



**An  
Phríomh-Oifig  
Staidrimh**

Central  
Statistics  
Office

**Standard Report  
on  
Methods and Quality  
for**

**Environment Goods and Services Sector**



**Standard Report**  
**on**  
**Methods and Quality**  
**for**  
**Environment Goods and Services Sector**

This documentation applies to the reporting period:

**2019**

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## 1 Overview

Environmental Accounts is a satellite account within the European System of Accounts (ESA), a satellite account provides additional information on selected areas of specific interest. The Environment Goods and Services Sector (EGSS) is a subdivision within Environmental Accounts concerned with estimating the gross output and gross value added (GVA) at basic prices and employment by category of environment activity and industry in the State. EGSS statistics are compiled under EU Regulation (EU) 691/2011 and its amendment EU Regulation (EU) 538/2014. The official estimates of EGSS for Ireland covering the years 2010 to 2019 are published in this release.

The principal EGSS statistics made available in this release relate to the supply of environment goods and services by category of environment activity and the economic sector of the producer or supplier.

Environment goods and services sector activities can be classified by their purpose. Regulation (EU) 691/2011 distinguishes two broad types of environment sector activity according to their purpose:

*“Environment protection activities include all activities and actions which have as their main purpose the prevention, reduction and elimination of pollution and of any other degradation of the environment, and*

*Resource management activities include the preservation, maintenance and enhancement of the stock of natural resources and therefore the safeguarding of those resources against depletion.”*

EGSS, sometimes called ‘eco-industries’, encompasses activities in the so-called *green economy*. These activities generally include the production of renewable energy and energy saving activities such as retrofitting homes, along with the supply of water, treatment of wastewater, handling of waste and the construction of environment-related facilities. Using a variety of data sources, overall gross output in EGSS is estimated and allocated to industries according to NACE Rev. 2 (the Statistical Classification of Economic Activity in the European Communities) and type of environment sector activity. Importantly, for national economic purposes this shows the breakdown of environment activity and how the relative weights in that breakdown evolve over time. Ireland’s classification of environment sector activities aligns with those of other EU member states. Accordingly, this information is particularly useful for informing policy on the green economy both nationally and at the EU level and more generally for monitoring developments in the wider economy.

## 2 General Information

### 2.1 Statistical Category

Environment Goods and Services Sector statistics are based on data gleaned primarily from CSO structural business surveys and the Supply-table augmented by specific analysis of the environment sector and figures taken from the annual reports of agencies participating in the environment sector.

### 2.2 Area of Activity

Environment Accounts (EA).

### 2.3 Organisational Unit Responsible, Persons to Contact

Environment and Climate Division

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## 2.4 Objectives and Purpose

Environment policy aims to reach national and international environment and sustainable development goals. In this context the EGSS account provides a measure of the size and importance of economic activity associated with the production of environment goods and the supply of environment services. EGSS statistics are needed to enable policy makers assess the proportion of overall economic output that is environment-related. This data is vital in appraising us on whether, and to what extent, Ireland is transitioning to a *green economy*. The distribution of environment activity and how this distribution evolves over time is central to understanding the nature and extent of this transition. This release provides key data within the overall framework of environment accounts that contributes to meeting these needs for Ireland.

## 2.5 Periodicity

Environment Goods and Services Sector estimates are compiled annually.

## 2.6 Client

Environment Goods and Services Sector estimates are compiled under EU Regulation (EU) 691/2011 and its amendment EU regulation (EU) 538/2014 for Eurostat.

## 2.7 Users

National users: CSO; Environmental Protection Agency; Department of the Environment, Climate and Communications; Department of Finance; economic commentators; the media; third level educational institutions; and the public at large.

International users: Eurostat and OECD.

## 2.8 Legal basis

The legal basis for the compilation of Environment Goods and Services Sector statistics is under EU Regulation (EU) 691/2011 and its amendment in EU Regulation (EU) 538/2014. This provides a framework for the development of various types of environmental accounts (also called modules). Other modules cover air emissions, economy wide material flow accounts, energy accounts, environmental protection expenditure and environment taxes accounts. In addition to these mandatory modules, there are two voluntary environmental accounts on forest accounts and environmental subsidies and similar transfers.

# 3 Statistical Concepts, Methods

## 3.1 Subject of the Statistics

EGSS statistics produced cover estimated gross output and gross value added (GVA) at basic prices, and estimated employment classified by categories of environment activity:

### Environment Protection

This includes all activities and actions which have as their main purpose the prevention, reduction and elimination of pollution and of any other degradation of the environment.

### Resource management

This includes activities related to the preservation, maintenance and enhancement of the stock of natural resources and therefore the safeguarding of those resources against depletion.

## 3.2 Units of Observation/Collection Units/Units of Presentation

Unit level data relates to firms on the CSO's Central Business Register who have been identified as participants in the green economy. Gross output, GVA and employment numbers in these firms obtained from structural business surveys conducted by CSO, augmented by environment specific surveys of large firms have been weighted to State level to provide an analysis of EGSS according to NACE Rev. 2 and environment sector activity.



### **3.3 Data Sources**

The main data sources are CSO structural business surveys, Supply tables compiled by National Accounts, small-scale green economy survey results covering large firms and annual reports from various agencies participating in environment-related activities.

### **3.4 Reporting Unit/Respondents**

Firm level unit data for participants in structural business surveys.

### **3.5 Type of Survey/Process**

EGSS uses standard survey weighting (grossing) by NACE Rev 2. and environment activity to arrive at State level estimates of gross output, gross value added and employment. Weights are computed based on small-scale survey results focused on large firms involved in the production or supply of environment goods and services within the State.

### **3.6 Characteristics of the Sample/Process**

The key characteristic of the estimation process is that it is primarily based on the methodology set out in the Eurostat publication, "*Environmental goods and services sector accounts — Practical guide — 2016 edition*".

The guide emphasises a mixed approach incorporating bottom-up estimation based on structural business surveys complemented by a top-down estimation approach based on aggregate data available in the supply-table augmented by data available from administrative sources.

### **3.7 Survey Technique/Data Transfer**

A survey of large businesses identified from the Central Business Register as candidate green participants was conducted over three initial waves in 2016-2018. The first wave concentrated on the manufacturing sector, the second on services and the third focussed on construction within the framework of the Building and Construction Inquiry undertaken by CSO - the third wave was repeated in 2019. The distribution of gross output according to type of environment activity is used to inform EGSS estimates.

The effective survey response rate excluding nil returns was approximately 40%.

### **3.8 Questionnaire (including explanations)**

A simple questionnaire asking relevant firms for their turnover broken down by environment activity.

### **3.9 Participation in the Survey**

Businesses with turnover in the upper quartile of the turnover distribution on structural business survey returns identified as partially or wholly environment-related based on their economic activity description stored on the CSO's Business Register.

### **3.10 Characteristics of the Survey/Process and its Results**

The key characteristic of the estimation process has been outlined above in subsections 3.5 to 3.9.

### **3.11 Classifications used**

NACE Rev. 2 classification.

Classification of environment activities as set out in Eurostat's EGSS Practical Guide.

### **3.12 Regional Breakdown of Results**

The statistics are not available at sub-national level.



## **4 Production of the Statistics, Data Processing, Quality Assurance**

### **4.1 Data Capture**

Data from emailed returns were manually keyed into the return data capture system within the CSO's Data Management System. Preliminary scrutiny and consistency checking of the input data was undertaken to ensure it was captured correctly.

### **4.2 Coding**

All survey participants were initially coded according to their environment activity. NACE codes were taken from the CSO Business Register.

### **4.3 Data Editing**

Range and consistency checks were applied to ensure correct data capture.

### **4.4 Imputation (for Non-Response or Incomplete Data Sets)**

Non-response weighting is applied – see Section 4.5 below.

### **4.5 Grossing and Weighting**

Grossing strata are defined as the combination of NACE Rev. 2 sector used in the release and the environment activity classification code given in the Eurostat Practical Guide 2016. Grossing factors for all businesses with a structural business survey return within these strata were computed as a function of the inclusion probability adjusted for non-response. These factors are applied to each firm's gross output and the result aggregated across all firms in the sample stratum – this procedure is standard.

Where the number of returns in a stratum was deemed to be too small, that stratum was combined with a similar one based on their NACE Rev. 2 aggregates group code. Furthermore, as our sample only covers large enterprises, accordingly an adjustment was made when estimating a small firm's environment gross output based on the relative size of gross output for smaller firms to larger firms on the appropriate structural business survey.

### **4.6 Computation of Outputs, Estimation Methods Used**

#### **4.6.1 Bottom up gross output estimates for manufacturing, services and construction**

Where detailed firm data was available from our surveys, we directly estimate State level environment gross output across all strata as the sum of the aggregate strata level gross outputs.

#### **Construction**

The Building and Construction Inquiry in 2019 had a question added to the survey asking respondents to indicate whether they participated in green construction activities. Weights derived from a sophisticated analysis based on Latent Dirichlet Allocation of construction firm's activity description on the CSO's Business Register, coupled with a small number of large construction firms who participated in our green goods and services survey, were then used to allocate environment gross output according to environment activity. The output of the Latent Dirichlet Allocation method is also calibrated against more recent estimates compiled from the Building Energy Rating (BER) dataset.

#### **4.6.2 Top-down methods**

##### **Agriculture**

EGSS agriculture is mainly composed of organic agriculture production. This was estimated based on aggregate organic acreage data available from CSO's Farm Structure Survey coupled with basic prices data adjusted to reflect higher farm gate prices for organic produce. CSO data relating to subsidies is also included. The bulk of this estimate was allocated to environment protection related activities covering soil, surface water and biodiversity.

##### **Electricity and gas**

Energy balance data relating to kilo-tonnes of oil equivalents for renewables are combined with the Supply-table production value for electricity and gas from the Supply-Use tables to arrive at an estimate of EGSS gross output for electricity. This amount was allocated to renewable energy production.



## **Water and wastewater**

EGSS gross output for water supply and wastewater treatment come from the Supply-tables. Prior to 2014 supply-table estimates were predominantly derived from the Census of Industrial Production and the Annual Financial Statement of local authorities. In 2014 the transfer of local authority functions relating to water and wastewater to Irish Water began, a consequence of this is our estimates show a discontinuity in 2014. Treatment of wastewater is classified as an environment protection related activity while the supply of *potable* water is classified as a resource management activity.

## **Waste**

EGSS gross output for waste handling comes directly from the Supply-tables. This is further broken down by firms within the sector based on Census of Industrial Production data. The bulk of this overall supply is allocated to waste handling with most of the remainder allocated to scrap and mineral recovery within resource management environment activity.

## **Construction**

Gross output for wind power has been estimated based on investment data taken from Wind Energy Europe and allocated to renewable energy production. For water and wastewater, capital investment data taken from the Commission for Regulation of Utilities decisions relating to Irish Water has been incorporated to arrive at an estimate of gross output. These estimates have been allocated to environment protection and resource management activities respectively. Data from the Sustainable Energy Authority of Ireland in respect of grants made in respect of energy saving are also incorporated into the estimates and allocated to energy saving activity within resource management.

## **Services**

Gross output for non-profit enterprises and government related participants in the services sector are estimated from annual reports of various bodies involved in the provision of EGSS services - included in this group are relevant agencies, government departments, and universities. Typically, administration and pay amounts are abstracted from these sources and allocated to the appropriate environment activity.

A detailed once-off analysis based on a Census of the charities sector has also been undertaken to arrive at an estimate of gross output of charity and second-hand shops, with the estimate classified as a resource management activity.

### **4.6.3 Final gross output EGSS estimates**

Estimated bottom-up and top-down aggregates are added to arrive at overall estimated EGSS gross output. Resulting estimates are held as Excel files and are available by environment activity type and NACE Rev.2 industry division of the supplier or producer. The outputs required for the release and for Eurostat are generated from these Excel files.

### **4.6.4 Final gross value added EGSS estimates**

EGSS gross value added is estimated within each NACE Rev. 2 sector and category of environment activity along similar lines to gross output. Specifically, where gross value added data is available from a CSO survey source such as the Census of Industrial Production, Prodcom, Building and Construction Inquiry or Annual Services Inquiry, this value is taken and used to estimate gross value added in a similar way to gross output.

Where specific gross value added data is not available, the ratio of gross value added in Table 21 of CSO's National Income and Expenditure (NIE) release to supply-table output for the relevant NACE Rev. 2 sector is applied to the EGSS gross output to arrive at an estimate of EGSS gross value added within each NACE Rev. 2 sector cross-classified by category of environment activity. This method of estimation is recommended by Eurostat in their publication "*Environmental goods and services sector accounts — Practical guide — 2016 edition*".

### **4.6.5 Methodology for estimating EGSS full-time equivalents**

The number of EGSS full-time equivalents employed is estimated within each NACE Rev. 2 sector and category of environment activity along similar lines to gross output. Specifically, where employment data is available from a CSO survey source, this value is taken and used to estimate EGSS employment.

Where specific employment data is not available, the ratio of employment in the Labour Force Survey to Supply-table output for the relevant NACE rev. 2 sector is used to arrive at an estimate of EGSS employment within each NACE Rev. 2 sector cross-classified by category of environment activity. This method of estimation is also recommended by Eurostat in their Practical Guide publication referenced above.



#### **4.7 Other Quality Assurance Techniques Used**

Eurostat provide tools to ensure aggregate level data consistency and continuity in year on year comparisons is maintained. These tools are applied to ensure outputs fulfil Eurostat quality requirement annually with errors corrected and discontinuities explained.

Prior to publication, some further manual checking is also carried out to ensure the robustness of the estimates.

### **5 Quality**

#### **5.1 Relevance**

The key driver for the compilation of environment goods and services sector estimates comes from the need of policy makers to measure the size and distribution of environment activity within the wider economy. Accordingly, EGSS statistics assist policy makers assess the proportion of overall economic output that is environment-related. This data is vital in appraising us on whether and to what extent Ireland is transitioning to a *green economy*. The distribution of environment activity and how this distribution evolves over time is central to understanding the nature and extent of this transition. This release provides key data within the overall framework of environment statistics that contributes to addressing these needs for Ireland.

In the international context these data are needed to fulfil Ireland's requirements under EU Regulations (EU) 691/2011 and (EU) 538/2014, specifically the 'module' on environment goods and services. This contributes to the development of a satellite account for the environment sector. The principal EGSS statistics are annual gross output by environment activity in the state.

#### **5.2 Non-sampling effects**

##### **5.2.1 Quality of data sources used**

Data used in the procedure comes from CSO sources and annual reports of public bodies and agencies. These data sources are highly reliable.

##### **5.2.2 Register coverage**

Based on CSO's Central Business Register.

##### **5.2.3 Non-response**

Non-response weights were used to compensate for non-response, see Sections 3 and 4 for specific details.

##### **5.2.4 Measurement errors**

Not applicable.

##### **5.2.5 Accuracy and Reliability**

###### **5.2.5.1 General Observations**

The estimation was based on procedures set out in the Eurostat Practical Guide – 2016 edition. SAS programs were written to arrive at grossed-up estimates. New data sources or improved survey data that might cause revisions could be readily incorporated without contaminating the procedural aspects of the estimation. Standard errors for survey estimates have not been made available, though usual stratified sample standard errors apply. Instead, our focus was on accuracy and reducing bias. Thus, even though sample sizes are small at 10%, bias in the State level estimates is considered small as these estimates are based on firms in the upper quartile of the turnover distribution and these cover the bulk of overall national gross output. With adjustments made for smaller firms the estimates are satisfactory and reliable.

###### **5.2.5.2 Back-casts of EGSS estimates**

Back-casts to years 2010-2012 have been incorporated into the release. For gross output the method of back-casting uses the supply-table.



Thus, each in NACE Rev.2 sector used in the release, to back-cast to get the previous year's estimate of EGSS gross output we applied the ratio of current year's supply to the previous year's supply to the current year's EGSS gross output.

Identical procedures were used to back-cast EGSS gross value added and EGSS employment estimates using NIE gross value added and Labour Force Survey tables respectively, and separately for environment activity type identified in the release.

### **5.3 Timeliness and Punctuality**

The results arising from this procedure are required to be sent to Eurostat within 30 months of the end of the year to which the figures relate.

### **5.4 Coherence**

Insofar as practicable, all sources are up to date, and sources are reliable. On this basis coherence with other sources is maintained to the maximum extent possible.

### **5.5 Comparability**

The statistics are compiled to meet, to the greatest extent possible, the recognised statistical standards recommended by Eurostat as set out in their publication, "EGSS Practical Guide, 2016 edition". Accordingly, they are regarded as being methodologically sound and comparable over time and between those countries subscribing to the methodology. However, survey results and supply tables are country specific and so reflect specific shocks that occur in that economy, irrespective of whether those shocks are anticipated or not. Statistical comparisons over time and across countries should therefore be made with care.

### **5.6 Accessibility and Clarity**

#### **5.6.1 Assistance to Users, Special Analyses**

The release and background notes are available on the CSO website at 11am on the release day.

The release calendar is published on the CSO website: <http://www.cso.ie/en/newsandevents/statisticsdueforrelease/>

The release presents data across six tables. Tables 1A to 1C present the total gross output, gross value added and employment, respectively in EGSS from 2010 to 2019, broken down by category of environment activity. Tables 2A to 2C present EGSS total gross output, gross value added and employment, broken down by the economic sector of the producer or supplier over the same time period.

#### **5.6.2 Revisions**

Revisions will be made annually as more up to date supply tables and other data become available. Indeed, the need for annual revisions based on more up to date information is highlighted in the Eurostat EGSS Practical Guide – 2016.

In 2019 EGSS show revisions when compared with corresponding figures in the 2018 EGSS release. These revisions arise due to the incorporation of the most up-to-date available data. Significant revisions mainly relate to renewable energy of foot of accrued investment data received from Wind Energy Europe which show a large increase in 2018. Revisions also relate to water and wastewater services.

A complete full set of estimates for the year 2013 have been compiled bringing the 2013 estimates fully in line with estimates for the years 2014 to 2019. In contrast, for the 2018 release the estimates for the year 2013 were based on backcasts.

#### **5.6.3 Publications**

##### **5.6.3.1 Releases, Regular Publications**

The Environment Goods and Services Sector Release is available on the CSO's website

[Environment Accounts - CSO - Central Statistics Office](#)



### 5.6.3.2 Statistical Reports

Not applicable

### 5.6.3.3 Internet

<http://www.cso.ie/en/statistics/environment/>

Estimates will be made available on CSO PxStat databank.

### 5.6.4 Confidentiality

Certain key data used to compile environment goods and services sector statistics, such as the Supply table, are available on the CSO website. Other data are available internally in CSO, these are confidential and so in accordance with Statistics Act, 1993 cannot be accessed under the terms of the Freedom of Information Act, 1997. Such data are not disclosed by the CSO to any other Government Department or outside body.

## 6 Additional documentation and publications

The Eurostat publication, “*Environmental goods and services sector accounts — Practical guide — 2016 edition*”, is available at:

[Environmental goods and services sector accounts — Practical guide — 2016 edition - Products Manuals and Guidelines - Eurostat \(europa.eu\)](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&plugin=1)

### EU Regulations

Regulation (EU) No 691/2011 of the European Parliament and of the Council of 6 July 2011 on European environmental economic accounts (Text with EEA relevance)

<https://op.europa.eu/en/publication-detail/-/publication/ac1fd63f-2f9d-4216-a968-2ea290552919/language-en/format-PDF/source-search>

Regulation (EU) No 538/2014 of the European Parliament and of the Council of 16 April 2014 amending Regulation (EU) No 691/2011 on European environmental economic accounts (Text with EEA relevance)

<https://op.europa.eu/en/publication-detail/-/publication/8f5dc5e0-e656-11e3-8cd4-01aa75ed71a1/language-en>