

A New Approach for Executing an Ecological Assessment for Organisations

DFGE-TopDown Approach for the Carbon Footprint

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1. Problem

Ecology is a multilayer topic for companies.

In these days many companies see the need for proving their ecological process methods because of their self-conception, because of customer's requests or because of legal aspects and the increasing worldwide discussions and awareness of the topic. All stakeholders of a company ask sooner or later for the ecological impact.

Is an eco-balance the solution?

Yes, a so called eco-balance is the preferred way to answer these questions. But an ecological assessment of a product or a company covers all company related consumption and processes. This company-wide analysis spreads across various balance layers along the process chains back to the primary resource in the deposit. It must be handled by several micro analyses for every single expenditure independent of their impact on the overall results. Items of big importance as well as items with only low significance are analyzed the same way, following the same procedure. The eco-balance is measured according to ISO norm 14000 et. qq. but also other bodies provide guidance in calculating e.g. the GHG protocol.

An eco-balance is exact – and complex.

This approach – in the literature called “BottomUp” – increases the accuracy of the findings. However it increases also the related effort in regards to time and company resources (man-days). And last but not least this is a static approach: Once started you will get – after a time delay for processing – a final result, valid for a certain time. Thus the eco-balance is comprehensive and carries statistical tolerances in the range of 10% and more. And it is retrospective, accounting what has happened in the past.

An ecological assessment follows the Pareto principles.

In the economic and ergonomic world this is well known: 80% of the work causes 20% of the results – 20% of the work determines 80% of the results (sometimes values may differ to 90%-10% or even 95%-5%). Or the other way round: If you choose carefully the ‘proper’ work items you will be able to find an optimum between accuracy and effort. 10..20% of the emitters cause 80% ... 90% of the total emissions.

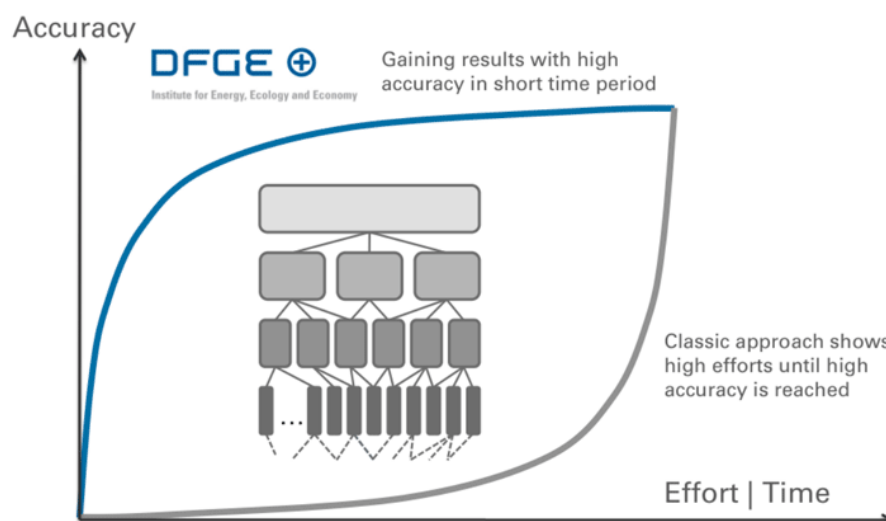


Figure 1: Accuracy and efforts over several balance layers for generating an eco-balance

Economy and Ecology – nature costs money, but not 1:1.

It took a long time but nowadays it is understood and commonly agreed that economic and ecologic values are somehow related to each other. So it is obligatory to have a look on methods which are proven in the economic world and to verify their applicability in the ecologic world. Our scientific analysis show that there is NOT a 1:1-applicability but similar coherence: Also an eco balance follows the Pareto principles, but money is not equal to nature. Rather than equalizing money and nature the aim is to find similar coherences between these two.

2. TopDown Approach

Using Pareto for an ecological assessment leads to a TopDown approach.

By using a different approach the experienced operator is able to reduce the efforts significantly with only a small loss of accuracy but with huge savings of time and effort. Experienced users are able to develop a holistic balance in less time by focusing on items of big importance, the “sensitive elements”. Based on an estimation of the total balance single items are compared, assessed and then prioritized in order to further specify and analyze the sensitive elements.

Advantages and side effects.

Thus the analysis can be detailed and the results will constantly improve in an iterative and recursive process. This approach – called “TopDown” in the literature – can be easily implemented in a dynamic process which enables you to get up-to-date data with adequate accuracy, see Figure Comparison BottomUp – TopDown.

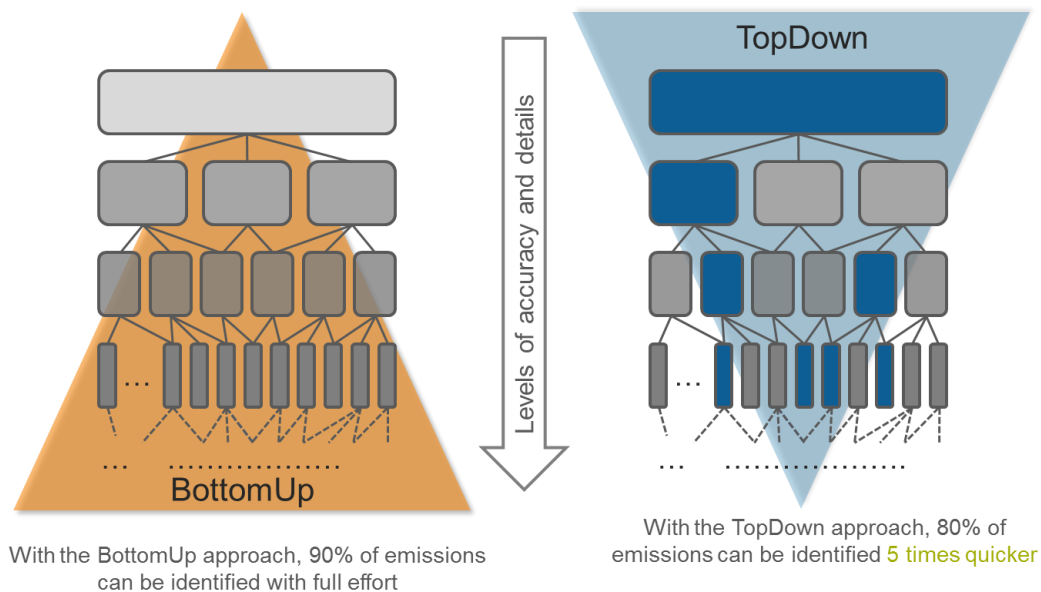


Figure 2: Comparison BottomUp – TopDown

Furthermore it enables the user to speed up the process of eco-balancing his company. Thus such an assessment can be used not only for retrospective analysis but also for future oriented strategic decisions for the company. And it enables to implement an Environmental Management System (EMS). And it spreads the efforts over a certain period without running into severe problems with misinterpreting certain environment-related issues. The TopDown approach is the foundation of the further activities around energy and carbon management and a wise start. It delivers a status of all the activities and makes the progress measurable.

Disadvantages – risks and threads.

There are a lot of advantages, but even more disadvantages. This approach can only be used by an experienced operator. The usage is bound to a deep technical understanding about the underlying context and knowledge about correlation especially the NON-correlation between economy and ecology. Thus it is evident that a TopDown approach is reserved for experts.

3. Operations for a TopDown Approach: Development Cycles

The first Development Cycle: “TopDown by Accountancy”

Based on a rough estimation of the whole investigation object sensitive elements are determined and detailed. The rough estimations can be gained via financial and/or operational indicators like business volume (turnover), number of employees etc. Although financial data can give an hint on the ecological impact it is recommended to base this first step on operational data e.g. as

- number of employees,
- number of business trips,
- number of company cars
- seize of buildings (in sq.ft./m², with differentiation of production sites and office locations)
- transported goods etc

These data can be achieved from the financial department (accountancy, bookkeeping), so no additional work besides checking for already existing data is required. From an operational point of view this is normally covered by the first Development Cycle “TopDown by Financials”.

The second Development Cycle: “Ecological Assessment”

In this Development Cycle the transfer from economic data to an ecologic assessment is realized. Based on the collected data and combined with experiences from similar investigations in the past (stored in a database, e.g. the DFGE environmental-impact-database) you are able to evaluate the environmental impacts as e.g. the carbon footprint roughly. Then you detect the sensitive elements and specify the results for them more precisely by investigating more in deep. So you create reference key data which can be used for estimating other similar sites. All together is done in cycle 2 “Ecological Assessment”.

The third Development Cycle: “Scale Up and Projection”

As last step (Projection of a Corporate Carbon Footprint) you build clusters of analogue loads and emitters and scale these up to a corporate carbon footprint by using the reference key data and the available environment variables (e.g. power generation in different countries/regions). By repeating this procedure in the following periods (can be bound to fiscal, financial, calendar or any other period which fits into the company's strategic direction) the results will become more precise.

Next Steps and Close

After having passed all 3 cycles and once deployed this allows in addition reflecting the actual situation at short notice. An internal (departments, functional units within the company) and external (competitors) benchmark allows to determine reduction options and goals and to deduce strategic advice and portfolio of suggested actions.

4. Towards an Environmental Management System

Mission critical for implementing an EMS.

Above outlined project should be the first step towards a holistic Environmental Management System (EMS). The conceptual design does not focus on the calculation of a single value but on a dynamic, usable and especially vital tool for further development.

Especially when it comes to environmental topics in a globally acting company the acceptance differs depending on factors like 'where is the subsidiary located', 'how many employees are working there' and much more. Our experiences show that for example environmental topics are in Europe quite accepted, however in APAC often there are some resentments.

This leads to a situation that – in order to pass these hurdles – some important factors exist there under

- Internal communication (informing employees in an adequate way and promoting the economic usability of this knowledge).
- External communication (informing stakeholders) and last but not least
- Usability of the EMS

Involvement of users – Help by IT.

As long as the users are neither able to understand the importance nor to implement such a tool in their daily work life any additional measurements will run into drawbacks. To overcome any obstacles often a software based solution is used. This application software should be embedded into the internal reporting system. Ideally it's an Add-On where the user is not forced to enter additional data, but receives the proper results from the EMS. A possible useful tool is for example an eco-Report which breaks down the ecological impact of a single product or process and outlines methods and results for customers as well as colleagues.

The Cloud can help – but administration by specialists is needed.

DFGE recommends a self-running system, administered by some specialists but usable for all decision makers (and especially for sales purposes). Such a system should be bound to the existing in-house solution and can be realized as closed system (piece of software, installed onsite) or as SaaS (Software as a Service) where the software is placed into the cloud (data bases are managed and actualized by external experienced eco-specialists) and can be accessed via the internet.

5. Continuous Strategy Development

Continuity is the solution – management the key.

Environmental protection is supported and carried out by the employees of a company, which should be supported and enhanced by internal systems and processes. Often the minor changes show big impacts like for example the reduction of the room temperature by only one degree. The willingness of the employees is in most cases existent but there is often a lack of support by the company. Also the benchmark with the competition and their environmental approach can provide valuable input to the company strategy.

“Eco” must be part of the company’s strategy.

To “activate” employees and managers a company has to show a clear strategic direction which should be supported by an “Eco Task Force” (Environmental Group or Council) staffed with internal experts from all departments. The policy unit carries out activities like implementing internal workshops, supporting existing in-house developments and supporting in the development of future activities, workshops or trainings. Those activities should ensure a broad acceptance and the possibility to integrate as many people, groups and sites as possible to institutionalize the internal ecological awareness.

Help by external consultants, experienced in handling environmental topics.

It makes sense to involve an external advisor which brings in another point of view, covering external stakeholder of the company.

Examples for their work are:

- Regular attendance on meetings
- Continuous Support in Environmental Strategy
- Evaluation/Comment on findings and approach of the Eco Task Force
- Assistance in choosing proper partners and vendors (e.g. electricity)
- Classification of own activities in the competitive environment, benchmarking selected competitors
- Information about recent developments in environmental and standardization topics
- Support in reporting and documentation (CSR, internal, ...)

6. Your roadmap towards a Carbon Footprint

Start today with a transparent roadmap and concrete steps

The DFGE offers a transparent roadmap to get your Carbon Footprint in place within several weeks. Beside the already described benefits of the process the Carbon Footprint will no longer be an abstract figure but the measuring point for your environmental activities. It will also enable you to benchmark your situation and process with others as well as to be able to communicate a transparent strategy, with clear targets and even reduction potentials. Following table shows the roadmap and a rough time line for evaluating your Carbon Footprint:

Cycle	Step	Time-Line
1	Kick-Off Workshop	½ day ¹⁾
	TopDown by Financials	2 – 3 weeks
2	Ecological Assessment	1 – 2 weeks
3	Scale Up and Projection	3 – 5 weeks
	Validation	
	Benchmark (internal & external)	
Close	Reduction Options & Goals	1 – 2 weeks
	Strategic advice & suggested action	
	Your Carbon Footprint	7 – 12 weeks

¹⁾ either on-site visit or telco

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7. About DFGE

The DFGE – Institute for Energy, Ecology and Economy – was founded in 1999 as a spin-off of the technical university Munich. DFGE provides answers to questions in relation to environmental sustainability, energy efficiency, international standardization and climate protection.

Many ecological projects though lack the economic feasibility. On the other hand the most profitable solution often neglects the ecology. If and under which conditions the combination of those objectives can be achieved is our core business. DFGE focuses on the determination of facts and proposals to interpret those data. The result is a proven process where facts rather than opinions dominate. We can rely on a strong partner network and offer experience and excellence in research and business adoption.

We provide strategic advice on topics like technology, energy and emissions with an expanded view on business related and socio-economic aspects. We support you in developing and managing a customized analysis for a testified Carbon footprint.

As an independent institute we secure investments by validating methods and results of your carbon footprint analysis for sustainable accuracy.

Customers include – besides well known corporates like Aurubis, Avnet Inc., Dachser Logistics, Dräxlmaier, Kaufland/Lidl, Ratiopharm, Salzgitter and others – the DAX companies BASF, Daimler, Deutsche Telekom, Deutsche Bahn, e.on, Volkswagen as well as the European Union and the Government of Bavaria.



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