# Measuring the „green economy" in Austria – content and limitations

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**Abstract:** Green economy activities or resource efficient products have become an increasingly important part of the economy in industrialized countries. Hence, there is a high interest in representative data concerning the potential and progress of the "green economy". Within the framework of "environmental accounts" and according to a new EUROSTAT concept on the "environmental goods and services sector (EGSS)" the turnover and employment potentials of the Austrian "green economy" have been identified on an official basis. The data collection started in 2009 (year 2008 under review) and since then has been accomplished on a yearly basis. The article examines the concept and the practical approach in operationalising the EGSS database and gives a critical overview of the content and limitations of the so measured "green economy". Policy implications of the information retrieved from EGSS data are not straight forward as conflicting objectives might arise when one tries to maximize the "green" share in the economy.

## 1. Introduction

The awareness of issues regarding "environment and sustainability" is widespread in Austrian society. This is also reflected in the economic importance of the "green economy": the production of goods, technologies and services to counter environmental problems like air pollution or waste and to save energy resources, provide a significant contribution to the Austrian economy. To take this into account, Statistics Austria started the data collection on turnover and employment potentials of the "environmental goods and services sector" in 2009 (year 2008 under review). [1] Since then the data collection has been conducted on an annual basis [2].

The statistical concept followed the EUROSTAT handbook „The Environmental Goods and Services Sector (EGSS)" [3].This manual was developed by the EUROSTAT Task Force "EGSS" in 2009, under the participation of Statistics Austria. The handbook provides definitions and methodological guidance to identify the environmental sector on a comparable basis. The goal is that EU countries generate harmonised, detailed data at national level in the future. These data will allow analysing economic growth, employment potential, exports and value added of the EGSS. At present a module for data collection on the "environmental goods and services sector" is in

discussion to be added to the EU-Regulation No 691/2011 on European environmental economic accounts [4].

*What is new about the concept on EGSS?* Previous concepts like the Eco-Industries by OECD/EUROSTAT [5] focused on control, restoration and treatment of already existing environmental damages. In recent years, however, an increased awareness of avoiding environmental damages before they occur and preserving natural resources can be observed. Consequently, a considerable change in the structure of the environmental sector with a shift from "end-of-pipe" to "integrated" environmental technologies has taken place.

This is also reflected in the new EUROSTAT definition of the environmental sector and as a result also in the Austrian data on EGSS: In 2010 61.4% of turnover of the Austrian EGSS was conducted with resource management activities by 42.5% of employees. The entire EGSS generated a turnover of €33.7 billion, 188 505 people were employed.

*The new concept has been widely discussed in Austria.* Data on the "environmental goods and services sector" were received with great interest. Especially the measurement of resource depletion and resource management activities was broadly discussed among environmental experts and other interested parties. The EUROSTAT manual gives some clear instructions e.g. concerning the handling of renewable energy (included) or public transport (not included), which are not fully agreed by all stakeholders. Another point of discussion considered the implication of a so called "green economy". The issue of "green jobs" not necessarily being "good jobs" was extensively debated.

In implementing the concept 2009 some data restrictions occurred as the official data collection is not yet focusing on "green" goods, technologies and services. Therefore a data compilation on a broad basis was necessary, taking into account also data from expert studies or direct information from enterprises. The discussion with experts from other institutions like the environmental agency helped to close some data gaps; starting with the report 2010.

*In summary it can be concluded* that in spite of some limitations and restrictions the project EGSS allows a very detailed look at the environmental economy. The data provide the possibility for complex evaluations and explain the development of the environmental sector in a comprehensive and international harmonised manner. Still, important questions on e.g. indirect employment effects or the workplace quality remain unanswered.

## 2. Theoretical data collection framework

### 2.1 Definition and delimitation

The EUROSTAT handbook „The Environmental Goods and Services Sector (EGSS)" [3; page 29] defines "green economy" as follows:

"The environmental goods and services sector consists of a heterogeneous set of producers of technologies, goods and services that:

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

Integrated technologies and adapted goods must be *better than the average alternative* available in the market which supplies similar services and has similar functions and characteristics in all respects except for those relating to environmental protection or natural resource preservation – this refers to the *national standard* of the product.

The technologies, goods and services must have an *environmental purpose* as their prime objective. This refers to the "technical nature" of the product - e.g. a waste treatment plant has an environmental purpose regardless if the operating company might have economic success as prime intention. Consequently, even if products or activities are somehow beneficial to the environment, they are excluded from the EGSS if the primary purpose is to satisfy technical, human and economic needs.

This means that – for instance – the following activities are *not included*:

- The service of drinking water supply (NACE 36)
- Public Transport
- Natural risk management (e.g. flood control activities)
- Industrial safety (e.g. Noise protection for the workplace)
- Integrated technologies and adapted goods that already meet the national standards
- Also trade is excluded from EGSS in order to avoid the risk of double counting [6].

From a theoretical point of view the definition of EGSS is quite clear and comprehensive. Undoubtedly, products that protect the environment and prevent resource depletion, are "green products" – and thus corresponding jobs are "green jobs" and the corresponding turnover is an environmental one. However, focusing on potential environmental goods, technologies and services *in practice* the assessment might not be as clear. Desalination plants e.g. help to minimise or prevent the use of inland water reserves, but the operation of the facility requires a lot of energy. Public transport might use fewer resources than individual transport e.g. by car, but the main purpose is "mobility" and not the environmental purpose - thus, it is not part of the concept of EGSS.

For some products the EGSS handbook provides clear guidelines that help to identify the products and to categorise them (e.g. renewable energy or organic agriculture). The identification especially for integrated technologies and adapted goods – defined as "*better than the average alternative referring to the national standard*" –is, however, not always that easy (chapter 4).

*2.2    Classification of the "environmental goods and services sector"*

One benefit of the data collection on EGSS lies in the different levels of detail. Mainly speaking, the structure of the data allows the following types of classification (see figure 1):

- Goods, Technologies and Services (adapted and connected goods, end-of-pipe and integrated technologies and environmental services).
- Economic sector (NACE 2-digit level): EGSS activities are 'economic' activities and are classified according to the international NACE rev.2 classification[7] as it is used by EUROSTAT.
- Environmental protection and resource management.
- Environmental domains like air, soil or noise according to CEPA (Classification of Environmental Protection Activities according to SERIEE [8]) and management of water or energy resources according to CREMA (new Classification of Resource Management Activities by the EUROSTAT Task Force EGSS) (see figure 1).

Figure 1: Environmental domains according to CEPA and CREMA

| **Environmental Domains** | | | | |
|---|---|---|---|---|
| Environmental Protection (CEPA) | | | Resource Management (CREMA) | |
| • Ambient air and climate    • Waste management    • Noise and vibration    • R&D | | | • Management of waters    • Energy resources    • Wild flora and fauna | |
| • Wastewater management    • Soil, ground- / surface water    • biodiversity & landscape    • Others | | | • Forest resources    • Management of Minerals    • R&D    • Others | |

S: Statistics Austria, EUROSTAT, The environmental goods and services sector, a data collection handbook.

These various specifications of the data on EGSS allow for very detailed analyses, depending on the different areas of interest. Several approaches to the data analysis are possible:

- The product and activity point of view: what kind of technology, good or service is important to the EGSS?
- The economic point of view, what are the contributions of different economic sectors to the green jobs and environmental turnover?
- The environmental point of view, what environmental domains contribute more or less to green employment and green turnover?

Of course, also a disaggregation by more than one classification level is possible. A look at the "environmental technologies" in the sector "machinery" for the domain "ambient air and climate" might give an important insight in the matter of EGSS.

## 3. Measuring the "green economy" in practice

### 3.1 Identifying Data

When implementing the EGSS in Austria, the problem occurred that no single data source was sufficient to fully reflect the "environmental goods and services sector". Data acquisition across all economic sectors is necessary. Therefore, a mix of methods is used for data generation on environmental products and services conform to the EUROSTAT EGSS handbook. Overall, the supply-side approach is favoured, but in some cases it is necessary to look at data from the demand-side (e.g. Use of renewable Energy). Preferential data from official statistics are used. Due to data limitations in official statistics; however, additional information from studies of other institutions, of interest groups and experts' estimates is integrated. The "*environmental share*" of relevant technologies, products and services must be approximated if product groups or producing companies are identified as partly relevant for the environment.

Statistics Austria uses many different data sources to identify the green economy as a whole. Information derives mainly from secondary statistics, although in some cases primary data are collected: Companies that produce, amongst others, environmental technologies are identified directly and are contacted annually to retrieve information on their "environmental share". Furthermore, a survey in the service sector was conducted in 2010. Secondary statistics in use are e.g. the production values and employment figures of Short Term Statistics (STS), turnover and employment of Structural Business Statistics (SBS), and data on Environmental Protection

Expenditure Accounts (EPEA). Information from the business register is used concerning enterprises specialised in the production of environmental goods and technologies.

The Austrian data collection is limited to environmental turnover and employment. If the statistic in use provides only one of these values the other is estimated with data from STS or SBS.

In 2010 the Austrian "green economy" generated a turnover of € 33.7 billion, 188 505 people were employed. The share of environmental turnover amounts to 11.8 percent of GDP in 2010, 5.4% of total employment refers to the EGSS (see figure 2).

Figure 2: The "green economy" in Austria 2008 to 2010

| Environmental goods and services sector 2008 to 2010 | | | | |
|---|---|---|---|---|
| | Unit | 2008 | 2009 | 2010 |
| Total environmental turnover | Million € | 31,818 | 31,589 | 33,677 |
| Share of environmental turnover on GDP (nom.) | In percent | 11.3 | 11.5 | 11.8 |
| Total environmental employees (full time equivalent) | Persons | 171,986 | 174,700 | 188,505 |
| Share of environmental employees on total employment | In percent | 4.9 | 5.0 | 5.4 |

S: Statistics Austria, National Accounts and Environment Statistics.

## 3.2 *Data problems occurring*

As already mentioned, the main problem is that *no single data source provides the necessary information*. Due to the use of numerous data sources and additional research activities the "environmental goods and services sector" was estimated quite comprehensively, but the following problems occurred:

- For some products and services the environmental share must be estimated, this can lead to some inaccuracy of data – under-coverage as well as over-coverage can occur.
- „Adapted goods" are not covered exhaustively– for some positions the „environmental purpose" is not clearly visible, for some relevant goods no reliable data source is available (e.g. energy efficient household products).
- End-of-pipe and integrated technologies: some relevant companies might be missing if information about their environmental activities is not available.
- Estimation of revenue from employment figures, and vice versa, can lead to some data bias.
- The use of STS and SBS leads to some under coverage as both statistics collect data only from companies with a certain minimum size.
- Resource management activities focus on renewable energy – resulting partly from the importance of the resource "energy", but also from the existing data situation: energy statistics

are well developed in Austria, while there is hardly any official statistics on e.g. water management or wild flora and fauna.

- The risk of double counting might occur if some environmental products or services (e.g. water filters) are used in the production of another environmental output (e.g. wastewater treatment plants) and both products are counted for EGSS.

- Ancillary activities, the production of environmental technologies, goods and services by companies for internal use only, (like in-house waste collection or the production of renewable energy for internal consumption) are difficult to estimate.

- Timeliness of data – not all information used is available for the actual year under review, resulting in some cases in estimations and forecasts.

## 4.      Discussion points regarding the concept of EGSS

As already mentioned, the statistics of the "green economy" in Austria has attracted widespread attention. In 2010 Statistics Austria organised a large expert workshop to discuss the concept of EGSS. Also, in various national working groups the EUROSTAT guidelines were presented by Statistics Austria and commented by environmental experts. The following issues were discussed:

The *definition of "green jobs"* (see chapter 2.1) was criticised as being imprecise. The national statistical offices have to determine to some extent if a good, technology or service is environmentally friendly or not. This determination on a national level may cause problems in terms of international comparability. In contrast, the explicit specification of some products was criticised as well (e.g. renewable energy is included but not all renewable energy sources (like bio fuels) have a clear environmental focus).

The use of "*national* standards" (see chapter 2.1) for the selection of environmentally friendly goods and integrated technologies was criticised harshly. These products must be more environmentally friendly or more resource efficient than the average alternative with similar functions available in the *national market*. This might cause a problem in the case of international harmonisation: if a country with already very high environmental standards (e.g. water based paints are standard and therefore not included) is compared to countries with low environmental standards (water based paints are the exception and therefore included).

Generally speaking, the *new concept of resource management* was evaluated ambiguously by the experts. While the importance of data was indisputable, some listed products for resource management were not accepted as sustainable (e.g. de-salination as water management activity still consumes a lot of energy). On the other hand, the restriction to the resource management of

"*natural* forest resources" and "*wild* flora and fauna" was criticised as too restrictive. Especially in Austria, great attention is paid to the maintenance of cultivated forest and its biodiversity. This is not included in the concept.

The fact that environmental products and services must have an environmental protection or resource management purpose (means "*environmental purpose*"') as their prime objective caused extensive debates. This applied especially for public transport with the main purpose "mobility", though an environmental benefit still is apparent. Nevertheless, public transport is not at all included in the EGSS, not even with an "environmental share"[9].

## 5.    Questions answered?

Which kind of information is provided by the new concept of EGSS and what are the questions that remain unanswered?

### *5.1    Information provided*

In short, Statistics Austria collects national data on environmental turnover and employment, strictly following the statistical concept by EUROSTAT. Despite the discussed limitations and restrictions, data on EGSS allow a very comprehensive view on the Austrian "green economy". Starting from 2008, the data provide the possibility to look at the development of turnover and employment under consideration of environmental domains and economic sectors, in an international harmonised and comparable way.

In summary the EUROSTAT concept of EGSS answers the following questions:

- *What is the scope of the „green economy"?* The figures explain the overall turnover and employment in environmental protection and resource management activities. This refers to the direct turnover and employment effects.
- *Which industries produce which environmental goods, technologies and services for which environmental domains?* Various possibilities of classification are defined by the concept.
- *What about the environmental industry in other EU countries?* The EUROSTAT concept will allow in the future the comparison of EGSS on an international level.
- *How has the "green economy" developed since 2008?* The development of EGSS in Austria on a yearly basis is analysed.

*5.2    Questions not answered*

The data provide interesting conclusions, but not all questions concerning the "green economy" are answered. The debate in Austria focused on environmental employment ("green jobs"), environmental turnover was not discussed in detail.

- *Are the counted „green jobs" new jobs or only newly defined jobs?* An organic farmer who worked as a conventional farmer in the past cannot be counted as newly created job in terms of employment statistics. The EGSS has no information on this matter.
- *What are the indirect employment effects concerning "green jobs"?* The implementation of resource management measures – e.g. for renewable energy – can even result in a negative balance of employment in other sectors. The EGSS provide only figures concerning the direct effects on employment.
- *Are „green jobs" in any case "good jobs"?* It was discussed whether "green jobs" can be seen as "good jobs" in terms of workplace quality or not. For example, what about the workplace quality in waste management? This question cannot be answered with the data on EGSS.

These questions cannot be answered by the data on EGSS but require additional economic studies and model calculations. The use of data for environmental policy decisions cannot be determined by the concept of EGSS itself.

## 6.    Policy Implications

EGSS gathers important information for policy makers on the share of the green economy, in terms of turn-over and employment, given a particular definition of environmental goods and services. Focussing policy makers' attention on the green economy can help to accelerate technological progress and increase sensitivity towards environmental issues. If, however, a political objective is set to maximize or increase the EGSS share in the economy, several problems might occur:

- In Austria, the largest share of "green jobs" falls on employment in the agricultural sector, which contributes to overall GDP with a share of 1.5%. The second largest group of green jobs comes from the public sector. A policy maker would hence be inclined to create incentives to boost employment in these two sectors if the maximisation of green jobs would be a declared policy objective. Creating jobs in the agricultural or the public sector would certainly raise questions about the overall economic growth and public finance perspectives of this country.
- Another way for a policy maker to boost the green economy would be to introduce sustainability criteria when providing subsidies to particular industries. This would (in the case of a limited

availability of funds) imply a shift of resources away from industries that are not marked as "environmental". Other objectives of industrial policy like employment maximisation, enhancement of R&D, external competitiveness etc. might conflict with the EGSS maximisation goal.

A further policy implication referring back to the theoretical concept of different "national standards" not only distorts the international comparability of EGSS data, but also causes what one could call the "infinity problem". The higher the overall environmental standard of an economy is, the less leeway remains for integrated technologies and adapted goods that are better than the average alternative – hence the smaller the calculated EGSS gets. In infinity, with progress towards the perfect environmental economy, the EGSS share would tend to zero.

## 7.    References

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[9] EUROSTAT (2009), The Environmental Goods and Services Sector, a data collection handbook: page 115: "Sustainable transport refers to economic activities in the transport sector which make use of vehicles with reduced impact on the environment. The EGSS does not take into account these transport services since their purpose is not environmental."