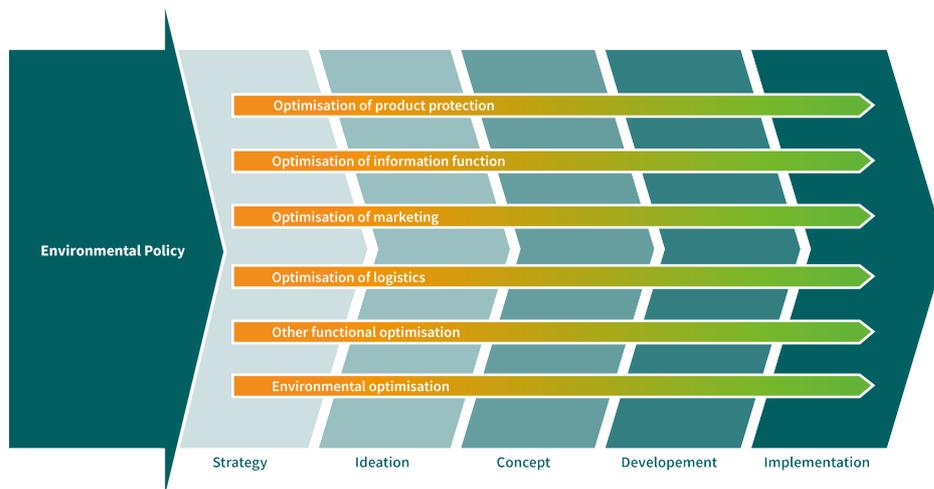




Instruction Management of Eco Design in Packaging Projects

Variety of optimization processes

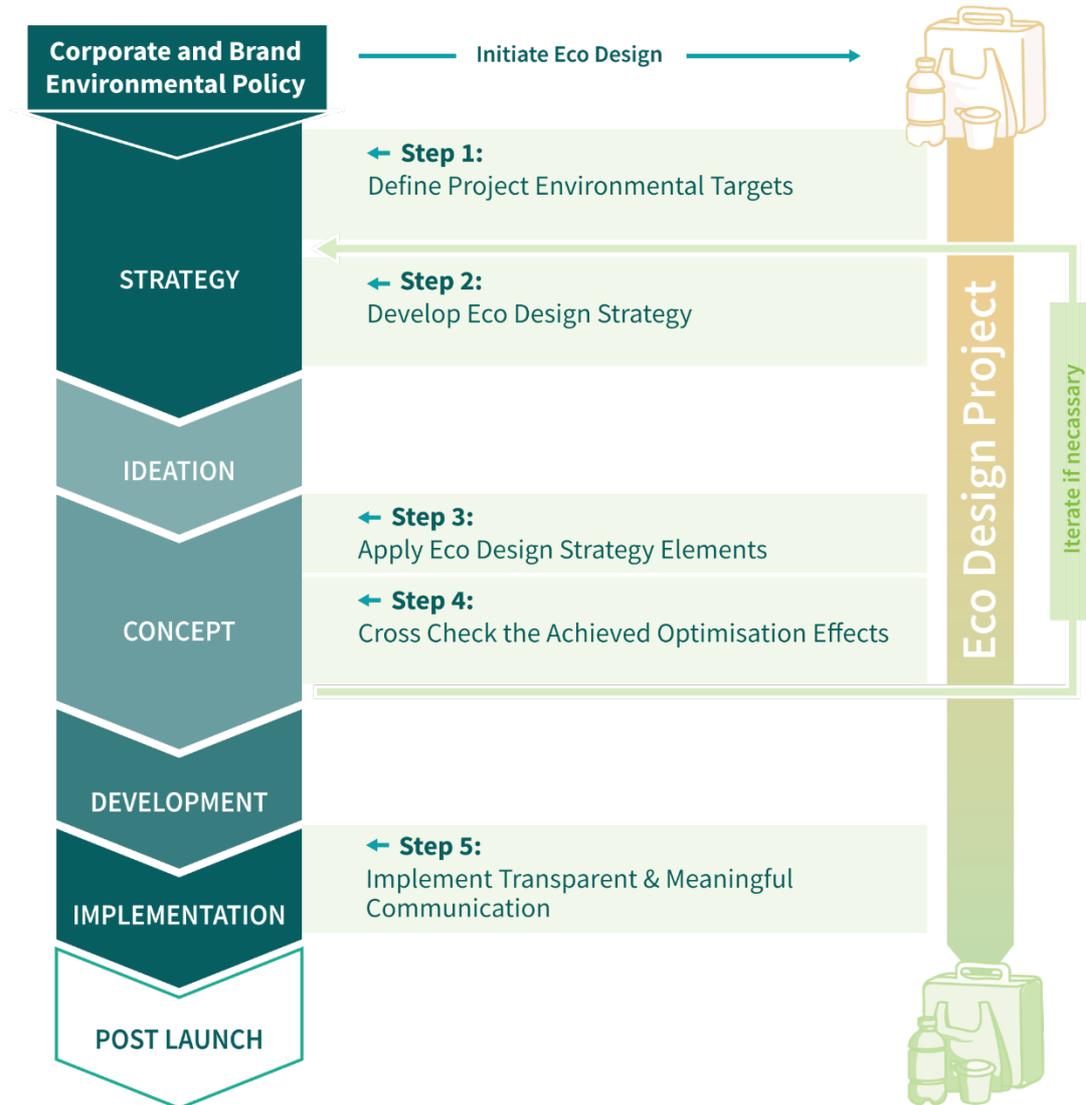


Basic Principles

As set out in the Round Table's guidelines, Eco design is an integral part of the management and decision-making processes involved in the development of a packaged product. The integrated process ensures that environmental requirements are on an equal footing with other key requirements in packaging development. Consequently, as well as other design objectives, environmental objectives must also be adequately taken into account in all phases of a packaging project.

To ensure this, these guidelines assign key Eco design tasks to the typical phases of a packaging project in clear steps.¹ Based on a stage-gate process, specific questions are formulated for review in each case. A positive answer must be given to successfully complete each step, if necessary, after appropriate modifications have been made to the packaging. Only then can a packaging project be successfully completed as a genuine Eco design project.

¹ Different companies sometimes use very different terms and distinctions for the various phases of packaging projects. The basic procedure and thus also the options for assigning the proposed Eco design review steps remain largely unaffected, however.

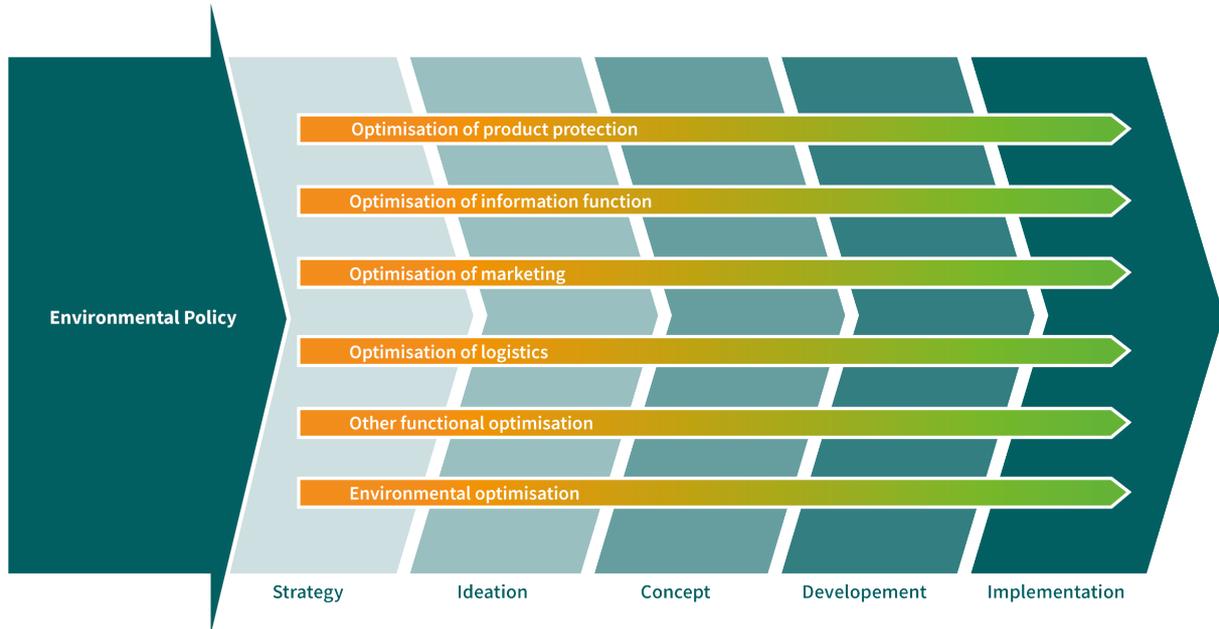


Given the complexity of the challenges related to integrating Eco design into packaging development, the Eco design process will be explained and illustrated in this fact sheet.

The authors are aware that in day-to-day business not only do environmental optimisations have to be implemented during a packaging project but similar efforts are also constantly made in other 'classical' areas related to requirements, and here, too, improvements need to be developed and tested, sometimes in multiple iterations.



Variety of optimization processes



Since modifications relating to one area of requirement normally also have effects on all other optimisation efforts, this leads to closely linked interactions and thus a high overall level of complexity.

However, this complexity is not exclusively a result of giving (additional) consideration to Eco design. Rather, since the introduction of systematic design processes, packaging projects have always been marked by complexity and successfully addressing this has been a hallmark of relevant management structures and decision-making processes.

Guideline Elements to Facilitate Eco Design Integration

The figure below shows at what stages of an Eco design project what elements provided by the present guidelines can and should be applied.



Procedure for Using the Management Process Checklist

A key tool for integrating Eco design into packaging projects is the use of the corresponding checklist for the management process. This management checklist should be reapplied for each specific packaging project and, at the same time, if necessary, supplemented depending on the number of packaging alternatives concerned. Information necessary for clearly indicating what part of the company the project belongs to should be noted.

Project name/title	[Please fill in]
Project number	[Please fill in]
Project manager	[Please fill in]
Date	[Please fill in]

The individual review questions on this checklist and the relevant requirements for successfully passing through the respective gate are explained step by step below, using annotated sections of the checklist.

Examples showing how to use this checklist structure are given under “Illustrative Examples”. Templates of the prestructured checklists are available as PDF downloads in the “Checklists” section. In practice, it may be advisable to use other versions of the checklists as part of processes at individual companies.

Initial Question

The initial question is essential for determining whether company management have decided that reducing negative environmental impacts is a key requirement for company/brand packaging. This is based on the authors’ belief that it is only within the framework of such a fundamental decision that the necessary conditions for a systematic Eco design are met.



However, an essential aspect of this fundamental decision should and must also be making resources available for the necessary capacity building and investment of time for the regular environmental evaluations involved in implementing Eco design.

While this initial question can also be answered generically for all (future) packaging design projects and implemented accordingly, all further review questions are to be repeated for each specific project.

Step 1: Setting Environmental Goals

As a first step, specific **environment-related goals** (“environmental goals”) for the relevant project should be **selected and/or set**. Setting these environmental goals is essential to an (Eco design) project since a structured improvement process can only be planned and implemented if it works towards the goals established at the outset. However, in view of the multidimensional nature of environmental impacts, reducing environmental impacts as such is still not a sufficiently operationalised goal.

Environmental goals to be considered may already exist both in an **environmental strategy** at the level of the **company** and as **part of the brand messages** of the relevant packaged good.

The fact sheet “Environmental Goals for Eco Design Projects” provides explanations of further possible environmental goals for a packaging design project. Possible environmental goals include, for instance, reducing greenhouse gas emissions (contribution to climate change mitigation), using a smaller quantity of materials (contribution to conserving resources) or increasing recyclability.

At this stage in the process, only one or several suitable initial environmental goals are to be set. The environmental goals will not be prioritised or quantified until the next step.



Question	Explanation	Instructions	Result
Initial question			
Has a decision been taken by management that reducing negative environmental impacts is a key requirement for company/brand packaging?	Only if reducing negative environmental impacts is an (equal) key requirement for the packaging is there a basis for a systematic Eco design.	If YES : provide relevant documentation. If NO : either obtain a corresponding decision from the management or terminate (or do not carry out) the Eco design project.	[Please fill in]
Step 1: Defining environmental goals for the packaging design project			
Does the environmental strategy of the company include clearly formulated environmental goals?	Here, the environmental strategy is to be reviewed for appropriate environmental goals.	If YES : for example, refer to the environmental strategy and list the key environmental goals. If NO : give reasons and continue.	[Please fill in]
Can specific environmental messages and environmental goals be derived from the brand message (of the packaged good)?	The brand conveys a large number of messages. These may also include environmental goals such as climate change mitigation, sustainability or protection of the natural environment.	If YES : list the brand's environmental goals and/or the environmental goals that can be derived from the key brand messages. If NO : give reasons and continue.	[Please fill in]
Have relevant environmental goals been selected for this packaging design project?	It is essential to select "relevant environmental goals" for an (Eco design) project. When selecting these, the two review questions listed above should be taken into consideration. At this stage, there is no need to prioritise or quantify the goals. The fact sheet "Environmental Goals for Eco Design Projects" includes appropriate proposals. Possible environmental goals include, for instance, reducing greenhouse gas emissions (contribution to climate change mitigation), using a smaller amount of materials (contribution to conserving resources) or increasing recyclability.	If YES : attach a list of the selected goals, giving reasons for accepting/rejecting the primary environmental goals. If NO : select goals (if necessary, working through the previous review questions once more) or terminate the Eco design project.	[Please fill in]
Has the type and order of priority of the environmental goals been established?	In order to allow a structured further workflow, it is essential to prioritise the environmental goals.	If YES : list the selected environmental goals and the priorities set. If NO : set the order of priority or terminate the Eco design project.	[Please fill in]
GATE 1 Have all review processes of step 1 been worked through, environmental goals for the packaging design project set and the decisions for all subsequent decision-making processes made available?	The results of decision-making processes should be documented and made accessible for the further workflow in order to ensure internal process quality and, if necessary, to facilitate subsequent communication activities (see step 5).	The review results and specifications (selected environmental goals each with a short explanation and order of priority) for the relevant design project resulting from step 1 should be documented and signed by the project manager.	[Please fill in]



Step 2: Developing the Eco Design Strategy

The second step is to determine a suitable Eco design strategy for the relevant packaging design project that will guarantee that the selected environmental goals are defined more precisely and implemented as part of a structured process.

For this purpose, first of all, **Eco design strategy elements should be selected** that (can) contribute to the selected environmental goals when implemented. When these are put into practice (step 3), the various approaches within the total of four Eco design strategy elements can then be used to carry out the specific review and optimisation of the packaging alternatives concerned.

Furthermore, the **degree of design leeway** of the packaging design project is of great importance for developing the Eco design strategy. For the project, a series of general decisions have been made previously and in parallel decision-making processes. Among many others, these decisions result from the following factors:

- logistics requirements based on the framework conditions for distribution of the corresponding packaged goods (such as how they are presented on the shelf),
- legal requirements based on the type and marketing channel of the packaged goods (such as the option of using recycled material),
- fundamental marketing features of the brand (such as the choice of colours).

These specifications also restrict the Eco design options and improvements in environmental performance that can be achieved, i.e. helping meet ambitious environmental goals. Consequently, they should be precisely documented so that, in the remainder of the process, any conflicting goals that arise can be clearly identified and addressed.

Development of the Eco design strategy also means that commitments to **environmental goals** previously made (see step 1) are **specifically put into practice, i.e. made measurable**.

In other words, firstly, suitable metrics for the various environmental goals should be selected, i.e., for example, CO₂ equivalents as a metric for the emission of greenhouse gases for the environmental goal of climate change mitigation or class A-F according to RecyClass certification or x per cent according to the Institute cyclos-HTP for the environmental goal of recyclability (see the fact sheet “Environmental Goals for Eco Design Projects”).

Secondly, the **goals** need to be **quantified**. Here, a distinction should be made between minimum requirements (minimum targets) and optimisation requirements (optimisation targets). While minimum requirements as minimum targets determine which environmental standards must be observed in each case by the packaging solution to be developed, optimisation requirements formulate more far-reaching objectives aimed at through environment-oriented optimisation of the packaging.

The various targets can either be indicated in absolute values (e.g. defined size per package or packaged good per unit) or, in most cases, more simply in relation to an existing benchmark (e.g. the existing packaging) – for instance, as “at least as good as” or as “x per cent reduction compared with”. Along with the selected strategy elements, the quantified environmental goals form the **specific environmental strategy** for the relevant Eco design project.



Question	Explanation	Instructions	Result
Step 2: Developing the Eco Design strategy			
Have “suitable” Eco design strategy elements been selected?	For the selected environmental goals, “suitable” Eco design strategy elements should be chosen that implement the review and optimisation appropriately. The Eco design strategy elements can (to some extent) be ranked according to the order of priority of the environmental goals. The fact sheet “ <i>Environmental Goals for Eco Design Projects</i> ” provides relevant information on this.	If YES : compile a list of strategy elements, if applicable, ordered in line with the priorities of the environmental goals for the design project. If NO : stop until the list has been compiled.	[Please fill in]
Has design leeway for the project been established?	The design project is subject to a series of basic specifications. These apply to logistics requirements, marketing requirements, filling technology etc. These specify a fixed framework and the (remaining) design leeway for the Eco design project. The more specifications are set here, the more restricted possible solutions are. For example, specifications at (logistics) system level determine whether multiple-use solutions would also be conceivable as an alternative to a single-use solution.	If YES : document the key requirements established for the design project and remaining design leeway. If NO : stop until the specifications have been finalised.	[Please fill in]
Are all environmental goals measurable? (Have all environmental goals been made measurable?)	Suitable metrics for the selected environmental goals should be chosen (for example, CO ₂ equivalents for the emission of greenhouse gases, class A-F according to RecyClass certification or x per cent according to the Institute cyclos-HTP for recyclability). This basis should be used to set environmental goals (minimum requirements and optimisation goals) (semi-quantitative). This can most easily be done in relation to an existing benchmark (e.g. the existing packaging) – for instance, as x per cent reduction of the environmental impact (to date).	If YES : list the (semi-)quantitative metrics for the environmental goals selected in step 1. If NO : check whether non-quantifiable environmental goals are indeed “relevant” for the design project. Justify or delete each goal accordingly.	[Please fill in]
GATE 2			
Have all review processes in step 2 been worked through and the results documented and made available for all subsequent decision-making processes?	Both to ensure the internal process quality and, if necessary, to facilitate later communication activities (see step 5), results of the decision-making processes should be documented and made accessible for the further workflow.	The review results and specifications for the relevant design project resulting from step 2 should be documented and signed by the project manager.	[Please fill in]
<p>➔ The specifications (results of steps 1 and 2) are incorporated into the creative process (ideation).</p> <p>➔ The next stage, step 3, builds on the packaging option(s) arising from this creative process. Step 3 needs to be repeated for each of these initial options.</p>			

The specific environmental strategy resulting from steps 1 and 2 forms one of the specifications (along with further specifications from other requirement areas) for the creative process (ideation) of packaging development.

Step 3: Implementing Specific Elements of the Eco Design Strategy

Step 3 of the Eco design project involves **implementing** specific **strategy elements** that **have been selected** for the relevant Eco design strategy (see *step 2*). These elements



should be applied to the packaging options resulting from the creative process which should now be considered in more depth.

Here, considerations for optimising the selected **strategy elements** need to be **successively applied** to all packaging options concerned. This should preferably be done in an order corresponding to the priorities of the relevant environmental goals. It is important to bear in mind that several different strategy elements help meet an environmental goal.

For this purpose, **the review questions** in the relevant **checklists** for the various Eco design strategy elements should be **worked through step by step** and appropriate evaluations conducted. Here, the need may arise **to make appropriate modifications for optimisation** of the packaging option(s) to be reviewed so as to take into account the environment-oriented objectives of the project.

The appropriately modified packaging options should then be used as a basis for review in the next strategy element.

It is, however, (also) possible that **modifications** desirable from an environmental perspective in order to achieve (further) **optimisation** are **not feasible** since they conflict with the basic specifications of the packaging design project (see “design leeway” in step 2). These **optimisation limitations should be noted**.

Furthermore, it may turn out that when the optimisation approaches for the second or third strategy element are reviewed, in fact, previous modifications need to be reversed. These **conflicting goals** arising from various optimisation efforts must also **be documented** and additional packaging options should be created accordingly, sometimes taking account of one optimisation and sometimes the other. The conflicting goals are then resolved as part of step 4.



Question	Explanation	Instructions	Result
Step 3: Implementing specific elements of the Eco Design strategy			
<p>➔ For each strategy element selected in step 2, the approaches described in the guidelines (and the fact sheets) should be used, as well as the relevant checklist.</p> <p>➔ Then the following questions need to be answered:</p>			
Was the checklist for the relevant strategy element used?	Review the packaging options using the corresponding checklist(s) of the strategy element.	If YES : document the review results using the relevant checklist. If NO : stop until the review has been completed.	[Please fill in]
What selection or modification of the packaging options results from this?	One or several (in principle) suitable (new) options can result from reviewing the packaging option(s) using the checklist.	Description of the selected/modified packaging options ("Final option(s) resulting from strategy element")	[Please fill in]
What difficulties became apparent?	When the checklist is used, it may turn out that, given the degree of leeway in the design project, no optimisations of the packaging item(s) were possible.	Obstacles to optimisation already identified should be documented.	[Please fill in]
Are there any conflicting goals that arise from optimising the other strategy elements reviewed?	When the optimisation review is carried out, it may also turn out that modifications resulting from applying the previous strategy element are obstructive (and/or must be partly reversed).	If YES : document the conflicting goals. If NO : continue.	[Please fill in]
⇒ Step-by-step reviewing and documentation of the results should be carried out successively for all strategy elements selected.			
GATE 3			
Have all review processes in step 3 been worked through, and the results documented and made available for all subsequent decision-making processes?	Both to ensure the internal process quality and, if necessary, to facilitate subsequent communication activities (see step 5), results of the decision-making processes should be documented and made accessible for the further workflow.	The review results and specifications for the relevant design project resulting from step 3 should be documented and signed by the project manager.	[Please fill in]
<p>➔ As a result of this step 3, for each initial option (packaging options from the ideation), a packaging option can be identified that has been further optimised ("modified") according to the optimisation reviews. If there are any conflicts between the various optimisation approaches, it may also ultimately mean several modified options in each case, however.</p> <p>➔ The modified options form the input in the subsequent stage, step 4.</p>			



Step 4: Reviewing the Optimisation Effects Achieved

In step 4, the packaging options that emerged from the previous optimisation review and the corresponding modifications should be evaluated in view of the environmental goals formulated for the relevant Eco design project at the start (see **steps 1 and 2**). Depending on the results of these evaluations, new optimisation processes should either be initiated or selection decisions made between several packaging options that have been optimised in line with various objectives.

The **packaging options** in question need to be **checked against** all **environmental goals selected** as relevant to the packaging design project concerned (see steps 1 and 2). The valuation parameters and scales used to establish the minimum requirements as well as the optimisation goals should be correspondingly **evaluated on a (semi-)quantitative scale** (on valuation parameters and scales, see also the fact sheet “[Environmental Goals for Eco Design Projects](#)”).

Appropriate aids should be used for the evaluations, i.e. firstly, LCA tools, and, secondly, also specialised applications for individual parameters such as assessing recyclability (see [Tools](#)). To some extent, the existing results of the evaluations from the review of the various optimisation approaches (see step 3) can also be used here.

Once the necessary evaluations have been carried out for all goal dimensions selected as relevant, it should first of all be checked whether the self-imposed **minimum requirements** have been **met** and thus whether there is a “**permissible**” **resulting option**.

If this is not the case, it should be checked whether **by increasing the degree of freedom** (for instance, of the design leeway) for the Eco design project (e.g. by reducing the requirements in other functional areas) and then carrying out another round of optimisation review and modification (see step 3), a “**permissible**” **packaging option** can be **achieved**. If this is not possible, the **underlying expectations** should be **adapted** to correspond to **the environmental optimisations**. This type of subsequent adjustment of original objectives should be clearly substantiated and documented here.

If there are **several permissible options** (with regard to an initial option in step 3), this is due to a **conflict of goals** between various **environment-oriented optimisation strategies**. In these cases, the separate checklist “[Dealing with Conflicting Targets](#)” should be used.

If there is **only one permissible option** (i.e. the initial option in step 3), it should be checked whether the **optimisation goals defined at the start** (see step 2) have been **met** by this option. If this has been achieved, **gate 4** can be **passed** with this “viable option”. Otherwise, here, too, the design leeway should be increased and another optimisation cycle run, or if this is not possible or not successful, expectations should be adapted to the environmental optimisation.



Question	Explanation	Instructions	Result
Step 4: Reviewing the optimisation effects achieved			
→ <i>Review of all packaging options from step 3.</i>			
Have the 'optimised' packaging alternatives (results of step 3) been evaluated in terms of their environmental impacts?	An evaluation is to be carried out using appropriate tools (streamlined LCA for quantifiable categories; expert-based qualitative evaluation for other categories; specific evaluations for recycling;).	If YES : document the results of the evaluation. If NO : stop until the evaluation has been completed.	[Please fill in]
Is there one or several permissible options?	The results of the previous evaluations should be compared with the minimum requirements relating to the environmental goals (see step 2). Options meeting the minimum requirements are deemed to be "permissible".	If there is no permissible option: <ul style="list-style-type: none"> ○ Recursion: check whether it is possible to increase the design leeway in the project. Then repeat the process starting from step 2. ○ If it is not possible to have more leeway or if after a recursion the answer is (still) NO: check whether individual minimum requirements (see step 2) can be weakened. If this also does not produce a result: terminate the Eco design project. If there is only one option: document the results for all environmental goals of the Eco design project and continue with review step " <i>If there is one permissible option</i> ". If there are several options: for all of these, use the checklist " <i>Handling Conflicting Environmental Targets</i> " and continue with review step " <i>If there are several permissible options</i> ".	[Please fill in]
If there is one permissible option:			
Does the resulting option meet the previously established optimisation goals?	The effects achieved must be compared with the previously formulated optimisation goals.	If YES : continue at gate 4 If NO : <ul style="list-style-type: none"> ○ Check whether it is possible to increase the design leeway. Then repeat the process starting from step 2. ○ If (still) NO: document the results and, if applicable, describe which aspects prevent the goals from being (fully) met. 	[Please fill in]
If there are several permissible options:			
1) Does one or do several resulting options meet the previously established optimisation goals?	The effects achieved must be compared with the previously formulated optimisation goals.	If NO : check whether it is possible to increase the design leeway. <ul style="list-style-type: none"> ○ Then repeat the process starting from step 2. ○ If (still) NO: document the results and, if applicable, describe which aspects prevent the goals from being (fully) met. 	[Please fill in]
2) Was the checklist " <i>Dealing with Conflicting Issues</i> " used and a possible solution opted for?	Refer to using the checklist " <i>Dealing with Conflicting Issues</i> ".	If YES : continue at gate 4. If NO : use the checklist " <i>Dealing with Conflicting Issues</i> ".	[Please fill in]
GATE 4			
Have the results of step 4 been documented and made available for all subsequent decision-making processes?	Both to ensure the internal process quality and, if necessary, to facilitate subsequent communication activities (see step 5), results of the decision-making processes should be documented and made accessible for the further workflow.	The review results and specifications for the relevant design project resulting from step 4 should be documented and signed by the project manager.	[Please fill in]
→ <i>At the end of step 4, according to the proposed course of action, there is only one resulting option which fulfils environmental goals defined for the Eco design project.</i>			



Step 5: Using Transparent and Effective Communication

The various **successful environment-oriented optimisations achieved** through the resulting option (from step 4) should each be checked to determine whether they

- are **perceived by customers** and, if applicable, critical stakeholder groups as **relevant** and
- can be **credibly communicated** in conjunction with other brand messages.

When optimisation results have to fulfil both of the above criteria, the relevant facts and key messages should be prepared for marketing by experts in that field.

In addition to proactive communication with the end customer, it is also **advisable for the sake of credibility and protection against possible scandals to process further facts** emerging from the optimisation reviews and **to ensure** that they **remain available for responding to any critical questions** that may arise. This applies in particular to obstacles identified in the course of the Eco design project which justifiably prevent further optimisation.

Finally, in gate 5, it should once again be checked whether **all knowledge gained** and **decisions taken** in the process have been recorded in a structured manner, allowing their targeted evaluation for future Eco design projects and making them available as **learning experiences**.

Question	Explanation	Instructions	Result
Step 5: Using transparent and effective communication			
➔ <i>For the options resulting from step 4.</i>			
Have aspects been selected and processed that can/should be used as part of proactive communication with the end customer?	Here, the relevant successful optimisations achieved need to be carefully checked to determine <ul style="list-style-type: none"> – whether they are (also) perceived as relevant by the customers and stakeholders and – how they can be credibly communicated in conjunction with other brand messages. 	Document these environmental aspects and the related facts and key messages.	[Please fill in]
Have aspects been selected and processed that are needed to respond to (any) critical queries?	In addition to the successful optimisations achieved, the difficulties identified in the course of the project which prevent further optimisations are also of particular relevance.	In addition to the above, document any obstacles encountered as well as key justifications.	[Please fill in]
GATE 5			
Have all statements, decisions and results of the overall project been fully documented and made available for subsequent Eco design projects?	The final documentation serves the dual purpose of both internal quality assurance and a knowledge base for future (Eco) design projects.	The completeness and future accessibility of the documentation of results should be checked and signed by the project manager.	[Please fill in]
Completion of the project			