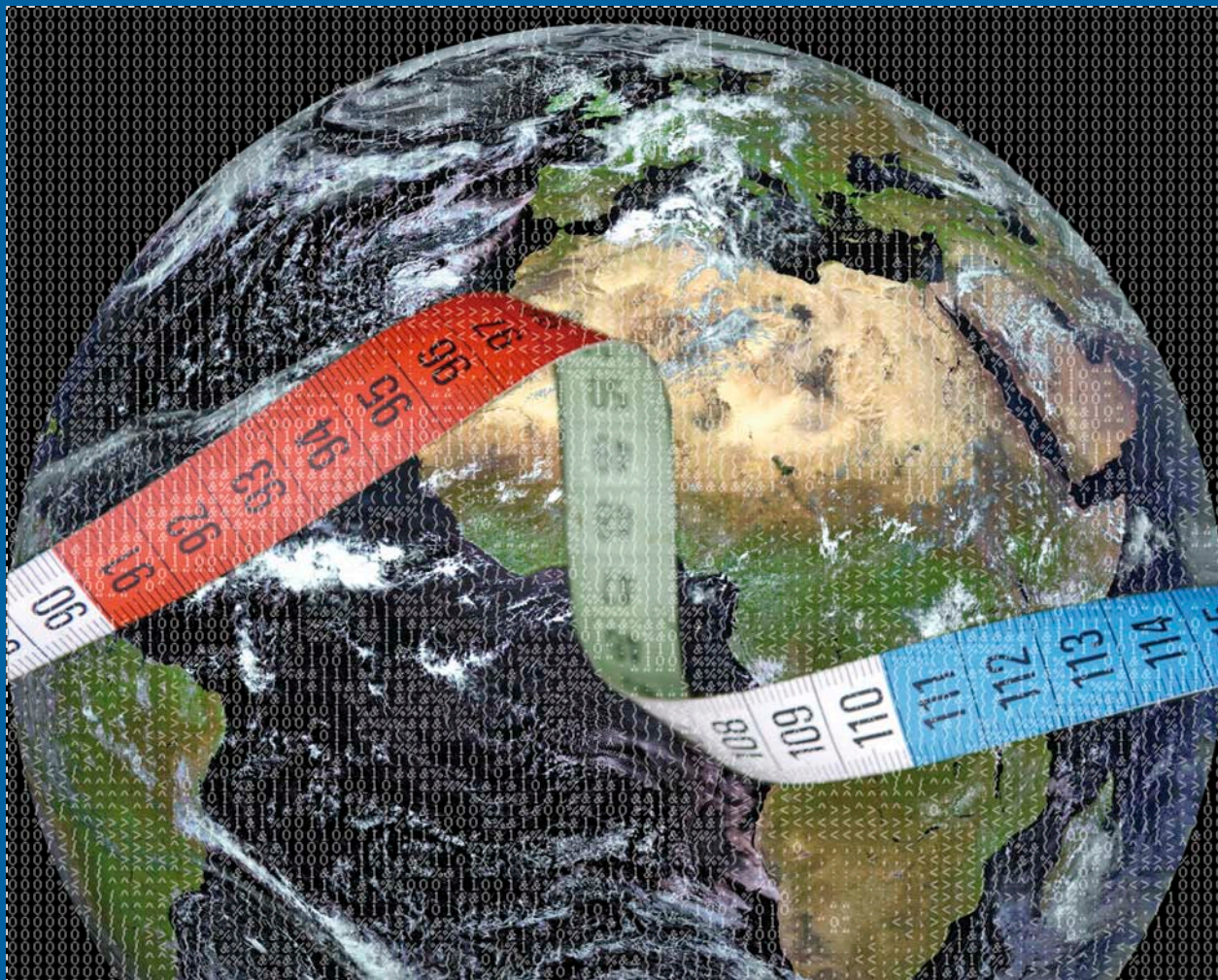


> Quality Requirements for Environmental Information

Development, Definition and Application of Quality Requirements for Reporting on the Environmental Impacts of Consumption and Production



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Reporting on the Environmental Impacts of Consumption and Production*

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> Foreword

In financial reporting, a true and fair view is considered the most prominent principle: the consolidated financial statements of companies must provide a true and fair view of their actual assets and liabilities, operational results and financial situation. Whenever this principle is violated, market participants are seriously affected.

It is also essential for information on the environmental impacts of consumption and production to convey an accurate overall picture. For that reason, this study develops quality requirements for environmental information based on the true and fair view principle. They are a part of the work done by the Federal Office for the Environment (FOEN) to improve information about the environmental impacts of Swiss consumption and production.

The publication is primarily intended for people and organizations that publish and assess environmental information about products, companies and national economies. A reliable overall picture of the environmental impacts of consumption and production is an absolute precondition for a well-founded environmental policy.

Even consumers and producers have to make daily decisions that have an impact on the environment. Although there is a large volume of different information about the various emissions and resource uses at their disposal, they often find it difficult to make an overall assessment. Yet, this is necessary to ensure that a gain for the environment in one area is not offset by a loss for the environment in another.

Therefore, it is essential for environmental information about products, companies and national economies to consider all relevant environmental impacts along the whole life cycle and focus on a reliable overall picture. These quality requirements are the main topic of discussion of this publication.

Bruno Oberle
Director
Federal Office for the Environment (FOEN)

> Extended summary

1. Context, objectives and content

The public and political and economic decision makers receive a wide range of information from diverse sources and in different forms about the environmental and climate impacts of their consumption and other economic activities. However, not all of this information conveys a reliable picture. The danger in this information overload is that it is easy to lose sight of the overall picture. For example, some of this information discusses selective environmental improvements that have only a marginal effect on the total environmental impact. At the same time, efficiency improvements that mitigate comparative environmental impacts are frequently accompanied by rising consumer demand, which ultimately increases the total environmental impacts. Therefore, it is still uncertain whether we are generally moving toward ecologically acceptable and sustainable levels of environmental impacts.

Context

The Federal Office for the Environment (FOEN) is currently working to improve the information about the environmental impacts of Swiss consumption and production and increase the environmental transparency of the market.

The objectives of this study are to develop and define quality requirements and apply them to reporting on the environmental impacts of consumption and production. The overall goal is to improve the quality and reliability of environmental information. The decisions of market participants and environmental and resource policy makers should be based on environmental impact information that conveys a true and fair view. In order to define the priority areas for action, comparisons will need to be drawn between the environmental impacts of different economic sectors and consumption areas along the whole life cycle of products.

Objectives of this study

Current environmental economic reporting by public authorities, research institutions, private enterprises and other organizations differ in quality and are not comparable with each other for the most part. Reporting is often not subject to clearly defined quality requirements. Where standards do exist, they are not uniform in many cases, often only loosely applied and not designed specifically for environmental economic reporting. In order to improve the situation, this study develops quality requirements for environmental economic reporting.

In order to establish the quality requirements, this study suggests concrete measures that can be adopted by policy makers and administrators to foster compliance with the quality requirements on a national and international level.

Establishing quality requirements for a true and fair view

Finally, the application of the quality requirements will be illustrated in a concrete example: They will serve as the basis for comparing the various methodological approaches to reporting on the environmental impacts of the consumption and production of a national economy. Using the quality requirements, the various pros and cons of the

Applying the quality requirements to different approaches to environmental economic reporting

approaches will be discussed. Thus, their methodological strengths and weaknesses and the limits of their application will become clear as a result.

Finally, the comparison of the methodological approaches will result in recommendations about their suitability for providing an accurate overall picture of the actual environmental impacts.

2. Quality requirements for environmental information that provide a true and fair view

When developing quality requirements, it is necessary to bear in mind that the issues covered in reporting are highly multi-dimensional and complex. For that reason, it will never be possible to develop a comprehensive body of rules and standards in advance that can effectively deal with all circumstances and contingencies and provide a true and fair view. This problem is familiar to financial reporting, where conveying the overall picture in the sense of a true and fair view is also ultimately more important than complying with all of the formal requirements.

True and fair view –
a principle in financial reporting

Accordingly, the true and fair view principle, which is the basis for the general principle in financial accounting, constitutes a logical objective (for the development) of generally accepted quality requirements for environmental economic reporting. In financial accounting, the true and fair view principle is considered the highest principle: consolidated financial statements must provide a true and fair view of the actual assets and liabilities, operational results and financial situation.

The quality requirements for a true and fair view of environmental economic reporting that were developed in this study are based on this conceptual framework and apply it to the issues concerned. Where appropriate or necessary, other requirements from statistical activities or environmental economic reporting systems were integrated.

Basis for the development of the
quality requirements

As far as environmental reporting is concerned, we define the concept of a true and fair view as follows: a true and fair view of environmental economic reporting systems conveys a reliable and intelligible picture of the actual environmental impacts of national economies, companies and products. In particular, all relevant environmental aspects along the whole life cycle of products are shown, from the extraction of raw materials through production and use to disposal. The calculations and assessments of environmental impacts are disclosed in a transparent fashion.

Definition of true and fair view for
environmental economic
reporting

Table 1 gives an overview of the developed quality requirements for a true and fair view of environmental economic reporting.

Tab. 1 > Quality requirements for environmental information (on the environmental impacts of national economies, companies and products) for a true and fair view

1. Relevance for decisions to be influenced by the information	Key quality requirements
2. Focus on the overall picture: Convey a true and fair view of the actual situation. Therefore, all relevant environmental impacts along the whole life cycle should be considered, and if possible, at the place they occur. ¹	
3. Reliability <ul style="list-style-type: none"> • trustworthiness (e.g. external assurance) • scientific soundness 	Other quality requirements
4. Transparency <ul style="list-style-type: none"> • traceability • verifiability 	
5. Comprehensibility	
6. Coherence and comparability <ul style="list-style-type: none"> • coherence (consistency) • continuity • scalability • standardisability, expandability and connectivity 	
7. Availability of information	
8. Up-to-date information	

The quality requirements are listed according to their priority. The first two requirements (relevance for decisions, focus on the overall picture) are the key requirements for environmental economic reporting and have the highest priority. Quality requirements 3 to 8 (reliability, transparency, comprehensibility, coherence and comparability, availability of information and up-to-date information) are basically conditions for the two key requirements.

“Relevance for decisions to be influenced by the information” is the first key quality requirement and means that environmental reporting should essentially explain all relevant information to decision makers in a comprehensible way. Information is only relevant if it allows decision makers to make decisions that significantly benefit the environment. Conversely, appropriate decisions affecting the environment are more difficult to make when relevant information is omitted or erroneous. Since the environmental impacts caused by foreign imports accounts for over half of Switzerland’s total environment impacts, imports cannot be overlooked for a true and fair view of the environmental impacts of Swiss consumption and production. Relevance also implies that false or misleading information is left out.

Relevance for decisions to be influenced by the information

“Focus on the overall picture: convey a true and fair view of the actual situation” is the other key quality requirement and means that the actual content of the information

Focus on the overall picture

¹ In particular, the analysis and verifiable documentation must consider all relevant environmental impacts and the whole life cycle. Information can be simplified in order to communicate results in a more straightforward form to a wider audience, provided that it is possible to demonstrate that information can be aggregated in the sense of a true and fair view and foster environmentally-friendly decisions.

ultimately takes priority over compliance with specific requirements and form specifications. Thus, for example, an exact report discussing greenhouse gas emissions along the whole value creation chain of biofuel production compared to conventional fuels does not meet the criteria of a true and fair view, since it does not take into consideration important aspects of environmental impacts, such as water and land use and all of the potentially adverse effects that pesticides can have on the quality of the environment. The principle of “better roughly right than exactly wrong” is part and parcel to achieving a focus on the overall picture. Those responsible for preparing the reports should also be encouraged to add to the quality requirements as needed or include additional information if it is relevant for the overall picture. In exceptional cases, they may even disregard existing quality requirements if strict adherence to them results in an overall picture that no longer reflects the actual situation. However, they must do this intelligibly and transparently and adequately justify their decision.

As for the “focus on the overall picture” quality requirement, the analysis and verifiable documentation must always consider all relevant environmental impacts and the whole life cycle. Information can be simplified in order to communicate results in a more straightforward form to a wider audience, provided that it is possible to demonstrate that the information can be aggregated in the sense of a true and fair view and foster environmentally-friendly decisions. Certain situations may call for focusing communication on particularly relevant life cycle phases if the other phases are irrelevant to the overall picture and to the recognition of environmentally-friendly decisions.

Just like in the general financial reporting standard of the same name, information that meets the true and fair view principle is first and foremost aimed at external stakeholders and risk carriers such as investors and residents who live near company sites with hazardous substances. The quality requirements are designed so that they can be applied to information on environmental impacts at various levels. Accordingly, they can in particular be applied to entire national economies (consumption areas and economic sectors), companies and products. However, they can also be used as quality assurance for other types of environmental information, such as environmental certifications and inventories.

3. Measures for establishing the quality requirements for a true and fair view

In order to establish the quality requirements for environmental economic reporting as widely as possible, the following options are available:

- > The first step is to establish the standard as a guideline for best practices and quality information on environmental impacts. Swiss administrators can contribute by recognizing the quality requirements themselves, making them mandatory within their administrations and applying them consistently.
- > In order to transfer the required know-how to actors, the quality requirements will be made available by ensuring that they are easily accessible and translated into major languages. The necessary approaches, methods and tools will be made available and the technical foundations for applying the quality requirements and verifying report-

Analysis and verifiable documentation for all relevant environmental impacts and the whole life cycle

Scope of application of the quality requirements:
 > national economies
 > companies
 > products

Voluntary compliance / example setting

Enabling actors

ing based on the standard will be laid, e.g. as part of guidelines. Another method is to allow those responsible for preparing the reports to have access to a large data base that complies with the quality requirements (such as ecoinvent data v2).

- > Politicians and administrators can work within international organizations and bodies to promote the discussion, recognition and consistent application of the quality requirements. This would be important, for example, in the United Nations, at the OECD, the World Bank, the EU (e.g. EEA, DG Environment and EUROSTAT). Switzerland could campaign for these institutions to declare the standards as “standards for good information about the environmental impacts of consumption and production” in their spheres of action and state that they are mandatory for other actors.

International dissemination
- > Politicians and administrators can try to influence existing and future voluntary standard systems, so that they explicitly incorporate the quality requirements into them. For example, this could be done with certification standards such as the EU’s Eco-Management and Audit Scheme (EMAS) and the EN ISO 14000 environmental standard series of the International Organization for Standardization (ISO), which already implicitly incorporate the key requirements for a true and fair view on a broad basis. These voluntary standards may have a major binding effect, especially if important stakeholders, such as individual clients or capital providers, demand them.

Incorporation in voluntary standard systems
- > It may be sensible in some cases to issue laws and regulations in Switzerland that make it mandatory for the actors who prepare reports (e.g. for companies, government organisations, etc.) to comply with the quality requirements.

Laws and regulations

4. Application to various approaches for determining the total environmental impacts of consumption and production

This study uses the quality requirements to compare approaches to determining the total environmental impacts of consumption and production. To do so, it examined the various approaches that were best suited to a comprehensive investigation and assessment of the environmental impacts of production and consumption and their attribution to economic sectors and consumption areas.

Accordingly, the analysis of the approaches focused on how effectively they are able to:

- > determine the environmental pressures of consumption and production,
- > calculate and assess the environmental impacts on the natural environment, and
- > attribute environmental influences and impacts to their drivers.

An important aspect is that the approaches can be connected and combined with macroeconomic accounting data. That way, it is easier to attribute environmental impacts to the drivers that cause them (consumption areas, economic sectors or the entire national economy). The table below provides an overview of the examined approaches:

Tab. 2 > Overview of examined approaches to determining the environmental impacts of a national economy

This table describes the characteristics of the examined methodological approaches. It distinguishes between approaches to determining environmental impacts and approaches to determining ecological, social and economic impacts.

Approach	Brief description	Methodological foundations
Approaches to determining environmental impacts		
Environmentally Extended Input-Output Analysis with Life Cycle Assessment (EE-IOA&LCA)	The goal of this approach is to determine the total environmental impacts of the consumption and production of a national economy.	This approach is based on economic Input-Output Tables (IOT), foreign trade statistics, NAMEA, national inventories and life cycle assessment (LCA) data. It develops an approach combining IOT and NAMEA (for an example, see the European Environment Agency, 2009). From a consumption perspective, the direct and imported environmental impacts are allocated to various consumption areas. From a production perspective, the environmental impacts of Swiss companies are allocated to various economic sectors.
Composite Environmental Indicator	A composite environmental indicator subsumes an entire range of environmental indicators. The EU is planning a composite indicator that is limited to environmental impacts within the EU territory.	Based on the most diverse national data bases, indicators were developed for a number of environmental aspects that were then combined into a composite indicator using a simple weighting method.
Ecological Footprint (EF)	The EF approach measures the amount of biologically productive land and water area necessary to supply the resources that a population consumes and mitigate the associated waste in a specific area in consideration of the predominant technology. It was developed to demonstrate a country's supply and consumption of its natural resources.	This approach converts consumption and impacts on resources into a measure of area that would be necessary to supply these resources. Furthermore, it also calculates the biocapacity, i.e. nature's ability to produce resources and absorb wastes. If the footprint and biocapacity of a region balance each other out, they are in harmony with the carrying capacity of resources, and the region is therefore sustainable.
Environmental Performance Index (EPI)	The EPI sets numerical benchmarks for several environmental policy categories and measures how well countries achieve them. Changes are measured, but not absolute conditions. It compiles a ranking of 163 countries based on 25 multi-level aggregate indicators.	For each indicator, the EPI sets a numerical benchmark that must be achieved. Countries that reach the benchmark receive 100 points, while the worst countries receive 0. As a result, the EPI merely provides a relative view.
Approaches to determining environmental, social and economic impacts		
Genuine Progress Indicator (GPI)	The GPI weighs the ecological and social costs against the benefits of economic activities by adding ecological and social aspects to macroeconomic accounting.	The GPI includes a range of additional benefit factors based on consumption data from macroeconomic accounting (e.g. housework, volunteering, higher education, leisure, etc.). Income inequality, criminality, resource consumption and environmental pollution are some of the additional cost factors that are deducted.
National Wellbeing Index (NWI)	The NWI is based on private consumption, a component of macroeconomic accounting, and indicates national wellbeing using the Index of Sustainable Economic Welfare (ISEW) and the Genuine Progress Indicator (GPI).	The NWI is an aggregate composite indicator that supplements and corrects the gross domestic product (GDP): First, GDP is weighted with an index of income distribution. Then, the economic activities that are not identified in GDP are added. Next, the economic activities that detract from wellbeing are removed, such as traffic accident costs, environmental costs, and climate costs.
Adjusted Net Savings (ANS)	ANS calculates the net investment of a national economy in production factors such as productive or economic capital, natural capital and human capital based on national accounting data.	ANS is derived from gross national savings and deducts the following factors: <ul style="list-style-type: none"> • economic capital consumption • depletion of natural resources • damages caused by pollution The ANS approach adds: <ul style="list-style-type: none"> • investments in human capital (training expenditures)

Approach	Brief description	Methodological foundations
Regional Quality of Development Index (QUARS)	QUARS measures regional wellbeing and development quality. It is used to identify the sustainability components that are important regional preconditions for life quality.	QUARS is an index composed of 45 ecological, social and economic variables that are divided up into seven domains: <ul style="list-style-type: none"> • ecology • economy and labour • rights and civil rights • equal opportunities • education and culture • health • participation
Wellbeing Index (WI)	The Wellbeing Index (WI) is a sustainability indicator that effectively weighs ecological and anthropocentric interests. It is based on three sub-indicators that each have different indicators and criteria: <ul style="list-style-type: none"> • Ecosystem Wellbeing Index (EWI) • Human Wellbeing Index • Wellbeing / Stress Index 	For each criterion, 0 to 100 points are subjectively awarded for corresponding performance values of very good, good, satisfactory, adequate, and inadequate. The best value in comparison always receives 100 points, while the lowest value receives 0. Since this rating is always relative, comparisons can only be made between countries or regions.
Dashboard of Sustainability (DoS)	The Dashboard of Sustainability (DoS) compiles environmental, economic and social data in a policy performance index.	For each individual indicator, a policy is evaluated and points are awarded based on a relative scale. The evaluation is performed according to seven rankings from good to very poor in relation to other countries and regions that are considered. Therefore, individual analyses are not possible, nor are comparisons beyond different years.
Sustainable Process Index (SPI)	The SPI measures the land area used by economic processes in relation to the available area. As a result, the SPI also calculates a sort of ecological footprint, i.e. those areas that have an economic activity exclusively based on natural resources in a year.	The land use that is needed to supply a product or service in the ecosphere is divided by the land area per capita that is available for the production process from a statistical point of view.

Tab. 3 evaluates selected approaches to determining the environmental impacts of consumption and production of national economies based on the quality requirements for a true and fair view.²

² A more detailed discussion of the methodological approaches and weighting methods can be found in appendix C of the full report in German (www.bafu.admin.ch/11119-d).

Tab. 3 > Evaluation of approaches to determining the environmental impacts of consumption and production in a national economy and their initiators based on the quality requirements for a true and fair view

Comparisons are made based on indices (“+” good performance, “-” poor performance, “+/-” both good and bad). The evaluation seeks to determine the suitability of the various approaches for indicating the total environmental impacts of consumption and production of a national economy and their initiators, but not their suitability for other issues.

Quality requirements for environmental reporting (on national economies, companies and products)	Approaches to determining environmental impacts				Approaches to determining ecological, social and economic impacts							
	EE-IOA& LCA	Composite Environmental Indicator	Ecological Footprint EF	Environmental Performance Indicator EPI	Genuine progress Indicator GPI	National Wellbeing Index NWI	Adjusted Net Savings ANS	Regional Quality of Dev.mt Index QUARS	Wellbeing Index WI	Dashboard of Sustainability DoS	Sustainable Process Index SPI	
1. Relevance for decisions to be influenced by the information. (In this case, decisions to reduce the total environmental impacts were evaluated.)	+	+	+/-	-	-	-	-	-	+/-	-	+	
2. Focus on the overall picture: convey a true and fair view of the actual situation. Therefore, it should consider all relevant environmental impacts along the whole life cycle, and if possible, at the place they occur.	+	-	+/-	-	+/-	+/-	+/-	-	+/-	-	+/-	
3. Reliability <ul style="list-style-type: none"> • trustworthiness (e.g. external assurance) • scientific soundness 	+	+	+/-	+	+/-	+/-	+/-	-	+/-	-	+/-	
4. Transparency <ul style="list-style-type: none"> • traceability • verifiability 	+	+	+	+	+	-	+	+/-	+/-	+	+/-	
5. Comprehensibility	+	+	+	+	+	+/-	+	+/-	+	+	+/-	
6. Coherence and comparability <ul style="list-style-type: none"> • coherence (consistency) • continuity • scalability • standardisability, expandability and connectivity 	+/-	+/-	+	-	+/-	+/-	+/-	-	+/-	-	+/-	
7. Availability of information	+	+	+/-	+/-	+/-	-	+	+	+/-	-	+	
8. Up-to-date information	+/-	+	+	+	+/-	+	+	+/-	-	+/-	+/-	

Source: Infrans and Ecologic

This comparison shows how suitable the approaches are for justifying decisions to reduce the total environmental impact. It reveals that out of all of the analyzed approaches, the EE-IOA&LCA approach is best suited for the “relevance for decisions to be influenced” and “focus on the overall picture” key quality requirements. Approaches that do not hold up well in comparison may in some circumstances be suitable for other issues (e.g. improving the ecological-social-economic balance). In our opinion, this applies somewhat to the GPI, the NWI and the ANS and possibly also to the Happy Planet Index (HPI), which was not examined in this study.

We think that the following approaches are the most suitable to determine total environmental impacts:

- > **Ecological Footprint:** The EF is a rather lean indicator that conveys an approximate view of the development of the environmental impacts of a national economy for almost all countries. It is particularly useful as a communication tool and for approximate comparisons of the environmental impacts of different countries. However, it should be supplemented by more in-depth approaches, as it does not consider any other environmental impacts apart from CO₂ emissions and land use. In its current version, the use of electricity from nuclear energy and the consumption of non-renewable water reserves are not allocated to the negative environmental impacts. This skews the balance.
- > **EE-IOA&LCA approach:** This approach connects economic data with emissions and resource uses and weights it using various impact assessment methods. The ecological scarcity method (environmental impact points), for example, is suitable for the weighting. As a result, the EE-IOA&LCA approach conveys an overall picture of the environmental impacts of a national economy in terms of its consumption and production. Since this approach also allows for conclusions to be drawn about the environmental impacts of various consumption areas, economic sectors and product groups, it is also suitable as a basis for monitoring sectoral or specific product group aspects of resource and environmental policies.

5. Conclusion

True and fair view quality requirements for environmental information

Environmental economic reporting systems that are based on a true and fair view should convey a reliable overall picture of the actual environmental impacts of national economies, companies and products. They do so by identifying all relevant environmental aspects along the whole life cycle of products and transparently disclosing the calculations and evaluations of the environmental impacts. The bases for the decisions of private and public decision makers can be significantly improved if efforts continue to advance high-quality and comparable environmental reporting.

The eight quality requirements for environmental information represent a synthesis of the most important quality information for statistical and environmental economic reporting. They are compatible with environmental information regulations in the EU and ISO standards in the 14000 series. At this time, there are already guidelines and initiatives in the EU that promote similar quality requirements for environmental information about consumption and production. An example of this is the “Misleading environmental claims” extract of the Guidance for the implementation of Directive 2005/29/EG concerning unfair commercial practices, which outlines the environmental claims about goods and services that are and are not misleading. The Guiding Principles of the European Food Sustainable Consumption and Production Round Table are also consistent with the quality requirements developed in this study.

Recommended approaches to determining total environmental impacts

Quality requirements should improve the basis for decisions

Synthesis of the most important quality requirements

Implementing uniform quality requirements

The true and fair view quality requirements should become the national and international standard for good information about environmental impacts. Furthermore, authorities/officers, administrators and other public and private actors can adopt the methods suggested in this study. The main spheres of action are the following:

- > Enabling actors
- > Voluntary compliance / example setting
- > Promoting voluntary compliance by actors
- > Incorporation in formal voluntary standard systems
- > International dissemination
- > Regulations, controls, sanctions

Promote the implementation of quality requirements

Using high-quality approaches to determining the environmental impacts of consumption and production

The assessment of wellbeing that is based solely on GDP, a limited indicator in many respects, is now obsolete given the challenges of sustainability. With that in mind, countries should assume a more instrumental role, further develop environmental reporting standards and become more involved in reporting on their national economy and industries. To achieve this, given the wide range of available approaches and methods, countries will first need to agree as quickly as possible on an appropriate set of approaches that can be applied to the issues. From the authors' point of view, methodological enhancements should not be the main focus at first, since many acceptable approaches are already available.

Add environmental indicators that are complementary to the GDP

Furthermore, reporting should be carried out regularly at varying levels. For example, it is conceivable that a relatively basic permanent indicator could be used every year or every two years for reporting and the EE-IOA&LCA-based approach could be used for a more extensive (and meaningful) analysis every three years. That way, overlooking important environmental aspects due to a narrow focus on a single indicator could be avoided in the medium term. Updates to the information in the data bases (e.g. LCA data) can be carried out on an ongoing basis or as needed. Since the various evaluation methods (UBP 2006, Eco-indicator 99, ReCiPe 2008, Impact 2002+) each have their specific strengths and weaknesses, we think that it makes sense for the environmental impacts to continue to be determined on the basis of different evaluation methods in order to obtain the truest possible overall picture of the environmental impacts.

Use basic indicators on a yearly basis and more complex indicators at wider intervals

All countries that import a large portion of their goods and services need to calculate the environmental impacts caused by foreign imports. The combination of input-output analyses, foreign trade statistics and life cycle assessments (EE-IOA&LCA) seems especially well suited in light of the quality requirements for a true and fair view and in comparison with other existing approaches.

The assessment of environmental impacts must take imports into consideration