

# 1 Management Summary

The Ecological Scarcity Method (ESM) enables measurement and assessment of the environmental impacts caused, for example, by manufacturing sites. Developed in Switzerland in 1990, where it has since been in use, the method is constantly being developed and updated. It has already gained regulatory status in Switzerland, for example for the purpose of proving entitlement for tax exemptions, in particular for environmentally friendly production of bio-fuels<sup>1</sup>. A data set has been available for Germany since 2014. The method assesses all important environmental impacts on the air, on water, the consumption of energy, the generation of waste and the consumption of freshwater.

Assessments of this kind are necessary, in particular for manufacturing companies, for assessing the environmental impacts caused by economic activity. They may, for example, take the form of environmental impact assessments of manufacturing sites or even of individual production processes. Such assessments are also a tool for identifying which amount of capital expenditure in field will have the greatest effect on the environment. When it comes to answering these questions, the reliability and traceability of the assessment is of vital significance to the companies basing decisions on these results.

The name “Ecological Scarcity Method” is derived from the fact that the environment's capacity for pollutants is limited up to a critical state, i.e. is scarce.

In the ESM, the scarcity situation is defined by the current, existing environmental impact and the capacity, as defined by a country's highest environmental authorities, to withstand this impact as a target state. This ensures that the various users of the assessment method will make use of a common basis of assessment, so making the assessment user-neutral, objective and reproducible at any time.

The scarcity situation of the environment with regard to a pollutant thus depends on the difference between the current environmental impact, for instance in tonnes of pollutant per year, and the quantity or “critical environmental impact” which, on the basis of the environmental objectives, is still just about acceptable. Each pollutant discharge or also each consumption of resources takes place against the background of a corresponding scarcity situation. The consequent relative deterioration in the scarcity situation, a ratio, can be added up for all such impacts, giving rise to the total environmental impact, for example for a manufacturing site in a specific year.

Before the assessment method can be applied, it is vital for the most important environmental impacts for the country under consideration to have been investigated as completely as possible. Such is the case in the EU and also in many other countries.

---

1 cf.: Swiss Confederation “Fuel life cycle assessment ordinance” of 9.4.2009, paragraph 6.

One significant feature of the ESM is that it can be used to assess completely different environmental impacts and to compare them with one another. The feature common to all environmental impacts, which makes such comparability possible, is the relative deterioration in the scarcity situation brought about by each individual environmental impact.

**Overview 1:** The present study researched eco-factor data for the following countries

EU 28 (regarded as one environmentally decision-making unit)

Austria  
Belgium  
Bulgaria  
Croatia  
Cyprus  
Czech Republic  
Denmark  
Estonia  
Finland  
France  
Germany (for the purpose of comparison)  
Greece  
Hungary  
Ireland  
Italy  
Latvia  
Lithuania  
Luxembourg  
Malta  
Netherlands  
Poland  
Portugal  
Romania  
Slovakia  
Slovenia  
Spain  
Sweden  
United Kingdom

The data for each country is available in chapter 6.

The method allows a user directly to establish whether the overall environmental impact on a site has fallen or risen and which individual impact has had what influence even in the presence of countervailing trends.

Using the ESM, environmental impacts may be calculated and classified in the form of eco-points (EP) and also used in various management tools for setting objectives, in a similar way to that known from management cost accounting.

The present report from SYRCON Darmstadt describes the transfer of the method to European conditions with a survey of the corresponding current impacts and the target impacts drawn up and published by the competent environmental authorities, specifically the European Environment Agency.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

