**Documentation of statistics for
Environmental Goods and Services 2019**

1 Introduction

The statistics on environmental goods and services show economic variables related to market-based business activities within environmental protection and resource saving areas. The statistics contribute to the overall picture of what happens in the environmental field and is a part of the environmental accounts. First results covers 2012.

2 Statistical presentation

Environmental goods and services (EGSS) is products with specific environmental or resource saving purposes (e.g. waste water management or production of windmills) as general products cleaner and/or more resource efficient than similar types. Freezers with low energy consumption and construction of low energy houses are examples. The statistics is part of the the Environmental-Economic Accounts for Denmark (Green National Accounts).

The statistics is designed to show results broken down by 8 environmental protection areas and 8 resource saving areas. The kind of activities can be categorized in 3 sub-types: Environmental specific services, connected goods and services and cleaner and resource efficient products.

2.1 Data description

Environmental goods and services are products with specific environmental or resource saving purposes (e.g. waste water management or production of windmills) as general products cleaner and/or more resource efficient than similar types. Freezers with low energy consumption and construction of house with very low use of energy are examples.

The statistics is designed to show results broken down by 8 environmental protection areas and 8 resource saving areas. The kind of activities can be categorized in 3 sub-types: Environmental specific services, connected goods and services and cleaner and resource efficient products.

Non-market based environmental goods and services also exists, mainly as public services and as internal environmental costs in the enterprises. These elements are not covered by the statistics in question.

The products and services are as far as possible only counted in first stage of production cycle. Activities within transport and trade sector is not included.

Main indicators are turnover, export, value added and employment. However, other variables can be compiled as well.

Data for the statistics is collected for 2013, 2015 and 2017 by a survey targeting types of industry expected to partly produce environmental goods and services. For 9 types of industry (2-digit level) the needed data are (2017) derived or estimated from existing statistics.

2.2 Classification system

The environmental goods and services has to be shown broken down on protective and resource saving activities.

For environmental protection the CEPA classification (Classification of Environmental Protection Activities) is used:

- Cepa 1: Protection of ambient air and climate.
- Cepa 2: Wastewater management.
- Cepa 3: Waste management.
- Cepa 4: Protection 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: Environmental research and development.
- Cepa 9: Other Environmental protection activities.

In the data collection and dissemination CEPA 7 is reported under CEPA 9.

For resource saving / optimizing is used the CreMa classification (Classification of resource Management activities):

- Crema 10: Management of water.
- Crema 11: Management of forest areas (11a og 11b).
- Crema 12: Management of wild flora and fauna.
- Crema 13: Management of energy resources. **13A**: Production of energy from renewable resources. **13B**: Heat/eanergy saving and management. **13C**: Minimisation of use of fossile materials.
- Crema 14: Management of minerals.
- Crema 15: Research and development for ressource management.
- Crema 16: Other ressource management activities.

Crema 12 are not directly included in the statistics, as the market based activities in these fields are seen as insignificant. Activities may be recorded under CreMa 16.

2.3 Sector coverage

The EGSS statistics covers the following NACE-groups:

- A Agriculture, forestry and fishing
- C Manufacturing
- D Electricity, gas, steam and air conditioning supply
- E Water supply, sewerage, waste management and remediation activities
- F Construction
- M Professional, scientific and technical activities

2.4 Statistical concepts and definitions

Annual Work Units as Employment Related to Environmental Goods and Services: Employment related to environmental goods and services in AWU.

Monetary Value of Export of Environmental Goods and Services: Export of environmental goods and services in mio. DKK.

Monetary Value of Turnover from Environmental Goods and Services: Turnover from environmental goods and services in mio. DKK.

Monetary Value for Value Added from Environmental Goods and Services: Value added from environmental goods and services.

2.5 Statistical unit

The core unit in the data collection and dissemination is the legal business units, grouped by type of industry. In few cases the economic unit is used. All units are in principle covered, independent of economic size.

2.6 Statistical population

Includes business units in agriculture, manufacturing, energy supply, sewage and waste, construction and professional/scientific .

2.7 Reference area

Denmark.

2.8 Time coverage

The descriptions covers 2012-2019. No results has been compiled for years before.

2.9 Base period

Not relevant for these statistics.

2.10 Unit of measure

Turnover, export and value added is shown in million DKK, current prices.

Employment is shown in annual work units, AWU.

2.11 Reference period

Calendar year.

2.12 Frequency of dissemination

Annually.

2.13 Legal acts and other agreements

Data used in the statistics is partly existing data, partly data collected specifically for this statistics. These data are collected according to the Law on Statistics Denmark, paragraph 8.

The EGSS-statistic and five other statistics (modules) are framed by regulation 691/2011. Further, implementing regulation 2015/2174 are in force.

The regulation decides that first data on EGSS had to be submitted to Eurostat by the end of 2017 with 2015 as the first reference year, but 2014-results are obligatory as well. The early compilation in Denmark (from 2012) was partly due to a wish from governmental agencies to get information earlier than stipulated by the regulation.

2.14 Cost and burden

DKK 100.000 for 2019. Lower than in 2017 due to smaller sample.

2.15 Comment

Please contact Statistics Denmark in case of further questions.

3 Statistical processing

The data collection is based on a stratified sample of 1,600 business units out of in total 3,100 units with 10 employees or more in the relevant types of industries

In the complete statistics also estimates for smaller business units and from existing sources are included.

3.1 Source data

There are overall two sources for the statistics:

- A. A survey by questionnaire, where enterprises are asked about turnover in 2013, 2015, 2017 and 2019 from EGSS broken down by environmental purposes. About 1.600 units were selected in 2019 as a sample covering a population of about 3.000 business units in the respective types of industry. The selection is by stratified methods.

The stratification is by type of industry and by number of employees (10-19, 20-49 and 50+). In the last group the selection is 100 per cent of population. Within manufacturing a pre-selection is carried out according to a list of environmental goods type of goods (CN8). Within advisory service engineer firms are prioritized. In 2013 Enterprises in Nace_rev2 38 and 39 was selected 100 per cent. In 2015 figures are estimated from other statistics

- B. Existing data from Statistics Denmark or other agencies, which could be used, either directly or as source for estimation.

Both sources are linked to statistical data on employment, value added and export.

The *survey* covers the following types of industry: 13, 14, 16, 17, 18 (from 2015), 20, 22, 23, 24, 25, 26, 27, 28, 29, 30, 33, 41+42+43 (2013 and 2015) , 71, 74 (until 2019)

Results covering the units with less than 10 employees has been estimated by industry, using data from units with 10-19 employees.

Existing data is used for the following industries: 01, 02, 35, 37, 38+39 (from 2015),41+42+42 (from 2017), 72 and 74 (from 2019)

Other statistical sources: - Account statistics for agriculture - Forestry statistics - Account statistics, non-agricultural industries - Enterprise statistics - Employment statistics - External trade statistics - National account statistics - Sale and purchase, enterprises - Business register - Construction statistics

For special analyses:

- Statistics on salaried workers
- Education statistics
- IFATS statistics (ownership)
- R&D-statistics
- Trade with Intellectual Property Rights
- Registers on property rights

3.2 Frequency of data collection

Every second year. Latest regarding 2019.

For other years results for environmental goods and services is compiled by combining newest data collected and other statistics.

For the types of industry, where existing data is used, the data collection is annual or more frequent.

3.3 Data collection

The survey for EGGS is web-based, meaning that a web questionnaire has been developed. The Danish version at: Grønne varer og tjenester.

The questionnaire was from 2015-collection developed into three sections, addressing manufacturing, construction and knowledge based services, respectively. However, the construction sector was not included in the data collection for 2017 and 2019, but covered by model-based estimates..

3.4 Data validation

The validation of collected data are given high priority. This because the not very precise definition on environmental goods and services makes it difficult to formulate very clear questions in the survey. Furthermore, for a first time statistics, full attention of data quality is very needed.

Overall, 70-80 per cent of the received answers has been subject to validation. Main checks was:

- if the answers match information from web site and other sources about the production of the firm in relation to possible EGSS products.
- if the answers about activity match with the PRODCOM statistics information.
- if the distinction between specific and adapted EGSS has been fully understood.
- if the data about turnover match in size with statistics from last years (to check the measurement unit).
- if the answers are consistent with answers regarding 2017

About 2-300 enterprises has been contacted for clarification of data. In many cases the communication has led to an increase in figures related to EGSS, as the definition has not been fully understood in first stage.

The reported data from consulting engineers units has been compared to data collected for the specific statistics for this type of industry.

The non-reporting units have been checked for their importance. In few cases imputation based on available information has been the practical solution.

3.5 Data compilation

The consistency of the specific collected data is to the possible extend ensured through the validation.

In general, there has been no imputation needed. The final weighting is expected to adjust for non-response.

Totals are estimated by using the stratification and related weights for the sample.

2019-compilation: The collected data for 2019 are adjusted by turnover from the provisional enterprise statistics 2019. Grossing has been done by using the provisional statistics on enterprises as frame, meaning that original weights has been adjusted. Estimation for small units (below 10 employed) is based on 2019-results adjusted to provisional 2019-results for the strata.

2018-compilation: The collected data for 2017 are adjusted by turnover from the final enterprise statistics 2018. Grossing has been done by using the provisional statistics on enterprises as frame, meaning that original weights has been adjusted. Estimation for small units (below 10 employed) is

based on 2017-results adjusted to final 2018-results for the strata.

2017-compilation: The collected data for 2017 are adjusted by turnover from the final enterprise statistics 2017. Grossing has been done by using the provisional statistics on enterprises as frame, meaning that original weights has been adjusted. Estimation for small units (below 10 employed) is based on 2017-results adjusted to final 2017-results for the strata.

2016-compilation: The collected data are adjusted using turnover and employment from the final enterprise statistics 2016. Grossing has been done by using the final statistics on enterprises as frame, meaning that original weights has been adjusted. Estimation for small units (below 10 employed) is based on 2015-results adjusted to final 2016-results for the strata.

2015-compilation*: For 2015 the collected data for 2015 are used adjusted for final turn over according to account statistics 2015. The weights are adjusted to the 2015-frame (accounts statistics 2015). Type of industry for the unit in 2015 has been used for the mounting up. Results for small units is adjusted to account statistics results as well.

2014-compilation: The collected data are adjusted using turnover and employment from the final enterprise statistics 2014. Grossing has been done by using the final statistics on enterprises as frame, meaning that original weights has been adjusted. Estimation for small units (below 10 employed) is based on 2013-results adjusted to final 2014-results for the strata.

2013-compilation*: For 2013 the collected data for 2013 are used adjusted for final turn over according to account statistics 2013. The weights are adjusted to the 2013-frame (accounts statistics 2013). Type of industry for the unit in 2013 has been used for the mounting up. Results for small units is adjusted to account statistics results as well.

2012-compilation: The collected data for 2013 are used for units also existing in 2012. . The collected data is adjusted to the to the 2012 turnover. The weights are adjusted to the 2012-frame (accounts statistics 2012). Type of industry for the unit in 2012 has been used for the mounting up for 2012. However, only few changes in type of industry.

Linking survey data to other statistics: The survey data are merged to data on employment and GVA for the individual firm by using the unique business ID. Data for small units has been merged at strata-level.

Value added: Value added 2012-2018 is based on Account statistics, by using the green share of turnover as proxy for share of value added.

Employment: Employment 2012-2018 is based on Account statistics by using the green share of turnover as proxy for share of employment. Employment 2019 is preliminary based on provisional enterprise statistic. For small units the employment 2019 has been adjusted to try to include the owner under employment.

Export: Export values of *goods* is for 2012-2018 is based on registers, where production data and export data is merged at enterprise level. However, the merging cannot be perfect as exporting unit are sometimes different from the producing unit, which may induce some noise in the overall picture. The Export is calculated by using the green share of turnover as proxy for EGSS-share of export. For 2019 the export are provisional and based on "raw" export data. Export values for *services" is compiled using the same model as for goods.

Other results

green enterprises: Enterprises with at least 25 per cent of turnover deriving from EGSS, is seen as *green* enterprises and the other enterprises in the population as *non-green*

Salaries: The collected data on EGSS are merged with data on salaried employees and paid salaries, using register on Account Statistics 2012. By this salary per employee are calculated.

Education: The collected data on EGSS are merged with data on persons latest finalized education for these employed at the units by January 1st 2013, according to the so-called RAS-register.

Ownership: For 2012 the collected data is merged by register on owners resident country to group by Danish and not-Danish owners.

Research and development: For 2013 the collected data, adjusted to final turnover and employment, is merged by collected data on Research, development and innovation in enterprises. The merging has been done for enterprises with at least 100 employees, where the surveys have similar coverage. Reporting using different units have been dealt with. The dataset counts 397 enterprises, of which 74 defined as *green*.

IP-rights: For 2013 the collected data, adjusted to final turnover and employment, is merged by collected data on Trade with patents and other IP-rights. The merging has been done for enterprises with at least 100 employees, where the surveys have almost similar coverage. Reporting using different units have been dealt with. The dataset counts 348 enterprises, of which 79 defined as *green*.

Existing statistics used for for EGGS are listed below. Results are in most cases provisional for latest year in question.

Agriculture: The results from Farm account statistics on organic holdings has been used for compiling turnover,, value added and employment. Export value is a subselection from Statistic results on trade with organic product as only primary goods are selected. The activity under agriculture is allocated to the environmental purpose: *Protection of soil and water*.

Forestry: The results from gross output calculation on wood production are used together with National Account statistics to compile turnover, employment and value added from wood production in certified forest. Export value are not compiled as expected to be marginal .The activity under agriculture is allocated to the environmental purpose: *Management of forest resources*.

Fishery and aquaculture Turnover, value added and employment is based on data from account statistics on fisheries and Aquaculture for organic producers. Export is estimated to 40 per cent of the turnover. As regards the environmental purposes, the results are equally distributed to *Protection of soil and water*.

Energy Supply: The activities in NACE 35.10.00, 35.21.00 and 35.30.00 includes energy products from renewables. Statistics Denmark compile economic data for the types of activity. From the statistics on energy production (From Danish Energy Agency) the share of renewables can be compiled and used to estimate of share of turnover, value added etc. A share of export of electricity is compiled using the share of renewables in electricity production. The activity relates to environmental purpose *Production of energy from renewable sources*.

Collection and treatment of waste water: Data for this type of industry is already compiled by Statistics Denmark and can directly be used for EGSS compilation. The activities relates to the purpose *Wastewater management*.

Collection and treatment of waste Data for this type of industry is already compiled by Statistics Denmark and are, using results for 2013-collection, distributed to environmental purposes, mainly "Treatment of waste" .

Construction. Using statistics covering the construction sector and information on environmental and resource saving activities in construction, the turnover 2017 - 2018 of EGSS in construction has

been estimated. Further information on the sources and the compilation can be provided by the contact person. Employment and value added is compiled by combining the EGSS-turnover and the Account statistics. Previously the construction sector was part of direct data collection for EGSS.

Research and development: By use of the R&D register and the variables *research in energy* and *environmental research* turnover and employment can be estimated for the EGSS. The value added is estimated based on Account statistics. Export is based on value of export and is the EGSS-share of exports from units in type of industry NACE 72. The estimates build upon several assumptions, which have to be noted when using of data.

Other technical business service: The results from 2018 are adjusted by use of statistics for organic production and Account statistics. The main business type is about agricultural advisory service.

3.6 Adjustment

No further adjustment than mentioned under Data compilation has been made.

4 Relevance

The data users are mainly public authorities working with environment, resources and business activities and international goals in these areas, including the SDG's from 2015. Associations in the same fields are interested as well. The level of satisfaction has not yet been measured.

4.1 User Needs

Information about business activities related to environmental and resource purposes is highly requested, in order to show the importance for the business sector in this field. Statistics on environmental goods and services (EGSS) has the aim to provide such information and was established in cooperation with governmental agencies in these fields. The development in turnover in EGSS is a selected valontary indicator for Denmark in the framework of Sustainable Development Goals.

4.2 User Satisfaction

Not yet measured.

The members of relevant fora for dialogue about the statistics has been informed and involved.

4.3 Data completeness rate

The dissemination for 2012 to 2014 got further than requested in the EU-regulation. This was due to domestic interests.

Only results for market-based activities is included in the results. EGSS in the public setcor can indirectly be found in the statistics on the public sectors spending on environmental sector.

5 Accuracy and reliability

There are several sources of errors, which are considered to induce uncertainty to the results for environmental goods and service. In particular, this is due to the level of clarity of definitions on EGSS. This size of this problem has been reduced by very intensive validation of data.

Errors exist mainly in the special surveyed data. In particular the result regarding firms with less than 10 employees have significant errors due to estimation methods.

5.1 Overall accuracy

Compiled on total turnover for EGSS, the error is expected to be plus/minus 10-15 billion DKK (related to a level at 200 billion DKK). The main part of the total error are considered to be due to measurement errors.

For value added, employment and export, the errors are of at least same size, relatively, as data are linked.

There is no indication if the results are over- or underestimating the "true" value.

5.2 Sampling error

The variance (CV) on the total estimate for turnover of EGSS in the surveyed types of industries is calculated to about 2 per cent . Its correspond to an error on 3 billion DKK, as the turnover in the subpopulation is 150 billion DKK.

For the single types of industries the error is higher, relatively. The typical variation is about 10 per cent.

On smaller units (less than 50 employees) the error is about 10 per cent. For larger holdings about 1,5 per cent.

5.3 Non-sampling error

The errors from other reasons than sample survey is measurement errors. It is difficult exactly to assess if a good or service is part of EGSS or not.

What matters other variables than turnover, the assumption is, that an EGSS share of turnover also reflects the EGSS share of export, value added and employment. Furthermore, it is assumed that 2013-data also could be used for 2012 and 2014 compilation - 2015 data for 2016 compilation and 2017-data for 2018-compilation.

The results for export is underestimating the real level, due to problems to connect data on production and export. It is assessed, that the underestimation is about 10 per cent.

5.4 Quality management

Statistics Denmark follows the recommendations on organisation and management of quality given in the Code of Practice for European Statistics (CoP) and the implementation guidelines given in the Quality Assurance Framework of the European Statistical System (QAF). A Working Group on Quality and a central quality assurance function have been established to continuously carry through control of products and processes.

5.5 Quality assurance

Statistics Denmark follows the principles in the Code of Practice for European Statistics (CoP) and uses the Quality Assurance Framework of the European Statistical System (QAF) for the implementation of the principles. This involves continuous decentralized and central control of products and processes based on documentation following international standards. The central quality assurance function reports to the Working Group on Quality. Reports include suggestions for improvement that are assessed, decided and subsequently implemented.

5.6 Quality assessment

There are several sources of errors, which are considered to induce uncertainty to the results for environmental goods and service. In particular, this is due to the level of clarity of definitions on EGSS. This size of this problem has been reduced by very intensive validation of data.

In particular service in EGSS can be difficult to estimate, as EGSS services often is a part of a comprehensive process. Isolation of buildings is most often part of repair or construction and the time spend on the EGS is not easy to estimate. Further, advisory service also contains elements of EGSS, but difficult to distinguish between EGSS and non-EGSS.

EGSS-data from existing statistical sources is considered to be of good quality. Is is difficult to access the quality of the estimated figures (since 2017) for the construction sector.

5.7 Data revision - policy

Statistics Denmark revises published figures in accordance with the [Revision Policy for Statistics Denmark](#). The common procedures and principles of the Revision Policy are for some statistics supplemented by a specific revision practice.

5.8 Data revision practice

As the statistics is still under development, needs for revisions will most probably show up.

The export results for 2012-2014 has been revised, due to revisions in the original results.

6 Timeliness and punctuality

First data release about 10 month after end of reference year. Broader and more comprehensive information 2-3 months later.

6.1 Timeliness and time lag - final results

First results 2013 (and 2012) were published October, 27, 2014.

Results for 2014 were published October 27, 2015 together with consolidated data on 2013.

Results for 2015 were published October 26, 2016, together with consolidated data on 2014.

Results for 2016 were published November 6, 2017, together with consolidated data on 2015.

Results for 2017 were published November 5, 2018, together with consolidated data on 2016.

Results for 2018 were published October 28, 2019, together with consolidated data on 2017.

Final figures 2018 will be published a year later - together with provisional data for 2019

6.2 Punctuality

The first six releases (2013 until 2018)- kept the deadline. The release for 2019 was delayed due to delay in account statistics

7 Comparability

The statistics exist only for 2012 to 2019. Results for these years can be compared, taken in consideration that results 2012-2014 on construction and knowledge service most probably were underestimated.

In principle the results for Denmark can be compared with results for other EU-countries.

7.1 Comparability - geographical

The statistics are in line with the Eurostat guidelines. Different methods by country may have negative impact on the comparability.

Manual environmental goods and services.

Results for more countries are available in Eurostat database.

In November 2015 a News release with international comparisons were produced.
Danmark i top-3 med grønne varer og tjenester

In the publication Green National Accounts 2015-16, comparisons also can be found.

7.2 Comparability over time

The statistics for 2012, 2013, 2014 is comparable at output level. Regarding 2015 -2019 , the higher values for construction and knowledge based service is partly due to improved questionnaire

Enterprises in type of industry NACE 180000 was not surveyed until 2015. Data for previous years has not been estimated.

Regarding the environmental purposes, in particular "Management of waste water" has been affected by the differentiated questionnaire used from 2015.

7.3 Coherence - cross domain

The EGSS statistics is using similar grouping and classifications as other business statistics. Final results will be consistent with The Accounts Statistics.

The classifications used for environmental protection is also these used in (other) environmental statistics.

7.4 Coherence - internal

Data are consistent.

8 Accessibility and clarity

The main variables are published in Statistical News and in the http://www.statbank.dk.

For a broader description, publications are produced.

More information can be found under the subject: Environmental-economic accounts.

8.1 Release calendar

The publication date appears in the release calendar. The date is confirmed in the weeks before.

8.2 Release calendar access

The Release Calender can be accessed on our English website: Release Calender.

8.3 User access

Statistics are always published at 8:00 a.m. at the day announced in the release calendar. No one outside of Statistics Denmark can access the statistics before they are published.

8.4 News release

See Statistical NEWS on EGSS: [Grønne varer og tjenester for 165 milliarder](#) and

Statistical NEWS on EGSS: [59.000 grønne arbejdspladser](#)

Statistical NEWS on EGSS: [Danmark i top-3 med grønne varer og tjenester](#)

Statistical NEWS on EGSS: [Mange erhverv bidrager til grøn omstilling](#)

Statistical NEWS on EGSS: [Produktion inden for grøn energi stiger](#)

Statistical NEWS on EGSS: [Stigende eksport af grønne varer og tjenester](#)

Statistical NEWS on EGSS: [Flere grønne varer og tjenester, men ikke i 2018](#)

8.5 Publications

A publication (60 pages) is produced in the beginning of 2015 (in Danish): [Grønne varer og tjenester 2013](#).

A publication (40 pages) is produced in the end of 2015 (in Danish): [Grønne varer og tjenester 2014](#).

8.6 On-line database
- Environmental Goods and Services by environmental purpose: [GRON1](#)
- Environmental Goods and Services by type of industry: [GRON2](#)

8.7 Micro-data access

Access to Micro-data 2013, 2015 and 2017 is possible via the research service unit. Please be aware of the high level of insecurity when used.

8.8 Other

Access to data is provided in line with Statistic Denmark's policies

8.9 Confidentiality - policy

The general policy in Statistics Denmark on data confidentiality applies: [Data Confidentiality Policy at Statistics Denmark](#).

8.10 Confidentiality - data treatment

In the compiling of results, groups are merged to ensure that the confidentiality rules are followed.

8.11 Documentation on methodology

Eurostats manual on environmental goods and services: [Manual](#)

Statistics Denmark
Sejrøgade 11
DK 2100 København Ø

8.12 Quality documentation

Results from the quality evaluation of products and selected processes are available in detail for each statistics and in summary reports for the Working Group on Quality.

9 Contact

The Statistics is compiled in the department Research, Technology and Culture. The responsible person is Ole Olsen, tel. +45 39 17 38 63, e-mail: olo@dst.dk

9.1 Contact organisation

Statistics Denmark

9.2 Contact organisation unit

Research. Technology and Culture, Business Statistics

9.3 Contact name

Ole Olsen

9.4 Contact person function

Responsible for the statistics

9.5 Contact mail address

Sejrøgade 11, 2100 Copenhagen

9.6 Contact email address

olo@dst.dk

9.7 Contact phone number

+45 39 17 38 63

9.8 Contact fax number

+45 39 17 39 99