



# Checklist

## Design for

# Sustainable Sourcing



## Project

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

### Situation:

- Checklists „Environmentally Sound Use“ and „Optimised Resource Use“ have already been applied..
- The result is a packaging option with dosing cap consisting of 75% bio-HDPE. In this checklist the possibility of sustainable sourcing will be evaluated.
- Material bottle: bio-HD-PE
- Volume: 1000ml
- Weight: 60g
- Cap: PP, flip-top cap, 20g





Question	Explanation	Instructions	Documentation of Results
<b>Step 1: Checking Sustainability Goals Related to Precursor Material Sourcing</b>			
Are there specific and up-to-date goals or standards for the environment/sustainability-oriented procurement of precursor materials?	In many companies or in the case of major brands, there are general purchasing guidelines/instructions related to working and environmental conditions that have to be observed when sourcing (precursor) materials and (also) packaging. In addition, there may be other basic goals for promoting the company or brand image which relate to the implementation of basic sustainability goals. To the extent that this has not already been done in the general management process (see the checklist "Management of Eco Design in Packaging Design Projects"), these goals should be made explicit for the further implementation of the strategy element.	If <b>YES</b> : If this has not already been done elsewhere, document these goals and (if necessary after repeating them in the overarching process) continue with the next item to be checked. If <b>NO</b> : continue with the next item to be checked.	No.
Is there a preferred approach based on relevant environment/sustainability goals, such as bio-based materials?	In part, the requirement for the use of bio-based materials are made without linking with specific environmental objectives. Such a missing frame of reference prevents the operationalization of the evaluation of advantages and disadvantages.	If <b>YES</b> : document the goals and proceed to the next item to be checked. If <b>NO</b> : formulate the environmental goals that are still missing and (if necessary after repeating them in the overarching process) proceed to the next item to be checked.	<i>Protection of natural resources, climate protection and water consumption have been defined as environmental targets. At least from the first two targets there is a relevance regarding the use of biomaterials as they can contribute to resource protection and CO2 savings.</i>
<b>Result:</b> Existing environment/sustainability-related requirements for precursor materials were reviewed for the packaging project and, where not carried out previously, made explicit and documented.			



Question	Explanation	Instructions	Documentation of Results
<b>Step 2: Checking the Suitability of Alternative Precursor Materials (Bio-Based or Recycling-Based Raw Materials)</b>			
Can the functional requirements of the packaging (or parts of it) also be ensured with the alternative precursor materials without changing the packaging design?	Depending on the characteristics of the alternative precursor materials, their technical properties correspond either to (i) fully "classic" primary / mineral oil-based materials or (ii) they have deviating technical properties which may require packaging design modifications	If <b>YES</b> : document this result (what alternative precursor materials can be used for which parts of the packaging?) Continue. If <b>NO</b> : state reasons and continue to review step 3.	<i>Yes, the use of at least. 75% biobased material is possible.</i>
Are there suppliers who are a) capable of delivering the precursor materials required in sufficient quantities (at the required level of quality) and b) are able to provide evidence of meeting sustainability requirements?	In particular in the field of bio-based plastics and with regard to recyclates of certain qualities, the possibility of a permanent supply or the presence of possible suppliers is not always given.  Since many of the detection systems for sustainably sourced materials are currently still in development, it is often not possible to provide a sufficiently secure supply of suitably tested ("certified") material	If <b>YES</b> : document this and proceed to review step 3. If <b>NO</b> : document reasons (result of the review). Assess the possibility/option of establishing an adequate system of supply. If this is also answered in the negative: document reasons (result of the review). Proceed to review step 3.	<i>There is a source for certificated biobased HDPE: Braskem. Braskem provide sufficient amounts of biobased HDPE. Brand name: I'm green</i>
<b>Result:</b> One (or more) packaging option(s) tested for the feasibility of alternative precursor material(s) with elaboration of any necessary modifications.			



Question	Explanation	Instructions	Documentation of Results
<b>Step 3: Determining Whether Sustainable Sourcing of Precursor Materials is Feasible</b>			
→ <b>Sustainable sourcing possibilities for the precursor material bio-HDPE are examined.</b>			
Has it been decided which precursor materials should be passed through the following review steps?	<p>With a view to the sustainability goals specified in step 1 for the packaging project, it is thus necessary to specify which (source) materials the test should initially apply to. The following are conceivable, for example:</p> <ul style="list-style-type: none"> <li>• a limitation on alternative materials (as a result of step 1)</li> <li>• a complete test of all materials. For practical reasons, it may make sense to set a relevance threshold (e.g. all materials with a share of the packaging &gt;1% or &gt;5%)</li> <li>• deliberate selection of materials</li> <li>•</li> </ul>	<p>If <b>YES</b>: document the 'list of materials' and continue</p> <p>If <b>NO</b>: agree upon, establish and document a 'list of materials', then continue.</p>	<i>In this case, it was determined that only the biobased polymer (bio-HDPE) would undergo the following evaluation steps.</i>
What kind of evidence of adherence to sustainability aspects in raw material production and processing is available for the different precursor materials to be tested?	<p>For many precursor materials, such verification systems that document compliance with relevant environmental requirements for raw material production and processing as well as minimum social standards are available on the market.</p> <p>The test intensity as well as the transparency and traceability of the documentation of the test results and the question of an independent review are important quality criteria.</p>	<p>For precursor materials that are to be reviewed, research and list the appropriate verification systems that are available on the market.</p> <p>If no verification systems are available, options for establishing your own verification system (in cooperation with the supply chain) should be assessed and the result (positive/negative) documented.</p> <p>Following this, continue.</p>	<p><i>For the precursor material "I'm green" by Braskem the following certificates are available:</i></p> <p><i>Bonsucro, ISCC PLUS, ISO 14001, Agro-Ecological Zoning Regeln, „Green Protocol“, Responsible Care Program, Braskem „Code of Conduct“</i></p>
Is there a form of verification that confirms that competition with land use for food production was avoided?	<p>If the extraction of the precursor materials takes place on land that would otherwise be used for the cultivation of food, a from a sustainability point of view undesired competitive situation results.</p> <p>Competition with land can be inhibited by:</p> <ul style="list-style-type: none"> <li>• Corresponding certifications</li> <li>• Supplier certifications</li> <li>• Other plausibility reasons</li> </ul>	<p>If <b>YES</b>: make a note of this in the case of the verification systems involved, including the kind of review.</p> <p>If <b>NO</b>: document accordingly.</p> <p>In the event that this is regarded as <b>not relevant</b>: state reasons and continue.</p>	<p><b>No.</b> <i>Land use competition is only addressed to a limited extent in the available evidence.</i></p> <p><i>Basically, the situation is such that the cultivation of bio-based raw materials is associated with a higher land consumption than the use of fossil raw materials and these areas are in most cases also suitable for food production.</i></p> <p><i>However, studies show that so far only a small part of the agricultural land has been used for</i></p>



Question	Explanation	Instructions	Documentation of Results
			<i>the cultivation of raw materials for the production of bioplastics. Only substitution of the total global plastic demand would result in a relevant land use (estimate &lt;12%). Braskem uses an area of 68,000 hectares or 0.02% of the available agricultural land in Brazil for 200,000 tonnes of bio-based sugar cane. In total, 2.4% of Brazil's arable land is used for sugar cane cultivation.</i>
Is there any verification that confirms that irreversible negative effects on natural space and biodiversity have been minimised?	If the extraction of the precursor materials takes place on hitherto natural areas that are significant for biodiversity, the regeneration capacity of the biosphere is correspondingly impaired.	If <b>YES</b> : make a note of this in the case of the verification systems involved, including the kind of testing carried out. If <b>NO</b> : document accordingly. In the event that this is regarded as <b>not relevant</b> : state reasons and continue to the next review item.	<i>The reduction of negative impacts on biodiversity is documented with the relevant certificates.</i>
Is there any verification that confirms that permanent negative effects of production on soils and water have been minimised?	In the case of precursor material sourcing the use of certain substances (such as pesticides or fertilizers) can cause a significant deterioration of the soil and the aquatic environment - this should be avoided.	If <b>YES</b> : make a note of this in the case of the verification systems involved, including the kind of testing carried out. If <b>NO</b> : document accordingly. In the event that this is regarded as <b>not relevant</b> : state reasons and continue.	<i>The reduction of negative impacts on soil and water is documented with the relevant certificates.</i>
Is there a form of verification that confirms that fresh water consumption was reduced to a level which guarantees long-term regeneration of local drinking water resources?	In many cases, sourcing of precursor material is accompanied by a (very high) demand for fresh water, which along with (intensive) groundwater extraction or the use of fresh water resources leads to a competition with drinking water supply. Besides during the cultivation of renewable raw materials, this may also be the case during their processing and also when conducting recycling processes under "simple" conditions	If <b>YES</b> : make a note of this in the case of the verification systems involved, including the kind of testing carried out. If <b>NO</b> : document accordingly. In the event that/if this is regarded as <b>not relevant</b> : state reasons and continue.	<i>Water demand and the protection of local drinking water resources are addressed by the ISCC Plus certificate. It should also be noted that the cultivation takes place mainly in the central south of Brazil, where it is almost always possible without irrigation due to the high rainfall.</i>



Question	Explanation	Instructions	Documentation of Results
			<i>In addition to the cultivation, the energy management and the efficiency of the processes are addressed by the present certificates.</i>
Is there a form of verification that confirms that current environmental protection process standards (e. g. in accordance with state-of-the-art best available techniques (BAT)) were/have been guaranteed?	The processing (or recycling) processes of the materials may be responsible for relevant negative environmental effects which are largely avoided by using appropriate environmental protection techniques. In view of the development dynamics of the environmental protection technologies, a current standard of protection is to be used more appropriately as a reference.	If <b>YES</b> : make a note of this in the case of the verification systems involved, including the kind of testing carried out. If <b>NO</b> : document accordingly. In the event that this is regarded as <b>not relevant</b> : state reasons and continue.	
Is there a form of verification that confirms that during production and processing of raw materials fair working conditions were/have been maintained?	The extraction of the materials partly takes place in remote regions with few job alternatives. The observance of fair working conditions (for example, in compliance with the relevant ILO core labor standards) is of particular importance for the respective living conditions.	If <b>YES</b> : make a note of this for the various precursor materials (alternatives) in the case of the verification systems involved, including the kind of testing If <b>NO</b> : document accordingly. In the event that this is regarded as <b>not relevant</b> : state reasons and continue.	<i>Compliance with fair working conditions is documented by the present certificates.</i>
What kinds of verification of the observation of sustainability aspects during production and processing of raw materials are available for the precursor materials to be sourced?	For many precursor materials, there are such verification systems available on the market. However, they differ in which concrete environmental requirements or minimum social standards are to be checked and proven. Also the test intensity as well as transparency and traceability of the documentation of the test results as well as the question of the independence of the examination can be quite different.	List the (kind of) verification systems available for the relevant (quantities) of precursor materials. If no verification systems are available, possibilities/options for establishing your own verification system (in cooperation with the supply chain) should be assessed and the result documented. Continue.	<b>Yes.</b>
<b>Result:</b> Subsequent overview of the available evidence / certifications for the precursor material "I'm green" and the addressed sustainability aspects.			



## Note --> Result:

Checking the possible supplier „Braskem“: Available evidence / certifications for the precursor material „I'm green“ and their scope

Evidence / Certifications	Short description	Type	Covered categories					
			Land use competition	Biodiversity	Soil & water	Drinking water resources	Process standards	Working conditions
<b>Bonsucro</b>	Bonsucro is a global non-profit initiative committed to reducing the negative environmental and social impacts of sugar cane production. The core criteria must be fulfilled to 100% and further requirements must be fulfilled to 80%. In the ecological area, the core criteria are soil, forest, chemicals and biodiversity, and in the social area human and labor rights, which are largely based on the 15 standards of the International Labor Organization (ILO). Certification by Controlunion & Bonsucro. Certificates available online.	<b>External validation</b>		X	X	(X)	(X)	X
<b>ISCC PLUS</b>	ISCC PLUS is a voluntary certification system of ISCC for all types of biomass and their applications in the food and feed industry as well as in the chemical industry. The ISCC PLUS system consists of a set of mandatory basic requirements. These include, but are not limited to, the sustainability requirements for agricultural land (ISCC-certified biomass must not be obtained in high-biodiversity, carbon-rich soils, or peatland areas, including high nature conservation areas) and traceability requirements for products. Traceability, specifying the country of origin, the agricultural product through the entire supply chain and other relevant information from the previous delivery stage is required. Certification by PCU Germany GmbH. Audit report and certificates available online.	<b>External validation</b>		X	X	(X)	(X)	X
<b>ISO 14001</b>	The ISO 14001 certificate certifies that the company has implemented an environmental management system, thus complying with applicable environmental legislation and managing the activities that affect the environment in accordance with the ISO requirements. Appropriate certification is available for most Braskem sites.	<b>External validation</b>			X		X	



Evidence / Certifications	Short description	Type	Covered categories					
			Land use competition	Biodiversity	Soil & water	Drinking water resources	Process standards	Working conditions
<b>Agro- Ecological Zoning Rules</b>	Brazilian regulation regarding sugar cane cultivation and nature conservation. Inter alia the following specifications are made: <ul style="list-style-type: none"> <li>No expansion of sugar cane plantations or processing facilities in sensitive eco systems.</li> <li>No clearing of native plants in the area of the Cerrado (Brazil's savanna) to expand the sugar cane cultivation.</li> <li>Identification of suitable areas where sugarcane cultivation should be a priority. These are e.g. areas where there are good conditions for mechanical harvesting, cattle breeding areas that are being used or degraded, and regions with lower water needs in cultivation.</li> </ul>	<b>Legal requirements</b>		X	X			
<b>„Green Protocol“</b>	A voluntary agreement between UNICA, the Brazilian sugar cane industry association, and the state of São Paulo (largest sugar cane growing area, which aims to stop the burning of sugarcane at harvest and to protect the riverbanks.	<b>Voluntary supplier declaration</b>			X			
<b>Responsible Care Program</b>	A voluntary initiative of the global chemical industry to improve the environmental management of chemical companies and their supply chain. Criteria are work safety, processes and products, the health of the workers and the protection of the environment.	<b>Voluntary supplier declaration</b>		X	X		X	X
<b>Braskem „Code of Conduct“</b>	Company Code of Conduct, prohibits e.g. the burning of sugarcane.	<b>Voluntary supplier declaration</b>			X			





Question	Explanation	Instructions	Documentation of Results
<b>Step 4: Decision on Sustainable Precursor Material Sourcing</b>			
Which precursor materials in the new packaging should be sourced while applying what systems for verifying sustainability aspects?	With regard to the environmental goals of the packaging project (see step 1), the technical and economic applicability of alternative materials (see step 2) and the checking of established sustainability certificates (see step 3), it should be specified whether and where alternative materials (bio-based or recycled) are used and for which (precursor) materials of the packaging what type of evidence of the sustainable design of the relevant upstream processes is required.	<b>Selection</b> of the alternative precursor materials and <b>specification</b> of the required verification systems (or different systems for areas where different requirements apply). Documentation of decisions.	<i>It will be procured "I'm green" from Braskem.</i>
Were the necessary modifications made in the packaging design appropriate for the chosen precursor-material options?	As already explained in step 2, the use of alternative (precursor) materials due to changed technical properties may necessitate a modification of packaging design (e.g. changed surface weights or seal types).	If <b>YES</b> : end of step 4. If <b>NO</b> : make the required design modifications, and then end step 4.	<b>Yes.</b>
Does any modification of the packaging required as a result of the use of alternative precursor materials necessitate checking other elements of the Eco design strategy (once again)?	The modification of packaging required as a result of the use of alternative precursor material may necessitate the need to re-run other optimization approaches. The use of bio-based materials requires, in particular, the examination of the strategy element Design for Recycling: biobased materials can involve problems in terms of both sortability and actual recycling with existing systems and infrastructures.	If <b>YES</b> : state reasons and (if necessary, once again) check relevant optimisation approaches. If <b>NO</b> : document results and conclude the review process.	<b>No</b> , that aspect was evaluated as part of the application of the Optimised Resource Use checklist.
<b>Result:</b> Selected precursor material "I'm green", which was tested with regard to sustainability aspects. A modification of the packaging variant itself was not necessary			