

Foreign trade statistics for the Dutch Environmental Goods and Services Sector 2009 - 2012

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Explanation of symbols

:	Not applicable
.	Data not available
x	Publication prohibited (confidential figure)
-	Nil
o (o.o)	Less than half of unit concerned
*	Provisional figure
**	Revised provisional figure (but not definite)

Figures are rounded off to the nearest ten million Euro. Consequently, some totals may not correspond to the sum of the separate figures.

Abbreviations

BIO/EKO	Label for organic products
CEPA	Classification of Environmental Protection Activities
CPA	Statistical Classification of Products by Activity
CPC	Central Product Classification
CReMA	Classification of Resource Management Activities
DNB	De Nederlandse Bank (Central Bank of the Netherlands)
EGSS	Environmental Goods and Services Sector
FTS	Foreign Trade Statistics
GDP	Gross Domestic Product
MFA	Material Flow Accounts
MWh	Megawatt hour
NA	National Accounts
OECD	Organization of Economic Cooperation and Development
PRODCOM	PRODUCTION COMMUNAUTAIRE; Community Production for mining, quarrying and manufacturing
REC	Renewable Energy Certificate
RM	Resource Management
SEEA	System of Economic Environmental Accounts
SERIEE	European System for the Collection of Economic Information on the Environment
NACE	Standard Industrial Classification
SKAL	Association for certification of organic products
SNA	System of National Accounts
UN	United Nations

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Summary

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. On the one hand, they are interested in the economic burden of environmental regulation and taxation. As industries have to invest in pollution abatement control in order to comply with environmental regulation, additional (internal) costs may have negative side-effects on (global) competitiveness. On the other hand, they want information on the performance and development of enterprises producing goods and services that measure, prevent, limit, minimise or correct environmental damages, resource depletion and resource deterioration. Enterprises of this type belong to the so called Environmental Goods and Services Sector (EGSS) and can be classified into two main categories: Classification of Environmental Protection Activities (CEPA) and Classification of Resource Management Activities (CReMA).

To date, annual statistics on the EGSS included production, (gross) value added and employment. Trade statistics of the EGSS, one of the required variables for the legal base (No 691/2011 on European environmental economic accounts), are however still lacking. Hence, this report shows the results of a feasibility study to compile data on international trade for the Dutch EGSS. This update presents figures for the 2009-2012 period and is a follow-up of the pilot study executed in 2013.

Concepts and data sources

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. The compilation of international trade figures for the EGSS is partly based on the methodologies and concepts developed in the two former studies of Statistics Netherlands on the EGSS (Statistics Netherlands, 2006 and Statistics Netherlands, 2008).

The Dutch EGSS consists of 17 activities, of which 5 have no international trade by default. For this reason the following activities are excluded from this study: Managerial activities of governmental bodies, Water quantity control, Organisations on the environment and nature, Environmental related education and Ancillary activities. The traditional environmental activities consist of three activities: environmental services, recycling and wholesale trade in waste and scrap. Three activities relate to renewable energy or energy saving: energy systems and energy saving, the production of renewable energy and insulation. The other activities are: environmental inspection and certification, second-hand shops (not antiques), environmental consultancy and engineering, environmental related construction activities and production of industrial environmental equipment and organic agriculture.

The two main sources for this feasibility study are the national accounts data and the foreign trade statistics (FTS). The FTS consists of two different datasets, one for goods and one for services. In this update the 2010 figures published in the previous 2013 study have been changed. An error in merging the EGSS relevant businesses and FTS in services data was corrected and a minor update of list of EGSS businesses was processed.

Methodology

This pilot study uses several approaches. Where feasible the national accounts are used, because the environmental accounts are a satellite of the national accounts. Another set of activities uses FTS data combined with NACE codes in order to compile data on international trade. A third set of activities uses the FTS data and combines this data with the micro database of Dutch businesses active in the activities which are scattered all over the NACE system. In addition for renewable electricity and organic agriculture some alternative sources were investigated.

The international trade figures for 'environmental services' and preparation for recycling can be directly derived from the national accounts. These coincide with 2- and 3-digit level NACE codes which are readily available in the national accounts. The insulation services for newly built residential buildings abroad (export) may also be obtained from the national accounts.

For the wholesale trade in waste and scrap the FTS is preferred as both imports and exports can be derived from this source. For environmental inspection and certification and second-hand shops (not antiques) lower level of NACE codes can be applied to the FTS in goods. For insulation activities the FTS services data is used as well.

The third method connects the FTS to the 'micro approach database of businesses' for the following environmental activities: environmental consultancy and engineering, environmental related construction activities, production of industrial environmental equipment, energy systems and energy saving. A lot of environmental specific activities are scattered over different NACE categories. A list of relevant businesses is formed in order to compile statistics. For each business in the list an individual specialisation factor (or environmental share) is estimated mostly based on an expert guess. The data on international trade of goods and the businesses in the list are merged on business level. In order to compile statistics for international trade in services by the EGSS we made the effort to merge the business identification (ID) numbers of the businesses to the survey data on international trade in services.

For organic agriculture export figures are based on 'Export trend Biologisch' published by Bionext (Dutch business organisation on sustainable, organic agriculture and food) (2013) of the exports in potatoes, vegetables and fruits grown organically in the Netherlands in 2012. The time series is based on the trade in 2009-2012 by wholesalers specialised in organics.

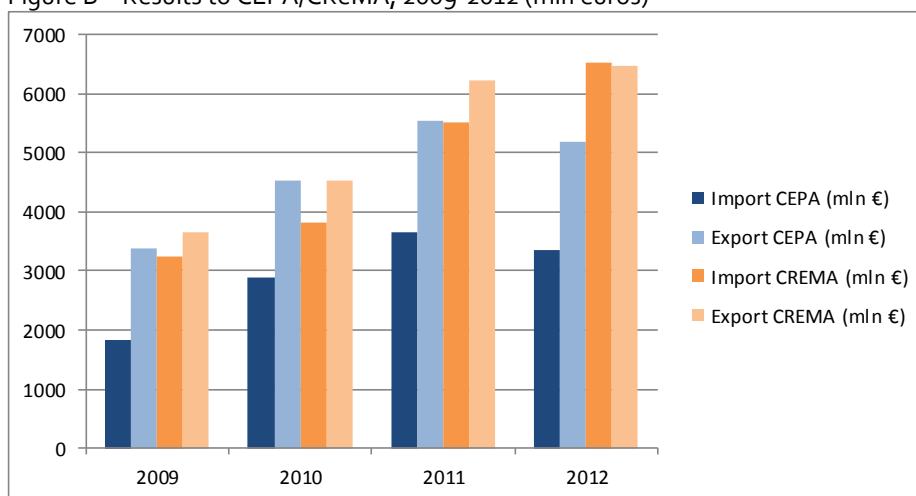
Table A - Overview of international trade, reporting year 2012 (mln euros)

EGSS activities	Labour	Output at	Gross	Export
	input of employed persons	basic prices	value added at basic prices	
	1 000 years	m ln euros	m ln euros	m ln euros
Organic agriculture	3	546	138	110
Energy systems and energy saving and Production of renewable energy	25.2	9,601	3,325	6,040
Wholesale trade in waste and scrap	5.7	2,393	2,001	3,640
Philanthropic envir organisations	1.6	178	107	-
In-house environmental activities	3.3	1,344	-	-
Environmental consultancy, engineering	8.3	1,131	603	340
Environmental services	32	8,425	3,079	500
Education about the environment	0.4	66	51	-
Gov. administration for environment	8.7	1,430	556	-
Production of industrial envir equipment	5.1	1,437	381	750
Preparation for recycling	3.9	2,421	646	290
Water quantity management	3.9	1,111	622	-
Insulation activities constr. Industry and Environmental inspection, certification and Environmental related constr. Activities and Second-hand shops (not antiques)	28.8	4,443	1,731	130
Total	130	34,526	13,239	11,790

Results

Figure B shows an overview of exports, imports and trade balances obtained in the Dutch EGSS. The share of EGSS in the total export of the Netherlands, including both export of services and goods, is estimated at 2.2 percent. The share in exports is larger than the share in employment (1.8%) and value added (2.1%), this could indicate that the Dutch EGSS is involved in export intensive economic activities. The total export and import of the EGSS can be divided into CEPA (environmental protection) and CREMA (resource management) categories (table 4.6). For export 34 % falls under CEPA, and for import this is 44% in 2012. Organic agriculture is not included in figure B, for this activity only an estimate for exports was feasible..

Figure B – Results to CEPA/CREMA, 2009-2012 (mln euros)



Conclusions

This pilot study shows that it not feasible to use only the national accounts data for compiling data on international trade of the EGSS. Other sources are needed to compile data for the various activities of the EGSS (table 6.1). This pilot study shows that it is feasible to use the national accounts data for international trade figures on environmental services and preparation of recycling. For other EGSS activities the National Accounts are unfortunately not

Table C – Possible sources per activity

Activity	Source			Other
	NA	Goods	Services	
Wholesale trade in waste and scrap	.	X	.	.
Preparation for recycling	X	.	.	.
Environmental services	X	.	.	.
Energy systems and energy saving	.	X	X	Micro approach
Production of renewable energy	.	X	.	Product codes, Micro approach, CertiQ
Environmental industrial envir eq.	.	X	X	Micro approach
Environmental consultancy, engineering	.	X	X	Micro approach
Environmental related const. activities	.	X	X	Micro approach
Environmental inspection, certification	.	X	.	.
Organic agriculture	.	Partly	.	Bionext
Insulation activities	Partly	-	-	.
Second-hand shops	.	X	.	.

detailed enough. In these cases the trade data sources, the FTS, was used directly. It is feasible to construct data for the wholesale trade in waste and scrap, the insulation activities, the environmental inspection and control and second-hand shops. While the wholesale trade in waste and scrap accounts for 51% of total EGSS export, the latter three contribute only less than 1 percent together.

The results based on the micro approach are subdivided between trade in services and trade in goods. The value of the exports in the micro approach goods exceeds the export in services by 11 fold. The limitation of the data sources on trade in services likely result in an estimate of the lower bound of the trade in services. The activities related to resource management, mostly energy resource management resources, hold a large share in the export figure.

Data on international trade of organic agriculture is limited to the export of potatoes, vegetables and fruits grown organically in the Netherlands. This based on information published by Bionext. This figures may not be available continuously over the years to come..

Discussion

Four issues are discussed in this feasibility study: the sources, the delineation of the EGSS, the interpretation of the results and the robustness of the data. It is important to note that two different data sources are used to construct data on international trade of the EGSS. On the one hand data from national accounts is used directly and for most activities it is recommended to use the FTS. Improvements are desirable for several different EGSS activities. The quality of the data can be improved by gathering more detailed information by means of designed

questionnaires. Especially the quality of the specialisation factor can be improved. Now the specialisation factor is often based on expert guesses. It would be better to survey the businesses active in the environmental market. At this moment we only make use of already existing sources and expert knowledge of different parties, no specifically designed questionnaires were send out. Such questionnaires can be helpful but will increase the administrative and financial burden.

The current delineation of the EGSS in the Netherlands differs for different activities. In future studies harmonizing this would be advisable. This is especially true for wholesale activities. These activities are so far not treated consistently over different activities within the EGSS. For renewable energy systems (e.g. PV panels) wholesalers were always included in the Dutch EGSS. Also wholesale in waste and scrap is in, but so far wholesale in organic agricultural products is still out. Production of organic agricultural products is part of the EGSS. Also the international comparability of EGSS statistics would benefit from such a harmonisation.

In considering the international trade of the EGSS for the Netherlands the objective is to compile figures for export and import for the relevant economic activities of the EGSS. This does not necessary equal the import of all environmental goods and services, nor is the import of environmental goods and services done exclusively by EGSS activities. Import figures represent those flows which are imported by activities of the EGSS. The EGSS imports also non-environmental products. The trade balance of the EGSS represents the contribution of the EGSS to the trade balance of the Netherlands. It does not represent the trade balance in environmental products.

The overall quality of the results for FTS for the environmental activities ranges from 'not good' to 'good'. Not all figures for the relevant activities within EGSS are of good or sufficient quality and because of confidentiality issues it is not possible to present the international trade of the EGSS in much detail. The most detailed level in this study is total CEPA (environmental protection)/CREMA(resource management) per activity. Several activities may be allocated in full to a single CEPA or CREMA class. Activities that should be distributed over multiple classes (CEPA or CREMA) lead to confidentiality issues as the number of businesses trading internationally within the activity and a single detailed CEPA or CREMA class is simply too small. A point that needs more attention is the subdivision of total exports into export from national production and re-export.

Recommendations

Based on this study several recommendations can be made. Overall, it is advisable to fine-tune the approaches, and invest in further research to improve the quality of the data. A more specific recommendation to consider to set up a survey or to add additional questions to existing questionnaires. The suggested survey should result in more robust environmental shares (specialisation factors) per business in the 'micro approach' based activities within EGSS and to diversify these factors for the different indicators as well as over time.

In terms of classifications it is advisable to coordinate the harmonisation of definitions, concepts and data sources internationally. Adding (more) environmental specific classifications to the standard classification systems may improve the registration of environmental specific activities (manufacturing of wind turbines) and products (e.g. renewable electricity, PV panels). Also the consistent inclusion of relevant wholesale activities seems a necessity for compiling meaningful export figures.

Compiling figures for certain activities requires a lot of effort, but results in small economic numbers or sometimes a low level of robustness. In these cases it is recommended to reduce the periodicity or to model the developments over time. Prioritising is important once resources are scarce.

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. On the one hand, they are interested in the economic burden of environmental regulation and taxation. As industries have to invest in pollution abatement control in order to comply with environmental regulation, additional (internal) costs may have negative side-effects on (global) competitiveness. On the other hand, they want information on the performance and development of enterprises producing goods and services that measure, prevent, limit, minimise or correct environmental damages, resource depletion and resource deterioration. Enterprises of this type belong to the so called Environmental Goods and Services Sector (EGSS) and can be classified into two main categories: Classification of Environmental Protection Activities (CEPA) and Classification of Resource Management Activities (CRema).

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 the one hand, the interest focuses on the economic burden of environmental regulatory measurements as well as taxation. Industries have to invest in pollution abatement control in order to comply with environmental regulation, additional (internal) costs may have negative effect on (global) competitiveness. 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).

The EGSS is part of the SEEA (System of Environmental-Economic Accounting) Central Framework (UN et al., 2012), which was adopted as international statistical standard in 2012. The EGSS is one of the three modules for the new legal base for environmental accounting (elaboration of Regulation (EU) No 691/2011 on European environmental economic accounts). According to the set-up of this legal base, data are required for the following economic variables: output, exports, value added, and employment.

Annual statistics on the EGSS are compiled and published by Statistics Netherland and include data on production, (gross) value added and employment. Export figures of the Dutch EGSS, one of the legal base variables, are still lacking. Hence, this report shows the results of a feasibility study to compile foreign trade statistics (FTS) for the Dutch EGSS in the Netherlands. In 2013 Statistics Netherlands carried out a pilot study for compiling import and export figures in reference year 2010 for economic activities included in EGSS (Statistic Netherlands, 2013). The continuation of this study which was carried out in in 2014 focussed on compiling a 2009 – 2012 time series for exports and import by the Dutch EGSS (2014 update). Also, an estimated import and export figure for the trade in organic certified potatoes, vegetables and fruits is new to the 2014 update. The results for reference year 2010 are changed in this update. The 2010 figures published in 2013 included an error in the trade of services and for several activities in the EGSS the overview of relevant businesses was updated.

The objective of this study is to identify the appropriate data sources and methodologies to compile FTS for all relevant activities of the EGSS. National accounts offer directly suitable figures for industries that entirely belong to the EGSS (traditional activities). For the other

activities, import and export figures related to the EGSS are calculated by merging a list of businesses that (partly) belong to the EGSS, identified by Statistics Netherlands, with sources on FTS. sources in order to calculate their imports and exports. For the other parts of the EGSS, like organic agriculture, alternative methodologies and data sources may supply figures imports and exports. This study is commissioned by the European Union. This report presents a time series for the 2009- 2012 period. For earlier reference years (before 2009) not all relevant data sources are available. National account based results may be provided for earlier years, but other parts of the EGSS require detailed micro data, which is unavailable of lower quality for earlier years.

The report is structured as follows. The next chapter outlines the concepts of the EGSS and provides information about the two main data sources: the national accounts and the FTS. Chapter 3 explains the different methodologies used and chapter 4 presents the results. Chapter 5 concludes and the last chapter provides the discussion and several recommendations.

2. Concepts

This chapter describes the concepts underlying the EGSS. The Dutch EGSS is sub-divided into so-called "environmental activities". These activities share similar environmental aspects, but may be scattered over different economic activities. For example the environmental activity 'organic agriculture' belongs to three economic activities (NACE 01, 02 and 03). Moreover, environmental activities can be classified to different categories of environmental protection and/or resource management activities.

Note that the international trade statistics of the Dutch EGSS do not represent the import of all environmental goods and services, nor the import of environmental goods and services done exclusively by EGSS activities. The delineation applies to *the environmental character of the activity*, which differs from a delineation based on the environmental character of products traded internationally. For example, 'waste water filtering equipment' imported by a business active in manufacturing of chemical products is not included, even though this is an import flow of an environmental good. On the contrary, computer equipment imported by an organisation involved in environmental research is included, while it actually does not concern an environmental good.

Chapter 2.1, describes the different environmental technologies and products that are part of the Dutch EGSS, i.e. the classification of CEPA and CReMA. Chapter 2.2. describes the different environmental activities relevant for this pilot study and chapter 2.3. shortly describes the main sources used in this pilot study.

2.1 Environmental technologies and products

Following the SERIEE, the SEEA, the Environmental Industry OECD/Eurostat Manual (OECD, 1999) and the handbook on the EGSS (Eurostat, 2009), Statistics Netherlands classifies production activities of environmental technologies and environmental products into two main categories:

- *Classification of Environmental Protection Activities (CEPA)*

Includes technologies and products of 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 ;radiation, prevention, reduction and elimination of soil erosion and salinity and other kinds of degradation. The CEPA category also includes the preservation of biodiversity and landscapes as well as the monitoring and control of the quality of the environmental media and waste.

- *Classification of Resource Management Activities (CReMA)*

Comprises technologies and products that 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, which are summarized in annex AI.

The EGSS consists of primary, secondary and ancillary activities (Eurostat, 2009). The primary activity of a statistical unit is the activity which contributes most to the total value added of that unit. The secondary activities are all other products for delivery to third parties. Ancillary activities exist solely to support the principal or secondary economic activities of a unit, by providing goods or services for the use of that unit only. For the Dutch EGSS the primary and secondary are combined and the ancillary activities are presented as a separate item. For this study only the primary and secondary activities involved in international trade are taken into account.

In the Netherlands, the 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. Among these sources are the national accounts, environmental statistics, energy statistics, PRODCOM statistics, the business register, information from branch associations and reports from government institutions. This study uses the same methodologies and concepts developed in the two former studies on the EGSS by Statistics Netherlands (Statistics Netherlands, 2006 and Statistics Netherlands, 2008a).

2.2 Description of activities

This section describes the different activities and the methods used for compiling the FTS data.

The whole Dutch EGSS consists of 17 activities, of which 5 have no international trade by default. The following 5 activities are therefore excluded from this study: Managerial activities of governmental bodies, Water quantity control, Organisations on the environment and nature (non profit organisations), Environmental related education and Ancillary activities.

The traditional environmental activities consist of three activities: environmental services, recycling and wholesale trade in waste and scrap. These activities can be seen as a sequence of events; collection, transformation/treatment and sales. They are called 'traditional activities' as they have been carried out for a long time and are not part of the more innovative activities in the EGSS, like the production of renewable energy.

- Environmental services include the collection and treatment of household and industrial waste for removal, cleaning services and treatment of contaminated soil and water (these activities can be derived from NACE codes 37, 38 and 39 of the National accounts). The environmental services can be executed by both private and public parties. However, only private environmental services are of interest with regard to the international trade statistics. Be aware that 'processing waste, scrap and articles into secondary raw materials' as well as 'wholesale trade in waste and scrap' are part of the other traditional environmental services.
- Recycling includes the preparation for recycling of scrap metals and waste (not metal) This activity can be derived from NACE code 383.
- Wholesale trade in waste and scrap metals includes the wholesale trade in car demolition materials; wholesale trade in iron and steel scrap and old non-ferrous metals; and wholesale trade in other used and waste materials (these activities can be derived from NACE code 46779). Be aware that this does not include the following activities: the treatment of waste with the aim of disposal; processing of waste and scrap and other articles into secondary raw material when a real transformation process is required (belongs to recycling); dismantling of automobiles, computers, televisions and other equipment for materials recovery;

ship-breaking; shredding of cars by means of a mechanical process; retail sale of second-hand goods.

Three activities are related to renewable energy or energy saving: energy systems and energy saving, the production of renewable energy and insulation.

- Energy systems and energy saving refers to activities related to the production of renewable energy systems. It involves businesses and institutions active in the production of energy-saving products and technologies in the pre-exploitation phase of renewable energy production. This includes the production of renewable energy systems; installations related to renewable energy systems; research and development focused on renewable energy technologies and consultancy activities related to renewable energy. Activities related to the import of wood pellets and other biomass are also included, but not the production of renewable energy itself.
- The production of renewable energy (exploitation phase) includes flow energy, energy from waste and biofuels (for transport). Flow energy encompasses electricity from wind, hydro or solar energy and heat produced by solar collectors or heat pumps. Energy from waste encompasses heat generated in incineration, heat generated by combustion of wood and biogas produced by the fermentation of organic material.
- Insulation activities form a separate activity and it includes installation in buildings or other structures of insulation against heat, noise or vibration . Also the installation of insulation on pipes, ducts, boilers and the like is included. Insulation activities limit noise, heat or vibration and are therefore within the scope of the EGSS.

The following activities are categorised on their own.

- Environmental consultancy, engineering and other environmental services belong to the more innovative part of the EGSS and it only involves activities which are produced by the services industries. It encompasses the work of consultancy offices who advise people and businesses on how to protect the environment and how to save on inputs. This includes the engineering services supplied by commercial services, like environmental advice and engineering aimed at environmental protection and resource management. Excluded are activities aimed at renewable energy production and energy conservation as these are already included in a separate activity category.
- The production of environmental industrial equipment for the benefit of the environment and management of natural resources. It includes only activities related to manufacturing.
- Environmental related construction activities refer to those activities aimed at producing construction products for the benefit of the environment and management of natural resources. It only includes activities which are produced by the construction industry.
- Environmental analysis and control activities include taking measurements that safeguard the purity of water or air; conducting analysis of potential sources of pollution, such as smoke and sewage; conducting research, identifying and

reporting to prevent asbestos; and conducting inspections related to soil contamination. Excluded are Research and development activities on the terrestrial environment, environmental radiation and the like as well as medical laboratories.

- Second-hand shops that are selling goods and clothes in stores, antique is excluded. This activity leads to the preservation of natural resources.
- Organic agriculture involves agricultural production where no chemical fertilizers and pesticides are used. Only organic fertilizers are allowed to protect the crops. It also has to adhere to stringent legislation regarding the use of concentrates and veterinary medicines for livestock. Organic products are certified with EKO, BIO or EU organic logos. International trade in organic products is of interest as the market for organic products is growing. As not all products can be produced domestically, it is important to retrieve the share of organic products from the agricultural imports. In 2007 the share of organic products in international trade was small compared to the relative share of organic products in Dutch consumption (Bakker & Bunte, 2009). A large share of the Dutch expenses to food that have a sustainable label, is dedicated to food with the BIO/EKO label (label that identifies organic food). This share was 43% in 2011 and the organic food market has been growing faster than the total food market (Ministerie EL&I, 2012). Hence, it is interesting to see whether the international trade in organic products follows a similar trend. In this study, foreign trade in organic agricultural products is, for practical reasons, limited to certified organic potatoes, fruits and vegetables. Collecting and analysing data on wider portfolio of organic products would simply be too time consuming.

2.3 Data sources

This section describes the two main sources used for this pilot study: the national accounts and the FTS (Foreign Trade Statistics).

National accounts

The national account (NA) is a system that presents the structure and evolution of a country's economy. Several economic indicators are at the core of the national accounts such as GDP (Gross Domestic Product, that measures the production of goods and services in a country) and national income.

The NA form a system which produces plausible estimates through integration of several statistics. The systematic approach connects a variety of sources and it is based on definitions underlying the systems which make it possible to relate the different statistics. The NA uses, like many data-sources, the FTS. Consistency over time is an important aspect, which contributes to the quality and possibilities of uses. However, this also limits the possibility to improve the national accounts regularly, as the entire system needs to be revised simultaneously which makes it impossible to partially change concepts and/or definitions. The objective of measuring a correct development of the economy (e.g. GDP growth) outweighs the aim of measuring the correct level of economic indicators.

International comparability is another important aspect of the national accounts. International guidelines and classifications are used, such as the SNA (System of National Accounts) (UN et al., 2009) and NACE (nomenclature of economic activities in the European Union) (Eurostat,

2008). For a more detailed description see the National Accounts of the Netherlands 2011 (Statistics Netherlands, 2012b) and the international guidelines and classification systems.

Foreign trade statistics

FTS are compiled both for goods and services. When GDP is derived from the expenditure side, allowance also has to be made for goods and services produced by non-residents but consumed by residents (imports) as well as for goods and services produced by residents but consumed abroad (exports) (SNA 2008). More detailed information can be found on the website of Statistics Netherlands (Statistics Netherlands, 2007; Statistics Netherlands, 2011).

Regarding goods, both the intra and extra-EU trade flows are tracked. Relevant data on international trade in goods comes from both a register of the customs and a dedicated survey by Statistics Netherlands. Businesses report their trade to and from non-EU member nations to the Dutch customs. The customs share this data with Statistics Netherlands. Trade between Dutch businesses and other EU-members is collected directly from these businesses by Statistics Netherlands. Businesses that annually trade over 900.000 Euro's to other EU-members are obliged to report details on their trading to Statistics Netherlands on a monthly basis. Businesses that trade quantities less than 900.000 Euro's a year within the EU are not required to report trade-details. Hence, the results are grossed up accordingly. The information provided by businesses is checked for plausibility and when necessary verified and adjusted. In the 'micro approach', businesses are connected to the data on foreign trade in goods.

For the international trade in services, Statistics Netherlands uses various different data sources. The data on services are collected every quarter by Statistics Netherlands in a sample survey among 5.000 businesses located in the Netherlands. The 350 largest are requested to provide more detail on their international trade than the other businesses. For the EGSS services such as 'consultancy', 'research and development', 'construction and transport' are of interest. Merging the data on international trade in services with the businesses in the EGSS is more complicated than for the trade in goods, as part of the international trade in services is only allocated to the aggregated enterprise and not to the individual businesses (statistical units). Also not all identification numbers of units in FTS services data are up-to-date so the coordination with the Statistics Netherlands business register is quite complex. Trade by the financial sector is registered at the National Bank of the Netherlands (DNB), but this data is not used as this activity/sector does not occur in the Dutch EGSS so far.

Other data sources

European tax authorities register goods and services sold to consumers in other EU member states (ICP). Especially for services this data source may provide additional information to the Statistics Netherlands' sample survey used in this study. The inclusion of services in the ICP is relatively new (2010) and it is likely to suffer from start-up problems. Another disadvantage is the scope, which is limited to the trade within the EU.

Although this data is not presently available at Statistics Netherlands, customs register the value of certified organic goods imported to and exported from the Netherlands to non-EU countries. However the most important foreign export markets for organic agricultural are the EU member states that are geographically close to the Netherlands (Bionext Exporttrend Biologisch 2013, 2014). Any data source limited to extra-EU trade will have limited relevance.

Several studies from research organisations and/or businesses can provide additional information on export (and imports) of the Dutch EGSS. For example, 'Export trend Biologisch' published by Bionext (Dutch business organisation on sustainable, organic agriculture and

food) provides information on the international trade of organic raw materials and food products. Databases on international offshore wind farm construction projects provide information on Dutch civil engineers and other contractors involved in project abroad (export of services) .

3. Methodology

In this section we describe what methodology we have applied to determine FTS data for the different environmental activities. Where feasible, the national accounts are used, because the environmental accounts are a satellite of the national accounts. Another set of activities uses FTS data combined with NACE codes in order to compile data on international trade. A third set of activities uses the foreign trade data and combines this data with the micro database of Dutch businesses active in the activities which are scattered all over the NACE system. A fourth set of activities investigates the possibility of making use of some additional data sources.

3.1 National accounts

The traditional activities consist of environmental services, the recycling and wholesale trade in waste and scrap. Gross value added and production for these activities can be directly obtained from the supply-and-use tables from the national accounts. In the national accounts these three activities are registered in corresponding NACE Rev.2 classes.

For the activities preparation for recycling and environmental services the foreign trade data can be directly derived from the national accounts. The following NACE codes were used: 383 Materials recovery¹ for the activity preparation for recycling. For environmental specific services the following codes are used: 37 Sewerage, 381 Waste collection, 382 Waste treatment and disposal and 39 Remediation activities and other waste management. From the national accounts a distinction can be made between goods and services. In addition it is possible to distinguish re-export from export from national production.

Businesses are allocated (in full) to a single NACE based on their principal activity. Though secondary activities of these businesses may have no environmental relevance, they are included in the figures for the EGSS. Under these assumption all economic indicators (production, value added, employment, import and export) are simply obtained from the National Accounts.

3.2 Foreign trade statistics and NACE

For several different other EGSS activities specific NACE codes, or subsets of NACE codes can be used to determine foreign trade figures. These activities are

- Wholesale of waste and scrap
- Second-hand shops
- Environmental inspection and control

Starting point is identifying the relevant businesses. These businesses are linked to the FTS database in order to compile international trade data.

For wholesale trade in waste and scrap the NACE code 4677 'Wholesale of waste and scrap' is used. It was not possible to determine the export of this activity directly from the national accounts. For second-hand shops (excluding antiques) codes 47792 Shops selling second-hand clothing and 47793 Shops selling second-hand goods (no clothing) are used.

¹ NACE codes and descriptions can be found in Statistics Netherlands (2009)

For Environmental analysis and control NACE code 71203 Other technical testing and analysis is used, under the assumption that this category entails only environmental analysis and control. In theory Environmental analysis and control are also part of the foreign trade in services and is most likely to fall within code '280 Architectural, engineering and other technical services' or '284 Other business services not elsewhere classified'. This would connect to CPA 2008 code 712; and more specifically to the code 71.20.19 Other technical testing and analysis services. Unfortunately, insufficient information is available to distribute any of the services to this product group. Therefore no data can be derived from this source. As the value added of environmental related inspection and control amounts to less than 1% of value added of all EGSS activities it is not expected that the amount of imported and exported environmental inspection and certification would be substantial.

In the 2013 study, for Insulation activities NACE Rev 1 code 4532 Insulation activities was used, but this is an outdated NACE classification. Since this approach holds little relevance for future reference years, this approach was discontinued in this 2014 update. An alternative approach has not been discovered. As the results of approach used for the 2013 study showed that the trade is of small numbers, finding an alternative methodology is not a priority.

From the database of foreign trade in services the export of insulation activities is added. The assumption is that export of insulation services is executed by the Insulation activity and that import of insulation services is done by other activities. Insulation services belong to the international trade in services, under the 'Construction services' identified with service code 25. However, no separate information is requested for insulation activities. A key is used to divide the 'construction services' to separate activities. It is estimated that a certain share of total construction services are insulation services. The product group of interest is 432 (CPA 2008) Electrical, plumbing and other construction installation works. For the Netherlands insulation activities are divided into buildings and dwellings, which are subdivided to newly built and already existing buildings and dwellings. The international trade in insulation services is only applicable to the insulation of newly built dwellings.

3.3 Micro approach

The 'Foreign trade and NACE' approach (section 3.2) and the micro approach differ in the way relevant businesses are selected for the EGSS. In the 'Foreign trade and NACE' approach all businesses in relevant NACE classes are selected. The micro approach is based on a list of businesses scattered over various NACE categories. Selected business are not necessarily included fully in EGSS an environmental share is attributed to each individual business. In order to compile statistics, a list of relevant businesses is constructed with the help of business associations and knowledge institutes. This list is joined with data collected by Statistics Netherlands for the FTS. This micro approach is used for:

- Renewable energy systems and energy saving (CReMA 13; excluding the trade in electricity from renewable resources, see section 4.4)
- Environmental consultancy, engineering (not CReMA 13)
- Environmental related construction activities (not CReMA 13)
- Production of industrial environmental equipment (not CReMA 13)

Data on international trade of goods and services are collected in different ways by Statistics Netherlands. In both cases our method consists of linking the businesses in the list to FTS data on business level. Not every business is 100% specialised in EGSS activities. Many businesses produce and trade environmental goods and services alongside other non-environmental

goods and services. For example, a business exporting solar panels may also be trading air-conditioning equipment. In these cases the estimated specialisation factor is applied to all economic variables. For each business in the population an individual specialisation factor (or environmental share) is estimated mostly based on an expert guess. The assumption is made that the specialisation per business is the same for production, employment, import, export and other economic figures. The specialisation factor is one for businesses that produce and trade only environmental goods and services. For goods and services the available data on international trade differs.

The businesses in the pre-exploitation phase of the sustainable energy sector are simply linked to the import and export data in goods. However, for biofuels and biomass the figures are compiled directly from the trade in goods database, because they can be directly linked to specific good codes². This is important, because large parts of trade of businesses that are involved in trade in biofuels and solid biomass also import and export other conventional energy carriers. Furthermore, it is important to note that the method leaves room for improvement. First because the scope of the GN codes is in particular cases not specific enough, which is a problem because some goods might have multiple purposes. Second, the figures only contain trade in goods and not in services, because appropriate data on the business level (statistical unit) is not available for trade in services.

3.4 Other methods

To investigate the international trade of renewable electricity several other sources were used. In theory this could be added to the activity production of renewable energy. However it proved to be impossible to include the international trade of renewable electricity, more details can be found in the box 'renewable electricity'. For the activity of organic agriculture also another method is proposed, but the results are incomplete and scope issues remain.

Production of renewable energy

All economic indicators (production, employment and value added) for this activity are based on the physical quantities of electricity, heat, biofuels and biogas produced in the Netherlands. The relevant, individual businesses are not all identified. Hence, the micro approach (see section 3.3) cannot be applied for this activity. Besides this activity is dispersed over many different NACE codes, as the production of (renewable) energy is in many cases not the principal activity.

² The following international trade codes (GN) are included: 22071000, 22072000, 29091910, 38249091, 15111010, 15111090, 15119091, 15119099, 44013020, 44013040, 44013080.

Box - renewable electricity

Renewable energy production includes the production of physical renewable energy (exploitation phase). This energy is divided into flow energy and energy from waste. 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. Biogas and renewable heat are (almost) not traded internationally. It is attempted to quantify the export and import flows of renewable electricity in monetary terms for the Dutch economy. In doing so the focus lies only on the distribution of the commodity renewable electricity. The trade related to biofuels and biomass are discussed in section 4.3.

Renewable electricity is, unfortunately, not a distinct product category in official classification systems like CPC (UN, 2008) and Harmonised System for International Trade (World Customs Organization (WCO), 2007). So in standard FTS and therefore also in national accounting these specific commodity flows are not registered over time. In national accounts only the commodity 'electricity' is registered. These flows can be both 'renewable' and 'non-renewable'. From a statistical point of view it is very hard to specify renewable flows and non-renewable flows because of the absence of a more detailed product classification-system. It is therefore concluded that it is nearly impossible to compile statistics for international trade in monetary terms using existing international classification systems.

To provide more insight in the available sources and their limitations, two alternative approaches were developed. The starting point for these conceptual frameworks is the market for 'renewable energy certificates' or RECs. A REC is proof that one megawatt-hour (MWh) of electricity was generated from a renewable energy resource. Once the electricity provider has fed the electricity into the grid, the REC they received can then be sold on the open market as a commodity. Because of the additional cost for producing "green" energy, the RECs provide an additional income stream to the energy provider, thus making it a bit more attractive to produce (Investopedia, 2013). The RECs gives us administrative information on virtual imports and exports of renewable energy. These RECs do not represent real

physical flows crossing borders and or transfer of ownership. This means that these RECs give us only an indication of the market for renewable energy and the position of the Netherlands in this market. There are two options: one can value the virtual international flows (based upon administrative information on

RECs) pretending that these certificates really represent international flows of electricity (change of ownership). One can also interpret these certificates as financial products. These flows are not registered in the production account but in the financial accounts of the national accounts.

Both concepts do not comply with NA concepts for international trade in commodities. The second framework approximates financial flows associated with certificate trade more closely, it is advised to interpret certificates as financial products. In national accounting it is advisable to use the second framework. Trade in certificates is not registered in the supply and use tables because it is a financial product. Financial products are registered in the sector accounts, but not specified for the RECs. Therefore figures on import and export compliant with national accounts cannot be produced. The numbers presented in this study on the exploitation phase of the renewable energy sector can thus not be implemented in the EGSS framework.

Box - renewable electricity continued

This does not mean that the information based upon both developed conceptual frameworks (virtual market-approach and financial product-approach) is meaningless. The value of these financial products (imports) is relatively small, only 3 million euro in 2010. The Netherlands is a net-importer of financial products. The mark-up for labelling electricity 'green or renewable' is approximately 0.7% of its intrinsic value. This is due to the fact that the market for certificates is not very scarce. It takes at this moment only a small mark-up for labelling commodities 'green' instead of 'grey'. The import of RECs by the Netherlands provides an additional income stream to the energy provider abroad of roundabout 3 million in 2010.

Organic agriculture

Estimating the export and import of 'organic agriculture' is complicated by several issues:

- The methodology for compiling figures for employment, production and value added is based on the share of organic agricultural businesses in the surface area used by all agricultural business. The surface area data has little relevance for estimating import and export figures.
- In many cases agricultural products are traded internationally by wholesale businesses/ distributors (NACE G) rather than by agricultural businesses (NACE A). In the indicators published for the Dutch EGSS so far (e.g. employment, value added), the wholesale activities related to organic agricultural products are not included.
- Some distributors are specialised in organic products whereas other distributors offer both organically certified and "conventional" goods. Also product codes in the international trade data do not distinct between organic and non-organic products.
- Many agricultural product are processed to food products such as meat products or dairy products before being exported.

Mostly to bypass the latter issue the trade in organic agricultural product the import and export is limited to potatoes, vegetables and fruits. Export figures published by Bionext³ (Bionext exporttrend biologisch 2012, 2013) for 2012 are the starting point. Total exports (350 mln euros) in 2012 are reported and exports from nationally produced goods (107 mln euros) are differentiated from re-exports (243 mln euros). Thanks to Bionext sharing their knowledge on wholesalers that are fully specialised in certified organic produce it has become feasible to select the specialised wholesales from the trade data of Statistics Netherlands in the 2009 to 2012 period. When the assumption is made that the growth of the trade in organic potatoes, fruits and vegetables by specialised wholesalers equals the growth in the total exports of these products this results in an estimate for 2009 to 2012.

Starting point are the exports from nationally produced goods in 2012 (Bionext). So far employment, production and value added in organics are limited to agriculture (NACE Rev 2 class A). Related activities in other NACE classes such as wholesale and food processing manufacturing industries are not included. The exports from nationally grown goods may be more relevant in this context than the total exports (including re-exports). The trade margins,

³ Bionext is the business organisation for organic agricultural businesses, wholesalers and retailers in the Netherlands.

packaging and possibly shipment costs included in the export figure may be deducted in order to improve alignment across different variables, but this has not been done yet.

Unfortunately, this approach does not result in an estimate for the imports of growers of organic products, like farm machinery, consultancy services or other inputs. In addition to 'organic potatoes, fruits and vegetables', 'livestock' or 'livestock products' from certified organic farms are relevant as well. However, many of these latter products, such as dairy or meat, undergo substantial processing before being exported. The processing steps add value and this results in an unsolved scope issue, where only a part of the export value is actually related to agriculture. The export value includes e.g. packaging, processing steps, trade margins.

4. Results

This chapter discusses the results for each of the different developed approaches and it concludes with an overview. Contrary to the previous chapters, the results for 'production of renewable energy' and 'renewable energy systems and energy saving' are combined in this section⁴.

4.1 National accounts

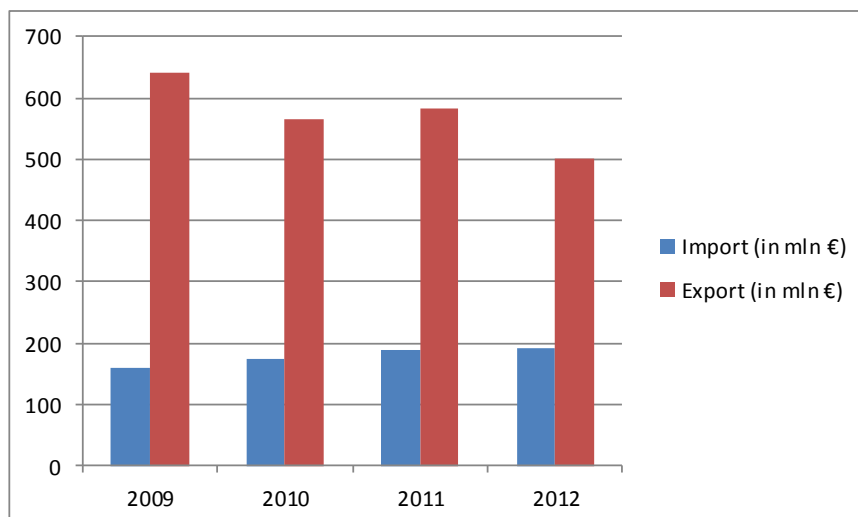
International trade figures for 'environmental services' and 'preparation for recycling' can be directly derived from the national accounts. The results are presented in figure 4.1 and figure 4.2.

Environmental characteristic services industry

The export by environmental specialist producers (NACE 37, 381, 382 and 39), both environmental services and goods, amounts to 430 mln euros (mainly waste products), while the import is only 70 mln euros in 2012 (see figure 4.1.). Figures are obtained from the National Accounts' input/output tables. This results in a relatively high positive trade balance.

International trade of 'environmental specialist services' are attributed to CEPA 3. The trade in services only is fairly stable over time, with import figures around 100 mln euros and export figures around 70 mln euros. In export value the trade in services is more than 6 times smaller than the trade in goods, especially scrap and waste metals.

Figure 4.1- International trade by the 'environmental services' industry in the Netherlands (mln euros).

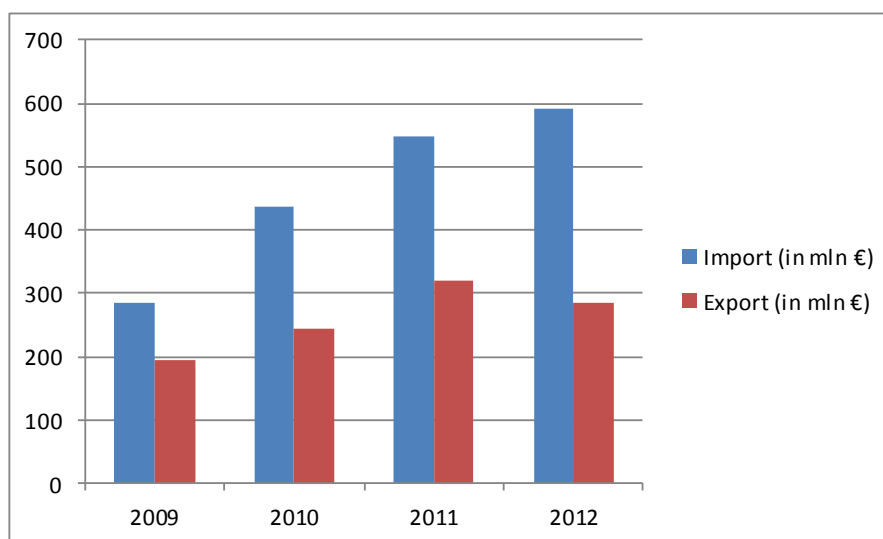


Preparation for recycling

'Preparation for recycling' is fully attributed to CReMA 14 (management of materials) and NACE 383 (preparation of recycling). In contrast to 'environmental services', the trade balance of the activity 'preparation for recycling' is negative (see figure 4.2.). The import consists mainly of waste products. Imports and exports of services are relatively small and stable over time, around 20 and 60 mln euros respectively.

⁴ trade in biomass and biofuels are not solely based on the micro approach

Figure 4.2- International trade by the 'preparation for recycling' industry in the Netherlands (mln euros).



Insulation activities

Trading in 'insulation' activities is in this study limited to the export of services. The figures are obtained from the national accounts, based on the selection of the corresponding product code. The export of 'insulation' activities is estimated at 40 to 50 mln euros (2009-2012 period).

In the previous study (Statistics Netherlands, 2013), trade figures of goods and services in the 'insulation' industry were estimated by using an outdated NACE Rev 1.1 classification. This resulted in an import of 20 mln euros and an export of 10 mln euros in 2010. As the present NACE classification (Rev 2) does not allow for the identification of businesses in this activity, this methodology is not future proof. The figures for 2010 show that the trade flows are of limited amounts, finding an alternative approach is not a priority.

Trade by manufacturers and wholesalers of insulation materials, such as mineral wools and multi-layered glass, is included in the activity 'Renewable energy systems and energy saving' (see section 4.3 micro approach) and will therefore not be discussed in this section.

4.2 Foreign trade statistics and NACE

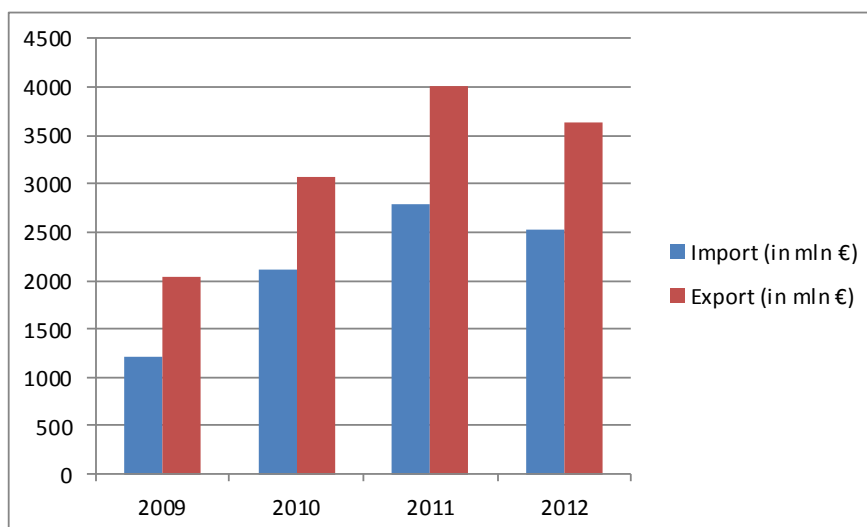
Activities which are delineated by a NACE-class are based on the selection of businesses in this NACE class from the business register and joining these businesses to the foreign trade statistics. This approach is used for wholesale trade in waste and scrap, environmental inspection and certification and second-hand shops (not antiques).

Wholesale trade in waste and scrap

'Wholesale trade in waste and scrap' is fully attributed to CEPA 3 (waste management) and NACE 46 (Wholesale). It has a positive trade balance of 1.1 bln in 2012 (see figure 4.3). Remarkably, after years of import-growth, from 1.2 billion euros in 2009 to 2.8 billion euros in 2011, the import fell with 10 percent in 2012 compared to 2011. The export shows a similar pattern, increasing from 2.5 billion euros in 2009 to nearly 4.0 billion euros in 2011 and decreasing as well by almost 10 percent in 2012. The import- and export-growth (in value)

between 2009 and 2011 was partly caused by a surge in the price of metal waste, which started to decrease in 2012 and therefore resulted in a lower import- and export-value. The majority (80%) of both imports and exports belongs to the wholesale trade in 'iron, steel and other non-ferrous waste'. Around 15 percent belongs to the wholesale of 'other waste and scrap' and the remaining part belongs to the wholesale of 'reusable parts of motor vehicles'. While the majority consist of waste and scrap, it may also include trade in other product-groups (secondary activity of the wholesale trade in waste and scrap).

Figure 4.3- International trade by the 'Wholesale trade in waste and scrap' industry in the Netherlands (mln euros).



Environmental inspection and certification

The foreign trade in 'environmental inspection and certification' is very small. Both import- and export-figures had not exceeded the 5 mln euros until 2011. The export shows a strong increase in 2011, but this is caused by a single business only and can therefore not be attributed to a general trend.

Second-hand shops

Imports by second hand shops remained stable over time, around 15 to 20 mln euros. Exports declined from 16 mln euros in 2009 to 10 mln euros in 2012, resulting in a small negative trade balance in 2012.

4.3 Micro approach

The micro approach covers the following four activities: 'Renewable energy systems and energy saving'⁵, 'Environmental consultancy and engineering', 'Environmental related construction activities' and 'Production of industrial environmental equipment'.

In the former study (Statistics Netherlands 2013), the identification numbers of the data source for foreign trade in services were misinterpreted in the micro approach. The micro data obtained from the national accounts department included a ID-number created by the foreign trade statistics department for their own use and purpose (variable name: WEID). This ID

⁵ Excludes goods and services that may be traded by businesses in the exploitation phase of renewable energy (exploitation stage).

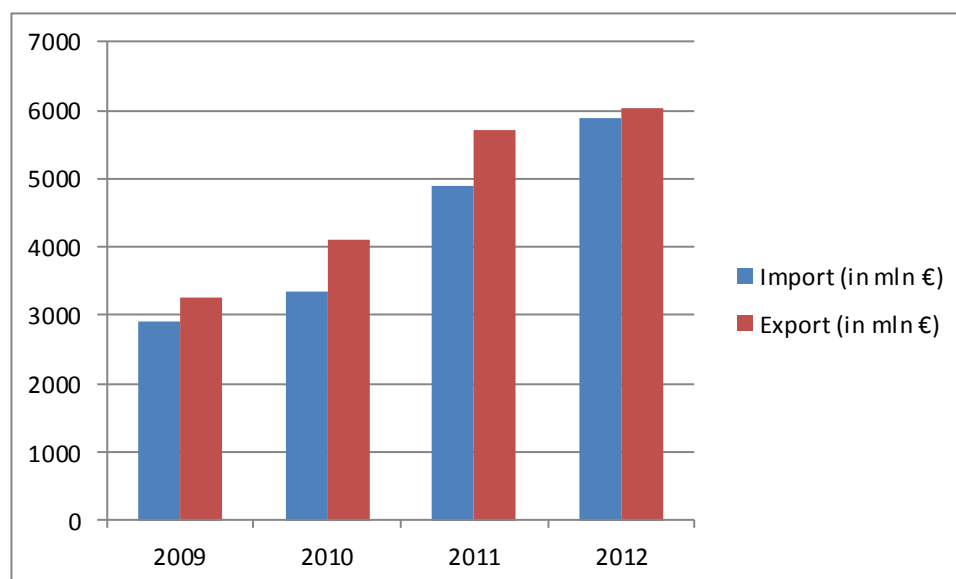
number holds no current relation to the ID numbers in the business register (variable name BEID or OGID). It was, however, mistakenly used in merging the trade data of services to the business register. This was clarified by the trade statistics department during the 2014 update-consultation and new micro data files were supplied for the period 2009-2012. Hence, the 2010 figures have been revised in this update. Changes in the 2010 results are also explained in part by the changes that have been made to the list of relevant businesses, especially for 'renewable energy systems and energy saving'.

Renewable energy systems and energy saving

Figure 4.4. shows a strong import- and export-growth in goods and services traded by the 'renewable energy systems and energy saving' between 2009 and 2012. Imports grew much faster than exports in 2012, which reduced the positive trade balance to about 170 mln euros. The international trade of 'biofuels and required inputs', as well as goods related to 'wind- or solar energy', have a large share in the figures.

Services in the 'renewable energy systems and energy saving' activity only have a small share in the figures presented in figure 4.4. In 2012, both import (290 mln euros) and export (410 mln euros) in services were similar to the figures in 2009. This can be explained by the assumption of a fixed environmental share per business in the micro approach (see section 3.3). The traded service include 'Research and Development', 'Construction', 'Licenses and Royalties' and Architectural, Engineering and other technical services'.

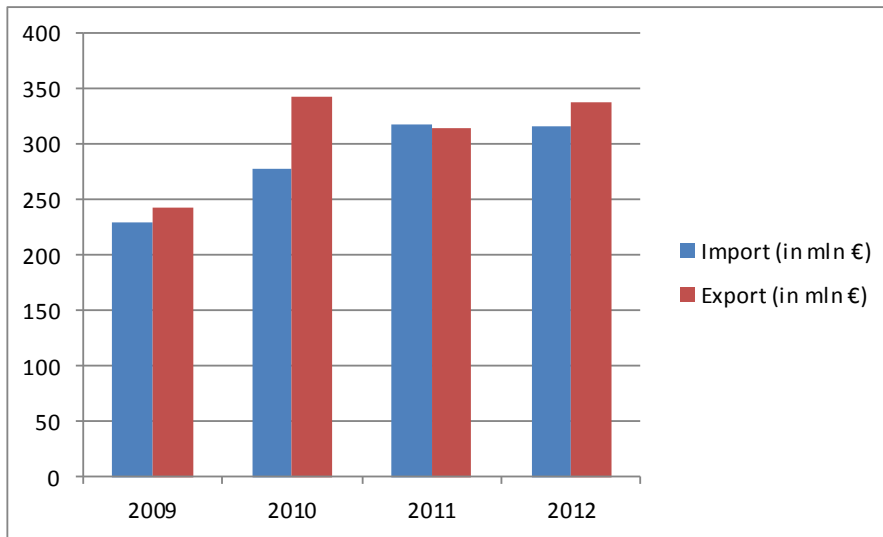
Figure 4.4- International trade by the Renewable energy systems and energy saving industry in the Netherlands (mln euros)..



Environmental consultancy and engineering

The total import in goods and services of this environmental activity in 2012 is estimated at 320 mln euros, while the export is estimated at 340 mln euros (see figure 4.5). Most important in this category is the trade in goods aimed at environmental protection by wholesale traders. Unlike the total of environmental consultancy and engineering (see figure 4.5), the trade balance of 'wholesale trade activities' is negative. The trade balance in services by environmental consultancy and engineering is positive and includes 'Architectural, Engineering, 'other technical services' or 'Transport services'.

Figure 4.5- International trade by the Environmental consultancy and engineering activity in the Netherlands (*mln euros*).



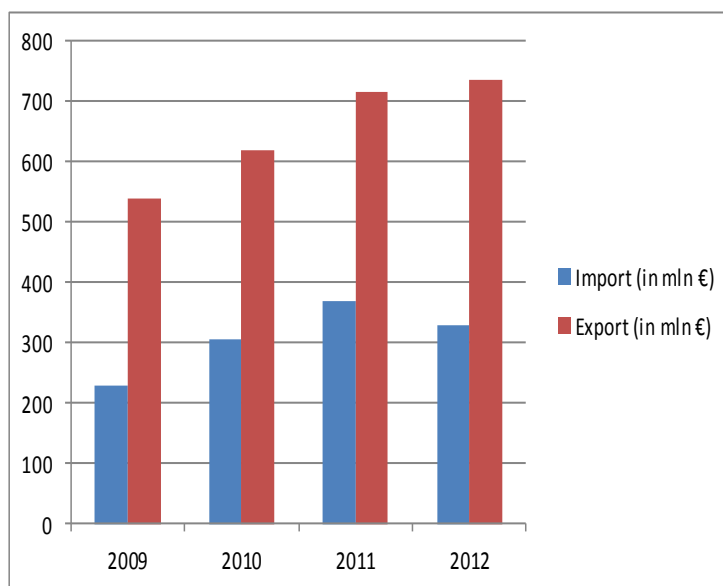
Environmental related construction activities

The international trade by businesses in the construction industry, related to the environment and management of natural resources other than energy resources, is small. Energy resources (Crema13) related construction is included in the activity: 'Renewable energy systems and energy saving'. The total import and export of goods and services of these activities is between 10 and 25 mln Euros. Both export and import figures are volatile over time, but this is often the case when figures are based on a relatively small number of businesses.

Production of industrial environmental equipment

As the industrial production related to renewable energy systems and energy saving is already included in the activity of renewable energy, the focus is here on the industrial goods for environmental protection such as garbage trucks, degreasers and pollution filtering equipment. With an export of 740 mln Euros and an import of 330 mln Euros in 2012, this activity has a relatively large contribution to the positive trade balance of the activities, see figure 4.6.

Figure 4.6- International trade by the Production of industrial environmental equipment activity in the Netherlands (*mln euros*)..



4.4 Other methods

This section shows the results for 'organic agriculture'. As explained in the box on 'renewable electricity', no results could yet be obtained for this activity.

Organic agriculture

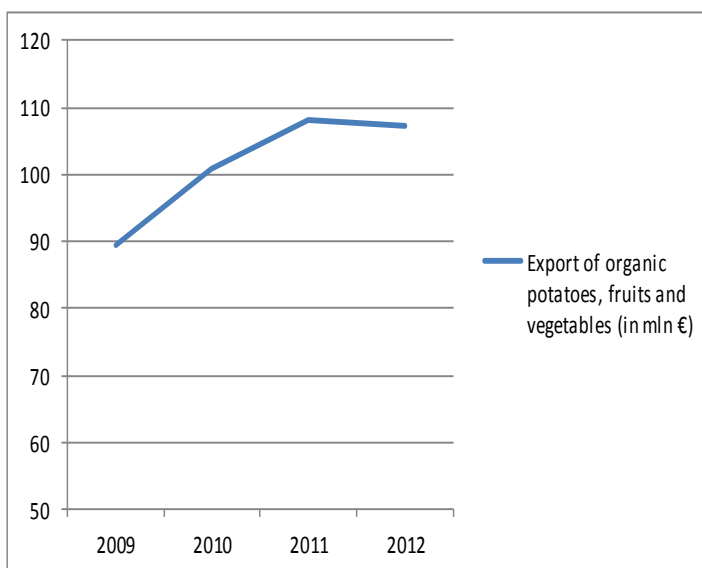
In this study, the focus for the 'organic agriculture' activity lies on trade in organic potatoes, fruits and vegetables. Exports in organic potatoes, fruits and vegetables are presented in the study '*Bionext Exporttrend Biologisch 2012*' (Bionext, 2013). The total exports are about 350 mln euros in 2012, the exports from only nationally produced goods are about 107 mln euros and the re-exports are estimated to be 243 mln euros.

Starting point is the export from nationally produced goods in 2012 and based on trade in organic potatoes, fruits and vegetables by wholesalers specialised in organics. Figure 4.7 shows the result.

Employment, production and value added in organics have been limited to agriculture. So far employment, production and value added in organics are limited to agriculture (NACE Rev 2 class A). Related activities in other NACE classes such as wholesale and food processing manufacturing industries are not included. The exports from nationally grown goods may be more relevant in relation to agriculture than the total exports (including re-exports by wholesalers). The trade margins and possible shipment costs, included in the export figure, should be deducted in order to improve alignment across different variables. This has not been done so far.

An estimate of the imports of organic agricultural businesses is not available.

Fig 4.7- Estimated export of organic potatoes, fruits and vegetables grown in the Netherlands (in wholesaler prices, mln euros).

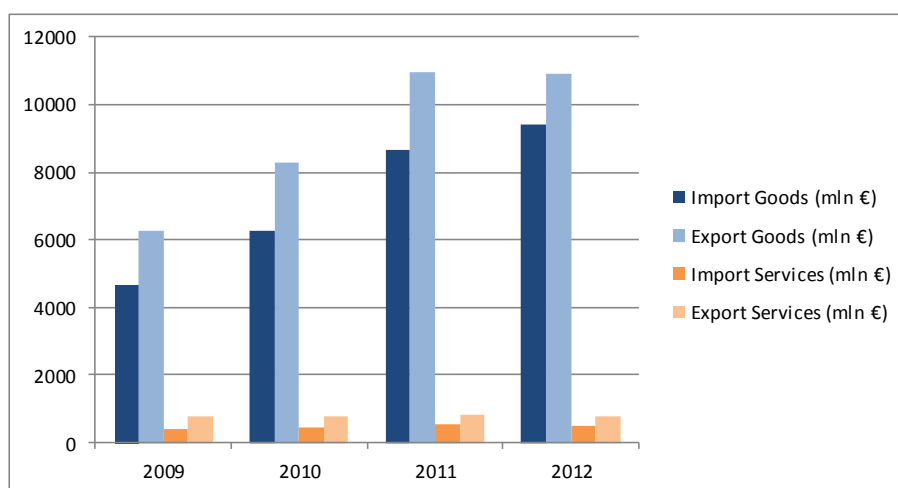


4.5 Overview

This section presents several results across the different approaches and activities. The results for 'organic agriculture' are excluded in figure 4.8 and 4.9 because for this activity only partial data for exports is available.

Figure 4.8 shows that the exports of both services and goods outnumber the imports of the same product type. The tradeflows of services only are much smaller and more stable over time than the tradeflows of goods (see again figure 4.8). This could be partly explained by the less complete and detailed data sources available for services compared to goods. Hence, the estimated tradeflows of services should be considered as a lower bound figure.

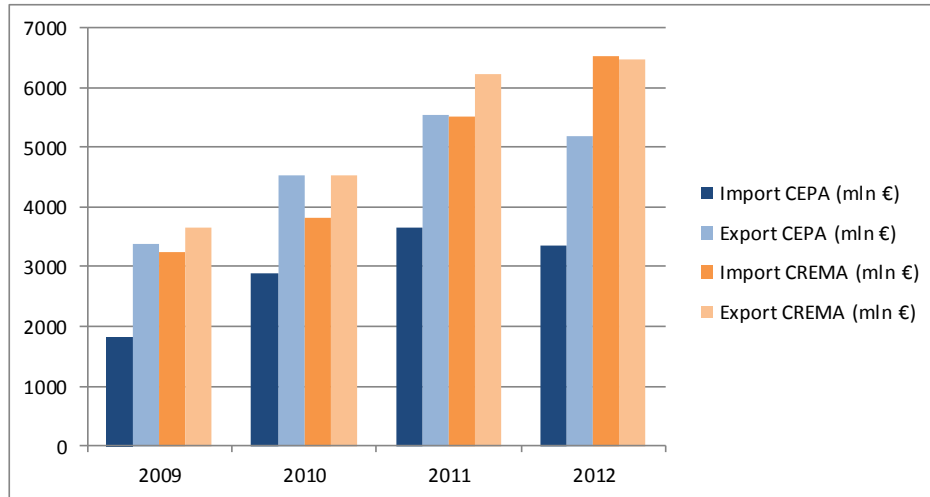
Figure 4.8- Foreign trade of goods versus services by all EGSS activities (organic agriculture excluded, mln euros)



The disaggregation of environmental protection (cepa) versus resource management (crema) activities is presented in figure 4.9. Resource management related activities show a larger growth in both imports and exports than environmental protection activities. The imports of crema-activities grew however more rapidly in value than the exports, which changed the trade

balance of crema-activities to a small negative balance in 2012. The trade balance of cepa-activities remains positive over the whole 2009-2012 period.

Figure 4.9- Export and import voor enviromental protection activities (cepa) versus resource manamenet activities (crema) in the Dutch EGSS (mln euros).



The results of the exports in the EGSS have been added to the other existing indicators, 'employment', 'production' and 'value added', for the Dutch EGSS (see figure 4.10). Output of wholesale and retail activities in the national accounts is measured by trade margin, i.e. the difference between sale less the cost to repurchase the good sold at the time it is sold. Exports may rherefore have a higher value than output for activities that consist partly) of wholeslae activities.

Figure 4.10 – Employment, production , value added and export per EGSS activity in 2012.

EGSS activities	Labour		Gross	
	input of employed persons	Output at basic prices	value added at basic prices	Export
	1 000 years	mIn euros	mIn euros	mIn euros
Organic agriculture	3	546	138	110
Energy systems and energy saving and Production of renewable energy	25.2	9,601	3,325	6,040
Wholesale trade in waste and scrap	5.7	2,393	2,001	3,640
Philanthropic envir organisations	1.6	178	107	-
In-house environmental activities	3.3	1,344	-	-
Environmental consultancy, engineering	8.3	1,131	603	340
Environmental services	32	8,425	3,079	500
Education about the environment	0.4	66	51	-
Gov. administration for environment	8.7	1,430	556	-
Production of industrial envir equipment	5.1	1,437	381	750
Preparation for recycling	3.9	2,421	646	290
Water quantity management	3.9	1,111	622	-
Insulation activities constr. Industry and Environmental inspection, certification and Environmental related constr. Activities and Second-hand shops (not antiques)	28.8	4,443	1,731	130
Total	130	34,526	13,239	11,790

The share of EGSS in the total export of the Netherlands, including both export of services and goods, is estimated at 2.2 percent. The share in exports is larger than the share in employment (1.8%) and value added (2.1%), this could indicate that the Dutch EGSS is involved in export intensive economic activities.

5. Discussion

The discussion focusses on four points; the data sources, the delineation of the EGSS, the interpretation of the data and the robustness of the data. Next some recommendations for further research are made.

Possible sources

The possible data sources per activity are listed in table 6.1 below. For most activities it is recommended to use the FTS (foreign trade statistics) or NA (National Accounts). However, improvements are desirable for several methodologies. The policy at Statistics Netherlands to reduce the administrative burden results in the restriction to use only existing sources; no specifically designed questionnaires were sent out. Such questionnaires can be helpful but will probably have a negative impact on the administrative and financial burden. However, data quality is likely to improve by introducing an EGSS questionnaire. The micro approach uses specialisation factors which introduce a margin of error to the results as the factors are based on expert guesses. Also the assumption that the same specialisation factor applies to all economic variables of an individual business is rather troublesome. For example; a business may be a trader in solar panels while it produces air-conditioning equipment. In this case the number of employees involved in the solar panel trading may be relatively small, while the share of solar panels in the business's import is relatively large. These kind of differences in the structure of the environmental products and other goods and services within a business are not accounted for in a desired way.

Table 7.1 – Possible sources per activity

Activity	Source			Other
	NA	Goods	Services	
Wholesale trade in waste and scrap	.	X	.	.
Preparation for recycling	X	.	.	.
Environmental services	X	.	.	.
Energy systems and energy saving	.	X	X	Micro approach
Production of renewable energy	.	X	.	Product codes, Micro approach, CertiQ
Environmental industrial enviro. eq.	.	X	X	Micro approach
Environmental consultancy, engineering	.	X	X	Micro approach
Environmental related const. activities	.	X	X	Micro approach
Environmental inspection, certification	.	X	.	.
Organic agriculture	.	Partly	.	Bionext
Insulation activities	Partly	-	-	.
Second-hand shops	.	X	.	.

The relatively new ICP register from the tax authorities may offer opportunities to future improvement to the estimated export (within the EU) in services in the more recent years.

Case studies by governmental or business organisation may provide insight in the trade by specific activities within EGSS by making use of expert opinion or data collected outside

Statistics Netherlands. Continuity is lacking in most cases as these studies are executed incidentally instead of annually.

Delineation

The EGSS includes those *'businesses that produce goods and services that measure, prevent, limit, minimise or correct environmental damage, resource depletion and resource deterioration'*. In future studies more attention should be devoted to the delineation of this definition when compiling statistics particularly on international trade.

The export of organic agricultural goods is mostly done by wholesale traders and not by the (organic) farmers themselves, but employment, value added and production in wholesale of organic agricultural products is not included in the Dutch EGSS so far.

Currently, it is recommended not to use data on international trade in renewable electricity certificates (REC) for the EGSS, because the amount of REC's traded internationally is not a good indicator for the amount of renewable electricity traded. Certificates are traded independently of the electricity. In theory, international trade in renewable energy should be included in the current account of the national accounts. Unfortunately network administrators cannot split international trade into green electricity and grey electricity (product is homogeneous; process is heterogeneous).

Another advantage of further refining the definition of EGSS would be international comparability. On an international level it should be agreed upon which activities belong to the EGSS and which not. International comparability is at this moment a problem for all economic variables of the EGSS. The handbook on EGSS needs more guidelines on this issue.

Interpretation

Considering the international trade of the EGSS for the Netherlands the objective is to compile figures on the export and import of relevant economic activities of the EGSS. This does not necessarily equals the import of all environmental goods and services, nor is the import of environmental goods and services exclusively done by EGSS activities. Import figures represent the import-flows of the EGSS, including non-environmental products. Hence, the trade balance of the EGSS represents the contribution of the EGSS to the trade balance of the Netherlands and it does not represent the trade balance in environmental products only. When considering only exports the conceptual difference between 'exports by businesses in EGSS' and 'exports of environmental goods and services' is less relevant.

For example, waste water filtering equipment imported by businesses active in manufacturing of chemical products is not included, though this is an import flow of an environmental good. On the contrary the import of computer equipment (not an environmental good) by an organisation involved in environmental research is included. On the other hand, a Dutch producer of garbage trucks may export this environmental good. The import of this business may consist of tyres, steering wheels and engine parts. For the activity of wholesale trade in waste and scrap this is less of a problem as both imports and (re-)exports mainly consist of similar types of goods.

In line with the previous point it is important to note that the methodologies differ within this study. Where the data from the national accounts (NA) is the result of confrontation of data sources in NA framework, the data from the FTS is used as direct input without this coordination of multiple data sources in the NA framework. For most activities holds that the

nature of imported products may differ from the nature of exported products. This is especially relevant for activities producing a certain good (production of energy systems).

Robustness of data

Table 7.2 below reproduces the quality assessment done in the 2012-study for the variables gross value added, production and employment (van Rossum, 2012). Because some methods have been revised, the current data may differ slightly from the data used in 2012. Moreover, international trade is added to the table. The assessment only takes into account the already existing sources. The overall conclusion at this stage is that, where feasible, the FTS for the traditional environmental services ranges from not good to good. Data derived from the national accounts are considered to be of good quality (integration/confrontation of multiple sources in the NA framework adds quality). Data for 'wholesale trade in waste and scrap' is of less quality, as this is derived directly from one of the data sources, the FTS. In fact obtaining several figures from an integrated framework, the national accounts, while compiling other activities may be obtained from a single data source (FTS), used for national accounts, may result in a reduced quality of result for the total EGSS, that is neither consistent with the national accounts nor the FTS data source.

The Quality of the trade in goods results is higher than the quality of the international trade in services. Employment in the Dutch economy is more service activities (82% in 2013, Eurostat) than the EU-28 average of 73% in 2013 (Eurostat). The estimate included in this study is based on a sample survey and may be considered a lower bound. 'Organic agriculture' is still under development and therefore assessed as not good.

Table 7.2 - Quality assessment per activity and indicator

Activity	Value added	Production	Employment	International trade
Wholesale trade in waste and scrap	D	D	D	C
Preparation for recycling	D	D	D	D
Environmental services	D	D	D	D
Energy systems and energy saving	C	C	C	C
Production of renewable energy	C	D	C	A
Production of industrial enviro equipment	B	B	B	B
Environmental consultancy, engineering	B	B	B	B
Environmental related constr. activities	B	B	B	B
Environmental inspection, certification	C	C	C	B
Organic agriculture	C	C	C	A
Insulation activities constr. industry	B	B	B	B
Second-hand shops (not antiques)	C	C	C	C

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

The activities based on a population of individual businesses (i.e. micro approach: energy systems and energy saving; production of renewable energy; production of industrial environmental equipment; environmental consultancy, engineering; environmental related construction activities) are assessed as 'acceptable' or 'needs improvement'. The production of renewable energy is assessed 'not good', because data still lacks for trade in renewable electricity. The assessment for the micro approach is based on the following observations:

1. The estimated environmental share (specialisation factor) is based on expert guesses. A dedicated questionnaire for businesses that potentially produce environmental goods and

services or the addition of several EGSS questions to existing questionnaire may improve the environmental shares as well as the completeness of the list of businesses in the EGSS. This argument is valid for all economic variables of the activities involved.

2. Part of international trade in services is only available on enterprise or holding level and not on the level of individual businesses. Also, the business identification numbers in the database on international trade of services are not fully coordinated with the Dutch Business register . And the coverage of the data of trade in services (sample survey) is much lower than the coverage of the trade in goods.
3. The figures for production, employment and value added for the environmental related construction activities include an estimate for the production of sewage systems and waste treatment facilities. This estimate is based on the gross capital formation in Dutch businesses and government bodies. The results of this investment based approach are added to the results of the construction businesses in the EGSS population (micro approach). For foreign trade is not accounted regarding construction of sewage systems and waste treatment plants.
4. The introduction of specific product codes (CPA) in the international trade registers for certain environmental goods and services, such as solar panels, would improve the robustness of the results in the future. So far, solar panels are included in a much broader CPA category of electronic equipment. The results of trade in services are less robust, because the sample of the survey is relatively small. When merging the FTS services data and the list of businesses, no export-figures in services could be obtained for some relevant businesses. It may be that they were simply not included in the 2010-sample or that the coordination with business register is lacking. Another explanation could be that these businesses operate abroad in foreign branches, which means that these activities are not allocated to the export of the Dutch economy.

Because not all data is of good or sufficient quality and because of confidentiality issues it is not possible to present the international trade of the EGSS in much detail. For several activities the lowest possible break down in CEPA/CREMA classes is total CEPA and total CREMA. The confidentiality requirements for publication prevent publishing further details.. Another point that needs attention is the division of total export into export from national production and re-export.

6. Conclusions

A time series for the international trade by EGSS activities for 2009-2012 is compiled. For earlier reference years (before 2009) not all relevant data sources are available. National account based results may be provided for earlier years, but other parts of the EGSS require detailed micro data (FTS and the list of selected EGSS businesses), which are unavailable or of lower quality for earlier reference years.

This pilot study shows that it is feasible to use the national accounts data for several EGSS-activities, i.e. the 'environmental services' and the 'preparation of recycling'. For the 'wholesale trade in waste and scrap' it is, however, recommended to follow the FTS-data (foreign trade statistic), because the trade margins of the national accounts cannot be attributed to 'wholesale trade in waste and scrap'. The traditional environmental activities account for a large share of the export and import of the EGSS. 'Wholesale trade in waste and scrap' accounts for 31% of the export of the EGSS in 2012. Also the export of 'insulation' activities by the 'construction' industry can be retrieved from the national accounts. The FTS is a valuable source to derive most other relevant activities of the EGSS. It is not only used for activities that are delineated by a specific NACE category, but also in the micro approach, which is based on a selection of relevant businesses that cuts across many different NACE-categories. The NACE delineated activities are 'environmental inspection and control' and 'second-hand shops' that, altogether, contribute less than 0.3 percent to the total exports of EGSS.

The micro approach, already applied for the production, employment and value added indicators of various EGSS-activities, is fairly easily extended to foreign trade figures. Merging the list of relevant EGSS businesses with the FTS-data is more successful for trade in goods than for trade in services. Based on the available resources, it was necessary to assume that the environmental share of foreign trade for a business (i.e. specialisation factor) equals the share of the other economic indicators. The specialisation factor for each individual business is based on an expert guess. The majority (about 60 %) of the businesses have a specialisation factor of 1. Overcoming the deficiency in the available data sources by using an expert guess lowers however the robustness of the results.

The trade-results of the micro approach differs between services and goods. The value of the export in goods exceeds services by 11-fold. The activities classified under 'resource management (crema)', mostly energy resources, hold an export-share of 85 percent. The export of 'biofuels' and 'biomass for energy production' hold a large share in the export of 'resource management' activities.

The businesses in the 'production of industrial environmental equipment' (excluding 'management of energy resources') generated a positive trade balance (over 400 million Euros), with a main focus on trade in goods.

Most of the services exported (55 percent of the 750 million euros in services) are related to 'renewable energy' and 'energy saving' activities. Examples are the construction of offshore wind farms abroad or energy efficiency consultancy provided to businesses or government bodies outside the Netherlands.

Figures on international trade in organic agriculture are not complete yet, as both scope and data availability issues remain in place. Even though the 'organic agricultural businesses' supply their products to foreign markets, they often do not export their products themselves. Many

goods will be traded by wholesalers or will be processed to processed food-products before being transported abroad. To date, the 'wholesale activities' and the 'food processing' industry is not included in the Dutch EGSS figures for employment, value added and production. The Dutch business organisation on sustainable, organic agriculture and food (Bionext) provides information on the export (valued at export prices, including trade margins, shipment and packaging cost) of organic raw materials, agricultural and food products for the years 2012 and 2013. However, a time series is not available nor an insight in the imports of the relevant businesses.

7. Recommendations

Based on this study several recommendations can be made. In general, it is advisable to fine-tune the approaches, and invest in further research to improve the quality of the data. More specific recommendations are listed below.

- In theory, a new survey or additional questions to existing surveys may enhance the data quality. This additional potential data source however does not comply with the current policy of Statistics Netherlands to reduce the administrative burden on businesses. It may also require substantial financial resources.
- In case a more detailed survey is not possible, it is recommended to investigate alternative methods, such as consulting experts, to update the specialisation factors.
- For services recorded in the FTS, it would be advisable to introduce more categories for large differentiated services like 'construction services'. Specifically for 'insulation activities' and 'environmental inspection and certification' it would be an option to further specify the questionnaires on foreign trade of services, but this would increase in the administrative burden for businesses.
- Some figures require a large effort in compiling, but they result in either small numbers or a low level of robustness. In cases such as foreign trade in services by businesses in the micro approach or the trade in organic products it is recommended to reduce the periodicity or to apply indicators for the developments over time.
- The consistent inclusion of relevant wholesale activities, such a whole sale of organic produce, seems necessary for compiling meaningful export figures. The position of Eurostat towards the inclusion of wholesale activities is not clear. The practical guide (page 28, Eurostat (2014)) on EGSS suggests that it is included. In the EGSS indicative compendium (Eurostat (2014)), wholesale activities (NACE G) are not mentioned.
- International coordination in harmonisation of definitions, used concepts and data sources (including guidance on the inclusion or exclusion of wholesale traders), is welcome especially in relation to the export of environmental activities.
- Identification of activities belonging to the EGSS will improve if the classifications used in Statistics, such as NACE and CPA, will be adjusted according to changes over time.

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Annex

AI- Environmental domains in the Environmental Protection Group and Resource Management Group

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
