

## Green Economy and Measuring the Environmental Goods and Services Sector (EGSS)

Daniel Clarke\*

United Nations-ESCAP, Bangkok, Thailand [clarke@un.org](mailto:clarke@un.org)

### Abstract

*Green economy policies were endorsed by world leaders at the 2012 UN Conference on Sustainable Development (Rio+20) as a strategy for achieving sustainable development and poverty eradication. Multiple measurement frameworks have been developed internationally for the green economy or green growth. Among this literature, two major categories of green economy measurement can be identified: (i) indicators that reveal trends of decoupling between economic activity and environmental pressures and (ii) measures of the portion of economic activity with a purpose of reducing environmental pressures or improving the sustainable management of natural capital. The United Nations standard for environmental-economic accounting, known as SEEA, broadly defines and provides a list of categories for environmental-related activities, and an environmental goods and services sector (EGSS), which is based on whether there is a purpose to reduce environmental pressures or manage resources sustainably. Applying the SEEA standard to the collections of economic statistics used in national accounts would allow for calculation of a number of relevant indicators for green economy measurement, such as the proportions of environmentally-related employment, income, production, and investment. However, implementation of EGSS and the Classification of Environmental Activities (CEA) requires addressing several practical challenges, particularly related to identifying and maintaining a registry of basic information on environmental goods, services, and the enterprises in the environmental goods and services sector. This paper briefly reviews some of the practical challenges for measuring green activity within an economy using the current national accounting standards.*

**Key Words:** Green Economy, Environmental Accounting, Sustainable Development

### 1. Introduction

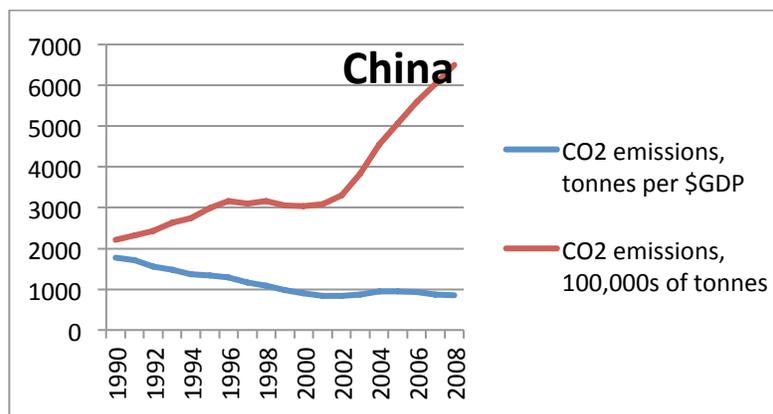
Green economy policies were endorsed by world leaders at the 2012 UN Conference on Sustainable Development, or Rio+20, as a strategy for achieving sustainable development and poverty eradication. Multiple measurement frameworks have been developed internationally for the green economy or green growth. Among the literature, two major categories of green economy measurement can be identified: (i) indicators that reveal trends related to decoupling between economic activity and environmental pressures and (ii) measures of the proportion of economic activity with a *purpose* of reducing environmental pressures or improving the sustainable management of natural capital. Each approach has a distinct object of measurement. The object of measurement for the first approach is the “greenness” of the whole economy. The scope includes all economic activity and the measures should reflect the extent to which that activity is relatively green, meaning decoupled from environmental pressures. The object of measurement for the second approach is green activities, a selection of activities within the broader economy. This approach allows for positive relationships between economic activity and environmental goals, rather than viewing the economy as strictly the source of negative pressures. Examples of the first category of green economy measures include decoupling or environmental efficiency indicators, such as

greenhouse gas emissions per unit of GDP. Examples of the second category include measures such as “green jobs” or production in the Environmental Goods and Service Sector (EGSS).

## 2. Decoupling indicators

Green economy indicators related to decoupling (category (i) indicators) can be useful for analyzing the broad trends for the relationships between economic growth and environmental externalities. However, care must be taken in attributing relative increases in productivity or efficiency measures to ‘greenness’ because there are many potential reasons (some green and others not) for relative decoupling of economic growth and an environmental pressure variable. For this reason, environmental efficiency measures do not make good green-related *policy targets*, although they are clearly relevant to *evaluation* of green economy policies. This point is illustrated in the below example for China, in which relative decoupling has occurred and yet emissions of carbon dioxide also increased dramatically in absolute terms. Ultimately what is important for ‘greenness’ is absolute reductions in environmental pressure variables such as greenhouse gas emissions. A similar point is made in Federal Statistical Office of Germany (2012) and OECD (2011).

**Figure 1: CO<sub>2</sub> emissions in China: relative decoupling and absolute growth**



Deconstruction analysis can be used to better identify the multiple sources of impact on trends for efficiency measures (UN, 2013). Another complementary approach is to monitor not only the flows of pressures but also the stocks of natural capital, including not only stocks of natural resources but also qualitative measures of the state of the environment (e.g. water quality, biodiversity, etc.). Statistics Netherlands (2011) showed that the scope of green growth indicators includes not only the flows of production, consumption, natural resources and residuals, but also the measures for the “natural asset base” and information on the relevant policy responses (e.g. environmental taxes and subsidies). A national accounting approach provides a foundation of integrated data for not only calculating productivity and efficiency measures by sectors of the economy for the complete range of flows of natural inputs and residuals but also coherent information on the assets, or natural capital, in relation to these flows. Integration in accounts allows for using measures of depletion and degradation to environmental assets to calculate adjusted measures of GDP, which may be called “Green GDP”. But such indicators would require not only comprehensive measurement of depletion and degradation across the natural

capital base, but also monetization of those measures. However, even without monetization, natural capital should at least be monitored regularly so that the sustainability of economic activities can be more reasonably determined.

### **3. Relevance of EGSS**

Measurement of EGSS is important because “development of the EGSS can play a key role in a transition towards a more sustainable economy and society.” (UN, 2013) It also can contribute to other unrelated economic and social development goals, such as creating new employment opportunities (commonly known as ‘green jobs’), increased opportunities for economies of scale gains or reorienting the industrial structure towards new areas of specialization and competitive advantage. Measuring EGSS can provide information for identifying and assessing not only opportunities to reduce environmental pressures but also positive feedback for other economic and social objectives.

Eurostat (2009) compiled a list of policy questions that would benefit from implementing EGSS. The list included measuring the contribution of EGSS to economic growth and job opportunities, innovation and environmental technology development, barriers to international competition, role and impact of government, and the impact of EGSS on environmental protection goals. Key indicators for these analytical purposes include: value added, production, employment, trade, and capital formation in EGSS.

The analysis of these economic indicators should not be limited to EGSS in aggregate. Where possible the indicators should be further disaggregated by economic sectors within the EGSS, by environmental domains, and by type of output (e.g. production of adapted goods or connected products). UNEP (2008) provides many examples of disaggregation by the traditional economic sectors for a measure of green jobs. Eurostat (2009) provides examples for simple breakdowns of other measures, such as value added in EGSS, by environmental domains.

### **4. Defining and Measuring Environment-related Activities**

In the United Nations System of Environmental-Economic Accounts (SEEA) 2012, the first international standard for environmental-economic accounting, there are two elements to environment-related activity measurement. The Environmental Goods and Services Sector (EGSS) is defined and classified according to two broad categories of intended purpose for a good or service: environmental protection (EP) and resource management (RM). The second element, Environmental Protection Expenditure Accounts (EPEA), is an application of EGSS “motivated by identifying and measuring society’s response to environmental concerns through the supply and demand for environmental protection services and through the adoption of production and consumption behaviour aimed at preventing environmental degradation.” (UN 2013)

EGSS is broader than EPEA in that it includes both of the two elements of the Classification of Environmental Activities (below), whereas EPEA refers only to environmental protection.

**Table 1: SEEA Classification of Environmental Activities (CEA)**

Group	Classes
Environmental Protection (EP)	1 Protection of ambient air and climate
	2 Wastewater management
	3 Waste management
	4 Protection and remediation of soil, groundwater and surface water
	5 Noise and vibration abatement (excluding workplace protection)
	6 Protection of biodiversity and landscapes
	7 Protection against radiation (excluding external safety)
	8 Research and development for environmental protection
	9 Other environmental protection activities
Resource Management (RM)	10 Management of mineral and energy resources
	11 Management of timber resources
	12 Management of aquatic resources
	13 Management of other biological resources (excl. timber and aquatic resources)
	14 Management of water resources
	15 Research and development activities for resource management
	16 Other resource management activities

Resource management varies according to the type of resource, but generally they are activities aimed at minimisation of extraction or use of scarce resources from the environment. For example, in the case of energy resources, activities that aim to reduce the intake of non-renewable resources, including production of energy from renewable sources, are included in RM, and thus also part of EGSS. Management or maintenance activities connected with the exploitation of fossil fuels, including exploration and discovery of new stocks, are *not* included. SEEA defines resource management as “those activities whose primary purpose is preserving and maintaining the stock of natural resources and hence safeguarding against depletion.” Eurostat (2009) provides examples of goods, services and technologies for each resource management class.

EPEA is also broader than EGSS in that it includes all activities or expenses related to the demand for the goods and services, including, e.g., the purchase and use of assets, such as vehicles, as part of the environmental protection activity. This difference points to a limitation of a simple application of EGSS: there may be enterprises engaged in green activities that are not their primary activities. For example, a manufacturing or extractive enterprise may employ experts for the purpose of reducing environmental impacts or reducing resource depletion from their activities. These non-primary activities of businesses would be included as part of EPEA but not EGSS.

An advantage of the EGSS approach is the simplicity of its boundary or scope, but the boundary is also inevitably dependent on some subjective choices. EGSS is defined according to the purpose or intent of the good or service and its production or consumption. Goods or services that have positive impacts on environmental protection or resource management, but for which it wasn’t the main purpose, will not be included in EGSS. For example, electronic delivery of documents substitutes printing and physical delivery and therefore has helped to reduce resource use and associated environmental pressures. However, if this has not been the direct purpose for the emergence of the technology and associated products and services it would not constitute as a part of EGSS (Eurostat, 2009).

A study by the United States Department of Commerce (2010) compiled and compared two versions of a green economy definition: one that is relatively strictly defined and a broad, or relatively liberal, application of the notion of 'greenness'. For example, bicycles were included in the broad definition for green because although bicycles are often inputs into leisure or recreational activity, on balance it was expected that the intended purpose in the use of bicycles tends to be an energy-saving alternative mode of transportation. In some cases, there may be differences in the interpretation of intended uses of the same or similar products across different societies. However, as long as the intended purpose is appropriated identified the EGSS indicators will still be comparable across countries.

The US Department of Commerce study identified 497 green goods and services for the US economy using a relatively conservative or strict definition of green economy, and a total of 732 goods and services using a broader definition. Importantly, the study found that using either a broad or narrow definition to green did not impact the overall findings. In both cases the proportion of green activity is a modest 1-2% of the economy and the trends and the shares of employment or activity by green categories are mostly the same.

## 5. EGSS and CEA Implementation

In theory, measurement of private expenditure and employment in environment-related activities should be feasible by applying the classification of environmental activities (CEA) to the existing data collections, such as regular enterprise surveys. Enterprise surveys already include relatively complex and difficult questions on business operations; therefore introducing questions to identify environment-related activities should be possible as long as the scope and purpose of measuring environment-related activity is clear to respondents. For example, Eurostat (2009) recommends including in establishment surveys a question for environmental employment as follows: *“Of the total employment of your establishment, please estimate the proportion of your employees who spent any time in the production/provision of environmental technologies, goods and services or who carry out environment-related activities.”*

Measuring EGSS or the green economy without implementing CEA with appropriate questions into the existing economic data collection instruments is constrained by the fact that existing classifications used for economic statistics are generally not malleable to identifying environmental impacts or an environment-related purpose. This problem applies particularly to adapted products – e.g. alternative fuel vehicles or more energy efficient appliances. In the international classification for products (CPC ver. 2), for example, the category “motor vehicles” are disaggregated by types of use (road tractors, public transport, private transport of person, transport of goods, etc.) but not by other qualities like type of fuel or efficiency. There are a few cases, however, where product classification codes may provide useful hints, for example reference to “recycled” or “reused” material. The lack of a formalized system of identification for statistical purposes of emerging green adaptations to products, like bio-plastics, electric motor vehicles, and so on, points to a need to make special estimations or adjustments to the current product coding. While more traditional categorizations for industries or economic activities are connected to the supply chain, measurement of the green sector is connected to the purpose or intention of the goods or services. In the long run, a more systematic approach compared to implementing CEA may be to integrate its concepts into the other existing industrial and product classifications – in other words a ‘greening’ of the existing classification systems rather than a new green classification system.

Alternative data sources that could help to identify EGSS-related goods and services include: studies of private market share estimates (e.g. for the hybrid automobile market, for top rated energy efficiency appliances, or for organic agriculture), information from government certification programmes (e.g. eco-labelling) and other relevant (public or private) market and industry analyses. But the only comprehensive approach for EGSS seems to be to integrate CEA into the data collection instruments.

## 6. Conclusion

Compilation of indicators for the green economy could be done through a step-wise process beginning with the relatively simplest cases that are also within the scope of EGSS. The first step is to identify environmental goods and technologies in the economy and construct a database of establishments with EGSS activities. This step requires not only an initial rough delineation of relevant categories from CEA and the economic activities classification (e.g. ISIC) but also some special research into the producers of known green, or environmental-related, goods and services in the economy. Second, measures of activity, e.g. value added and employment, could be estimated from data from each EGSS enterprise using the existing statistics. The measures provide the shares in the economy for establishments engaged in production of environmental goods or services as their primary activity. A third step involves broadening the investigation to include secondary activities of the green economy. If a suitably representative list of relevant goods and technologies is identified in the first step, each enterprise could be asked through the enterprise survey to identify expenditures, employment, research and development, and so on, in full alignment with CEA. These latter measures will not be reproducible for historical data but would provide a more complete picture of the share of the green economy.

## References

- Eurostat (2009) "The Environmental Goods and Services Sector", Luxembourg
- OECD (2011) "Towards Green Growth: Monitoring Progress", Paris
- Statistics Netherlands (2011) "Green Growth in the Netherlands", The Hague
- Federal Statistical Office of Germany (2012) "Test of the OECD Green Growth Indicators in Germany", Wiesbaden
- UN (2012) "System of Environmental-Economic Accounting: Central Framework", White Cover Version, New York
- UN (2013) "SEEA Applications and Extensions", New York
- UNEP (2008) "Green Jobs: Towards decent work in a sustainable, low-carbon world", Nairobi
- US Department of Commerce (2010) "Measuring the Green Economy", Economics and Statistics Administration, Washington D.C.