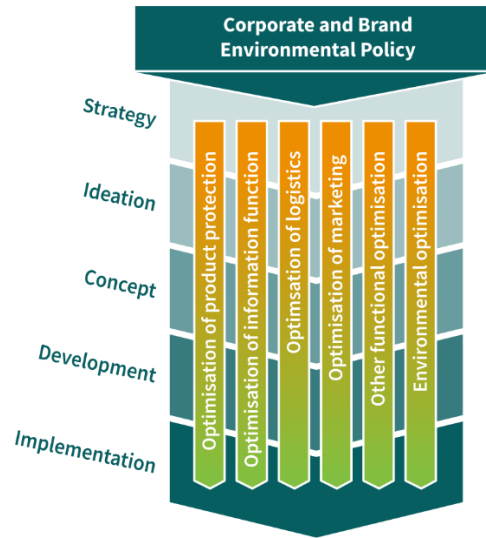




Checklist Management of Eco Design in Packaging Projects



Project

Project name	Example “Detergents”
Project number	040 – 39 1002 – 0
Project manager	Max Mustermann
Date	12.02.2018

Initial situation: An existing packaging for 1000ml laundry detergent is to be redesigned. Negative environmental impacts should be minimised.

It has been discovered, that over-dosing of the product often takes place while using the existing packaging design.

<ul style="list-style-type: none"> • HDPE bottle, Weight 60g Volume 1000ml • Flip top cap: PP Weight 8g 	
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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 (of the brand company).</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.	<i>Yes. Environmental targets: Protection of natural resources, climate protection</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.	<i>No.</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.	<i>Yes.</i> <ul style="list-style-type: none"> • <i>Protection of natural resources</i> • <i>Climate protection</i> • <i>Waterconsumption</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.	Yes Priorities: <ol style="list-style-type: none"> 1. <i>Protection of natural resources</i>



Question	Explanation	Instructions	Documentation of Results
		If NO : set the order of priority or terminate the Eco design project.	2. <i>Climate protection</i> 3. <i>Water consumption</i>
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.	Yes , (<i>were documented in place XY; signed by XY</i>)



Question	Explanation	Instructions	Documentation of results
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.	Yes <i>Selected Eco Design strategy elements:</i> <ul style="list-style-type: none"> ○ <i>Design for Environmentally Sound Use</i> ○ <i>Design for Optimised Resource Use</i> ○ <i>Design for Sustainable Sourcing</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.	Yes <i>Requirements:</i> <ul style="list-style-type: none"> ○ <i>Minor geometric changes are allowed; the basic shape of the bottle should not be changed due to marketing aspects.</i> ○ <i>Dosage of the product has to be improved</i> ○ <i>No fundamental changes possible regarding the logistics system.</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: Initial packaging as specified above</i> <i>Measurable values for the selected target categories are:</i> <ul style="list-style-type: none"> ● <i>Resource Use: Abiotic Depletion, mineral, fossil and cumulative energy demand</i> ● <i>Climate protection: Global Warming Potential (GWP)</i> ● <i>Water consumption: Water Resource Depletion (WRD)</i> <i>Minimum requirements:</i> <ul style="list-style-type: none"> ○ <i>Each category minus 5%</i> <i>Optimisation targets:</i> <ul style="list-style-type: none"> ○ <i>Each category minus 10%</i>



Question	Explanation	Instructions	Documentation of results
<p>GATE 2</p> <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>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.</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>	<p>Yes, ...</p>



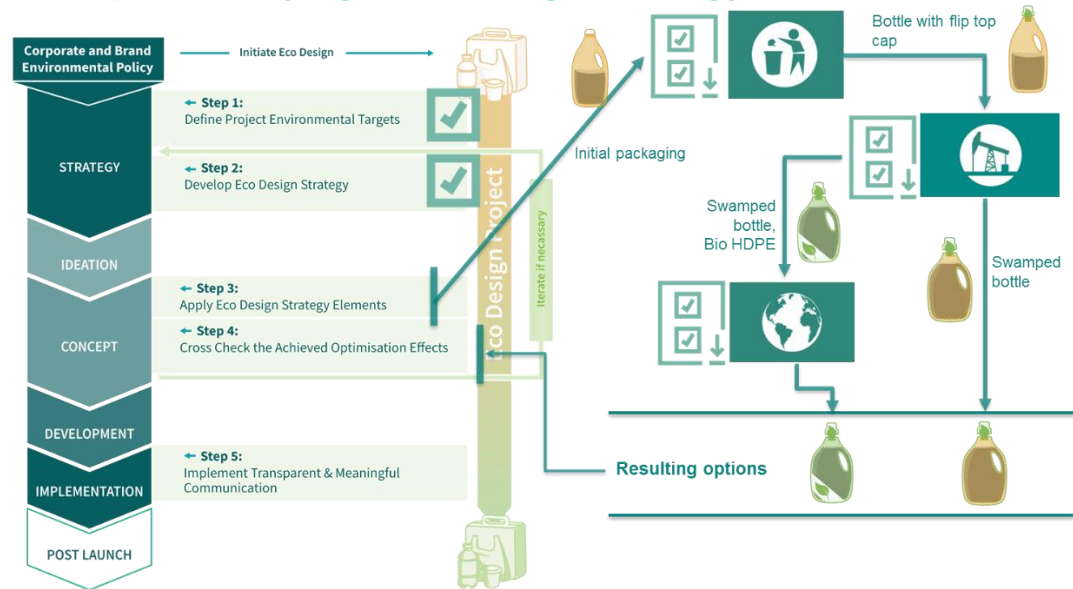
Question	Explanation	Instruc-tions	Documentation of results
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Step 3: Applying Eco Design strategy elements

- ➔ 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. Here it is based on the initial packaging:
- ➔ 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:

Side Note

Step 3: Applying Eco Design strategy elements



First two steps are completed.




Now the application of the Eco Design strategy takes place, specifically in the form of checklists of the selected strategic elements. Input for the first strategy element is the initial packaging option.

- ➔ The first strategy element (Design for Environmentally Sound Use) provides an optimised version with dosing cap, which prevents overdosing.
- ➔ The second strategy element (Design for Optimised Resource Use) results in two options:
 - a) Compressed HDPE bottle (with dosing cap)
 - b) Compressed HDPE bottle (with dosing cap) made of 75% biobased HDPE
- ➔ The bottle made of biobased HDPE is evaluated using the checklist „Sustainable Sourcing“ regarding the possibilities for sustainable sourcing.
- ➔ Resulting from Step 3 there are two options:
 - a) Compressed HDPE bottle (with dosing cap)
 - b) Compressed HDPE bottle (with dosing cap) made of 75% biobased HDPE, which is evaluated regarding sustainable sourcing.



<p>➔ Continuation of the checklist</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.	Yes. Checklists were applied for all strategy elements. See documentation for the respective checklists.
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")	a) Compressed HDPE bottle (with dosing cap) b) Compressed HDPE bottle (with dosing cap) made of 75% biobased HDPE, which is evaluated regarding sustainable sourcing.
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>There have been no difficulties and no conflicts between the strategic elements</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.	
<p>GATE 3</p> <p>Have all review processes in step 3 been worked through, and the results documented and made available for all subsequent decision-making processes?</p>	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 ...
<p>➔ Those packaging options resulting from the application in step 3 („tested options), will again be evaluated for optimisation effects and any existing conflicting issues</p>			



Question		Explanation		Instructions		Documentation of Results	
Step 4: Cross checking the optimisation effects achieved and 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. The resulting (two) options from Step 3 provide the input for Step 4.</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.		Yes. See the following documentation. In addition to the original target categories, land use was included, as this is a relevant aspect for bio-based HDPE	
Option		Climate Contribution	Land Use	Water Consumption	Resource Use	CEA	
Initial Option (HDPE bottle, 60g, without dosing cap)		3,1	1,4	0,0038	1,54E-02	289	
Minimum Requirements		2,945	1,33	0,0036	0,01463	275	
Optimisation Targets		2,79	1,26	0,0034	0,01386	260	
Compressed HDPE bottle (50g) with dosing cap (20g)		0,12	7,07E-02	7,46E-04	1,38E-02	4,4	
Compressed Bio HDPE bottle (50g) with dosing cap (20g)		0,12	0,39	8,96E-04	1,38E-02	2,1	
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: Continue with review step "If there is no permissible option".		Yes, both resulting options are permissible.	



Question	Explanation	Instructions	Documentation of Results
		<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>If there are several „permissible options“:</i>			
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.	<p>If NO: check whether it is possible to increase the design leeway.</p> <ul style="list-style-type: none"> Then repeat the process starting from step 2. <p>If (still) NO: document the results and, if applicable, describe which aspects prevent the goals from being (fully) met.</p>	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> ”.	<p>If YES: continue at gate 4.</p> <p>If NO: use the checklist “<i>Dealing with Conflicting Issues</i>”</p>	Yes; see following Note „Checklist Dealing with Conflicting Issues“.
<p>GATE 4</p> <p>Have the results of step 4 been documented and made available for all subsequent decision-making processes?</p>	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. Resulting option is „Compressed HDPE bottle with dosing cap“.
<p>➔ At the end of step 4, there is one resulting option. In step 5 its environmental properties are filed and communicated in a structured and targeted manner.</p>			



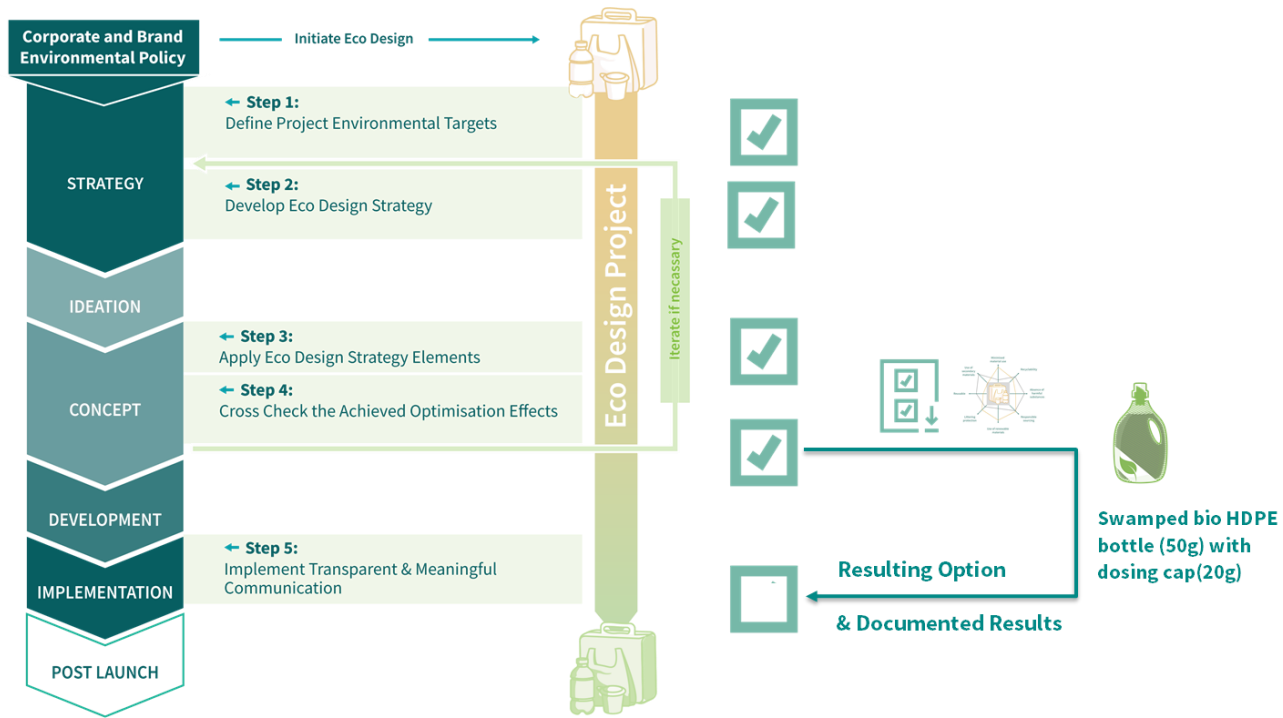
Side Note: Checklist Dealing with Conflicting Issues																											
Question	Explanation	Instructions	Documentation of Results																								
<p>➔ To be applied if more than one permissible packaging solution have been identified (step 4 of management process)</p> <p>➔ Input: All permissible packaging solutions.</p>																											
Have the results of the assessment been visualized in an appropriate form?	A summarizing visualization of the evaluation results in a suitable form (for example as a spider diagram, tabular comparison, etc.) facilitates the further evaluation	If YES , use visualization / result representation for further consideration If NO , prepare a visualization or justify NO	Yes. See following visualisation..																								
Spider-web-diagram: <p>Practical Example "Detergents"</p> <p>Legend: — Initial Option (PEHD 60g) - - - Dosing-bottle HDPE, swamped — Dosing-bottle 75% Bio HDPE - - - Minimum Requirements - - - Optimisation Targets</p> <p>Explanation: The further inside of the diagram the line lies, the better the performance in the target category.</p>		Tabular comparison: <table border="1"> <thead> <tr> <th>Option</th> <th>Climate Contribution</th> <th>Land Use</th> <th>Water Consumption</th> <th>Resource Use</th> <th>CEA</th> </tr> </thead> <tbody> <tr> <td>Initial Option (HDPE bottle, 60g, without dosing cap)</td> <td>3,1</td> <td>1,4</td> <td>0,0038</td> <td>1,54E-02</td> <td>289</td> </tr> <tr> <td>Compressed HDPE bottle (50g) with dosing cap (20g)</td> <td>0,12</td> <td>7,07E-02</td> <td>7,46E-04</td> <td>1,38E-02</td> <td>4,4</td> </tr> <tr> <td>Compressed bio HDPE bottle (50g) with dosing cap (20g)</td> <td>0,12</td> <td>0,39</td> <td>8,96E-04</td> <td>1,38E-02</td> <td>2,1</td> </tr> </tbody> </table>		Option	Climate Contribution	Land Use	Water Consumption	Resource Use	CEA	Initial Option (HDPE bottle, 60g, without dosing cap)	3,1	1,4	0,0038	1,54E-02	289	Compressed HDPE bottle (50g) with dosing cap (20g)	0,12	7,07E-02	7,46E-04	1,38E-02	4,4	Compressed bio HDPE bottle (50g) with dosing cap (20g)	0,12	0,39	8,96E-04	1,38E-02	2,1
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Side Note: Checklist Dealing with Conflicting Issues			
Question	Explanation	Instructions	Documentation of Results
Step A: Reviewing a possible prioritization of permissible solutions			
Is there a packaging variant that performs best in the highest priority category (s)?	In step 1 of the Eco Design project management process, a selection of prioritised environmental targets were defined. Here only the results of the relevant packaging variants in the target category with the highest priority should be compared. Variants with a better result in the highest priority category are to be preferred.	<p>If YES: If there is such a solution, continue with the next test step.</p> <p>If NO: Then the comparison has to be carried out again with target category with next lower priority (etc.). If no ranking can be specified then go to step B.</p>	<i>Resource Use was evaluated with highest priority. Here two categories were created: Abiotic Ressource Depletion (Resource Use in table) and CEA. For „Abiotic Ressource Depletion“ both options perform almost equally, for CEA the biobased option is slightly better. Compared to the initial option, both alternatives perform significantly better.</i>
Is the performance of this packaging solution in the other categories “sufficient”?	Even if a packaging solution performs best in the highest priority category, the other categories are to be examined to see whether (in comparison) sufficient results are achieved or whether another variant is preferred. This is a "qualitative decision".	<p>If YES, then this is the preferred variant.</p> <p>The test result has to be documented / justified then go back to gate 4 in the management process.</p> <p>If NO: Continue to step B</p>	<i>Yes. The performance in the other categories is considered sufficient. Although there are higher impacts on land use and water consumption compared to the option without bio-based HDPE. However, taking into account the improvement achieved in comparison to the initial option, this result is considered sufficient. That means the preferred option is: (Compressed) bottle with dosing cap made of 75% biobased HDPE.</i>



Back to the management checklist





Question	Explanation	Instructions	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	<i>E.g.: „This packaging protects natural resources 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 relevant for this specific case)</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 project is considered sufficient.</i>
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.	Yes, ...
Completion of the project			