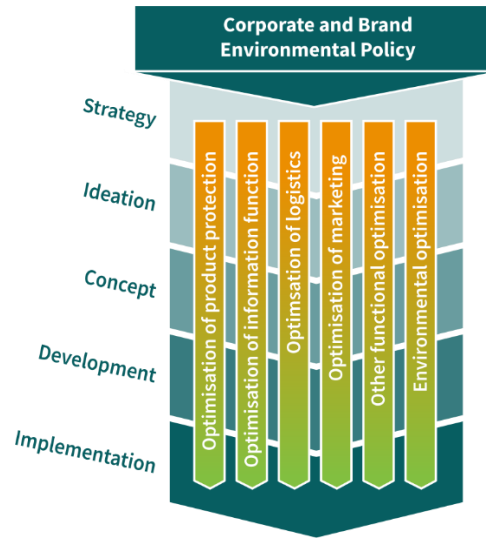




Checklist Management of Eco Design in Packaging Projects



Project

Project name	Example “Yoghurt Pot”
Project number	040 – 39 1002 – 0
Project manager	Schweig / Zimmermann
Date	01.02.2018

Initial situation: An existing K3-Pot (3 Component-Pot) with the following specifications is to be (eco-) re-designed.

- Yoghurt Pot 500ml, K3-system
- Lid: Aluminiumfoil, 30µm, - Weight: 0,8g
- Sealing lacquer: 2g/m²
- Pot: PS-thermoformed, 6,4g unprinted
- Paper sleeve: White lined chipboard ~240g/m². Weight 7,8g





Questions and Documentation

Question	Explanation	Instructions	Documentation of results
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.	<i>The reduction of negative environmental impacts was specified as an equal core requirement by the top management.</i>
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.	Yes. <i>Environmental goals: Climate protection, recyclability, weight (because logistics-relevant because waste-reducing)</i>
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.	Brand message: <ul style="list-style-type: none"> ○ <i>Climate protection and recycling go hand in hand with the brand message (ecological, „good“)</i> ○ <i>Weight: no direct connection</i>
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.	Yes. <ul style="list-style-type: none"> • <i>Reduction of GHG emissions (contribution to climate protection)</i> • <i>Recyclability,</i> • <i>Weight reduction.</i>
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.	Priorities: <ol style="list-style-type: none"> 1. <i>Weight (because also economically relevant) (understood here as: total weight of the pot)</i> 2. <i>Recyclability</i>



Question	Explanation	Instructions	Documentation of results
			3. <i>Climate protection (easy to communicate)</i>
<p>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?</p>	<p>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).</p>	<p>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.</p>	<p>Yes, <i>(were documented in place XY; signed by XY)</i></p>



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.	<i>Selected Eco Design strategy elements:</i> <ul style="list-style-type: none"> • <i>Design for Optimised Ressource Use</i> • <i>Design for Recycling</i>
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.	<i>Design leeway and requirements:</i> <ul style="list-style-type: none"> • <i>Cost-neutral / no additional costs</i> • <i>Single use plastic packaging; no investments in new plants are possible</i> • <i>Pot type is variable: In addition to the K3 pot, an all-plastic pot can also be chosen.</i> • <i>Pot has to be white</i> • <i>Besides that no basic specifications for the choice of material, but processing options of the existing machines / systems must be observed</i>
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.	<i>Reference case for optimisation goals: K3-Pot, see above</i> <i>Minimum requirements:</i> <ul style="list-style-type: none"> ○ <i>Weight: -5%</i> ○ <i>Climate protection: 5% GHG reduction</i> <i>Optimisation goals:</i> <ul style="list-style-type: none"> ○ <i>Weight: -10%</i> ○ <i>Recyclability: according to RecyClass (C)</i> ○ <i>Climate protection: 10% GHG reduction</i>
GATE 2	Both to ensure the internal process quality and, if necessary, to facilitate later communication activities (see step 5), results of the decision-making processes		Yes, (were documented in place XY; signed by XY)



<p>Have all review processes in step 2 been worked through and the results documented and made available for all subsequent decision-making processes?</p>	<p>should be documented and made accessible for the further workflow.</p>	<p>The review results and specifications for the relevant design project resulting from step 2 should be documented and signed by the project manager.</p>	
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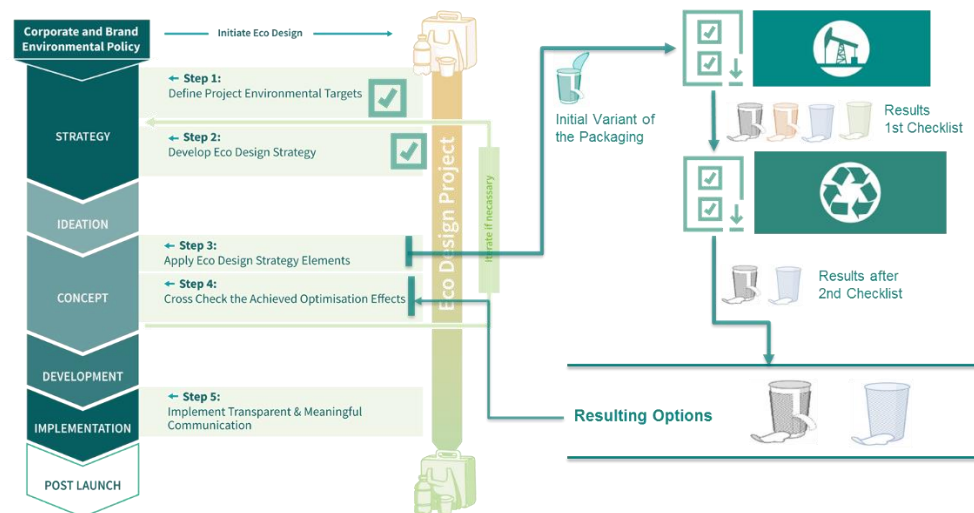


Step 3: Implementing specific elements of the Eco Design strategy

- ➔ Step 3 is based on the packaging variant(s) resulting from the creative process (ideation phase). Step 3 is to go through for each of these packaging variants.
- ➔ 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.
- ➔ Then the following questions need to be answered:

Note for explanation

Step 3: Application of the Eco Design Strategy



- ➔ Step 1 and step 2 are completed
- ➔ Now the application of the Eco Design strategy takes place, specifically in the form of checklists of the selected strategic elements „Optimised Resource Use“ and „Design for Recycling“
- ➔ Input for the first strategic element („Optimised Resource Use“) is the initial variant (PS thermoforming pot, aluminium foil lid, paper sleeve)
- ➔ The first strategic element (Design for optimised Ressource Use) provides 5 outcomes:

- **K3-Pot made from PP**
- **K3-Pot made from chalk plastic: PP with CaCO3**
- **PS all-plastic pot**
- **PP all-plastic pot**
- **Chalk plastic pot: PP mit CaCO3**

These variants are the input to the second strategic element. The outcome of the strategic element "Design for Recycling" results in 2 variants:

- **K3-Pot made from PP**
- **PP all-plastic pot**



Question	Explanation	Instructions	Documentaion of results
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.	See <i>Checklist for Optimised Ressource Use and Checklist Design for Recycling</i>
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")	<u>Checklist Optimised Ressource Use</u> <ul style="list-style-type: none"> • K3 pot made from chalk plastic: PP with CaCO₃, • K3 pot made from PP • PS all-plastic pot • PP all-plastic pot • Chalk plastic pot • In each case: As cylindrical as possible, minimally arched bottom • For K3: Sleeve made from wood pulp / virgin fibres <u>Checklist Design for Recycling</u> <ul style="list-style-type: none"> • K3 pot with internal pot made from PP • Allplastic pot made from PP • Explicit information text for proper (separate) disposal of pot and sleeve
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.	<i>The use of chalk plastic (as a result of the „Optimised Resource Use“ checklist) is currently preventing recycling. Chalk plastic variants and PS are eliminated in the element „Design for Recycling“. Regarding the sleeve the assessment of recyclability depends on whether it is assumed that the sleeve is correctly separated by the consumer.</i>
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.	
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.	Yes. Documentation for all variants is available (were documented in place XY; signed by XY)



Question	Explanation	Instructions	Documentaion of results
<p>➔ <i>The packaging variant(s) resulting from step 3 ("tested variants") will be evaluated again in the following step for optimisation effects and any existing target conflicts</i></p>			



Question	Explanation	Instructions	Documentation of results
Step 4: Reviewing the optimisation effects achieved and solution of conflicting issues			
<p>➔ <i>The input in step 4 is not necessarily identical to the result of step 3, since in real packaging design projects parallel testing and optimization processes in other areas (e.g. in terms of requirements for the marketing function, etc.) may result in further limitations of the number of variants.</i></p>			
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.	<i>Yes, an assessment of GHG emissions and recyclability (according to RecyClass) has been made. See the following documentation. It also lists the options (in gray) that have been eliminated by applying the strategy element "Design for Recycling".</i>
Note: Assessment of environmental impacts:			
	Prio 1 Weight [g]	Prio 2 Recyclability [Class after RecyClass]	Prio 3 GHG Emissions [g CO2e per pot]
Initial variant: K3, PS	15,1	F	33,5
Minimum requirements	14,3	F	31,8
Optimisation target	13,5	C	30,2
Option K3, PP	12,8	C / F	22,9
Option PP	10,2	C	20,4
Option K3, chalk	13,8	F	17,3
Option PS	12	F	40,8
Option chalk	13,5	F	14,9
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".	<p>If there is no permissible option: Continue with review step "<i>If there is no permissible option</i>".</p> <p>If there is only one option: continue with review step "<i>If there is one permissible option</i>".</p> <p>If there are several options: continue with review step "<i>If there are several permissible options</i>".</p>	<i>Yes, both options meet the minimum requirements.</i>
<i>(If there are several „permissible options“:</i>			



Question	Explanation	Instructions	Documentation of results
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. ○ 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.	Yes . See documentation of results.
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> ”	Yes ; see following Note „ <i>Checklist Dealing with Conflicting Issues</i> “.
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.	Yes (were documented in place XY; signed by XY) Resulting option is „ <i>PP all-plastic pot</i> “.
<p>➔ At the end of step 4, according to the proposed course of action, there is only one resulting option. In step 5 its environmental properties are filed and communicated in a structured and targeted manner.</p> <p>➔ Depending on the nature of the project, real packaging design projects are followed by a series of further development, test and implementation steps, especially with regard to the technical realization of the new packaging variant. This may also always result in the need for one or more re-runs (also) of the Eco Design process (from step 2 or step 3). The result will be (again) a result variant.</p>			



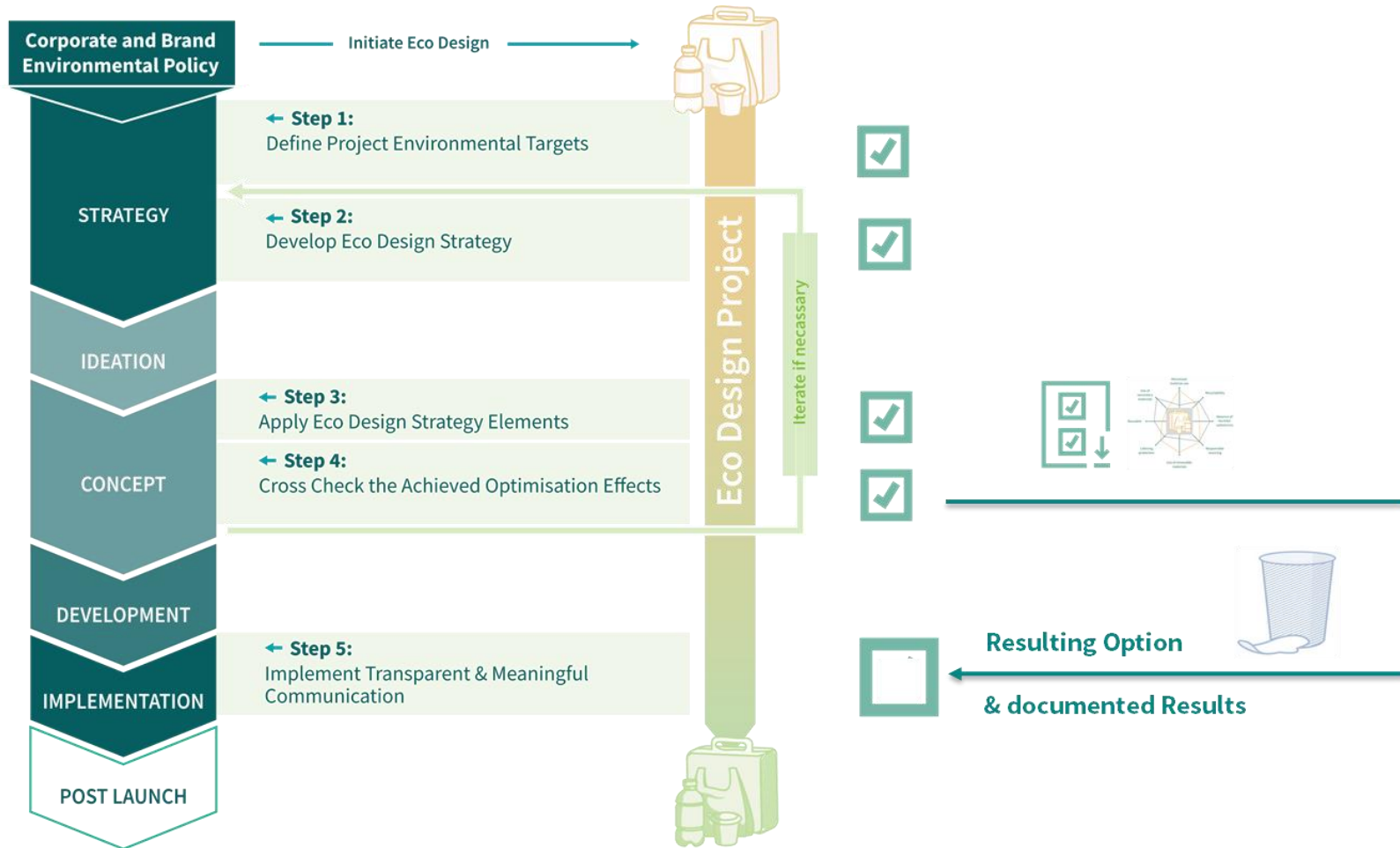
SIDE NOTE: Checklist Dealing with Conflicting Issues																											
Question	Explanation	Instructions	Documentation (of results)																								
<p>➔ Apply after several permissible packaging options have been identified (step 4 of the "Checklist Management for Eco Design")</p> <p>➔ Input: All "permissible" packaging options according to the previous assessment.</p>																											
Were the results of the evaluation of the relevant packaging options visualized in a suitable form?	A concluding visualization of the evaluation results in a suitable form (for example as a spider-web diagram, tabular comparison, etc.) facilitates the further evaluation	If YES : Use visualization / presentation of results for further consideration If NO : Visualize or otherwise justify	Yes. See the following visualization.																								
<p>Spider-web diagram:</p> <p>Practical Example "K3 Yoghurt Cup"</p> <p>Legend: - Initial Variant K3-PS (Orange solid line) - Minimum Requirements (Grey dotted line) - Optimisation Targets (Blue dashed line) - K3-PP (Green solid line)</p> <p>Explanation: The further inside of the diagram the line lies, the better the result in the target category</p>		<p>Tabular comparison:</p> <table border="1"> <thead> <tr> <th>Option</th> <th>Weight [g]</th> <th>Recyclability (RecyClass)</th> <th>GHG Emissions [g CO2e per pot]</th> </tr> </thead> <tbody> <tr> <td>Initial variant K3-PS</td> <td>15,1</td> <td>F</td> <td>33,5</td> </tr> <tr> <td>Minimum requirements</td> <td>14,3</td> <td>F</td> <td>31,8</td> </tr> <tr> <td>Optimisation target</td> <td>13,5</td> <td>C</td> <td>30,2</td> </tr> <tr> <td>K3-PP</td> <td>12,8</td> <td>C / F</td> <td>22,9</td> </tr> <tr> <td>PP</td> <td>10,2</td> <td>C</td> <td>20,4</td> </tr> </tbody> </table>		Option	Weight [g]	Recyclability (RecyClass)	GHG Emissions [g CO2e per pot]	Initial variant K3-PS	15,1	F	33,5	Minimum requirements	14,3	F	31,8	Optimisation target	13,5	C	30,2	K3-PP	12,8	C / F	22,9	PP	10,2	C	20,4
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Step A: Checking the possibility of a ranking between the permissible options																											
Is there a packaging option that performs best in the highest priority category(s)?	In step 1 of the Eco Design project management process, a selection of environmental objectives ("target categories") and their ranking were defined. Now only the evaluation results of the relevant packaging options in the target category with the highest rank ("priority") should be compared.	If YES : If there is such an option, continue with the next test step. If NO : There are several options that are the same (in the highest priority category). Then the comparison has to be carried out again with the target	Yes. The PP all-plastic pot performs best.																								



SIDE NOTE: Checklist Dealing with Conflicting Issues			
Question	Explanation	Instructions	Documentation (of results)
	Options with a better result in the highest priority category are to be preferred.	category with next lower priority (etc.). If no ranking can be specified then go to step B .	
Are the results of this option in the other categories "sufficient"?	Even if an option performs best in the highest priority category, the other categories have to be examined to see whether (in comparison) sufficient results are achieved or whether another variant is preferred. This is a "qualitative decision".	If YES: Then this is the preferable option ("resulting option"). The evaluation result is to be documented / justified then back to Gate 4 in the management process . If NO: Continue with Step B	Yes. <i>In the other categories it performs best as well. Therefore the PP all-plastic pot is chosen as the resulting option.</i>



Back to the Management Checklist





Question	Explanation	Instruction	Documentation of results
Step 5: Using transparent and effective communication			
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 - 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.	If YES : continue If NO : select and prepare appropriate environmental aspects and related facts and key messages	Message (e.g.): <i>The packaging is recyclable and makes a significant contribution to climate protection</i>
Is the preparation and external communication of the improved environmental properties in line with communication standards?	To ensure the resilience and transparency of environmental communication and unfair statements that distort competition, a set of standards for transparent environmental communication has been developed at various levels	If YES : document the application / compliance with the relevant standards accordingly If NO : Selection and application of suitable communication standards or justification why this should be waived for the specific project	<i>(not done in this example)</i>
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.	If YES : continue If NO : in addition to the above, document any obstacles encountered as well as key justifications., then continue to Gate 5	<i>At this point, the documentation of the completed project is considered sufficient.</i>
GATE 5			<i>Yes, (documented in place XY, signed by XY)</i>
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.	
Completion of the project			



Result:

- All-plastic pot
- Material: PP
- Total weight: 12g (corresponds with a reduction of 20%)
- Lid: Aluminium
- Recyclability: Improved from F (no recycling) to C (recyclable with limitations on the quality of recoverable recycled material)
- GHG Emissions: reduction by almost 40%

