services has stopped*

Next to traditional environmental activities, also other more innovative activities related to environmental protection and resource management belong to the definition of the EGSS. For example, within commercial services there exist a lot of small and big advice companies who advise people and companies on how to protect the environment and how to save on inputs. Also a lot of engineering services are supplied by commercial services. Value added related to these services has grown with nearly 190 percent[6] in the period 1995-2009. Value added in 2009 was equal to approximately 850 million euro

*Value added related to manufacturing of industrial environmental equipment quite stable*

In manufacturing, a lot of different environmental industrial equipment is produced, for example foil applications for waterproof applications, underground pipe systems for purification activities, water treatment systems, water quality-control systems and purifying systems for gases. Value added of this sector has been very stable over time. Value added in 2009 was equal to approximately 400 million euro.

*Employment related to energy saving and sustainable energy systems initially small but growing quite substantial*

Activities related to energy saving and sustainable energy systems generate more and more value added. In manufacturing, for example wind technology and solar panels are produced. In the services

[6] Advice and engineering related to energy saving and sustainable energy systems is not included here.

industry, a lot of energy advice and energy-engineering is produced for third parties. Compared to 1995, value added has increased with nearly 190 percent in the period 1995-2009 in this particular sector. Value added in 2009 was equal to approximately 1.1 billion euro.

## Paragraph 4.5 Second hand shops

| Concept | Method |
|---|---|
| **Second hand shops (no antiques)**<br><br>This activity includes:<br>- Second-hand goods in stores;<br>- Second hand clothing stores.<br>This activity does not include:<br>- Antiques | Making basically use of already existing statistics.<br><br>Business Statistics already compile statistics for second hand shops. One has to isolate the antiques revenues in order to compile valuable statistics fitting into the definition of EGSS. |

Second hand shops sell goods that have already been used by other consumers. Before a transaction, a new buyer of a good has the choice of buying a completely new product or buying the already used product. If the new user buys the already used product, he or she prevents the production of new products. This prevention induces less use of inputs in the production system, which leads to the preservation of natural resources. Therefore Statistics Netherlands has decided to include second hand shops into the Resource Management group of the EGSS under the environmental compartment 'Management of minerals'.

The retail sale of second-hand goods in stores includes second-hand shops selling goods which are defined as already used consumer goods, excluding motor vehicles, motorcycles and snowmobiles. Shops selling antique goods are excluded. This is because of the age of antique goods. Antique goods are at least circa 100 years old and it is thus not probable that antique goods will be discarded and considered as a replacement for new products. Furthermore, the production of these goods occurred several generations ago and their longevity have ensured that these goods have outlived their normal expected durability.

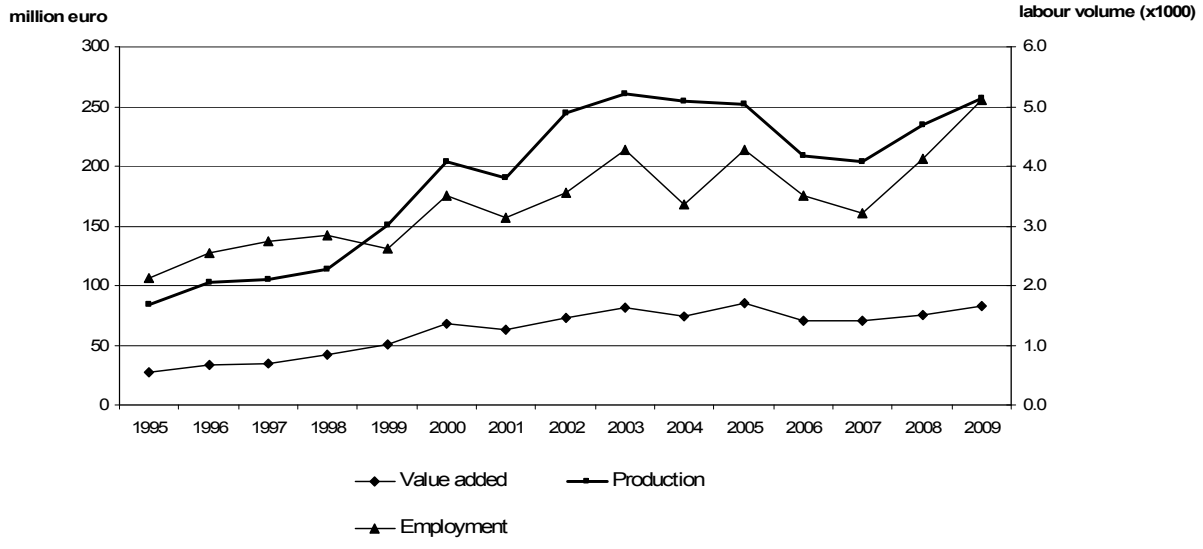


*Figure 4.5-Economic indicators for the second hand shops*

*Contribution of second hand shops small but growing over time*

Production of second hand shops has grown by 200 percent in the period 1995-2009. The production level in 2009 was equal to nearby 250 million euro. Value added has grown by nearby 200 percent and is in 2009 equal to 83 million euro. In 2009, employment is equal to 5100 man-years. This employment level was in 1995 considerably lower, namely 2100 man-years.

## Paragraph 4.6 Insulation activities

| Concept | Method |
|---|---|
| **Insulation works by construction**<br>This activity includes:<br>- Installation in buildings or other structures of insulation against heat, noise or vibration;<br>- Installation of insulation on pipes, ducts, boilers and like.<br>To date the insulation work can not be split off from other related installation services such as installation of heating equipment, ventilation and air conditioning (integrated production processes). | Making basically use of already existing statistics.<br><br>National accounts figures are used here as a proxy for insulation activities. This methodology needs further improvement in the near future because the level of detail for products in the national accounting framework has become less specific. More research is needed here. |

The NACE classification system incorporates the specific NACE class 'insulation work installations in buildings or other construction projects of thermal (e.g. foam), sound or vibration insulation (NACE 4532). All insulation activities of NACE 4532 are labelled primary activities. NACE class 4532 explicitly excludes waterproofing and installation of double glazing. Insulation activities belong to the 'resource management group' because they include practices aiming at managing natural resources in a sustainable manner. With insulation, the influences of weather from outside diminish and therefore prevent the use of natural resources (for example natural gas). Indirectly, insulation contributes to energy saving and thereby resource preservation. In cold weather conditions, insulation contributes to less natural gas use and in hot weather conditions to less electricity use (air-conditioning). This reasoning is used in allocating insulation activities to the group Resource Management activities.

In the Netherlands, information related to insulation work was available in the supply and use tables of the national accounts (only definitive years, most detailed level). In the supply and use tables, there is an industry called insulation work (NACE 45320) and there is a good called 'insulation of (old and new) houses and buildings. This NACE class produces goods like instalments of heat control systems in (new or old) houses and (new or old) buildings as a primary activity. Other construction related NACE classes produce insulation goods too as a secondary activity. In the case of insulation activities, it is very important to keep in mind that the figures presented here describe the primary activities as well as the secondary activities. Production, value added and employment related to insulation activities are attributed to the environmental compartment 'Management of energy resources (Resource Management)'.

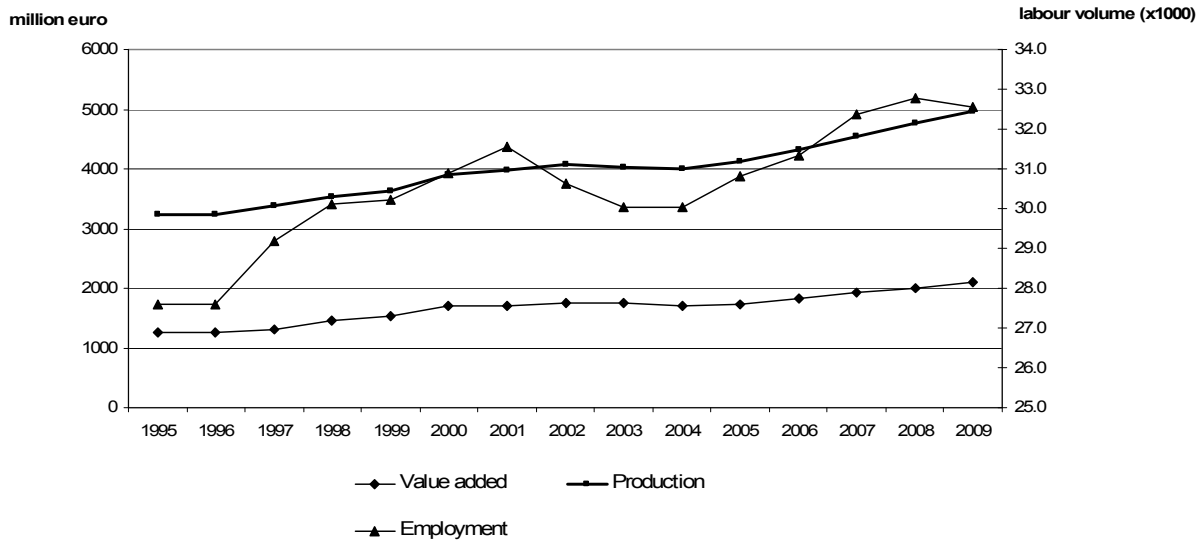


*Figure 4.6-Economic indicators for insulation activities*

*Insulation activities by construction companies stable over time*

Insulation activities account in 2009 for more than 32000 man-years, more than 4.9 billion euro of production and 2.1 billion of value added. Most of the insulation activities within the EGSS are executed as a secondary activity by construction companies. The market for insulation activities by construction companies is large but very stable over time.

## Paragraph 4.7 Wholesale in waste and scrap

| Concept | Method |
|---|---|
| **Wholesale of waste and scrap**<br>This activity includes:<br>- Wholesale in car demolition materials;<br>- Wholesale trade in iron and steel scrap and old non-ferrous metals;<br>- Wholesale in other used and waste materials.<br><br>This class excludes:<br>- collection of household and industrial waste<br><br>- treatment of waste, not for a further use in an industrial manufacturing process, but with the aim of disposal<br><br>- processing of waste and scrap and other articles into secondary raw material when a real transformation process is required (the resulting secondary raw material is fit for direct use in an industrial manufacturing process, but is not a final product)<br>- dismantling of automobiles, computers, televisions and other equipment for materials recovery<br>- ship-breaking<br>- shredding of cars by means of a mechanical process<br>- retail sale of second-hand goods | Making basically use of already existing statistics.<br><br>National accounts figures are directly used here. |

Wholesale of waste and scrap includes the wholesale of metal and non-metal waste and scrap and materials for recycling, including collecting, sorting, separating, stripping of used goods such as cars in order to obtain re-usable parts, packing and repacking, storage and delivery, but without a real transformation process.

Additionally, the purchased and sold waste has a remaining value. This class also includes the purchase and re-sell of usable parts of dismantled automobiles, computers, televisions and other equipment. This class is included in the Dutch EGSS because this sector brings together demand and supply for second hand goods and parts. The sector can be seen as the link between recycling and collection of waste and scrap and as a link between second hand shops and collection of waste and scrap. Hereby this class is an important link in the production chain of waste management. Therefore production, value added and employment related to wholesale in waste and scrap activities is attributed to the environmental compartment 'Waste management (Environmental Protection)'.

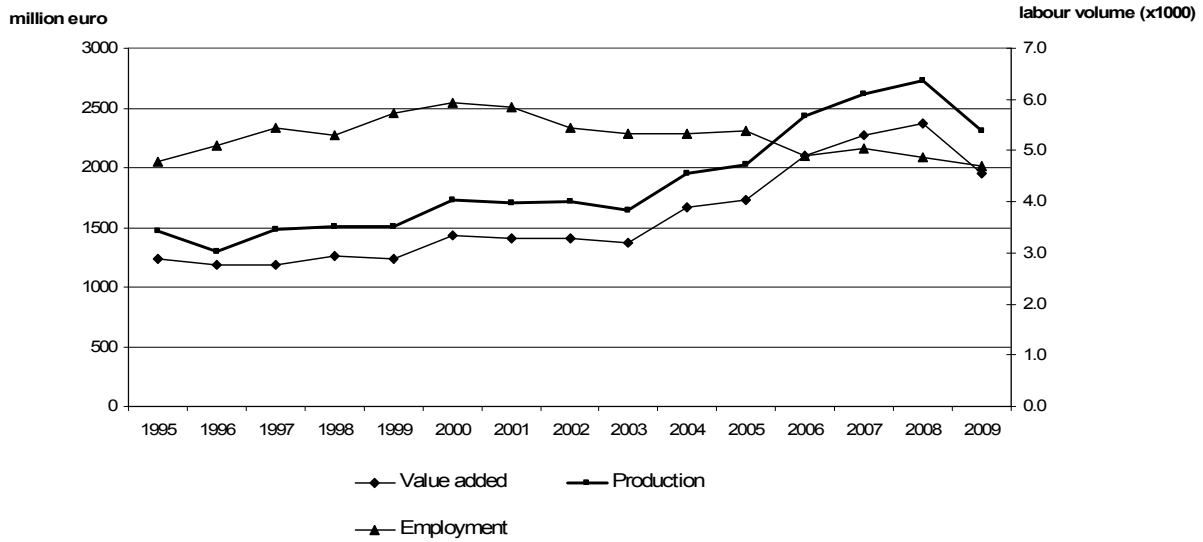


*Figure 4.7-Economic indicators for wholesale in waste and scrap*

*Wholesale in waste and scrap big player in EGSS*

This class creates value added by the optimisation of waste flows. The sector created in 2007 almost 2.5 billion euro and had a production of 2.9 billion euro. Growth of value added and production in the period 1995-2007 was equal to respectively 102 and 95 percent. Employment has grown with 60 percent and was in 2007 equal to almost 8000 man-years.

## Paragraph 4.8 Environmental analysis and control

| Concept | Method |
|---|---|
| **Environmental inspection and control**<br>This activity includes:<br>- Take measurements related to the purity of water or air;<br>- Conducting analysis of potential sources of pollution, such as smoke and sewage;<br>- Conducting research, identification and reporting to prevent asbestos;<br>- Conduct inspection related to soil contamination.<br>This activity does not include:<br>- Research and development of the terrestrial environment, environmental radiation and the like; - Medical laboratories. | Making basically use of already existing statistics.<br><br>National accounts figures are used here. In the national accounts framework exist a product describing the activities environmental inspection and control. There exists a specific NACE class for this kind of activity. Using the business register one can make a population of companies engaged in these companies. By means of this population one can construct employment statistics for these activities. |

This class comprises activities related to environmental testing and controlling and consists of activities like conducting measurements related to the purity of water and air and measurement of radioactivity. Analysis of potential pollution sources like wastewater and smoke as well as research

and reporting related to prevention of asbestos is included too and all control and inspection activities in the area of soil contamination are included. Production, value added and employment related to environmental analysis and control is attributed to the environmental compartment 'Other environmental protection activities (Environmental Protection)'.

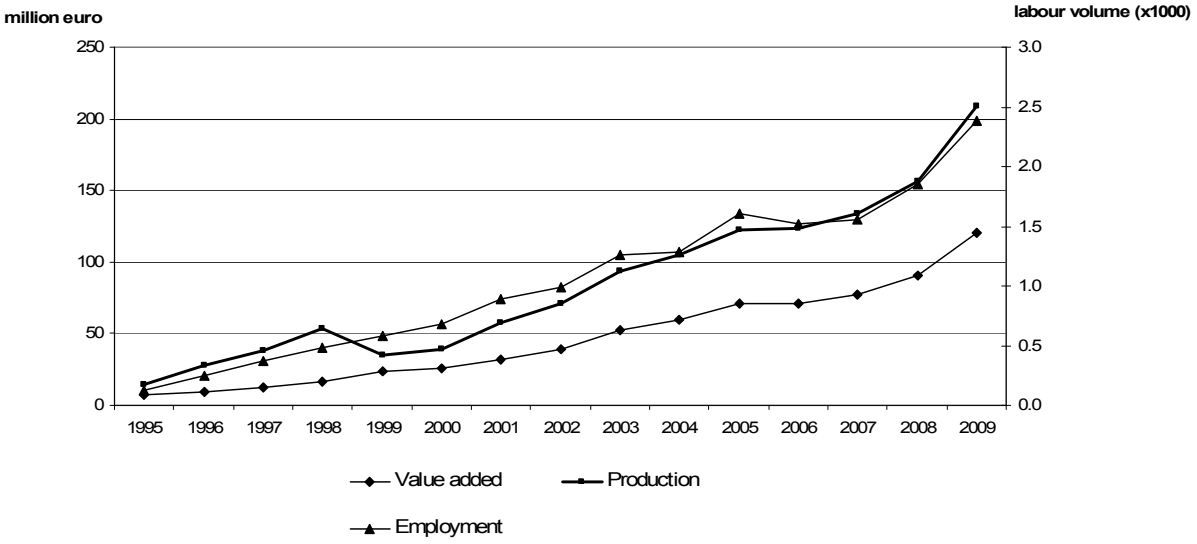


*Figure 4.8-Economic indicators for environmental analysis and control*

*Environmental analysis and control small but growing fast*

This sector is relatively small but is growing very fast. Value added in 2009 is more than 10 times larger than in 1995 and is equal to approximately 120 million euro. Production has also shown a large growth and was in 2009 equal to approximately 200 million euro. Employment was in 2009 equal to 2400 man-years.

## Paragraph 4.9 Organic agriculture

| Concept | Method |
|---|---|
| **Organic agriculture**<br>Organic agriculture means agricultural production, where no chemical fertilizers and pesticides are used. Instead organic fertilizers are often used to protect the crops. There is also other legislation with regard to the use of concentrates and veterinary medicines for livestock. For cattle there must be running space. | Making basically use of already existing statistics.<br><br>Several sources are used to construct figures for organic agriculture. Number of hectares used for organic agriculture is used to compile statistics on value added and production. Number of farms is used in compiling statistics on employment. Also product information of the institute LEI is used to quantify developments over time for the different variables. |

Sustainable agriculture has been defined in a number of ways. Some define sustainable agriculture as follows:

_ "…environmentally friendly methods of farming that allow the production of crops or livestock without damage to the farm as an ecosystem, including effects on soil, water supplies, biodiversity, or other surrounding natural resources. The concept of sustainable agriculture is an 'intergenerational' one in which we pass on a conserved or improved natural resource base instead of one which has been depleted or polluted"[7]

[7] National Safety Council, 2005. Environmental glossary; available at: www.nsc.org/ehc/glossar2.htm

_ "…farming that provides a secure living for farm families; maintains the natural environment and resources; supports the rural community; and offers respect and fair treatment to all involved, from farm workers to consumers to the animals raised for food"[8] (Eurostat, 2008).

Statistics Netherlands has decided to narrow the definition of sustainable agriculture and to focus only on organic agriculture. In the Netherlands there exists an official label for organic farmers. Statistics Netherlands has concluded that organic agriculture has a beneficial influence on the environmental domain of protection and remediation of soil, groundwater and surface water (Environmental Protection). Production, value added and employment of organic agriculture are therefore assigned to this domain.

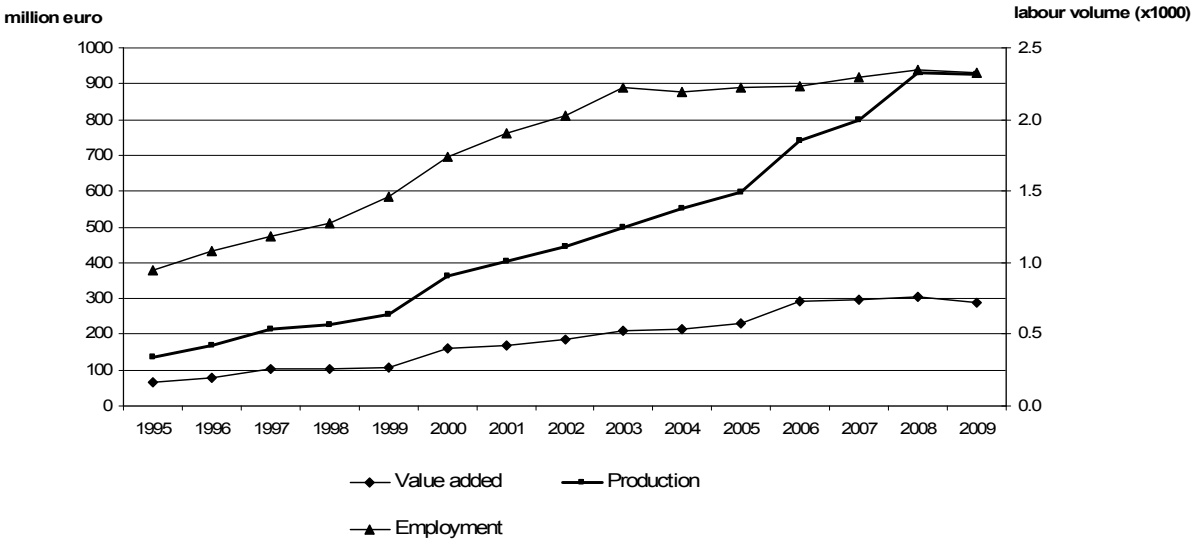


*Figure 4.9-Economic indicators for organic farming*

*Growth organic agriculture since 2003 very small*

Biological agriculture in the Netherlands, although small, had been growing quite rapidly from 1995 till 2003. Since 2003 the growth in value added and employment started to decline. Production is in 2009 equal to 900 million euro, which is almost seven times as much as in 1995. Value added is in 2009 equal to approximately 290 million euro, a growth of more than 350 percent since 1995. Employment is in 2007 equal to almost 2300 man-years, a growth of almost 150 percent since 1995.

**Paragraph 4.10 Recycling**

| Concept | Method |
|---|---|
| **Preparation for recycling**<br>This activity includes:<br>- Preparation for recycling of scrap metals;<br>- Preparation for recycling of waste (not metal). | Making basically use of already existing statistics.<br><br>National accounts figures are directly used here. |

Recycling diminishes the use of natural resources by transforming waste and scrap into secondary raw materials. These secondary materials can be used again in the production process instead of natural resources. For instance, melting scrap iron that can be used in the production of new iron products. In SEEA (2003) recycling is defined as the re-introduction of residual materials into production

[8] Global Resource Action Center for the Environment (GRACE), 2005. *Introduction to sustainability: sustainable dictionary*; available at: www.sustainabletable.org/intro/dictionary/#s.

processes so that they may be refabricated into new products. An example of recycling is re-introducing old newsprint into a paper mill as an input into the production of new newsprint. Only the resulting secondary raw materials are considered as environmental related goods in this study. Output produced with use of recycled raw materials is not considered in the Dutch EGSS. Production, value added and employment related to recycling activities are attributed to the environmental compartment 'Management of minerals (Resource Management)'.

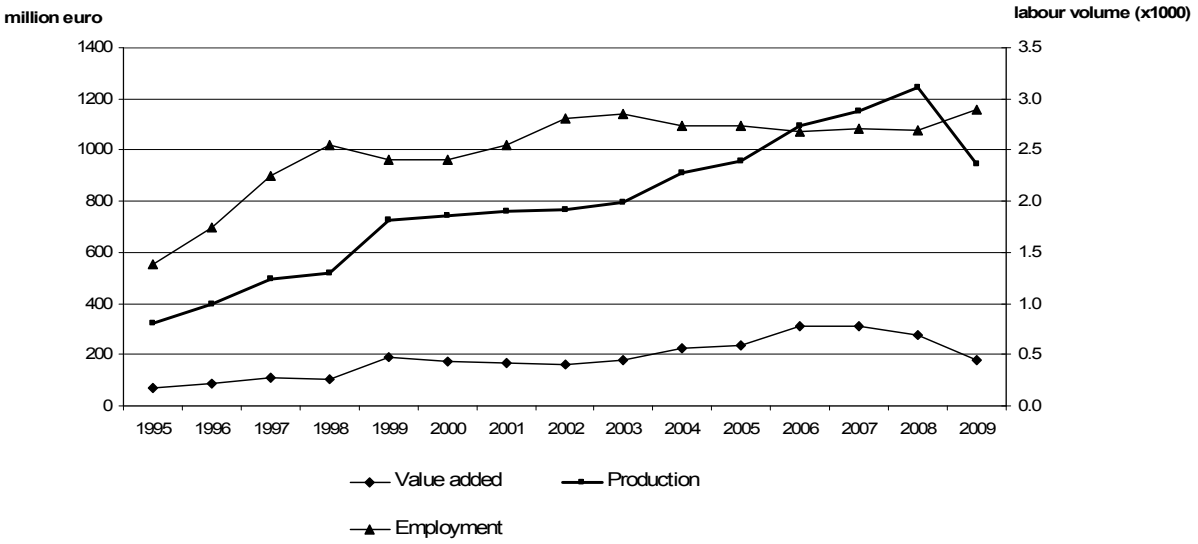


*Figure 4.10-Economic indicators for recycling*

*Very little growth in employment in recycling industry after 1998*

Between 1995 and 1998 the number of fulltime jobs in the recycling industry increased significantly from approximately 1400 fulltime equivalents to approximately 2600 fulltime equivalents. In the following years the attained level remains stable with some small fluctuations. In 2009, employment was equal to 2900 man-years while production and value added were respectively equal to approximately 950 and 180 million euro. The continued production growth after 1998 did not go along with increasing employment numbers. Probably this can be explained by the high capital-intensity of this sector.

## Paragraph 4.11 Managerial activities of government bodies

| Concept | Method |
|---|---|
| **Public administration aimed at protecting the environment and management of natural resources**. This includes administrative activities of government, provinces, municipalities and joint arrangements. | Making basically use of already existing statistics.<br><br>Environment statistics give detailed information on costs related to environmentally related public administration. These costs are a proxy for production. Value added and employment is based upon structure ratios (production/value added ratio, production/employment ratio) for the government sector. |

There is a whole range of environmental activities by government authorities at a more indirect level. These activities are in addition to the employment at a more executive level. Examples are policymaking, law enforcement, coordination, permits, control and nature protection. These activities have a more administrative character. These activities are found at all government levels, local and

central. By using information of the Environmental Statistics division from Statistics Netherlands on environmental costs, figures for provinces, municipalities and the central government are derived.

Because of the wide range of activities by government bodies production, value added and employment related to the environment are attributed to the environmental compartment 'Other environmental protection activities (CEPA 9)'.

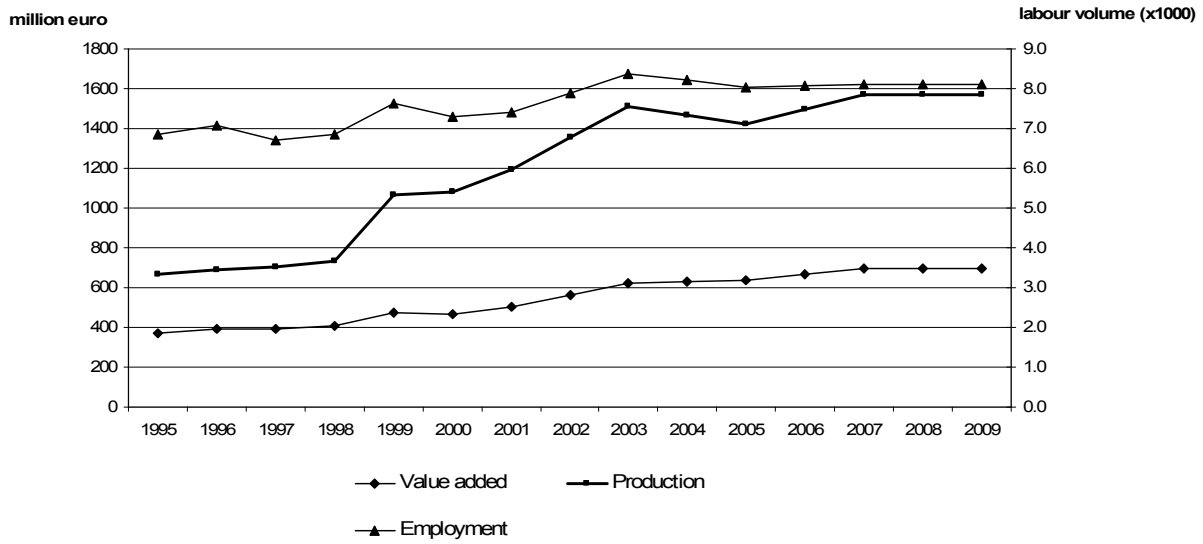


*Figure 4.11-Economic indicators for managerial activities of government bodies*

**Paragraph 4.12 Water quantity control**

| Concept | Method |
|---|---|
| **Water quantity control**<br>Water Boards are concerned with water quantity management in the Netherlands. This class includes the activities aimed at the prevention of flooding and water management (ensuring the appropriate water level) for agriculture, nature and people. Activities related to water quality control are explicitly not in this class. | Making basically use of already existing statistics.<br><br>Sector accounts of the national accounts give detailed information on production and value added. Employment is based upon specific water board economic ratio's (value added per employee). |

According to the EGSS compilation guide (Eurostat, 2008) management of inland waters belongs to the EGSS scope and includes activities and products aiming at the minimalisation of the inland water intake through in process modifications as well as the reduction of water losses and leaks, the installation of facilities for water reuse and savings.

The definition on EGSS of Eurostat states that dykes and embankments and their maintenance costs are excluded from the EGSS statistic. The reason is that these activities are related to natural risk management instead of natural resource management. In other words, dykes and embankments protect human beings from nature in stead of protecting the environment from human beings.

In the Netherlands, the problems related to desertification and scarcities of water are relatively small. Instead of a lack of water, the Netherlands deals with an overabundance of water. In an ideal situation, only activities related to the protection of natural resources (agricultural land) are counted in, not the activities related to the protection of human beings from the environment. So the activities related to the control of the water level in polders should be taken into account because these activities protect natural resources like the soil from natural disasters.

The theoretical definition leads to the decision to include only a part of the traditional activities of water boards. Unfortunately, in practical sense, it is impossible to segregate the traditional activities into damming activities and other traditional activities, like water level control in polders and cities. These damming activities should be excluded in order to be in line with the formulated definition. The results presented hereafter are based upon data including damming activities. This inevitably leads to the conclusion that some natural risk management activities related to water quantity control are included in the figures.

Production, value added and employment related to water quantity control are attributed to the environmental compartment 'Water management (Resource Management).

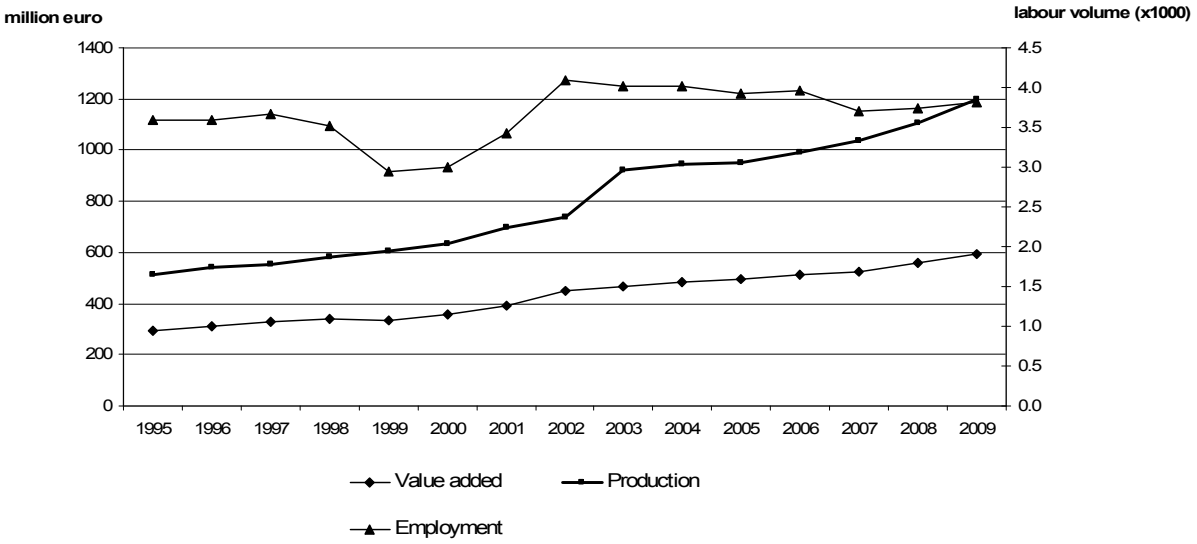


*Figure 4.12-Economic indicators for water quantity control*

The size of activities related to managerial water quantity control is stable over time. The employment number in 2009 is almost equal to that of 1995 while production and value added have risen by 133 and 100 percent. Employment was in 2009 equal to approximately 3800 man-years while production and value added where equal to approximately 1200 and 600 million euro.

**Paragraph 4.13 Organisations on the environment and nature**

| Concept | Method |
|---|---|
| **Philanthropic environmental organizations**<br>This class includes environmental, nature and animal welfare organizations and other non-profit organizations whose purpose is to protect the environment and management of natural resources. This activity does not include:<br>- Animal welfare organizations that focus on pets or captive animals. | Compose a population of relevant companies. Then making use of already existing statistics.<br><br>Business register gives detailed information on employment level on micro level. Value added and production is based upon specific economic ratio's (value added per employee and production per employee) for this industry. |

The category 'organizations on the environment and nature' includes activities of organizations (not directly affiliated to a political party) furthering a public cause or issue by means of public information, political influence and fund-raising. Environmental and ecological movements are included here. Production, value added and employment related to 'organizations on the environment and nature' are attributed to two environmental domains: 'Other environmental protection activities' (CEPA 9) and 'Other natural resource management activities' (CReMA 16).

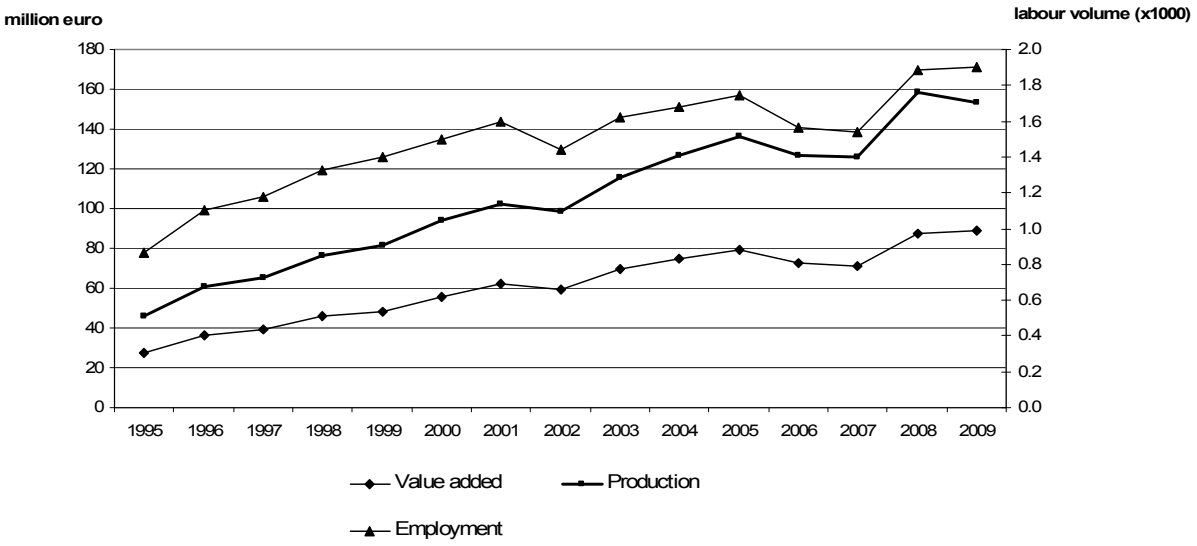


*Figure 4.13-Economic indicators for organisations on the environment and nature*

Value added in 2009 is more than 3 times larger than in 1995 and is equal to approximately 90 million euro. Production has shown a growth of 230 percent and was in 2009 equal to approximately 150 million euro. Employment was in 2009 equal to 1900 man-years and was in 2009 twice as large as in 1995.

## Paragraph 4.14 Environmental related education

| Concept | Method |
|---|---|
| **Environmental education**<br>This activity includes education aimed at environmental protection and management of natural resources. This activity includes secondary education (MBO) as well as tertiary education (non-university tertiary education and university tertiary education). | Compose a population of relevant institutions supplying environmental related courses. This can be done with use of the Education statistics. Number of students following environmental related courses can be calculated. Share of 'environmentally related students' in total number of students is multiplied by total production, value added and employment numbers of education in order to compile statistics for environmental related education. |

Environmental related education is included in the EGSS statistic. Only higher education and secondary education is included in the EGSS statistic for the Netherlands. Higher education includes the supply of post-secondary non-tertiary and academic courses and granting of degrees at baccalaureate, graduate or post-graduate level. The requirement for admission is a diploma at least at upper secondary education level. Secondary education includes the provision of general secondary and technical and vocational secondary education.

Production, value added and employment related to 'environmental related education' are attributed to the environmental compartment 'Other environmental protection activities' (Environmental Protection).

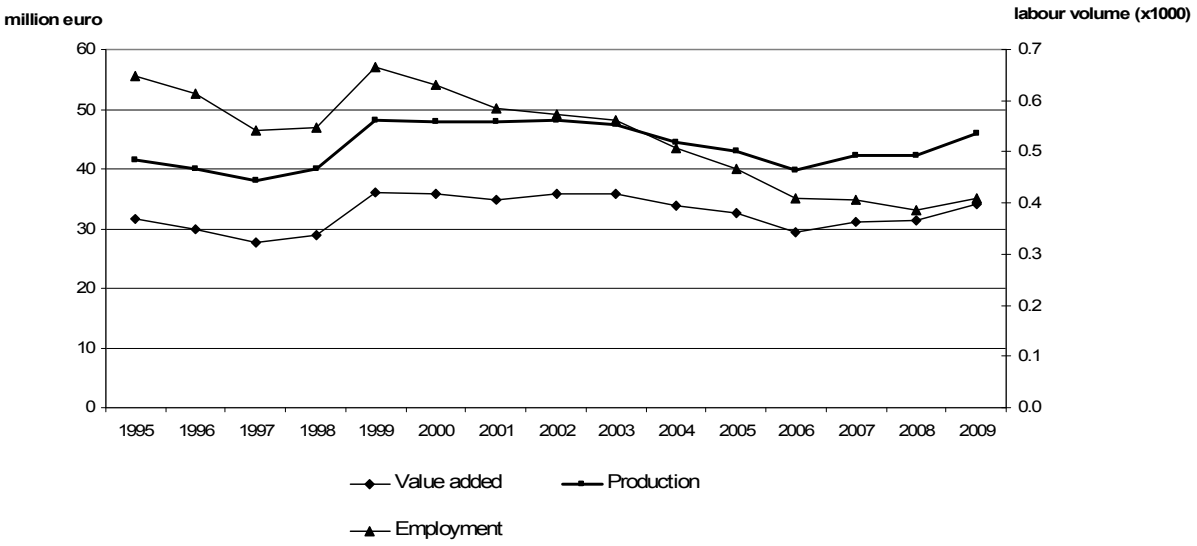


*Figure 4.14-Economic indicators for environmental education*

Production, value added and employment related to 'environmental related education' are attributed to the environmental compartment 'Other environmental protection activities' (CEPA 9).

In the period 1995-2009 production of environmental related education has increased by 10 percent. The production level in 2007 was equal to nearby 50 million euro. Value added has increased by nearby 8 percent and is in 2009 equal to 30 million euro.

**Paragraph 4.15 Ancillary activities (internal environmental activities in companies)**

| Concept | Method |
|---|---|
| **Internal environmental activities of companies**<br>Activities that companies undertake in-house for protection, restoration or improvement of the environment. | Making basically use of already existing statistics.<br><br>Environment statistics give detailed information on costs related to in-house activities for the purpose of protection, restoration or improvement of the environment. These costs are a proxy for production. Value added and employment is based upon structure ratios (production/value added ratio, production/employment ratio) of the industry 'environmental services' and R&D. |

The purpose of ancillary activities is to support principal and secondary activities of an enterprise. This support is seen as internal production of non-durable goods and services for the use of that enterprise. Some ancillary activities are environmental related. Examples are environmental management of waste and wastewater treatment on site. If there was no environmental legislation and / or environmental care in a particular jurisdiction, these costs (or production) and environmental related employment would not have exist. Following this way of thinking, ancillary activities which are related to the environment are included in the EGSS.

Information based on the survey on environmental costs and expenditures is used for compiling statistics on ancillary activities. Following the design of the survey, a distinction is made between several environmental compartments, environmental R&D and environmental coordination. Figures on the production can be directly derived from these statistics by assuming that environmental related

costs are equal to the internal turnover generated by the different ancillary activities. To calculate employment and value added, ratios on the production per employee and value added per employee in the Environmental Services industry have been applied. For the employment related to environmental related R&D, Statistics Netherlands has made the assumption that total costs in this subfield only consists of labour costs. Total employment in the R&D sector is therefore estimated by dividing these costs by the yearly wage of an employee in the R&D sector. To calculate value added for internal R&D an identical method is used as for the environmental domains. For this purpose the ratio of value added per unit production is derived from the R&D data originating from the system of National Accounts.

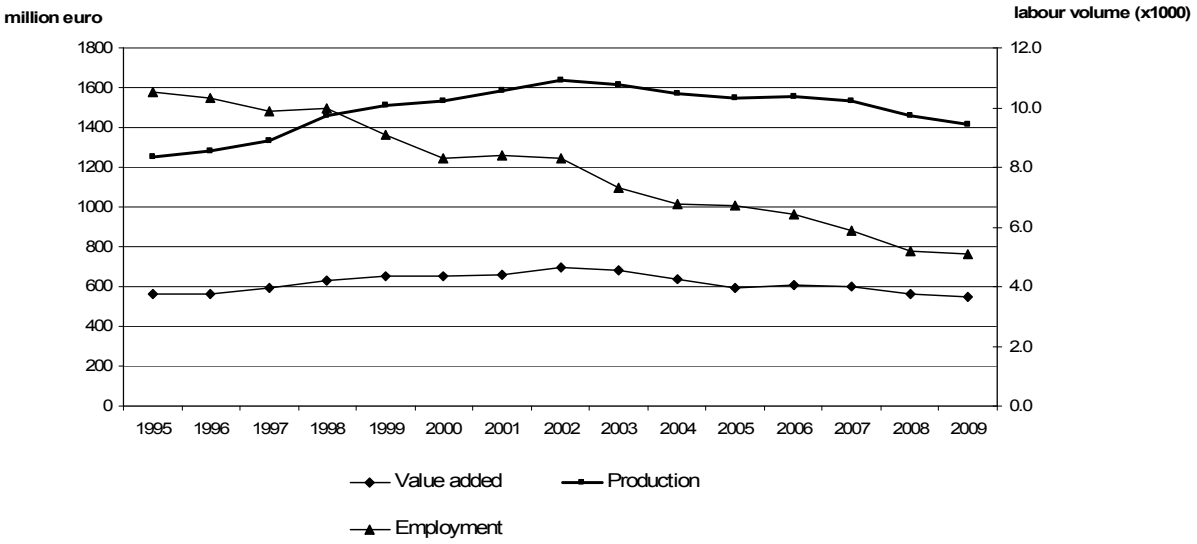


*Figure 4.15-Economic indicators for environmentally related ancillary activities*

In 2009, ancillary activities in the Environmental Goods and Services Sector contributed 550 million euro to total value added of the sector.

# Chapter 5 Conclusions and recommendations

**Conclusions on results**

Until now, the Environmental Goods and Services Sector is "not booming" in the Netherlands. Although employment and value added have grown slightly faster than the Dutch average in the period 1995-2009, it is hard to conclude that the sector in itself is booming. This conclusion is related to the diversity of the activities belonging to the EGSS. The traditional activities have a tendency to grow slowly over time while the more innovative activities grow faster than the average. The traditional activities have a large weight in the total of the EGSS whereas the more innovative activities have only a small weight in the total of the EGSS. Therefore it is recommended not to rely only on the macro numbers for the EGSS when addressing the question 'is the EGSS is booming or not' but it is very much recommended to also have a close look on the details of the individual activities. This recommendation is important because policy relevance nowadays (in the year 2009) is mainly focused on the more innovative activities in the sector and less focused on the more traditional activities.

**Robustness of data per activity and at the macro level**

The largest part of the Environmental Goods and Services Sector can be estimated making use of existing statistics and registers. Unfortunately, a lot of environmental specific activities are scattered over many different NACE categories. Examples are environmental advice and engineering, but also the production of industrial environmental equipment which is produced in manufacturing is very hard to identify in existing statistics. Another group of activities, like energy saving and sustainable energy systems and environmental technical construction are also very difficult to monitor. However, these activities fall under the definition of the EGSS set by Eurostat so data is required. For the purpose of data availability, a database of companies engaged in these activities has been constructed by Statistics Netherlands. For all the other identified activities, all kind of other sources have been used to compile statistics. The quality rates for the statistics have been presented per activity in table 24. The quality of the statistics differs quite substantially between activities. The quality of the statistics for the more traditional activities is generally speaking better than that of the more innovative activities in the EGSS. This is partly caused by historical developments in Statistics Netherlands. There is a long history in gathering statistics for traditional activities like environmental services, wholesale in waste and scrap and recycling. The more innovative activities in the EGSS have not been monitored on a regularly basis so far. Learning by doing will improve these statistics as time goes by. The overall quality rate for the EGSS can be qualified as 'acceptable'.

| Robustness of data per activity | | | | |
|---|---|---|---|---|
| | **Value added EGSS** | **Production** | **Employment** | **Main source** |
| Environmental services (i.e. waste- and wastewatermanagement) | E | E | E | National accounts |
| Wholesale in waste and scrap | D | D | D | National accounts |
| Renewable energy production | C | D | C | Energy statistics |
| Energy saving and sustainable energy systems | B | B | B | Database |
| Insulation activities | B | B | B | National accounts |
| Environmental related inspection and control | C | C | C | National accounts |
| Environmental advice, engineering and other services | B | B | B | Database |
| Industrial environmental equipment | B | B | B | Database |
| Environmental technical construction | B | B | B | Database |
| Organic agriculture | C | C | C | Agricultural statistics |
| Recycling | E | E | E | National accounts |
| Second hand shops | C | C | C | Business statistics |
| Government governance related to the environment | B | C | B | Environmental statistics |
| Organisations and associations on the environment | C | C | D | Database |
| Environmental related education | B | B | B | Education statistics |
| Water quantity control by waterboards | D | D | D | National sector accounts |
| Internal environmental activities at companies | C | D | C | Environmental statistics |
| Total EGSS in the Netherlands | C | C | C | |

A:not good
B:needs improvement
C:acceptable
D:good
E:very good

*Table 5.1-Robustnes of data per activity*

**Recommendations for improvement**

Improvement of the statistics for the group of activities 'energy saving and sustainable energy systems', 'environmental advice, engineering and other services', 'industrial environmental equipment' and 'Environmental technical construction' has the highest priority. For these kinds of activities it is very hard to determine the population. Statistics Netherlands has compiled its own database for these activities. In the future this database needs to be completed and needs to be kept up to date. Ongoing cooperation with branch associations will ensure that the database will be close to complete in the near future.

Secondly, individual companies, once identified, have been connected to the business register in order to retrieve information on value added and production and employment in full time equivalents at micro level. This approach has been applied for the years 2007/2008/2009 only. This micro based method differs from the method used until now for the years 1995 until 2006 to calculate production and value added. Until now we have made use of so called rules of thumb[9] in order to calculate value added and production on the basis of employment numbers for the period 1995-2006.

It is very important to improve this data for these activities because exactly these activities are very policy relevant. If one wants to support policy decisions, it is important to supply reliable statistics on this important topic.

Improvement in the statistics for the groups 'insulation activities', 'environmental related inspection and control', 'organic agriculture' and 'internal activities in companies' is the second highest priority.

For insulation activities holds that from now on it is impossible to rely only on national accounts data. Since 2006 the level of detail for products in the national accounts has been diminished. Specific insulation activities cannot be identified in the national accounts anymore. If one still wants to compile this data, on has to make use of different indicators from different sources to extrapolate the data

[9] Ratio's like production per employee and value added per employee

already compiled for this kind of activity. This story also holds for 'environmental related inspection and control'.

Statistics on organic agriculture can also be improved in the near future. Information on extra earnings and extra costs should be more detailed and should be integrated in the computation process.

The tendency towards more aggregated data is also a problem for statistics on internal environmental activities in companies (ancillary activities). A very high level of detail is necessary in order to compile reliable estimates for the different economic variables and different environmental compartments. This very detailed information is needed to fulfil the data needs of Eurostat regarding the EGSS. Without these details formerly available in the environmental statistics, statisticians become more and more dependent on making assumptions.

Finally, data on R&D & innovation, international trade and subsidies are very relevant in the context of the EGSS. More attention should be devoted to gather information on these topics specifically for the EGSS. Gathering data on these topics can help extend the research on important policy questions like:

- export innovative companies in the EGSS more than non-innovative companies?
- do companies with subsidies in the EGSS grow faster than companies without?
- do companies with subsidies in the EGSS innovate more than companies without?

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| Value added | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 200 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sewage and refuse disposal services | 1513 | 1609 | 1814 | 1936 | 2153 | 2364 | 2476 | 2675 | 2918 | 2879 | 2744 | 2889 | 3034 | 3257 | 3354 |
| Wholesale in waste and scrap | 1232 | 1180 | 1186 | 1260 | 1235 | 1433 | 1411 | 1411 | 1370 | 1663 | 1732 | 2097 | 2273 | 2367 | 1954 |
| Environmental related inspection and control | 7 | 9 | 12 | 17 | 23 | 25 | 31 | 39 | 53 | 59 | 71 | 71 | 77 | 90 | 120 |
| Government governance related to the environment | 369 | 393 | 393 | 411 | 471 | 470 | 501 | 561 | 620 | 629 | 638 | 666 | 693 | 693 | 693 |
| Organisations and associations on the environment | 28 | 36 | 39 | 46 | 49 | 56 | 62 | 60 | 70 | 75 | 80 | 73 | 71 | 88 | 89 |
| Internal environmental activities at companies | 561 | 565 | 595 | 627 | 655 | 653 | 662 | 697 | 679 | 634 | 590 | 611 | 601 | 562 | 552 |
| Renewable energy production | 64 | 76 | 92 | 93 | 95 | 104 | 107 | 100 | 115 | 106 | 68 | 213 | 413 | 576 | 629 |
| Energy saving and sustainable energy systems | 477 | 589 | 631 | 651 | 674 | 706 | 802 | 873 | 898 | 888 | 888 | 897 | 986 | 1123 | 1103 |
| Insulation activities | 1250 | 1250 | 1297 | 1462 | 1528 | 1710 | 1706 | 1741 | 1748 | 1692 | 1735 | 1820 | 1916 | 2009 | 2092 |
| Organic agriculture | 65 | 77 | 102 | 101 | 108 | 161 | 170 | 183 | 210 | 214 | 229 | 292 | 298 | 306 | 290 |
| Recycling | 72 | 88 | 109 | 105 | 188 | 175 | 169 | 159 | 178 | 222 | 235 | 310 | 312 | 279 | 181 |
| Second hand shops | 28 | 33 | 35 | 42 | 50 | 68 | 63 | 73 | 81 | 74 | 85 | 70 | 71 | 75 | 83 |
| Water quantity control by waterboards | 294 | 312 | 329 | 342 | 337 | 357 | 393 | 450 | 468 | 483 | 496 | 513 | 523 | 559 | 592 |
| Environmental advice, engineering and other services[1] | 295 | 369 | 332 | 440 | 438 | 467 | 531 | 592 | 547 | 631 | 579 | 687 | 758 | 892 | 855 |
| Industrial environmental equipment[1] | 251 | 261 | 264 | 278 | 320 | 317 | 359 | 372 | 385 | 342 | 384 | 406 | 406 | 380 | 402 |
| Environmental technical construction[1] | 77 | 80 | 85 | 94 | 102 | 129 | 130 | 134 | 181 | 202 | 187 | 222 | 221 | 226 | 227 |
| Environmental related education | 31 | 30 | 28 | 29 | 36 | 36 | 35 | 36 | 36 | 34 | 32 | 29 | 31 | 31 | 34 |
| Environmental Goods and Services Sector | 6613 | 6956 | 7342 | 7934 | 8462 | 9233 | 9607 | 10156 | 10558 | 10827 | 10772 | 11866 | 12685 | 13512 | 13249 |

| Production | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 200 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sewage and refuse disposal services | 3831 | 4092 | 4567 | 5096 | 5572 | 6151 | 6532 | 7107 | 7653 | 7765 | 7473 | 7817 | 8204 | 8979 | 9166 |
| Wholesale in waste and scrap | 1474 | 1298 | 1486 | 1508 | 1507 | 1727 | 1706 | 1719 | 1641 | 1947 | 2019 | 2428 | 2612 | 2729 | 2303 |
| Environmental related inspection and control | 15 | 28 | 38 | 53 | 35 | 39 | 58 | 71 | 94 | 105 | 123 | 124 | 134 | 156 | 208 |
| Government governance related to the environment | 667 | 688 | 706 | 737 | 1068 | 1082 | 1191 | 1352 | 1514 | 1468 | 1423 | 1497 | 1571 | 1571 | 1571 |
| Organisations and associations on the environment | 46 | 61 | 65 | 76 | 82 | 94 | 103 | 98 | 116 | 126 | 136 | 127 | 126 | 158 | 153 |
| Internal environmental activities at companies | 1254 | 1282 | 1337 | 1457 | 1510 | 1530 | 1587 | 1635 | 1615 | 1573 | 1548 | 1557 | 1533 | 1460 | 1413 |
| Renewable energy production | 98 | 118 | 137 | 148 | 150 | 187 | 216 | 244 | 259 | 314 | 483 | 654 | 658 | 902 | 966 |
| Energy saving and sustainable energy systems | 1654 | 1971 | 2135 | 2208 | 2273 | 2486 | 2743 | 3092 | 3214 | 3097 | 3038 | 3027 | 3444 | 4134 | 3843 |
| Insulation activities | 3230 | 3230 | 3378 | 3538 | 3635 | 3902 | 3975 | 4066 | 4026 | 4006 | 4120 | 4322 | 4551 | 4770 | 4969 |
| Organic agriculture | 136 | 170 | 213 | 227 | 255 | 363 | 405 | 446 | 497 | 553 | 597 | 741 | 797 | 931 | 925 |
| Recycling | 325 | 400 | 495 | 518 | 726 | 745 | 760 | 765 | 795 | 908 | 956 | 1094 | 1151 | 1243 | 947 |
| Second hand shops | 84 | 103 | 105 | 114 | 150 | 204 | 190 | 244 | 261 | 255 | 252 | 208 | 203 | 234 | 256 |
| Water quantity control by waterboards | 513 | 541 | 554 | 582 | 605 | 633 | 697 | 736 | 920 | 947 | 952 | 993 | 1036 | 1104 | 1196 |
| Environmental advice, engineering and other services[1] | 580 | 732 | 655 | 844 | 880 | 970 | 1134 | 1271 | 1194 | 1446 | 1253 | 1461 | 1629 | 1949 | 2220 |
| Industrial environmental equipment[1] | 866 | 885 | 920 | 961 | 1080 | 1089 | 1248 | 1390 | 1417 | 1313 | 1559 | 1569 | 1615 | 1671 | 1315 |
| Environmental technical construction[1] | 258 | 260 | 269 | 303 | 324 | 407 | 418 | 437 | 604 | 692 | 648 | 793 | 823 | 868 | 890 |
| Environmental related education | 42 | 40 | 38 | 40 | 48 | 48 | 48 | 48 | 47 | 45 | 43 | 40 | 42 | 42 | 46 |
| Environmental Goods and Services Sector | 15071 | 15900 | 17097 | 18411 | 19900 | 21655 | 23010 | 24722 | 25866 | 26559 | 26623 | 28451 | 30129 | 32903 | 32389 |

| Employment | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 200 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sewage and refuse disposal services | 20.7 | 21.4 | 22.7 | 23.8 | 24.5 | 25.2 | 26.2 | 27.1 | 28.2 | 27.1 | 26.8 | 26.3 | 26.6 | 26.9 | 28.0 |
| Wholesale in waste and scrap | 4.8 | 5.1 | 5.4 | 5.3 | 5.7 | 5.9 | 5.8 | 5.4 | 5.3 | 5.3 | 5.4 | 4.9 | 5.0 | 4.9 | 4.7 |
| Environmental related inspection and control | 0.1 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.9 | 1.0 | 1.3 | 1.3 | 1.6 | 1.5 | 1.6 | 1.9 | 2.4 |
| Government governance related to the environment | 6.9 | 7.1 | 6.7 | 6.9 | 7.6 | 7.3 | 7.4 | 7.9 | 8.4 | 8.2 | 8.0 | 8.1 | 8.1 | 8.1 | 8.1 |
| Organisations and associations on the environment | 0.9 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.4 | 1.6 | 1.7 | 1.7 | 1.6 | 1.5 | 1.9 | 1.9 |
| Internal environmental activities at companies | 10.5 | 10.3 | 9.9 | 10.0 | 9.1 | 8.3 | 8.4 | 8.3 | 7.3 | 6.8 | 6.7 | 6.4 | 5.9 | 5.2 | 5.1 |
| Renewable energy production | 0.4 | 0.5 | 0.6 | 0.6 | 0.7 | 0.8 | 0.8 | 0.9 | 0.9 | 1.1 | 1.3 | 1.6 | 1.7 | 2.2 | 2.3 |
| Energy saving and sustainable energy systems | 8.2 | 9.6 | 10.1 | 10.2 | 10.4 | 10.9 | 11.9 | 12.7 | 12.8 | 12.3 | 12.1 | 12.1 | 13.1 | 14.7 | 15.4 |
| Insulation activities | 27.6 | 27.6 | 29.2 | 30.1 | 30.2 | 30.9 | 31.6 | 30.6 | 30.0 | 30.0 | 30.8 | 31.3 | 32.4 | 32.8 | 32.6 |
| Organic agriculture | 0.9 | 1.1 | 1.2 | 1.3 | 1.5 | 1.7 | 1.9 | 2.0 | 2.2 | 2.2 | 2.2 | 2.2 | 2.3 | 2.3 | 2.3 |
| Recycling | 1.4 | 1.7 | 2.2 | 2.6 | 2.4 | 2.4 | 2.6 | 2.8 | 2.9 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.9 |
| Second hand shops | 2.1 | 2.5 | 2.7 | 2.8 | 2.6 | 3.5 | 3.1 | 3.6 | 4.3 | 3.4 | 4.3 | 3.5 | 3.2 | 4.1 | 5.1 |
| Water quantity control by waterboards | 3.6 | 3.6 | 3.7 | 3.5 | 3.0 | 3.0 | 3.4 | 4.1 | 4.0 | 4.0 | 3.9 | 4.0 | 3.7 | 3.7 | 3.8 |
| Environmental advice, engineering and other services[1] | 5.5 | 7.1 | 6.3 | 8.1 | 8.0 | 8.4 | 9.5 | 10.3 | 9.4 | 10.4 | 9.6 | 10.9 | 11.4 | 12.3 | 12.5 |
| Industrial environmental equipment[1] | 4.2 | 4.3 | 4.4 | 4.6 | 5.2 | 5.2 | 5.7 | 6.0 | 6.2 | 5.5 | 6.2 | 6.4 | 6.4 | 6.5 | 6.3 |
| Environmental technical construction[1] | 1.4 | 1.4 | 1.4 | 1.5 | 1.6 | 1.9 | 1.9 | 1.9 | 2.6 | 2.9 | 2.7 | 3.1 | 3.2 | 3.4 | 3.2 |
| Environmental related education | 0.6 | 0.6 | 0.5 | 0.5 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 |
| Environmental Goods and Services Sector | 100 | 105 | 109 | 114 | 115 | 118 | 123 | 127 | 128 | 125 | 127 | 127 | 129 | 134 | 137.0 |