HYBUILD

Hybrid Energy Storage for Buildings

Project Title:

Innovative compact HYbrid electrical/thermal storage systems for low energy BUILDings

Project Acronym:

HYBUILD

Deliverable Report

Deliverable number:

D5.2

Social Life Cycle Assessment of the HYBUILD system

Related task:	T5.3
Lead beneficiary:	UdL
Authors and institutions in alphabetic order:	STRESS: Maria Chiara Caruso, Carmine Pascale
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Publishable executive summary

The EU Horizon 2020-funded project HYBUILD, led by COMSA, is developing two innovative compact hybrid electrical/thermal storage systems for stand-alone and district-connected buildings.

Deliverable D5.2, related to Task 5.3 "Social Life Cycle Assessment", aims at analysing the social aspects of the HYBUILD systems developed within the project for both Mediterranean and Continental climates, in order to evaluate the positive and negative social impacts along their life-cycle. The two systems are composed by specific components, which are shown in Figure 1.
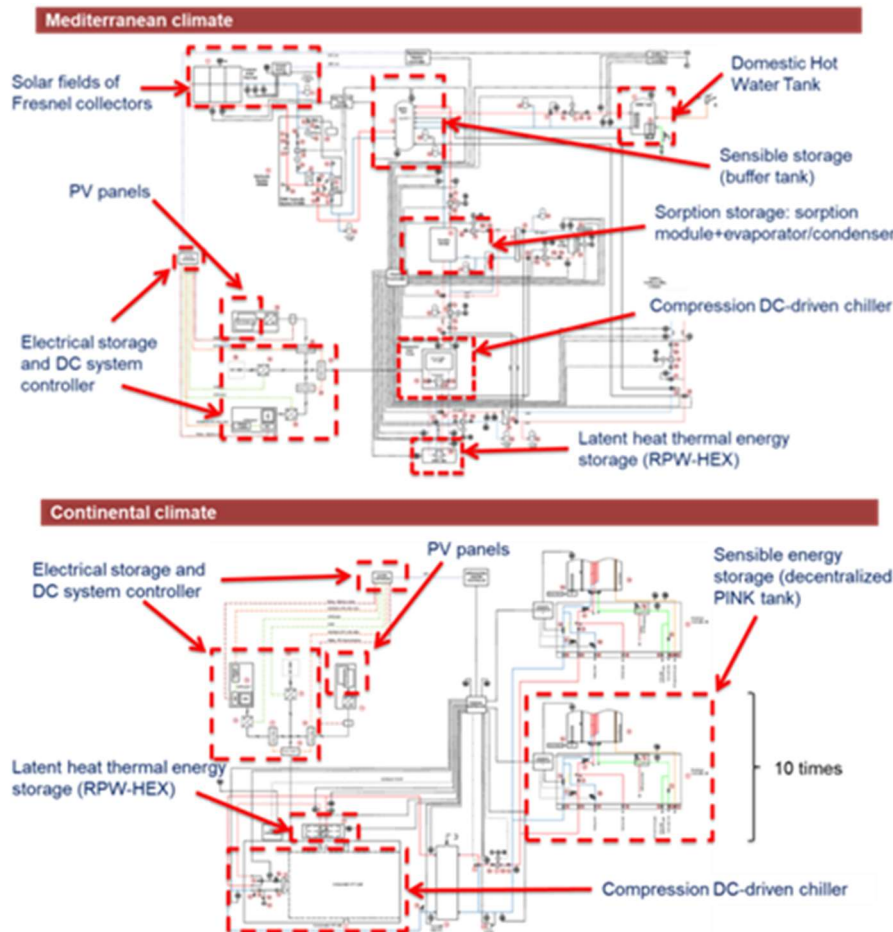
Figure 1. Mediterranean and Continental HYBUILD systems – identification of the system components

For both the systems, a Social Life Cycle Assessment (S-LCA) was performed according to the UNEP/SETAC Guidelines [1], by considering the same life cycle stages included in the Life Cycle Assessment (D5.1) and Life Cycle Cost Assessment (D5.3) analyses of the HYBUILD project and the single components of the systems.

The assessment starts with the identification of the actors involved in the HYBUILD systems lifecycle, i.e. the components producers, the companies installing the system, the ones involved in the replacement and in the End-of-Life of it or part of it. All of them have been asked to compile a social life cycle assessment questionnaire, firstly identifying the stakeholders considered in the analysis and their related special themes of interests (subcategories). Once all the data have been collected, the methodology developed by Ciroth et al. [5] has been used to evaluate the performance and the social impacts of each company.

The social impacts coming from all the involved companies have been then combined in order to provide a final social life cycle assessment score, for both the Mediterranean and the Continental HYBUILD systems.

From the results, it can be underlined that both the systems can be socially accepted, even if some improvements should be needed. Indeed, the social life cycle impact is equal to 4.06 for the Mediterranean system and to 3.93 for the Continental system, considering a scale ranging from 1 (positive effect) to 6 (very negative effect). Observations are made in the "Conclusions" section, which indicates the hot-spots of the assessment, suggesting how and where to intervene in order to reduce the overall social impacts.

Acronyms and Abbreviations

AKG	AKG Verwaltungsgesellschaft MBH
CNR/ITAE	Consiglio Nazionale delle Ricerche/Istituto di Tecnologie Avanzate per l'Energia
COMSA	Comsa S.A.U.
CONT	Continental
CSEM	Centre suisse d'électronique et de microtechnique
DAIK	Daikin Airconditioning Hellas SA
DC	Direct Current
DHW	Domestic Hot Water
EC	European Commission
EoL	End-of-Life
ENG	Engineering – Ingegneria Informatica Spa
EU	European Union
FAHR	Fahrenheit
FRESNEX	Fresnex GmbH
G	Governance
GA	Grant Agreement
HEX	Heat Exchanger
HP	Heat Pump
HR	Human Rights
HS	Health and Safety
IA	Impact Assessment
IC	Impact Category
ILO	International Labour Organisation
IFC	International Finance Corporation
IR	Indigenous Rights
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
LCC	Life Cycle Costing
LCI	Life Cycle Inventory

MED	Mediterranean
OCH	Ochsner Wärmepumpen GmbH
OECD	Organisation for Economic Co-operation and Development
PA	Performance Assessment
PCM	Phase Change Material
PINK	Pink GmbH
PRP	Performance Reference Point
PV panel	Photo-Voltaic panel
RPW-HEX	Refrigerant-PCM-Water HEX (latent storage integrated in the refrigerant cycle of a compression heat pump)
SER	Socio-Economic Repercussions
SETAC	Society of Environmental Toxicology and Chemistry
SLCA	Social Life Cycle Assessment
STRESS	Sviluppo Tecnologie e Ricerca per l'Edilizia Sismicamente Sicura ed ecoSostenibile
UDL	Universitat de Lleida
UNEP	United Nation Environment Program
WC	Working Condition
WP	Work Package

1 Introduction

1.1 Aims and objectives

The EU Horizon 2020-funded project "HYBUILD" is developing two innovative compact hybrid electrical/thermal energy storage systems for stand-alone and district connected buildings.

Deliverable 5.2 "Social Life Cycle Assessment of the HYBUILD system" reports the social assessment methodology and analysis of both the HYBUILD systems, providing, as result, a final S-LCA score describing the system social impacts. It is related to Task 5.3 "Social Life Cycle Assessment", which is a methodology that, in the near future, will support the purchasing choice of people. Indeed, nowadays buyers are not only driven by the cost and the quality of the product, because they are conscious of the effects their choices have on the environment, the local economies and the social and socio-economic effects as well, not only on workers but also on all the communities where production takes place [1].

The present S-LCA study has started from the identification of all the organizations; since it is linked to the behaviour of the enterprises involved in the system life cycle stages. For each of them, generic and specific data has been collected and analysed in order to provide a final score and also to identify social "hot spots" for suggesting overall social improvements and, therefore, for increasing the feasibility of the future HYBUILD commercial product. The assessment is not comparative, given the difficulty to collect the social data from existing organization involved in the life cycle stages of conventional systems.

S-LCA report could be of interest to many manufacturer companies both within the project and external, being a useful resource available for social comparisons and improvements.

1.2 Relations to other activities in the project

The present social life cycle assessment has been performed with the help of all consortium partners involved in the HYBUILD system life cycle. Indeed, the assessment is based on the behaviour of the companies providing a component or performing a process within the system life cycle, with respect to some defined social topics of interest. Therefore, all the necessary inputs for the analysis have been requested through S-LCA questionnaires and social data related to the companies' behaviour have been collected.

The present activity is connected to WP2 "Core components and modules design", where the information of the HYBUILD systems components are provided and to WP4 "Smart control and system integration", where the complete and detailed systems drawings are shown in Deliverable 4.2 "Functional requirements specification" annexes.

Moreover, Task 5.3 is connected to T5.1 "Life-Cycle Assessment (LCA)" and T5.2 "Life Cycle Costing Analysis (LCC)", because the same system boundary has been considered, which includes the manufacturing, the installation, the use, and the end-of-life stages.

1.3 Report structure

The deliverable is structured into the following section:
- In Section 1, an introduction is provided, including the aim and objectives of the deliverable, the relations with other activities within the HYBUILD project, the report structure and the contributions of partners.

- The main focus of the deliverable is reported in Section 2, Section 3 and Section 4, where the social life cycle assessment is developed, firstly explaining the methodology and then applying it to both the systems of the HYBUILD project, including the inventory, the impact assessment, and the interpretation of S-LCA stages.
- Additional considerations are reported in Section 5.
- Conclusions are reported in Section 6, summarizing the activity performed and the main results.
- Finally, the references used in the deliverable and in the analyses are listed.

1.4 Contributions of partners

As said before, all consortium partners involved in the HYBUILD system life cycle have contributed to the Social Life Cycle Assessment. In particular:

- STRESS has led the activity, by providing the questionnaire, collecting the data from partners, contacting one external partner for providing additional missing information, and performing the S-LCA.
- UDL has supported the activity by reviewing the first documents circulating, contacting three external partners for providing additional missing information, and reviewing the assessment.
- The following partners have provided the data for the manufacturing stage:
  - CSEM
  - OHSNER
  - AKG
  - FRESNEX
  - ENGINEERING
  - ITAE-CNR
  - FAHRENHEIT
  - DAIKIN
  - PINK
- COMSA has provided the data needed for the installation stage.

2 Social Life Cycle Assessment

A Social and Socio-Economic Life Cycle Assessment (S-LCA) is a social impact assessment methodology that aims at assessing the social and socio-economic aspects of products and their potential positive and negative impacts along their life cycle encompassing extraction and processing of raw materials, manufacturing, distribution, use, re-use, maintenance, recycling, and final disposal [1].

Social life cycle assessment is a relatively new analysis, which, together with the Life Cycle Assessment (LCA) and the Life Cycle Costing (LCC), complements the methodologies for the sustainability assessment of product and services, adding the social to the environmental and economic points of view of the product life cycle. The first indications on how to perform an S-LCA were reported by the "Guidelines for Social Life Cycle Assessment of products" in 2009, developed by UNEP and SETAC [1]. This document provides a map for S-LCA analyses, and it is supported by "The Methodological Sheets for Subcategories in Social Life Cycle Assessment (S-LCA)" [2] document, which helps in the data collection. S-LCA Guidelines framework is in line with the ISO 14040 [3] and 14044 [4] standards for Life Cycle Assessment, following the four steps needed to quantify the environmental/economic/social impacts, being:

1. The definition of the objective and the application fields. In this stage of the S-LCA, the "stakeholder categories" are defined considering the product under analysis, being a cluster of stakeholders that are expected to have shared interests due to their similar relationship to the investigated product systems. For each stakeholder category, particular themes or areas of interest, which are called "subcategories", are also defined.
2. The inventory, which involves the collection of characteristic and functional data for the development of the S-LCA analysis.
3. The quantification of the social impacts (Impact Assessment – IA).
4. The interpretation of the results and the identification of social "hot points", being critical points to take in consideration for future social improvements.

Steps 3 and 4 are not included in the S-LCA Guidelines, therefore the impact assessment method for social impacts developed by the GreenDeltaTC [5] was considered.

A new version of the S-LCA Guidelines was released in December 2020 [6]. The main differences among the two methodologies are that the 2009 version does not provide indications on the impact assessment methodology; whilst the 2020 version, which includes an additional stakeholder (children), provides IA methodologies in two different approaches (the Reference Scale Approach, if the aim is to describe a product system with a focus on its social performance, measured with specific data, or social risk, measured with generic, sector/country data; the Impact Pathway Approach, if the aim is to predict the consequences of the product system). In case Reference Scale approach is considered, the data collection should contain: a dataset to create the Reference Scale; another dataset for each Stakeholder Groups and Subcategories identified as relevant for the study; and finally, a dataset to apply the weighting. Therefore, inventory would be strictly dependent on the chosen impact assessment methodology.

Given that the activities of Task 5.3 started in M24 (September 2019) and the data collection in December 2020 was almost complete, it was decided not to modify the approach and the ongoing activities. Moreover, the methodological sheets of 2020 version of the S-LCA Guidelines were released in April 2021; this means that very short time would have been available to adapt the assessment and finalize the analysis.

2.1   S-LCA Methodology

In this section, the methodology used for the Social Life Cycle Assessment of the HYBUILD systems is described, according to the UNEP/SETAC Guidelines [1] and the GreenDeltaTC indications [5].

Firstly, the product under analysis needs to be identified, considering the functional unit and the system boundary. The functional unit represents the unit referring to which the results are given, while the system boundary represents the processes of the product life cycle that are included in the assessment. In order to identify these stages, the EN 15978 [7] is used, which groups the product life cycle stages into modules: A1-A3 modules are referred to the production stage (extraction and production of raw materials, transport to the manufacturing site, manufacturing); A4-A5 modules are referred to the construction/installation (transport to the installation site, installation); B1-B7 modules are referred to the use stage (use, maintenance, repair, replacement, …); C1-C4 and D modules are referred to the End-of-Life (EoL) stage (deconstruction/disassembly, transport to the waste processing site, waste processing, disposal, reuse/recovery/recycling).

Moreover, for the S-LCA, the identification of the system boundary is also related to the indication of the main group of stakeholders involved in each stage of the life cycle. Indeed, the guidelines identify five stakeholder categories, i.e. workers, local community, society, consumers, and value chain actors, which are shown in Figure 2. An example of identification of the most relevant and significant stakeholders categories for each stage of the life cycle is reported in Figure 3.
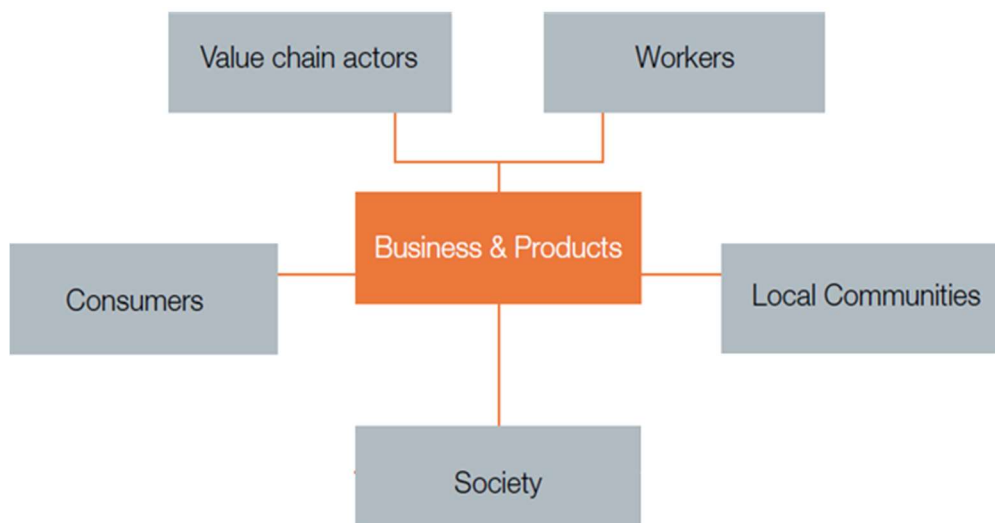
Figure 2. Stakeholders involved in the products life-cycle
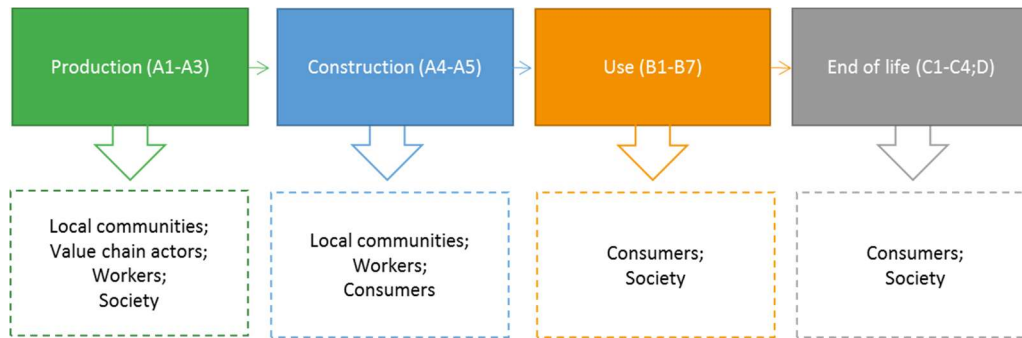
Figure 3. Example of stakeholders involved in each stage of the product life-cycle

For each stakeholder, special themes of interest need to be identified, which are called "subcategories". The S-LCA Guidelines provide the list of subcategories related to the single stakeholder. The list is reported in Figure 4.

Stakeholder	Sub-categories
Local Community	Delocalization and migration
	Community engagement
	Cultural Heritage
	Respect of indigeneous rights
	Local employment
	Access to immaterial resources
	Access to material resources
	Safe and healthy living conditions
	Secure living conditions
Value Chain Actors	Fair competition
	Respect of intellectual property rights
	Supplier relationships
	Promoting social responsibility
Consumers	Health and safety
	Feedback mechanism
	Consumer privacy
	Transparency
	End of life responsibility
Workers	Freedom of association & collective bargaining
	Child labour
	Fair salary
	Working hours
	Forced labour
	Equal opportunities/discrimination
	Health and safety
	Social benefits/social security
Society	Public commitments to sustainable issues
	Prevention and mitigation of armed conflicts
	Contribution to economic development
	Corruption
	Technology development

Figure 4. List of subcategories according to UNEP/SETAC Guidelines [1]

Going more in detail, subcategories are assessed by the use of inventory indicators, depending on data availability and the goal and scope of the study. The list of the indicators and the

description of their status for the considered processes represents the inventory of the S-LCA. Inventory indicators are reported in the S-LCA methodological sheets [2] and an example of indicators related to the "Freedom of Association and Collective Bargaining" subcategory is shown in Figure 5. Indicators, and the related collected data, can be quantitative, semi-quantitative (yes/no or rating scale responses) and qualitative (descriptive text), and are generally collected through questionnaires.

Figure 5. Methodological sheet and Indicators for "Freedom of Association and Collective Bargaining" subcategory [2]

Once all the data referred to all the stakeholder categories for each product life cycle stage are collected, the social impacts can be evaluated with the help of the Social Impact Assessment method elaborated by GreenDeltaTC [5].

This methodology can be divided into two main steps: the Performance Assessment (PA) and the Impact Assessment (IA).

In the Performance Assessment step, the performance of the company and of the country where the company works is assessed for each subcategory of each stakeholder involved, based on the indicators, whose data can be both generic (at country level) and specific (at company level). Indeed, a company cannot be blamed for country-related behaviour, such as high unemployment rates or underdeveloped infrastructure of a region, but it can improve the situation through, e.g., locally employed workers or infrastructure projects.

Moreover, it is important to state that the Performance Assessment of the companies and countries is based on Performance Reference Points (PRP), which are based on internationally accepted standards (such as the ILO conventions, the ISO 26000 guidelines [8] and the OECD Guidelines for Multinational Enterprises, but also the principles of the United Nations Global Compact or the IFC Performance Standards on Social and Environmental Sustainability), goals or objectives according to conventions and best practice, etc. For instance, for the stakeholder

"Worker" and subcategory "Child labour", the PRP is "No occurrence of child labour"; for the subcategory "Fair salary", the PRP is "The wage level should ensure a decent standard of living. The payment of the minimum wage is often not sufficient. Further, companies should pay in time and do not withhold shares of the salary" [3].

Therefore, at the end of the PA step, a list of scores for each subcategory results, ranging from 1, meaning "Very good performance", to 6, meaning "Very poor performance". At each score, a colour is also assigned (see Table 4).

In the Impact Assessment step, the social impacts are evaluated starting from the PA scores. The results are evaluated by combining the PA scores with the strength of correlation (none, weak, strong) between the subcategories and a list of social impact categories, namely: **Working Conditions (WC); Health & Safety (HS); Human Rights (HR); Socio-Economic Repercussions (SER); Indigenous Rights (IR); Governance (G).**

A correlation between each subcategory and each of the above listed social impact category was needed; Stress S.c.ar.l. has performed an internal brainstorming in order to define the relationship among each subcategory and each Social Impact Category. The results of the brainstorming are reported in Table 1 (e.g. fair salary strongly impacts on the working condition, weakly impacts on the health and safety, does not impact on the indigenous rights).

Table 1. Stress S.c.ar.l. brainstorming on the correlation between Subcategories and Impact Categories

Sub-categories	Impact Categories - STRESS					
	WC	HS	HR	SER	IR	G
Delocalization and migration	✓	(✓)	(✓)	✓	✓	(✓)
Community engagement	(✓)	✓	(✓)	✓	(✓)	✓
Cultural Heritage	-	-	(✓)	✓	✓	✓
Respect of indigeneous rights	(✓)	(✓)	✓	(✓)	✓	(✓)
Local employment	✓	(✓)	(✓)	✓	✓	✓
Access to immaterial resources	(✓)	(✓)	✓	✓	(✓)	✓
Access to material resources	-	(✓)	✓	✓	✓	(✓)
Safe and healthy living conditions	✓	✓	✓	✓	(✓)	(✓)
Secure living conditions	(✓)	✓	✓	(✓)	(✓)	(✓)
Fair competition	✓	✓	✓	✓	-	✓
Respect of intellectual property rights	(✓)	-	-	✓	-	✓
Supplier relationships	(✓)	(✓)	(✓)	✓	-	✓
Promoting social responsibility	✓	✓	✓	(✓)	(✓)	✓
Health and safety	-	✓	(✓)	✓	-	✓
Feedback mechanism	(✓)	(✓)	✓	✓	-	✓
Consumer privacy	-	-	✓	(✓)	-	✓
Transparency	(✓)	✓	✓	✓	(✓)	✓
End of life responsibility	✓	✓	✓	✓	✓	✓
Freedom of association & collective bargaining	✓	✓	✓	✓	✓	✓
Child labour	✓	✓	✓	✓	✓	✓
Fair salary	✓	(✓)	✓	✓	-	✓
Working hours	✓	✓	✓	✓	-	✓
Forced labour	✓	✓	✓	✓	✓	✓
Equal opportunities/discrimination	✓	✓	✓	✓	✓	✓
Health and safety	✓	✓	✓	✓	-	✓
Social benefits/social security	✓	✓	✓	✓	✓	(✓)
Public commitments to sustainable issues	(✓)	(✓)	-	(✓)	-	✓
Prevention and mitigation of armed conflicts	(✓)	✓	✓	✓	✓	✓
Contribution to economic development	✓	(✓)	(✓)	✓	(✓)	✓
Corruption	✓	✓	✓	✓	✓	✓
Technology development	✓	✓	(✓)	✓	-	✓

The six impact categories are put in relationship with subcategories, using the symbols and criteria described in Table 2.

Table 2. Relationship criteria between Subcategories and Impact Categories

Subcategories and Impact Categories	
-	no impacts
✓	strong relationship between subcategory and impact category
(✓)	weak relationship between subcategory and impact category

Once the correlation between Subcategories and Impact Categories is defined, in order to convert the PA into the IA, a quantitative approach based on conventions and best practice is used.

Precisely, some values are firstly assigned to the relationship criteria, i.e. 1 point for "✓", 1/2 point for (✓) and 0 points for "-" and, for each subcategory, the IA is evaluated, being the sum of the relationship criteria points related to the impact categories. From PA and IA, Table 3 reports the conversion rules defined in order to convert the performance assessment into social impacts.

Table 3. Rules for PA to IA conversion

	$\sum$ IC<2	$\sum$ 2<IC<4	$\sum$ IC>4	
PA=1	can turn 2	1	1	
PA=2	can turn 3	2	1	
PA=3	can turn 4	3	2	$\sum$ 5<IC<6
			3	$\sum$ 4<IC≤5
PA=4	can turn 3	4	4	$\sum$ 4<IC≤5
			5	$\sum$ 5<IC<6
PA=5	can turn 4	5	6	
PA=6	can turn 5	6	6	

Therefore, at each subcategory, the IA can be assigned, ranging from 1, meaning "positive effect", to 6, meaning "Very negative effect". At each score, a colour is also assigned, as reported in Table 4.

Table 4. Performance Assessment and Impact Assessment scale

Performance Assessment	Impact Assessment	Colour	Score
Very good performance	Positive effect		1
Good performance	Lightly positive effect		2
Satisfactory performance	Indifferent effect		3
Inadequate performance	Lightly negative effect		4
Poor performance	Negative effect		5
Very poor performance	Very negative effect		6

Once the IA of each subcategory is evaluated, the IA of each stakeholder and, finally, the overall IA can be evaluated. In particular, the stakeholder IA is assessed as the average score of the IA of all the related subcategories. Similarly, the overall IA is assessed as the average score of the IA of all the stakeholders. In addition, specific calculation rules for the calculation of the final values are applied, e.g. (i) if at least one subcategory in a specific stakeholder group is assessed with factor "6", the amount of this stakeholder group cannot be better than "5"; (ii) if at least one subcategory in a specific stakeholder group is assessed with factor "5", the amount of this

stakeholder group cannot be better than "4"; and so on. The same is applied for the evaluation of the overall IA from the IA of all the stakeholders.

For a better understanding, Figure 6 summarizes the whole social impacts assessment structure and an example is provided soon after.
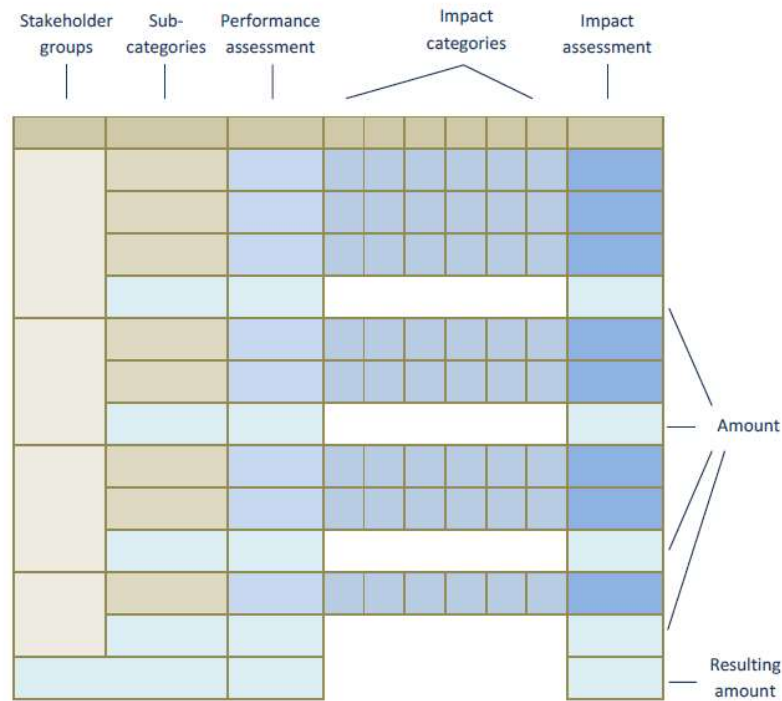
Figure 6. PA and IA assessment in S-LCA

The first column lists the different stakeholder groups and the second one incorporates subcategories associated to the stakeholders. In the third column, a PA indicator is assessed for each subcategory according to the behaviour described in the inventory, with the help of inventory indicators. From fourth to ninth column, the six impact categories are put in relationship with subcategories. In the final column, the PA indicators and the relationships between subcategories and impact categories are combined in order to provide the IA score. This process is performed for each subcategory and an example is provided in Figure 7 considering the Stakeholder category "workers" [3].

Stake-holder	Subcategory	PA	WC	HS	HR	SER	IR	G	IA
Workers	Freedom of association and collective bargaining	2	✓	✓	✓	✓	(✓)	(✓)	1
	Child labour	1	✓	✓	✓	✓	✓	✓	1
	Discrimination	5	✓	✓	✓	✓	✓	✓	6
	Amount	4.00							5.00

Figure 7. Example of Social Performance Assessment and Impact Assessment

The stakeholder group "workers" includes the subcategories "freedom of association and collective bargaining", "child labour", and "discrimination". From the inventory phase has been evaluated that:

- The company provides a trade union and collective agreements. It does in general not restrict the rights of workers regarding freedom of association and collective bargaining, so the performance of the company was assessed with "good", which gives a light green assessment colour and the score "2". This good company performance has positive impacts on working conditions, health and safety, human rights, and causes positive socio-economic repercussions. The impacts on indigenous rights including cultural heritage and governance are rather low, but also positive. In general, the company performance has positive impacts (score "1").

- The company does not employ children. This influences all impact categories positively in relation to an employment of children. The company performance is very good and this ideal company behaviour has positive social effects.

- In terms of discrimination, the company performance is poor (score "5"), because the company employs primary men and women earn less than men. In addition, cases of sexual harassment occurred. Because all impact categories are influenced negatively, the impacts of this company behaviour are estimated as very negative impacts (score "6").

Therefore, in the presented example, the total PA for the Stakeholder "workers" cannot be better than "4" because, even if the average of the subcategory PA is 2.7, the presence of a "5" influences the overall performance; similarly, the total IA of the stakeholder "workers" cannot be better than "5" because, even if the average of the subcategory IA is 2.7, the presence of a "6" influences the overall social impact.

2.2 S-LCA Inventory questionnaire

One of the most important steps of the methodology is the social data collection. The inventory can be performed with the help of S-LCA questionnaires which includes a list of questions derived from the social indicators reported in each subcategory methodological sheet [2].

Stakeholder	Sub-Categories	Production A1-A3	Construction A4-A5	Use B1-B7	EoL C1-C4
Local Community	Delocalization and Migration				
	Community engagement				
	Cultural Heritage				
	Respect of indigeneous rights				
	Local employment				
	Access to immaterial resources				
	Access to material resources				
	Safe and Healthy living conditions				
	Secure living conditions				
Value Chain Actors	Fair competition				
	Respect of intellectual property rights				
	Supplier relationships				
	Promoting social responsibility				
Consumers	Health and safety				
	Feedback mechanism				
	Consumer privacy				
	Transparency				
	End of life responsibility				
	Indoor climate comfort				
Workers	Freedom of association & collective bargaining				
	Child labour				
	Fair salary				
	Working hours				
	Forced labour				
	Equal opportunities/discrimination				
	Health and safety				
	Social benefits/social security				
Society	Public commitments to sustainable issues				
	Prevention and mitigation of armed conflicts				
	Contribution to economic development				
	Corruption				
	Technology development				

Figure 8. Identification of relevant stakeholders and subcategories

Questionnaires can be filled with the help of the companies and the involved stakeholders. For the HYBUILD project, the help of companies external to the consortium has been needed, in order to cover all the stages of the systems life-cycle (more details will be provided in the following sections). Therefore, two questionnaire typologies have been developed, having different complexity: a more detailed questionnaire made of around 120 questions (Table 5), and a shorter version of the questionnaire made of around 60 questions (Table 6). The shorter version was made in order to accelerate the data collection and collect data from partners external to the consortium.

Both questionnaires are shown below.

Table 5. Detailed version of the S-LCA questionnaire

Stakeholders	Subcategories	Questions
Local Community	Delocalization and Migration	Does the organization contribute, directly or indirectly, to migration of individuals? If yes, give details
		If yes, how many individuals resettle, voluntarily or involuntarily, because of the organization?
		Does the organization contribute to the integration of entering migrant? If yes, give details
	Community engagement	Does the organization support local initiatives? If yes, give details
		Does the organization collaborate with community stakeholders? If yes, give details
		How many meetings with the community stakeholders does the organization arrange?
		Does the organization contribute to the local development? If yes, how?
	Cultural Heritage	Does the organization have policies in place to protect cultural heritage? If yes, give details
		Does the organization have programs to include cultural heritage expression in the product design/production?
	Respect on indigenous rights	Does the organization have policies in place to protect the rights of indigenous community members?
		How many annual meetings does the organization held with indigenous community members?
		Are there indigenous land rights conflicts/land claims with the organization?
	Local employment	Does the organization hire local individuals? If yes, how many per year?
		Does the organization have policies for local hiring? If yes, give details
		Does the organization have policies for preference of local suppliers?
		What is the percentage of local suppliers on the total of suppliers?
	Access to immaterial resources	How many annual arrests connected to protests of organization actions have been conducted?
		Do policies related to intellectual property respect moral and economic rights of the community?

		Does the organization perform community education initiatives?
	Access to material resources	Does the organization conduct risk assessments with regard to potential conflict over material resources?
		Does the organization engage with local community over sustainable methods for sharing resources? If yes, give details
		Has the organization got a certified environmental management system? If yes, give details
		Has the organization caused infrastructures improvements (e.g. roadways, waste disposal systems) having long term effects? If yes, positive or negative effects?
	Safe and Healthy living conditions	Is the organization committed to strengthen community health? If yes, give details
		Is the organization committed to reduce hazardous substances? If yes, give details
		Does the organization have policies/regulations for safety? If yes, give details
		Does the organization measure air/water/earth pollution? If yes, give details
	Secure living conditions	How many causalities and injuries per year are ascribed to the organization?
		How many legal complaints per year occurred against the organization with regard to security concerns?
		Does the organization have management policies related to private security personnel? If yes, give details
Supply Chain Actors	Fair competition	Does the organization have documented statements or procedures to prevent engaging in anti-competitive behaviour? If yes, give details
		Are the employees aware of the importance of compliance with competition legislation and fair competition?
		Are there legal actions pending during the reporting period regarding anti-competitive behaviour and violation of anti-trust and monopoly legislation? If yes, give details
	Respect of intellectual property rights	How the organization approach to general intellectual property rights and related issues associated with the economic sector?
		What are the organization's policy and practice with regards to the respect of intellectual property rights?
	Supplier relationships	Is coercive communication with suppliers absent?
		Is lead time sufficient?
		Are volume fluctuations reasonable?
		Are the suppliers paid on time?
	Promoting social responsibility	What are the reference industry codes of conduct in the sector?

		Does the organization have an explicit code of conduct that protect human rights of workers among suppliers? If yes, give details
		What is the percentage of suppliers that the organization has audited with regard to social responsibility along the supply chain?
		Are there initiatives that promotes social responsibility along the supply chain? If yes, give details
		Does the organization integrate ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures? If yes, give details
		Does the organization support the suppliers in terms of consciousness-raising and counselling concerning the social responsibility issues? If yes, give details
Consumers	Health and safety	Does the organization provide qualitative or quantitative information on product health and safety? If yes, give details
		What is the number of consumer complaints regarding health and safety?
		Does the organization have management measures to assess costumer health and safety?
		Does the product have labels of health and safety?
	Feedback mechanism	Does the organization have a mechanism for customers to provide feedbacks?
		Does the organization have management measures to improve feedback mechanisms?
		Does the organization have practices related to customer satisfaction, including results of surveys measuring customer satisfaction?
	Consumer privacy	What is the organization strength related to internal management system to protect consumer privacy?
		What is the number of consumer complains related to breach of privacy or loss of data within the last year?
		What is the number of complaints by regulatory bodies related to breach on consumer privacy or loss of data within the last year?
	Transparency	Is the organization compliant with regulations regarding transparency?
		What is the number of consumers complaints regarding transparency?
		Does the organization publish annual sustainable reports?
		What is the quality and comprehensiveness of the information available in the sustainability report or in other documents regarding social and environmental performances of the organization?
		Does the organization communicate results of social and environmental life cycle impact assessment?

		Does the organization have certifications/labels for the product under investigation?
	End of life responsibility	Do internal management systems ensure that clear information is provided to consumers on end-of-life options?
		What is the number of incidents of non-compliance with regulatory labelling requirements in one year?
Workers	Freedom of association & collective bargaining	Are there evident restrictions to freedom of association and collective bargaining? If yes, give details
		Is the presence of unions within the organization adequately supported? If yes, give details
		Are the workers free to join unions of their choosing?
		Are the employee/union representatives invited to contribute to planning of larger changes in the company, which will affect the working conditions?
		Do the workers have access to a neutral, binding and independent dispute resolution procedure?
	Child labour	Are working children under the legal age or 15 years old present? If yes, how many?
		Are children performing work during night?
		Does the organization record all workers, including names, ages and date of birth? If yes, give details
		Are working children younger than 15 or under the local compulsory age attending school?
	Fair salary	What is the minimum local living wage?
		What is the percentage of workers receiving the lowest paid?
		Are the workers receiving the lowest paid considering that their wages meet their needs? If yes, give details
		Are there suspicious deductions on wages? If yes, give details
		Are the workers payments regular and documented?
	Working hours	What is the maximum number of working hours?
		What is the maximum number of hours effectively worked by employees?
		What is the number of holidays effectively used by employees?
		Are the contractual agreements concerning overtime respected?
		Is the communication of working hours and overtime arrangements clear?
		Does the organization provide flexibility?
	Forced labour	Do workers voluntarily agree upon employment terms?
		Do employment contracts stipulate wage, working time, holidays and terms of resignation?
		Are employment contracts comprehensible to the workers?
		Are employment contracts kept on file?

		Are birth certificate, passport, identity card, work permit or other original documents belonging to workers retained or kept for safety reasons by the organization?
		Are workers free to terminate their employment within the prevailing limits?
		Are workers bonded by debts exceeding legal limits to the employer?
	Equal opportunities / Discrimination	Does the organization have formal policies on equal opportunities? If yes, give details
		Does the organization announce open positions through national/regional newspapers, public job databases on internet, employment services or other publicly available media ensuring a broad announcement?
		What is the total number of incidents of discrimination? If there are, what is the number of actions taken?
		What is the composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity?
		What is the ratio of basic salary of men and women by employee category?
	Health and safety	What is the number/percentage of injuries or fatal accidents in the organization by job qualification?
		What is the number of hours of injuries per level of employees?
		Is a formal policy concerning health and safety present?
		Are adequate general occupational safety measures taken?
		Do preventive measures and emergency protocols regarding accidents and injuries exist?
		Do preventive measures and emergency protocols regarding pesticides and chemical exposure exist?
		Are appropriate protective gear required in all applicable situation present?
		What is the number of occupational safety and health administration violations reported within the past 3 years? What is the status of violation?
		Are education, training, counselling, prevention and risk control programs in place to assist workforce members, their families or community members regarding serious diseases?
	Social benefits / Social security	Do the workers have social benefits? If yes, give details
		Are there evidences of violations of obligations to workers under labour or social security laws and employment regulations? If yes, give details
		What is the percentage of permanent workers receiving paid time-off?
Society	Public commitments to sustainable issues	Are publicly available documents regarding promises or agreements on sustainability issues present?

		Does local community or other stakeholders complain on the non-fulfilment of organization's promises or agreements on sustainability issues? If yes, give details
		Are there mechanisms to follow-up the realization of promises on sustainability issues? If yes, give details
	Pervention and Mitigation of Conflicts	Is the organization doing business in a region with ongoing conflicts?
		Is the organization doing business in a sector that features linkages to conflicts (e.g. where the depletion of resources allows significant profits - extractive industries, forestry, fishery)?
		Is the organization doing business in a sector otherwise linked to the escalation or de-escalation of conflicts (e.g. conflict escalation by massive pollution, de-escalation by trade beyond conflict boundaries)?
		What is the role of the organization in the development of conflicts?
		Which are the disputed products?
	Contribution to economic development	Does the organization contribute to the local economic progress?
	Corruption	Is there risk of corruption in the sector?
		Is there a formalized commitment of the organization to prevent corruption?
		Does the organization carry out an anti-corruption program?
		Does the organization install or cooperate with internal and external controls to prevent corruption?
		Are there written documents on active involvement of the organization in corruption and bribery?
		If present, how much are the financial damages?
	Technology development	What is the sector effort in technology development?
		Is the organization involved in technology transfer program or projects? If yes, give details
		Does the organization have partnerships in research and development? If yes, give details
		Does the organization invest in technology development/transfer? If yes, give details

Table 6. Short version of the S-LCA questionnaire

Stakeholders	Subcategories	Questions
Local Community	Delocalization and migration	Does the organization contribute, directly or indirectly, to migration of individuals? If yes, give details
		Does the organization contribute to the integration of entering migrant? If yes, give details
	Community engagement	Does the organization support local initiatives? If yes, give details

		Does the organization collaborate with community stakeholders? If yes, give details
	Cultural Heritage	Does the organization have policies in place to protect cultural heritage and/or programs to include cultural heritage expression in the product design/production? If yes, give details
		Does the organization respect cultural customs and traditions in any way? If yes, give details
	Respect of indigenous rights	Does the organization have policies in place to protect the rights of indigenous community members?
		Does the organization respect indigenous rights, including the rights to lands, resources, cultural integrity, self-determination, and self-government?
	Local employment	Does the organization have policies for local hiring? If yes, give details
		Does the organization contribute somehow at the reduction of local unemployment? If yes, how?
	Access to immaterial resources	Does the organization guarantee freedom of expression of the local community?
		Does the organization support communities in education or other community services, if necessary?
	Access to material resources	Is the organization committed in minimizing somehow the resources consumption?
		Has the organization caused infrastructures improvements (es roadways, waste disposal systems) having long term effects, in case the infrastructure is underdeveloped or not sufficient for a decent standard of living?
	Safe and healthy living conditions	Is the organization committed to strengthen community health and minimize the environmental pollution?
		Does the organization have policies/regulations for safety? If yes, give details
	Secure living conditions	How many causalities and injuries per year are ascribed to the organization?
		Does the organization contribute to secure living conditions through private security personnel?
Supply Chain Actors	Fair competition	Does the organization have documented statements or procedures to prevent engaging in anti-competitive behaviour?
		Are the employees aware of the importance of compliance with competition legislation and fair competition?
	Respect of intellectual property rights	How the organization approach to general intellectual property rights and related issues associated with the economic sector?
		What are the organization's policy and practice with regards to the respect of intellectual property rights?
	Supplier relationships	Does the organization develop supplier relationships, based on mutual co-operation?

		Does the organization act fair regarding their suppliers and support them in terms of absence of coercive communication, sufficient lead time, reasonable volume fluctuation, payments on time?
	Promoting social responsibility	Does the organization have an explicit code of conduct that protect human rights of workers among suppliers?
		Does the organization audit the suppliers with regard to social responsibility along the supply chain?
		Does the organization integrate ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures?
Consumers	Health and safety	Do the organization provide qualitative or quantitative information on product health and safety? If yes, give details
		Does the organization have management measures to assess costumer health and safety?
	Feedback mechanism	Does the organization have a mechanism for customers to provide feedbacks?
		Does the organization have practices related to customer satisfaction, including results of surveys measuring customer satisfaction?
	Consumer privacy	What is the organization strength related to internal management system to protect consumer privacy?
		What is the number of consumer complains related to breach of privacy or loss of data within the last year?
	Transparency	Does the organization communicate regarding their product and social responsibility in a transparent way?
		Does the organization provide clear information to enable the consumer choice? (e.g. presence of product certifications/labels, publication of annual sustainable reports, communication of results of social and environmental life cycle impact assessment, ...)
	End of life responsibility	If relevant, does the organization provide information to consumers regarding appropriate end-of-life options?
		Does the organization develop systems for the product take back?
Workers	Freedom of association and collective bargaining	Are there evident restriction to freedom of association and collective bargaining?
		Are the workers free to join unions of their choosing and is the presence of unions within the organization adequately supported?
	Child labour	Are working children under the legal age or 15 years old present?
	Fair salary	Does the organization guarantee that wage level ensures a decent standard of living?
		Are the workers payments regular and documented?
		Are there suspicious deductions on wages? If yes, give details

	Working hours	What is the maximum number of hours worked by employees and does it differ from the maximum number of hours effectively worked?
		What is the number of holidays used by employees?
	Forced labour	Do workers voluntarily agree upon employment terms and are they free to terminate their employment within the prevailing limits?
		Do employment contracts stipulate wage, working time, holidays and terms of resignation?
	Equal opportunities/discrimination	Does the organization avoid any kind of discrimination?
		Does the organization have formal policies on equal opportunities? If yes, give details
		What is the composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity?
	Health and safety	Does the organization have an adequate management system for health and safety, so that the risk of workers is low?
		What is the number/percentage of injuries or fatal accidents in the organization? Please, also provide a reference period and a trend, if possible
	Social benefits/ social security	Does the organization provide social benefits as, for instance, medical insurance or pension insurance, which ensure a decent standard of living? If yes, give details
Society	Public commitments to sustainable issues	Are publicly available documents regarding promises or agreements on sustainability issues present?
		Are there mechanisms to follow-up the realization of promises on sustainability issues? If yes, give details
	Prevention and mitigation of conflicts	In case the organization is located in regions with a high risk of conflicts due to resource depletion, massive pollution or poor working standards, does it try to reduce the risk with appropriate measures?
	Contribution to economic development	Do the organization contribute to the local economic progress, through different aspects as payment of wages, purchase of raw materials and supplies, investments etc.
	Corruption	Is the organization involved into cases of corruption?
		Is there a formalized commitment of the organization to prevent corruption and/or does the organization carry out an anti-corruption program?
	Technology development	Does the organization engage in the development of efficient and environmental sound technologies?
		Is the organization involved in technology transfer program or projects? If yes, give details
		Does the organization invest in technology development/transfer? If yes, give details

The data collected through questionnaires are also called "specific data" because they are specific of the company considered. Moreover, also "general data" have been collected in the present assessment. General data are collected at country level, considering the references reported in the methodological sheets related to each subcategories' indicators, in order to enrich the inventory and include the national context of the company under consideration.

General data have been collected for the countries where the involved companies work, considering the following indicators (in parenthesis, the related subcategory):

- International Migrants as a Percentage of Population (Delocalization and Migration)
- Public Trust on Politicians (Community engagement)
- Unemployment Statistics by Country (Local employment)
- Poverty and Working Poverty by Country (Local employment)
- Patent Filings (Access to material resources)
- Burden of Disease by Country (Safe and healthy living conditions)
- Pollution Levels by Country (Safe and healthy living conditions)
- Strength of Public Security in Country of operation (Secure living conditions)
- Presence of consumer complaints (Health and safety)
- Country ranking related to regulations on data-sharing (Consumer privacy)
- Presence of a law or norm regarding transparency (Transparency)
- Evidence of Country non-respect or support to Freedom of association and Collective bargaining (Freedom of association & collective bargaining)
- Percentage of children working by country and sector (Child labour)
- Living Wages (Fair salary)
- Minimum wage by country (Fair salary)
- Maximum number of working hours (Working hours)
- Women in the Labour force participation rate by country (Equal opportunities/discrimination)
- Country gender index ranking (Equal opportunities/discrimination)
- Occupational accident rate by country (Health and safety)
- Social security expenditure by country and branches of social security (Social benefits/social security)
- Economic situation of the country/region (Contribution to Economic Development)
- Risk of corruption in the country and/or sub-region (Corruption)

The data sources are identified in the S-LCA methodological sheets [2].

3   Social Life Cycle Assessment of Mediterranean HYBUILD System

The methodology explained in the previous section has been applied to both the Mediterranean and the Continental HYBUILD systems.

Firstly, the goal and the scope of the assessment are defined. The topic of the assessment is the Mediterranean HYBUILD system developed in WP2 and WP3 and shown in deliverable D4.2. The system is schematized in

Figure 9 and the components are the following:

- ➢ Sorption storage (sorption module + evaporator condenser).
- ➢ Low temperature latent thermal energy storage (RPW-HEX).
- ➢ Electrical storage, DC system controller and PV panels.
- ➢ Compression DC-driven chiller.
- ➢ Solar fields of Fresnel collectors + sensible heat storage (hydraulic system, buffer tank and DHW tank).
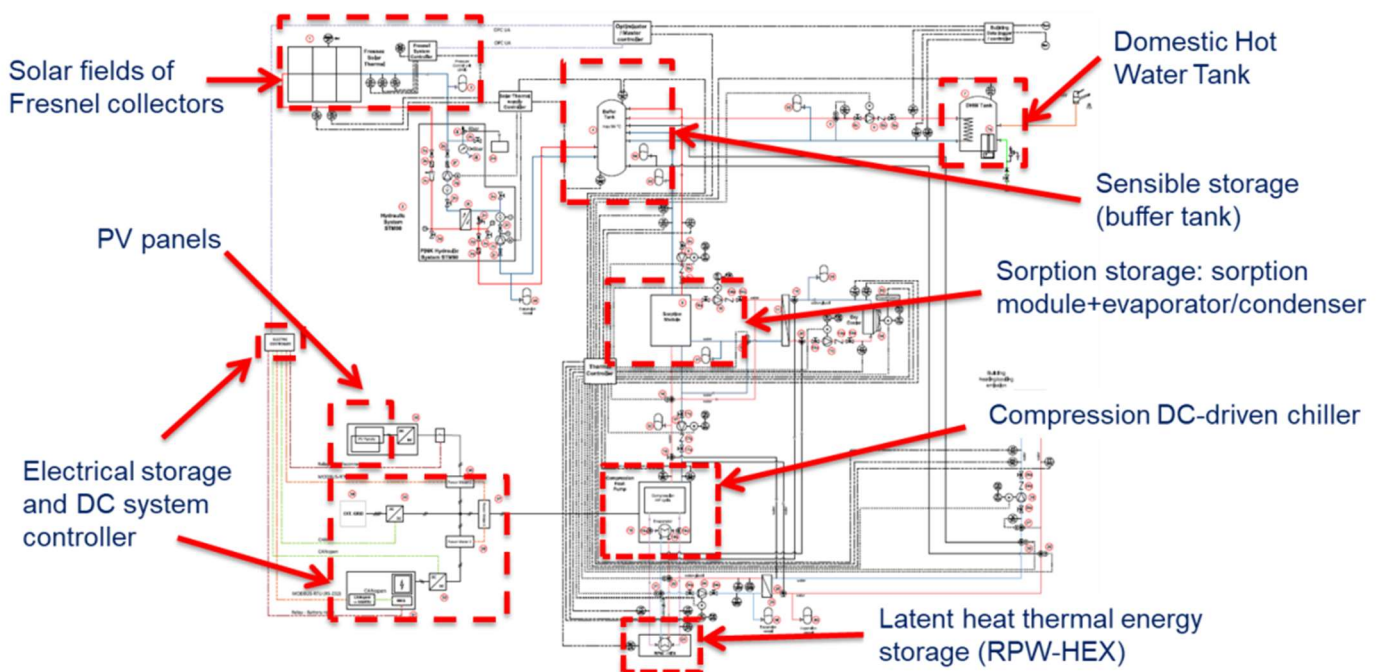
Figure 9. Components of the Mediterranean HYBUILD system

In the goal and scope phase of the S-LCA assessment, the life cycle stages of the Mediterranean system need to be defined. The stages included in the analysis, referred to the EN 15978 [7], are the following:

- A1-A3 stages, i.e. the production of each system components.
- A4-A5 stages, i.e. the transport from production site to installation site and the installation.
- B4 stage, i.e. the components replacement.
- C1-C4 stages, i.e. the component deconstruction, its transport of the component to waste processing, the waste processing and, finally, the disposal.

The companies involved in each of the indicated system life cycle stages were identified. For the A1-A3 stage, the related HYBUILD consortium partner responsible was chosen. For the other life cycle stages, if one or more of the HYBUILD partners were involved in these stages, they were taken in consideration; if not, partners external to the consortium were identified and included in the S-LCA. Indeed, since no companies inside the HYBUILD consortium are in charge of

performing the end of life stages of the system (or components) life-cycle, partners outside the consortium have been contacted.

Table 7 reports the identification of the involved companies. The social impacts are evaluated for each company included in the table and an average overall score is finally provided.

Table 7. Identification of the partners involved for each stage of the Mediterranean HYBUILD system life cycle

		A1-A3 stages	A4-A5 stages	B4 stage	C1 stage	C2 stage	C3 stage	C4 stage
Stages								
Components	DC-bus	CSEM	Fresnex, External Partner 1, COMSA	Fahrenheit, External Partner 1, External Partner 2	External Partner 2	External Partner 2, External Partner 3	External Partner 3	External Partner 3
	Master controller	ENG						
	Batteries	Toshiba						
	Low temperature latent heat thermal energy storage	AKG						
	Solar field of Fresnel collectors	FRESNEX						
	Heat pump	DAIKIN						
	Sorption storage (sorption module + evaporator condenser)	FAHR						
	Sensible heat storage (decentralized tank)	PINK						

Once the aim of the S-LCA and the involved actors are identified, the inventory and the impact assessment can start.

3.1 S-LCA Impact Assessment

The Social Life Cycle Assessment is based on the social data related to the involved companies and stakeholders. The data gathering has been performed with the help of the S-LCA questionnaires developed within the HYBUILD project and shown in Section 2.2. The questionnaires include a list of questions derived from the social indicators reported in each subcategory methodological sheet [2]. The questionnaires were sent for compilation to the partners involved in each stage of the HYBUILD system life cycle. Partners internal and external to the HYBUILD project provided their replies. In some cases, a 1-to-1 meeting was needed to help the partners in the data collection, in order to clarify the scope and the content of some requested info. General data have also been collected for the countries where the involved companies work, considering the indicators listed in Section 2.2.

The S-LCA Impact Assessment is the final stage of a Social Life Cycle Assessment. It is performed according to the methodology explained in section 2.1. Moreover, the analysis is performed for all the twelve companies indicated in Table 7.

In order to guarantee the confidentiality pledged between Stress S.c.ar.l. and the involved companies, the questionnaires replies are not provided; furthermore, when the S-LCA results are given for each company, the latter is renamed as "internal partner_ID" or "external partner_ID".

In the present section, for the sake of brevity, a couple of S-LCA impact assessments are provided. In particular, the assessment is explained for two out of twelve companies involved in

the Mediterranean HYBUILD system life cycle. All the IAs are provided in the Annex section, at page 63.

3.1.1 Impact Assessment of an Internal Partner

As reported in section 2.1, the S-LCA IA is performed by firstly doing a Performance Assessment of the company under analysis. Indeed, at each indicator, referred to each subcategory, collected during the inventory stage, a value from 1 (very good) to 6 (very bad) is assigned according to the Performance Reference Points (PRP). The score assigned to the subcategory is the average of the indicators values, in case the difference between the average value and maximum value among these indicators is minor/equal to one, otherwise is equal to maximum value less one. From the PA of each subcategory, the impact assessment is performed, considering six social impact categories (Working Condition, WC; Health and Safety, HS; Human Rights, HR; Socio-economic repercussions, SER; Indigenous rights including cultural heritage, IR; Governance, G), the relationship criteria between Subcategories and Impact Categories, described in Table 2, their correlation (Table 1) and the conversion rules from PA to IA (Table 3).

For the Internal Partner, this process leads to the following results (Table 8). The violet background of some indicators specifies the general data, i.e. that the information comes from national data, and not from the company data.

Table 8. S-LCA analysis of one Internal Partner included in the Mediterranean HYBUILD system life-cycle

Subcategories	Indicators	Inventory	PA	Impact Categories						IA	TOTAL STAKEHOLDER	TOT
				WC	HS	HR	SER	IR	G			
Local employment	Unemployment Statistics by Country	1	4	✓	(✓)	(✓)	✓	✓	✓	4	3	3
	Poverty and Working Poverty by Country	1										
	Percentage of workforce hired locally	-										
	Strength of policies on local hiring preferences (organization-specific indicator)	3										
	Presence of policies on spending on locally-based suppliers	3										
	Percentage on spending on locally-based suppliers	5										
Safe and healthy living conditions	Burden of Disease by Country	1	3	✓	✓	✓	✓	(✓)	(✓)	3		
	Pollution Levels by Country	1										
	Does the organization measure air/water/earth pollution?	1										
	Presence/Strength of Laws on Construction Safety Regulations	1										
	Management oversight of structural integrity	-										
	Organization efforts to strengthen community health (e.g. through shared community access to organization health resources)	4										

	Management effort to minimize use of hazardous substances	1										30	
Secure living conditions	Strength of Public Security in Country of operation	2	2	(✓)	✓	✓	(✓)	(✓)	(✓)	2			
	Management policies related to private security personnel	3											
	Number of legal complaints per year occurred against the organization with regard to security concerns	1											
	Number of causalities and injuries per year ascribed to the organization	1											
Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	1	1	✓	✓	✓	✓	-	✓	1			
	Employee awareness of the importance of compliance with competition legislation and fair competition	1											
	Legal actions pending or completed during the reporting period regarding anti-competitive behaviour and violations of anti-trust and monopoly legislation in which the reporting organization has been identified as a participant	1											
Respect of intellectual property rights	Organization's policy and practice with regards to the respect of intellectual property rights	1	1	(✓)	-	-	✓	-	✓	2			
Supplier relationships	Absence of coercive communication with suppliers	1	2	(✓)	(✓)	(✓)	✓	-	✓	2	3		
	Sufficient lead time	3											
	Reasonable volume fluctuations	2											
	Payments on time to suppliers	1											
Promoting social responsibility	Industry codes of conduct in the sector	1	4	✓	✓	✓	(✓)	(✓)	✓	4			
	Presence of an explicit code of conduct that protect human rights of workers among suppliers	1											
	Percentage of suppliers that the organization has audited with regard to social responsibility along the supply chain	1											
	Membership in initiatives that promotes social responsibility along the supply chain	5											
	Integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures	1											

Category	Criterion	Weight										
	Support to suppliers in terms of consciousness-raising and counselling concerning the social responsibility issues	5										31
Freedom of association & collective bargaining	Evidence of Country non-respect or support to Freedom of association and Collective bargaining	1	1	✓	✓	✓	✓	✓	✓	1		
	Presence of unions within the organization is adequately supported	1										
	Workers are free to join unions of their choosing	1										
	Employee/union representatives are invited to contribute to planning of larger changes in the company, which will affect the working conditions	1										
	Workers have access to a neutral, binding and independent dispute resolution procedure	1										
Child labour	Percentage of children working by country and sector	1	1	✓	✓	✓	✓	✓	✓	1		
	Absence of working children under the legal age or 15 years old	1										
	Children are not performing work during the night	1										
	Records on all workers, stating names, ages and date of birth are kept on file	1									3	
Fair salary	Minimum wage by country	1	1	✓	(✓)	✓	✓	-	✓	1		
	Percentage of workers receiving the lowest paid	1										
	The lowest paid workers are considering their wages meets their needs	-										
	Presence of suspicious deductions on wages	1										
	Regular and documented payment of workers	1										
Working hours	Maximum number of working hours	1	1	✓	✓	✓	✓	✓	✓	1		
	Number of hours effectively worked by employees (at each level of employment)	1										
	Number of holidays effectively used by employees (at each level of employment)	1										
	Respect of contractual agreements concerning overtime	1										
	Clear communication of working hours and overtime arrangements	1										
	The organization provides flexibility	1										

Category	Indicator											
Forced labour	Percentage (estimate) of forced labour by region	2										
	Workers voluntarily agree upon employment terms	1										
	Employment contracts are comprehensible to the workers and are kept on file	1										
	Employment contracts stipulate wage, working time, holidays and terms of resignation	1										
	Birth certificate, passport, identity card, work permit or other original documents belonging to workers are not retained or kept for safety reasons by the organization	1	2	✓	✓	✓	✓	✓	✓	1		
	Workers are free to terminate their employment within the prevailing limits	1										
	Workers are bonded by debts exceeding legal limits to the employer	1										
Equal opportunities/ discrimination	Women in the Labour force participation rate by country	2										
	Country gender index ranking	2										
	Presence of formal policies on equal opportunities	1										
	Announcement of open positions happen through national/regional newspapers, public job databases on internet, employment services or other publicly available media ensuring a broad announcement	1	2	✓	✓	✓	✓	✓	✓	1		
	Total numbers of incidents of discrimination and actions taken	1										
	Composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity	2										
	Ratio of basic salary of men to women by employee category	1										
Health and safety	Occupational accident rate by country	5										
	Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	1	4	✓	✓	✓	✓	-	✓	4		
	Presence of a formal policy concerning health and safety	1										
	Adequate general occupational safety measures are taken	1										
	Preventive measures and emergency protocols exist regarding accidents & injuries	1										

Category	Indicator	Weight										
	Preventive measures and emergency protocols exist regarding pesticides and chemical exposure	1										33
	Appropriate protective gear required in all applicable situation present	1										
	Number of occupational safety and health administration violations reported within the past 3 years and status of violations	-										
	Education, training, counselling, prevention and risk control programs in place to assist workforce members, their families or community members regarding serious diseases	1										
Social benefits/social security	Social security expenditure by country and branches of social security (e.g. healthcare, sickness, maternity)	2	2	✓	✓	✓	✓	✓	(✓)	1		
	List and provide short description of social benefits provided to the workers (e.g. health insurance, pension fund, child care, education, accommodation etc.)	2										
	Evidence of violations of obligations to workers under labour or social security laws and employment regulations.	1										
	Percentage of permanent workers receiving paid time-off	1										
Public commitments to sustainable issues	Presence of publicly available documents as promises or agreements on sustainability issues	2	2	(✓)	(✓)	-	(✓)	-	✓	2	3	
	Complaints issued related to the non-fulfilment of promises or agreements by the organization by the local community or other stakeholders	1										
	Presence of mechanisms to follow-up the realisation of promises	1										
Technology development	Sector efforts in technology development	-	3	✓	✓	(✓)	✓	-	✓	3		
	Involvement in technology transfer program or projects	4										
	Partnerships in research and development	1										
	Investments in technology development/ technology transfer	1										

From these results, it can be underlined that the Internal Partner has a medium interest towards the **Local Community**. Indeed, if, from one side, the secure living conditions of the local community are guaranteed, in terms of absence of legal complaints occurred against the organization with regard to security concerns and no causalities and injuries ascribed to the organization; on the other side, very few efforts are made to strengthen community health and, regarding the local employment, no policies on local hiring are present and the percentage on spending on locally-based suppliers is very low, being equal to around 10%.

With regards to the **Value Chain Actors**, the company behaviour is good in terms of fair competition (policies are in place to prevent engaging in or being complicit in anticompetitive behaviour; the employees are regularly trained regarding the importance of compliance with competition legislation and fair competition); respect of intellectual property rights though the presence of policies and practices; supplier relationships, being coercive communication with suppliers absent, lead time sufficient, volume fluctuations reasonable and payment to suppliers on time. Nevertheless, the organization has a variable interest in terms of the promotion of social responsibility; indeed, even if an explicit code of conduct that protect human rights of workers among suppliers exists and the suppliers are suppliers audited with regard to social responsibility, no initiatives that promotes social responsibility along the supply chain are organized.

The interest of the Internal Partner with respect to the **Workers** is very high. Freedom of association and collective bargaining is guaranteed, child labour and forced labour are forbidden, the salary is fair, since no suspicious deductions on wages are present and payments are regular and documented, the working hours is fair, since it is equal to 40 hours/week, the number of holidays per year is adequate, the contractual agreements concerning overtime are respected, the communication of working hours and overtime arrangements is clear and the flexibility is provided. Moreover, regarding the equal opportunities, the organization has formal policies, the open positions happen through national/regional newspapers, public job databases on internet or available media and the salary is not depending on the gender but on the qualification; and regarding the social benefits, the organization has health insurance, payment during illness, 30 days of vacation, pension plan options and clearly defined payments per job category. Finally, health and safety are also guaranteed for the employees because no fatal accidents occurred, a formal policy concerning health and safety is present, adequate general occupational safety measures are taken, appropriate protective gear required in all applicable situations are present and education, training, counselling, prevention and risk control programs are in place to assist workforce members, their families or community members regarding serious diseases. Regarding this subcategory, the orange score, meaning a performance equal to 4, is due to the national general data regarding the occupational accident rate; indeed, in the country where the Internal Partner works, yearly fatal and non-fatal accidents are high with respect to the population.

As regards the **Society**, the behaviour of the Internal Partner is good. Indeed, the public commitments to sustainable issues is guaranteed by the company's Code of Conduct; moreover, no complaints related to the non-fulfilment of promises or agreements by the organization by the local community or other stakeholders happened and mechanisms to follow-up the realization of promises are present. Regarding the technology development matter, the company has partnerships in research and development, such as cooperation with various

universities and research centres and funded projects, and invests in technology development; nevertheless, the technology transfer is allowed only within the company.

Following the methodology, from the PA evaluated for each subcategory and each stakeholder, it derives that <u>the total Impact Assessment IA of Internal Partner is equal to **3 (Indifferent effect**) on a scale ranging from 1 (positive effect) to 6 (very negative effect)</u>.

3.1.2   *Impact Assessment of an External Partner*

Following the process described in Sections 2.1 and 3.1.1, for the External Partner the results are reported in Table 9. Also in this case, the violet background of some indicators specifies the general data, i.e. that the information comes from national data, and not from the company data.

Table 9. S-LCA analysis of one External Partner included in the Mediterranean HYBUILD system life-cycle

Subcategories	Indicators	Inventory	PA	WC	HS	HR	SER	IR	G	IA	TOTAL STAKEHOLDER	TOT
Delocalization and Migration	International Migrants as a Percentage of Population	2	2	✓	(✓)	(✓)	✓	✓	(✓)	1	4	3
	Direct or indirect contribution of the organization to migration of individuals	1										
Community engagement	Public Trust on Politicians	5	4	(✓)	✓	(✓)	✓	(✓)	✓	5		
	Organizational support (volunteer-hours or financial) for community initiatives	1										
	Collaboration with community stakeholders	1										
Cultural heritage	Policies in place to protect cultural heritage and/or programs to include cultural heritage expression in the product design/production	1	1	-	-	(✓)	✓	✓	✓	1		
	Respect of cultural customs and traditions	1										
Local employment	Unemployment Statistics by Country	2	2	✓	(✓)	(✓)	✓	✓	✓	1		
	Poverty and Working Poverty by Country	1										
	Strength of policies on local hiring preferences (organization-specific indicator)	1										
	Contribution to the reduction of local unemployment	1										
Access to immaterial resources	Patent Filings	3	2	(✓)	(✓)	✓	✓	(✓)	✓	1		
	Guarantee freedom of expression of the local community	1										

Category	Indicator	Weight	Score							Score	
Access to material resources	Has the organization caused infrastructures improvements (e.g. roadways, waste disposal systems) having long term effects?	5	4	-	(✓)	✓	✓	✓	(✓)	4	
	Commitment in minimizing the resources consumption	1									
Safe and healthy living conditions	Burden of Disease by Country	1	2	✓	✓	✓	✓	(✓)	(✓)	1	
	Pollution Levels by Country	3									
	Commitment in strengthening community health and minimise the environmental pollution	1									
	Presence of policies/regulations for safety	1									
Secure living conditions	Strength of Public Security in Country of operation	3	2	(✓)	✓	✓	(✓)	(✓)	(✓)	2	
	Number of causalities and injuries per year ascribed to the organization	1									
Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	1	1	✓	✓	✓	✓	-	✓	1	
	Employee awareness of the importance of compliance with competition legislation and fair competition	1									
Supplier relationships	Mutual co-operation with the suppliers	1	1	(✓)	(✓)	(✓)	✓	-	✓	1	1
	Fair behaviour with the suppliers (absence of coercive communication, sufficient lead time, reasonable volume fluctuation, payments on time)	1									
Promoting social responsibility	Presence of an explicit code of conduct that protect human rights of workers among suppliers	1	2	✓	✓	✓	(✓)	(✓)	✓	1	
	Percentage of suppliers that the organization has audited with regard to social responsibility along the supply chain	2									
	Integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures	1									
Health and safety	Presence of consumer complaints (at national, sectorial, organizational level)	1	1	-	✓	(✓)	✓	-	✓	1	2

Category	Indicator	Weight	Score							Score
	Quality of or number of information/signs on product health and safety	1								
	Presence of management measures to assess costumer health and safety	1								
Feedback mechanism	Presence of a mechanism for customers to provide feedback	1	1	(✓)	(✓)	✓	✓	-	✓	1
	Practices related to customer satisfaction, including results of surveys measuring customer satisfaction	1								
Consumer privacy	Country ranking related to regulations on data-sharing	2	2	-	-	✓	(✓)	-	✓	2
	Strength of internal management system to protect consumer privacy	1								
	Number of consumer complains related to breach of privacy or loss of data within the last year	1								
Transparency	Presence of a law or norm regarding transparency	1	1	(✓)	✓	✓	✓	(✓)	✓	1
	Clear information to enable the consumer choice (e.g. presence of product certifications/labels, publication of annual sustainable reports, communication of results of social and environmental life cycle impact assessment)	1								
	Communications regarding the product and social responsibility in a transparent way	1								
End-of-Life Responsibility	Presence of systems for the product take back	2	2	✓	✓	✓	✓	✓	✓	1
Freedom of association & collective bargaining	Evidence of Country non-respect or support to Freedom of association and Collective bargaining	1	1	✓	✓	✓	✓	✓	✓	1
	Evidence of restriction to freedom of association and collective bargaining	1								
	Workers are free to join unions of their choosing and the presence of unions within the organization is adequately supported	2								
Child labour	Percentage of children working by country and sector	1	1	✓	✓	✓	✓	✓	✓	1
	Absence of working children under the legal age or 15 years old	1								
Fair salary	Living Wages	2	2	✓	(✓)	✓	✓	-	✓	1
	Presence of suspicious deductions on wages	1								

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Category	Indicator	Value	Score							Score		
	Regular and documented payment of workers	1										
	Guarantee that wage levels ensure a decent standard of living	1										
Working hours	Maximum number of working hours	1	1	✓	✓	✓	✓	-	✓	1		
	Number of holidays effectively used by employees (at each level of employment)	1										
	Maximum number of hours worked by employees and possible difference with the maximum number of hours effectively worked	1										
Forced labour	Percentage (estimate) of forced labour by region	2	2	✓	✓	✓	✓	✓	✓	1		
	Employment contracts stipulate wage, working time, holidays and terms of resignation	1										
	Workers voluntarily agree upon employment terms and are free to terminate their employment within the prevailing limits	1										
Equal opportunities/ discrimination	Women in the Labour force participation rate by country	4	4	✓	✓	✓	✓	✓	✓	5		
	Country gender index ranking	2										
	Presence of formal policies on equal opportunities	5										
	Composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity	4										
	Absence of any kinds of discrimination	1										
Health and safety	Occupational accident rate by country	3	2	✓	✓	✓	✓	-	✓	1		
	Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	1										
	Adequate management system for health and safety, so that the risk of workers is low	1										
Social benefits/social security	Social security expenditure by country and branches of social security (e.g. healthcare, sickness, maternity)	2	4	✓	✓	✓	✓	✓	(✓)	5		
	List and provide short description of social benefits provided to the workers (e.g. health insurance, pension fund, child care, education, accommodation etc.)	5										

Category	Subcategory												
Public commitments to sustainable issues	Presence of publicly available documents as promises or agreements on sustainability issues	5	5	(✓)	(✓)	-	(✓)	-	✓	5		4	
	Presence of mechanisms to follow-up the realisation of promises	5											
Contribution to Economic Development	Economic situation of the country/region (GDP, economic growth, unemployment, …)	4	3	✓	(✓)	(✓)	✓	(✓)	✓	3			
	Contribution to the local economic progress, through different aspects (e.g. payment of wages, purchase of raw materials and supplies, investments, …)	1											
Corruption	Risk of corruption in the country and/or sub-region	3	4	✓	✓	✓	✓	✓	✓	5			
	Formalized commitment of the organization to prevent corruption/presence of an anti-corruption program	5											
	Involvement in cases of corruption	1											
Technology development	Involvement in technology transfer program or projects	1	1	✓	✓	(✓)	✓	-	✓	1			
	Engagement in the development of efficient and environmental sound technologies	1											
	Investments in technology development/technology transfer	1											

From these results, it can be underlined that the External Partner has a medium interest towards the **Local Community**. Indeed, it does not contribute to the delocalization and migration of individuals; cultural heritage is respected through the presence of policies and programs taking into account the local use, culture and traditions; local employment is always preferred, when suitable. Regarding the access to immaterial resources, the company guarantees freedom of expression of the local community. Moreover, it is committed in strengthening community health and minimize the environmental pollution by installing systems with high energy efficiency and low emissions fuels, for the production of thermal and electric energy; and policies/regulations for safety are present, e.g. the air pollution is measured by monitoring the emissions of the energy production systems. Regarding the Health and Safety, no causalities and injuries are ascribed to the organization. On the other hand, some subcategories provide a worse contribution to the overall stakeholder category. Indeed, regarding the community engagement, from one hand the company supports the local initiatives and collaborates with community stakeholders by promoting them with the local authorities, with the aim at the energetic savings; but, on the other hand, in the country where the company works, the public trust on politicians is very low. This leads to a score equal to 4 for the subcategory "community engagement". The score is equal to 4 also for the subcategory "access to material resources" because, even if the company is committed in minimizing the resources consumption, it does not contribute to the improvements of the used infrastructures.

Regarding the **Value Chain Actors**, the company behaviour is very good in terms of fair competition, since policies are in place to prevent engaging in or being complicit in anticompetitive behaviour and the employees are aware of the importance of compliance with competition legislation and fair competition; supplier relationships, being the behaviour with the suppliers fair (meaning absence of coercive communication, sufficient lead time, reasonable volume fluctuations and on time payments); and social responsibility promotion, given the presence of an explicit code of conduct that protect human rights of workers among suppliers, the suppliers audits planning the with regard to social responsibility along the supply chain and the integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures.

With regards to the **Consumers**, the contribution to the overall S-LCA study is good. Indeed, regarding health and safety, the organization provides informative material for communication on health and safety of products; moreover, management measures to assess costumer health and safety are present. Mechanisms for customers to provide feedback are available and practices related to customer satisfaction are present. Consumer privacy is guaranteed, both at national and company levels, as well as transparency (information to enable the consumer choice is clear and communications regarding the product and social responsibility is done in a transparent way).

The interest of the External Partner with respect to the **Workers** is variable. Indeed, just few subcategories provide not a good behaviour, such as the "equal opportunities/discrimination", because no particular formal policies on equal opportunities are present and the number of female workers is very low (10% of the total employees); and the "social benefits/social security", because no particular social benefit are provided. On the other hand, freedom of association & collective bargaining is guaranteed, child labour and forced labour are absent, salary is fair (no suspicious deductions on wages are present, payments of workers are regular and documented, wage levels ensure a decent standard of living), working hours are fair (48 hours per week, 26 days of holiday per year, maximum number of hours worked by employees in line with the legislation).

Finally, with regards to the **Society**, the contribution to the overall S-LCA is equal to 4 (in a scale from 1-good to 6-bad). Indeed, from one side, the company has interest in the technology development, through the involvement in research and development projects with the national and regional authorities regarding the energy efficiency and the green chemistry and the investments in technology development/ technology transfer. Nevertheless, public commitments to sustainable issues are not present, a formalized commitment of the company to prevent corruption/presence of an anti-corruption program is not present and also the perceived level of national public sector corruption is quite high. Moreover, even if the company contributes to the local economic progress, the economic situation of the country is weak.

Following the methodology, from the PA evaluated for each subcategory and each stakeholder, it derives that the total Impact Assessment IA of External Partner is equal to **3 (Indifferent effect)** on a scale from 1 (positive effect) to 6 (very negative effect).

3.2 Results and recommendations

The previous two subsections (Sections 3.1.1 and 3.1.2) show how the assessment has been performed for each company involved in one or more HYBUILD system life cycle stage(s). Once the Performance Assessment and the Impact Assessment are performed for all the companies indicated in Table 7, firstly, an average is evaluated for each life cycle stage, and, finally, the overall IA of the Mediterranean HYBUILD system can be evaluated as the total average.

Therefore, the **Total Social Impact** evaluated for the **Mediterranean HYBUILD** system is **4.06**, on a scale from 1 (positive effect) to 6 (very negative effect), as reported in Table 10**.**

Table 10. Social Impact of the Mediterranean HYBUILD system

S-LCA Results - Mediterranean HYBUILD system								
		A1-A3	A4-A5	B4	C1	C2	C3	C4
Components	DC-Bus							
	Master controller							
	Batteries							
	Low temperature latent heat thermal energy storage	3.25	3.33	3.33	4	4.5	5	5
	Solar field of Fresnel collectors							
	Heat pump							
	Sorption storage (sorption module + evaporator condenser)							
	Sensible heat storage (decentralized PINK tank)							
TOTAL Social Impact				**4.06**				

The results indicate that the Mediterranean HYBUILD system has a lightly negative effect, it can still be socially accepted, but some social improvements are needed.

In particular, in the initial life cycle stages of the HYBUILD system (production of the system components, installation and the use), the social aspects are taken in consideration more than in the End-of-Life stages (deconstruction, transport of the component to waste processing, waste processing, disposal). The latter, indeed, contribute to the behaviour social worsening of the entire system life cycle.

In particular, in the production stage, the average of the impacts related to the single stakeholders is around 3 for all the considered components. This means that the social behaviour is almost equal with respect to the stakeholders categories. This is not completely true for the other stages, where, on average, the behaviour towards the Value Chain Actors is always better than the behaviour towards the other stakeholder categories. The highest contribution to the S-LCA impacts in the EoL stages is therefore related to the other stakeholder categories: local community, consumers, workers, society.

It is also important to underline that the companies involved in the EoL stages are not within the HYBUILD consortium; therefore, the overall social impacts could be enhanced involving other different companies in the End-of-Life Stages.

4   Social Life Cycle Assessment of Continental HYBUILD System

Similarly, the S-LCA methodology has also been applied to the Continental HYBUILD systems.

The S-LCA starts with the definition of the goal and the scope of the assessment. The topic of the assessment is the Continental HYBUILD system developed in WP2 and WP3 and shown in the deliverable D4.2. The system is schematized in Figure 9 and the components are the following:

➢ High temperature latent thermal energy storage.
➢ Electrical storage, DC system controller.
➢ Compression DC-driven chiller.
➢ Sensible heat storage (decentralized PINK tank).
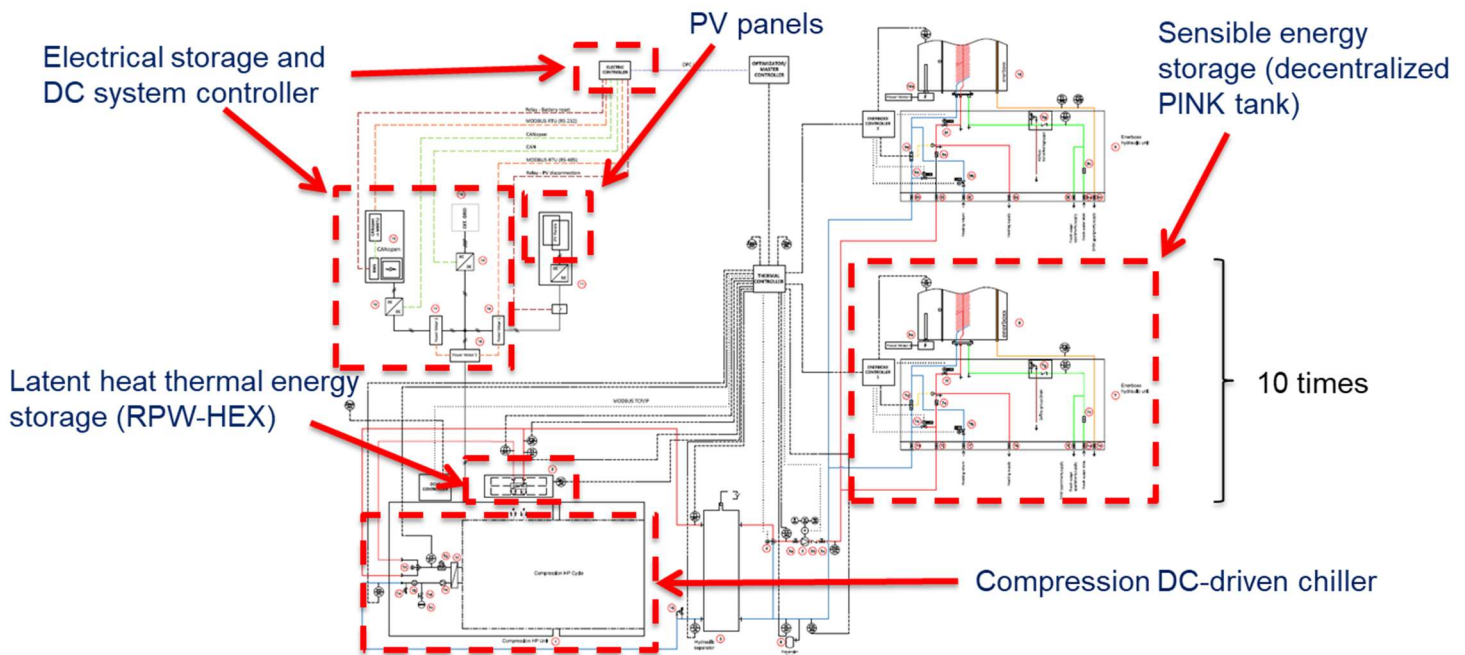
Figure 9. Components of Continental HYBUILD system

As for the Mediterranean system, the life cycle stages to be included in the analysis and referred to the EN 15978 [7], are the following:

- A1-A3 stages, i.e. the production of each system components.
- A4-A5 stages, i.e. the transport from production site to installation site and the Installation.
- B4 stage, i.e. the components replacement.
- C1-C4 stages, i.e. the component deconstruction, its transport of the component to waste processing, the waste processing and, finally, the disposal.

For each of the life-cycle stages above listed, the companies involved are identified. For the A1-A3 stage, the related HYBUILD consortium partner responsible is chosen. For the other life cycle stages, if one or more of the HYBUILD partners are involved in these stages, they are taken in consideration; if not, partners external to the consortium are identified and included in the S-LCA. Indeed, since no companies inside the HYBUILD consortium are in charge of performing the end of life stages of the system (or components) life-cycle, partners outside the consortium have been contacted.

Table 11 reports the identification of the involved companies. The social impacts are evaluated for each company included in the table and an average overall score is finally provided.

Table 11. Identification of the partners involved for each stage of the Continental HYBUILD system life cycle

		A1-A3 stages	A4-A5 stages	B4 stage	C1 stage	C2 stage	C3 stage	C4 stage
					Stages			
Components	DC-bus	CSEM						
	Compression DC-driven Chiller – Heat Pump	OCHNER						
	Master controller	ENG	External Partner 1, COMSA	External Partner 1, External Partner 2	External Partner 2	External Partner 2, External Partner 3	External Partner 3	External Partner 3
	Batteries	Toshiba						
	High temperature latent heat thermal energy storage	AKG						
	Sensible heat storage (decentralized PINK tank)	PINK						

Starting from the identification of the involved actors, the inventory, i.e. the social data gathering, and the impact assessment can be performed.

4.1 S-LCA Impact Assessment

As previously stated, the Social Life Cycle Assessment is based on the social data related to the involved companies and stakeholders. The inventory has been performed in parallel for the two HYBUILD systems. This means that, even if some different partners have been involved in the social life cycle assessment, same questionnaires have been sent in order to collect the social data. The data gathering and the questions asked are described in section 2.2.

The S-LCA Impact Assessment is the final stage of a Social Life Cycle Assessment, performed according to the methodology explained in section 2.1. For the Continental HYBUILD system, the analysis is performed for all the ten companies indicated in Table 11.

In order to guarantee the confidentiality pledged between Stress S.c.ar.l. and the involved companies, the questionnaires replies are not provided; furthermore, when the S-LCA results are given for each company, the latter is renamed as "internal partner_ID" or "external partner_ID".

Also in the present section, for the sake of brevity, a couple of S-LCA impact assessments are provided; indeed, the assessment is explained for two out of ten companies involved in the Continental HYBUILD system life cycle. All the IAs are provided in the Annex section, at page 63. One internal and one external partners are considered for the S-LCA of the Continental systems.

4.1.1 Impact Assessment of an Internal Partner

Following the process described in Section 2, and the previous examples described and analysed at the Sections 3.1.1 and 3.1.2, one internal partner involved in the life-cycle of the Continental HYBUILD systems is analysed hereafter. S-LCA results are reported in Table 12. Also in this case, the violet background of some indicators specifies the general data, i.e. that the information comes from national data, and not from the company data.

Table 12. S-LCA analysis of one Internal Partner included in the Continental HYBUILD system life-cycle

Subcategories	Indicators	Inventory	PA	Impact Categories						IA	TOTAL STAKEHOLDER	TOT
				WC	HS	HR	SER	IR	G			
Delocalization and Migration	International Migrants as a Percentage of Population	3	4	✓	(✓)	(✓)	✓	✓	(✓)	4	5	4
	Direct or indirect contribution of the organization to migration of individuals	4										
Community engagement	Public Trust on Politicians	2	5	(✓)	✓	(✓)	✓	(✓)	✓	6		
	Number of meetings with community stakeholders	6										
	Organizational support (volunteer-hours or financial) for community initiatives	1										
Local employment	Unemployment Statistics by Country	1	2	✓	(✓)	(✓)	✓	✓	✓	1		
	Poverty and Working Poverty by Country	1										
	Percentage of workforce hired locally	1										
	Strength of policies on local hiring preferences (organization-specific indicator)	2										
	Presence of policies on spending on locally-based suppliers	2										
	Percentage on spending on locally-based suppliers	3										
Access to immaterial resources	Patent Filings	1	1	(✓)	(✓)	✓	✓	(✓)	✓	1		
	Annual arrests connected to protests of organization actions	1										
Access to material resources	Strength of organizational risk assessment with regard to potential for material resource conflict	5	4	-	(✓)	✓	✓	✓	(✓)	4		
	Does the organization engage with local community over sustainable methods for sharing resources?	1										
	Does the organization have a certified environmental management system	2										
	Has the organization caused infrastructures improvements (e.g. roadways, waste disposal systems) having long term effects?	2										
Safe and healthy living conditions	Burden of Disease by Country	1	1	✓	✓	✓	✓	(✓)	(✓)	1		
	Pollution Levels by Country	1										
Secure living conditions	Strength of Public Security in Country of operation	1	1	(✓)	✓	✓	(✓)	(✓)	(✓)	1		
	Management policies related to private security personnel	1										

Category	Indicator	Score	Agg1							Agg2	Total
	Number of legal complaints per year occurred against the organization with regard to security concerns	1	(green)							(green)	5
Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	5	4	✓	✓	✓	✓	-	✓	4	5
	Employee awareness of the importance of compliance with competition legislation and fair competition	1									
	Legal actions pending or completed during the reporting period regarding anti-competitive behaviour and violations of anti-trust and monopoly legislation in which the reporting organization has been identified as a participant	1									
Supplier relationships	Payments on time to suppliers	1	1	(✓)	(✓)	(✓)	✓	-	✓	1	
Promoting social responsibility	Presence of an explicit code of conduct that protect human rights of workers among suppliers	5	5	✓	✓	✓	(✓)	(✓)	✓	6	
Health and safety	Presence of consumer complaints (at national, sectorial, organizational level)	1	1	-	✓	(✓)	✓	-	✓	1	
	Presence of consumer complaints (at national, sectorial, organizational level)	1									
	Presence of management measures to assess costumer health and safety	1									
	Presence of labels of health and safety requirements	1									
Feedback mechanism	Presence of a mechanism for customers to provide feedback	1	1	(✓)	(✓)	✓	✓	-	✓	1	
	Management measures to improve feedback mechanisms	1									
Consumer privacy	Country ranking related to regulations on data-sharing	1	1	-	-	✓	(✓)	-	✓	1	4
	Number of consumer complains related to breach of privacy or loss of data within the last year	1									
	Number of complaints by regulatory bodies related to breach on consumer privacy or loss of data within the last year	1									
Transparency	Presence of a law or norm regarding transparency	1	4	(✓)	✓	✓	✓	(✓)	✓	5	
	Non-compliance with regulations regarding transparency	1									
	Consumers complaints regarding transparency	1									
	Publication of a sustainability report	5									

Category	Indicator												
	Communication of the results of social and environmental life cycle impact assessment	5											
	Certifications/labels the organization obtained for the product under investigation	3											
End-of-Life Responsibility	Do internal management systems ensure that clear information is provided to consumers on end-of-life options?	1	1	✓	✓	✓	✓	✓	✓	1		
	Annual incidents of non-compliance with regulatory labelling requirements in one year?	1										
Freedom of association & collective bargaining	Evidence of Country non-respect or support to Freedom of association and Collective bargaining	1										
	Presence of unions within the organization is adequately supported	1										
	Workers are free to join unions of their choosing	1	4	✓	✓	✓	✓	✓	✓	5		
	Employee/union representatives are invited to contribute to planning of larger changes in the company, which will affect the working conditions	5										
	Workers have access to a neutral, binding and independent dispute resolution procedure	1										
Fair salary	Living Wages	1										
	Minimum wage by country	1										
	Percentage of workers receiving the lowest paid	1									5	
	The lowest paid workers are considering their wages meets their needs	1	1	✓	(✓)	✓	✓	-	✓	1		
	Presence of suspicious deductions on wages	1										
	Regular and documented payment of workers	1										
Working hours	Maximum number of working hours	1										
	Number of hours effectively worked by employees (at each level of employment)	1										
	Number of holidays effectively used by employees (at each level of employment)	1	1	✓	✓	✓	✓	-	✓	1		
	Respect of contractual agreements concerning overtime	1										
	Clear communication of working hours and overtime arrangements	1										

Category	Indicator		Score							Score		
	The organization provides flexibility	1										
Forced labour	Percentage (estimate) of forced labour by region	2										
	Workers voluntarily agree upon employment terms	1										
	Employment contracts are comprehensible to the workers and are kept on file	1										
	Employment contracts stipulate wage, working time, holidays and terms of resignation	1	1	✓	✓	✓	✓	✓	✓	1		
	Birth certificate, passport, identity card, work permit or other original documents belonging to workers are not retained or kept for safety reasons by the organization	1										
	Workers are free to terminate their employment within the prevailing limits	1										
	Workers are bonded by debts exceeding legal limits to the employer	1										
Equal opportunities/ discrimination	Women in the Labour force participation rate by country	2										
	Country gender index ranking	2										
	Presence of formal policies on equal opportunities	5	4	✓	✓	✓	✓	✓	✓	5		
	Announcement of open positions happen through national/regional newspapers, public job databases on internet, employment services or other publicly available media ensuring a broad announcement	1										
	Total numbers of incidents of discrimination and actions taken	1										
	Ratio of basic salary of men to women by employee category	1										
Health and safety	Occupational accident rate by country	5										
	Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	4										
	Presence of a formal policy concerning health and safety	1	4	✓	✓	✓	✓	-	✓	4		
	Adequate general occupational safety measures are taken	1										
	Preventive measures and emergency protocols exist regarding accidents & injuries	1										
	Preventive measures and emergency protocols exist	1										

Category	Indicator										
	regarding pesticides and chemical exposure										
	Appropriate protective gear required in all applicable situation present	1									
	Number of occupational safety and health administration violations reported within the past 3 years and status of violations	4									
	Education, training, counselling, prevention and risk control programs in place to assist workforce members, their families or community members regarding serious diseases	1									
Social benefits/social security	Social security expenditure by country and branches of social security (e.g. healthcare, sickness, maternity)	2	2	✓	✓	✓	✓	✓	(✓)	1	
	List and provide short description of social benefits provided to the workers (e.g. health insurance, pension fund, child care, education, accommodation etc.)	2									
	Evidence of violations of obligations to workers under labour or social security laws and employment regulations.	1									
	Percentage of permanent workers receiving paid time-off	1									
Public commitments to sustainable issues	Presence of publicly available documents as promises or agreements on sustainability issues	-	1	(✓)	(✓)	-	(✓)	-	✓	1	
	Complaints issued related to the non-fulfilment of promises or agreements by the organization by the local community or other stakeholders	1									
Contribution to Economic Development	Economic situation of the country/region (GDP, economic growth, unemployment, …)	1	1	✓	(✓)	(✓)	✓	(✓)	✓	1	1
	Contribution of the organization to the economic progress	1									
Technology development	Partnerships in research and development	1	1	✓	✓	(✓)	✓	-	✓	1	
	Investments in technology development/technology transfer	1									

From these results, it can be underlined that, regarding the **Local Community**, the behaviour is quite variable. Indeed, the Internal Partner is very interested in local employment, since around 90% of the staff comes from the nearest districts and also the percentage on spending on locally-based suppliers is high. Regarding the access to immaterial resources, no arrests connected to protests of organization actions happened and also the national number of total patents application is high when referred to the national population. Regarding the safe and healthy living conditions, no data are available from the partner, but the national data on the burden of disease and on the pollution levels are good; and regarding the secure living conditions, no legal complaints occurred against the organization with regard to security concerns, and a management policy related to private security personnel exists. On the other hand, in the community engagement the Internal Partner has a variable behaviour, given that it supports social associations and organizations, such as local fire brigades, sport clubs, hospitals, and others, but no meetings are organized with community stakeholders. With regards to the access to material resources, the Internal Partner is currently working on the ISO 14001 certification, it engages with local community over sustainable methods for sharing resources, but it does not perform a risk assessment with regard to potential for material resource conflict, even if it tries to be very resource-efficient. With respect to the delocalization and migration, the staff comes from 15 different countries, who voluntarily agree on their delocalization.

Also concerning the **Value Chain Actors**, the behaviour is quite variable. Moreover, few data could be collected. Therefore, even if the employees are aware of the importance of compliance with competition legislation and fair competition and no legal actions are pending or completed regarding anti-competitive behaviour, no documented statement or procedures to prevent engaging in or being complicit in anticompetitive behaviour exists. Nevertheless, if the company continues to grow, this is planned for the future. The suppliers relationships are good since the payments always are on time. However, an explicit code of conduct that protect human rights of workers among suppliers is not yet present, but it is planned for the future, in case the company continues to grow.

With regards to the **Consumers**, the performance of the Internal Partner is better, when compared to the previous two stakeholder categories. Indeed, for the subcategories "health and safety", "feedback mechanism", "consumer privacy" and "End-of-Life responsibility", the company behaviour is very good (no consumer complaints happened regarding the health and safety and the privacy, management measures to assess costumer health and safety are used, labels of health and safety requirements are present, mechanisms for customers to provide feedback are present, as well as management measures to improve feedback mechanisms and internal management systems ensuring that clear information is provided to consumers on end-of-life options. On the other hand, even if the company is compliant with regulations on transparency, no sustainability reports are published yet and no communication of the results of social and environmental life cycle impact assessment is made. Nevertheless, the company states that, in case of growth, these activities will be considered.

The performance of the Internal Partners with reference to the Workers is also not very good, because of some considered indicators. Indeed, salary is fair (suspicious deductions on wages are not present, workers payments are regular and documented and workers are overpaid according to the collective agreement), working hours are fair (on average, 40 hours per week, with 25-30 days of holidays effectively used by employees, possibility of flexibility, clear communication of working hours and overtime arrangements and respect of contractual

agreements concerning overtime), forced labour is absent, some social benefits are provided paid time-off, assistance of a company doctor provided. Nevertheless, regarding the equal opportunities/discrimination, even if the communication of open positions happens on media, social media and other public channels, no incidents of discrimination happened and the ratio of basic salary of men to women is fair; no formal policies on equal opportunities are present. This means that the behaviour of the company is fair, but to policies are present that can confirm it. With regards to the freedom of association & collective bargaining, the unions within the organization are present and adequately supported, workers are free to join unions of their choosing, but employee/union representatives are not invited to contribute to planning of larger changes in the company. Finally, regarding the Health and Safety, a formal policy concerning health and safety exists, adequate general occupational safety measures are taken, preventive measures and emergency protocols exist regarding accidents/injuries and regarding pesticides/chemical exposure. Nevertheless, one bigger injury happened 5 years ago, and three smaller injuries happened within the last 3 years and also the national occupational accident rate is high with respect to the national population.

Finally, with regards to the **Society**, the Internal Partner behaviour is very good. No complaints related to the non-fulfilment of promises or agreements by the organization by the local community or other stakeholders happened, the company contributes to the economic progress by paying good wages to the employees, by strongly investing in R&D, by investing for the expansion of the infrastructure at its production site. In addition, the company has partnerships in research and development and invests in technology development and technology transfer.

Following the methodology, from the PA evaluated for each subcategory and each stakeholder, it derives that the total Impact Assessment IA of the analysed Internal Partner is equal to 4 on a scale from 1 (positive effect) to 6 (very negative effect). It can be underlined that, in case the company continues its growth, the overall social performances will surely improve (e.g. policies would be developed, as well as management systems, and others).

4.1.2 Impact Assessment of an External Partner

An additional and final Impact Assessment is reported hereafter for an external partner involved in the Continental HYBUILD system life-cycle. S-LCA results are reported in Table 13. As for the previous cases, the violet background of some indicators specifies the general data, i.e. that the information comes from national data, and not from the company data.

Table 13. S-LCA analysis of one External Partner included in the Continental HYBUILD system life-cycle

Subcategories	Indicators	Inventory	PA	WC	HS	HR	SER	IR	G	IA	TOTAL STAKEHOLDER	TOT
Delocalization and Migration	International Migrants as a Percentage of Population	2	2	✓	(✓)	(✓)	✓	✓	(✓)	1	3	4
	Direct or indirect contribution of the organization to migration of individuals	1										
	Strength of organizational procedures for integrating migrant workers into the community	1										
Community engagement	Public Trust on Politicians	5	4	(✓)	✓	(✓)	✓	(✓)	✓	4		
	Organizational support (volunteer-hours or financial) for community initiatives	1										
	Collaboration with community stakeholders	1										
Cultural heritage	Policies in place to protect cultural heritage and/or programs to include cultural heritage expression in the product design/production	3	4	-	-	(✓)	✓	✓	✓	4		
	Respect of cultural customs and traditions	5										
Local employment	Unemployment Statistics by Country	2	2	✓	(✓)	(✓)	✓	✓	✓	1		
	Poverty and Working Poverty by Country	2										
	Strength of policies on local hiring preferences (organization-specific indicator)	1										
	Contribution to the reduction of local unemployment	1										
Access to immaterial resources	Patent Filings	3	2	(✓)	(✓)	✓	✓	(✓)	✓	1		
	Presence/strength of community education initiatives	1										
	Guarantee freedom of expression of the local community	1										
Access to material resources	Has the organization caused infrastructures improvements (e.g. roadways, waste disposal systems) having long term effects?	2	3	-	(✓)	✓	✓	✓	(✓)	3		
	Commitment in minimizing the resources consumption	3										

Impact Categories

Category	Indicator											
Safe and healthy living conditions	Burden of Disease by Country	1	1	✓	✓	✓	✓	(✓)	(✓)	1		52
	Pollution Levels by Country	1										
	Commitment in strengthening community health and minimise the environmental pollution	1										
	Presence of policies/regulations for safety	1										
Secure living conditions	Strength of Public Security in Country of operation	1	2	(✓)	✓	✓	(✓)	(✓)	(✓)	2		
	Management policies related to private security personnel	3										
	Number of causalities and injuries per year ascribed to the organization	1										
Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	4	3	✓	✓	✓	✓	-	✓	3		
	Employee awareness of the importance of compliance with competition legislation and fair competition	1										
Respect of intellectual property rights	Approach to general intellectual property rights and related issues associated with the economic sector	2	2	(✓)	-	-	✓	-	✓	2		
	Organization's policy and practice with regards to the respect of intellectual property rights	2										
Supplier relationships	Mutual co-operation with the suppliers	1	1	(✓)	(✓)	(✓)	✓	-	✓	1	3	
	Fair behaviour with the suppliers (absence of coercive communication, sufficient lead time, reasonable volume fluctuation, payments on time)	1										
Promoting social responsibility	Presence of an explicit code of conduct that protect human rights of workers among suppliers	3	4	✓	✓	✓	(✓)	(✓)	✓	4		
	Percentage of suppliers that the organization has audited with regard to social responsibility along the supply chain	5										
	Integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures	4										
Health and safety	Presence of consumer complaints (at national, sectorial, organizational level)	1	1	-	✓	(✓)	✓	-	✓	1	3	
	Quality of or number of information/signs on product health and safety	-										

Category	Indicator	Weight	Score							Score		
	Presence of management measures to assess costumer health and safety	1										
Feedback mechanism	Presence of a mechanism for customers to provide feedback	1	4	(✓)	(✓)	✓	✓	-	✓	4		
	Practices related to customer satisfaction, including results of surveys measuring customer satisfaction	5										
Consumer privacy	Country ranking related to regulations on data-sharing	1										
	Strength of internal management system to protect consumer privacy	1	1	-	-	✓	(✓)	-	✓	1		
	Number of consumer complains related to breach of privacy or loss of data within the last year	1										
Transparency	Presence of a law or norm regarding transparency	1										
	Clear information to enable the consumer choice (e.g. presence of product certifications/labels, publication of annual sustainable reports, communication of results of social and environmental life cycle impact assessment)	1	3	(✓)	✓	✓	✓	(✓)	✓	3		
	Communications regarding the product and social responsibility in a transparent way	4										
End-of-Life Responsibility	Do internal management systems ensure that clear information is provided to consumers on end-of-life options?	1	1	✓	✓	✓	✓	✓	✓	1		
	Presence of systems for the product take back	-										
Freedom of association & collective bargaining	Evidence of Country non-respect or support to Freedom of association and Collective bargaining	1										
	Evidence of restriction to freedom of association and collective bargaining	1	1	✓	✓	✓	✓	✓	✓	1		
	Workers are free to join unions of their choosing and the presence of unions within the organization is adequately supported	1									3	
Child labour	Percentage of children working by country and sector	1	1	✓	✓	✓	✓	✓	✓	1		
	Absence of working children under the legal age or 15 years old	1										
Fair salary	Living Wages	2										
	Minimum wage by country	2	2	✓	(✓)	✓	✓	-	✓	1		
	Presence of suspicious deductions on wages	1										

Category	Criterion	Wt										
	Regular and documented payment of workers	1									54	
	Guarantee that wage levels ensure a decent standard of living	1										
Working hours	Maximum number of working hours	2	2	✓	✓	✓	✓	-	✓	1		
	Number of holidays effectively used by employees (at each level of employment).	1										
	Maximum number of hours worked by employees and possible difference with the maximum number of hours effectively worked	2										
Forced labour	Percentage (estimate) of forced labour by region	2	2	✓	✓	✓	✓	✓	✓	1		
	Employment contracts stipulate wage, working time, holidays and terms of resignation	1										
	Workers voluntarily agree upon employment terms and are free to terminate their employment within the prevailing limits	1										
Equal opportunities/discrimination	Women in the Labour force participation rate by country	2	2	✓	✓	✓	✓	✓	✓	1		
	Country gender index ranking	2										
	Presence of formal policies on equal opportunities	1										
	Composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity	1										
	Absence of any kinds of discrimination	1										
Health and safety	Occupational accident rate by country	5	4	✓	✓	✓	✓	-	✓	4		
	Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	1										
	Adequate management system for health and safety, so that the risk of workers is low	1										
Social benefits/social security	Social security expenditure by country and branches of social security (e.g. healthcare, sickness, maternity)	2	2	✓	✓	✓	✓	✓	(✓)	2		
	List and provide short description of social benefits provided to the workers (e.g. health insurance, pension fund, child care, education, accommodation etc.)	2										
Public commitments to sustainable issues	Presence of publicly available documents as promises or agreements on sustainability issues	5	5	(✓)	(✓)	-	(✓)	-	✓	5	4	

Category	Subcategory											
	Presence of mechanisms to follow-up the realisation of promises	5	[red]							[red]		
Contribution to Economic Development	Economic situation of the country/region (GDP, economic growth, unemployment, …)	1	[green] 1	✓	(✓)	(✓)	✓	(✓)	✓	[green] 1		
	Contribution to the local economic progress, through different aspects (e.g. payment of wages, purchase of raw materials and supplies, investments, …)	1										
Corruption	Risk of corruption in the country and/or sub-region	3	[yellow] 3	✓	✓	✓	✓	✓	✓	[light green] 2		
	Formalized commitment of the organization to prevent corruption/presence of an anti-corruption program	4										
	Involvement in cases of corruption	1										
Technology development	Involvement in technology transfer program or projects	1	[green] 1	✓	✓	(✓)	✓	-	✓	[green] 1		
	Engagement in the development of efficient and environmental sound technologies	1										
	Investments in technology development/technology transfer	1										

Table 13 shows that, with regards to the **Local Community**, the behaviour is variable. Indeed, the society behaves well regarding the delocalization and migration (the company does not contribute directly or indirectly to migration of individuals); the local employment (it has policies on local hiring preferences, contributing to the reduction of local unemployment); the access to immaterial resources (it organizes community education initiatives, especially with universities, and guarantees freedom of expression of the local community); the safe and healthy living conditions, being committed in strengthening community health and minimizing the environmental pollution and having policies/regulations for safety; the secure living conditions, since no causalities and injuries are ascribed to the company. For these subcategories, also the national data indicates good performances. Nevertheless, the company does not respect cultural customs and traditions and, even if it supports community initiatives and collaborates with the community stakeholders, national data are not good (e.g. the public trust on politicians is very low). A moderate behaviour is related to the access to material resources, in terms of the commitment in minimizing the resources consumption and infrastructures improvements.

With regards to the **Value Chain Actors**, the behaviour is variable. Intellectual property rights are respected (i.e. policies and practices with regards to the respect of intellectual property rights are present); supplier relationships are good, considering the absence of coercive communication, the sufficient lead time, the reasonable volume fluctuation and the payments on time. However, regarding the fair competition, even if the employees are aware of the importance of compliance with competition legislation and fair competition, no documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour are present. Moreover, with respect to the promotion of social

responsibility, the organization does not audit the suppliers with regard to social responsibility, nor written policies exist regarding the integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures.

Also regarding the **Consumers**, the behaviour is variable. Indeed, on one hand, consumers health and safety is guaranteed through the presence of management measures to assess it; clear information is made to enable the consumer choice and internal management systems ensure that clear information is provided to consumers on end-of-life options; and consumer privacy is protected so that no consumer complains related to breach of privacy or loss of data occurred. On the other hand, no practices related to customer satisfaction, including results of surveys measuring customer satisfaction, and no written policies regarding a transparent communication on the product and social responsibility exist.

The interest of the External Partner with respect to the **Workers** is good, but the national data on one indicator negatively influences the final stakeholder category score. Freedom of association & collective bargaining is guaranteed; child and forced labour are not present; salary is fair (no suspicious deductions on wages are present, workers payments are regular and documented, wage levels ensure a decent standard of living); working hours are fair; equal opportunities are guaranteed, through the absence of any kinds of discrimination and the presence of formal policies on equal opportunities. Nevertheless, basic social benefits are provided to the worker; but mainly, with respect to workers health and safety, the national occupational accident rate is high when related to the national population, even if no injuries or fatal accidents happened in the company and an adequate management system for health and safety is present.

Regarding the **Society**, the performance is quite good, even if one subcategory negatively influences the final stakeholder score. The company contributes to economic development through different aspects and, regarding the technology development, it is involved in technology development/ technology transfer projects and programs, it invests in technology development/ technology transfer and it is engaged in the development of efficient and environmental sound technologies. Nevertheless, no publicly available documents as promises or agreements on sustainability issues are present and, even if the company is not involved in any case of corruption, no written policies exist regarding the formalized commitments of the organization to prevent corruption/presence of an anti-corruption program.

It can be concluded that, from the PA evaluated for each subcategory and each stakeholder, it derives that <u>the total Impact Assessment IA of the present External Partner is equal to 4 on a scale from 1 (positive effect) to 6 (very negative effect)</u>.

4.2 Results and recommendations

As done for the companies discussed in the previous subsections, the S-LCA is performed for each company involved in one or more Continental HYBUILD system life cycle stage(s). Once the Performance Assessment and the Impact Assessment are performed for all the companies indicated in Table 11, firstly, an average is evaluated for each life cycle stage, and, finally, the overall IA of the Continental HYBUILD System can be evaluated as the total average.

Therefore, the Total Social Impact evaluated for the Continental HYBUILD system is 3.93, on a scale from 1 (positive effect) to 6 (very negative effect), as reported in Table 14.

Table 14. Social Impact of the Continental HYBUILD system

		A1-A3	A4-A5	B4	C1	C2	C3	C4
S-LCA Results - Continental HYBUILD System								
Components	DC-BUS							
	Compression DC-driven Chiller – Heat Pump Master controller							
	Batteries	3	2.5	3.5	4	4.5	5	5
	High temperature latent heat thermal energy storage							
	Sensible heat storage (decentralized PINK tank)							
	TOTAL Social Impact				**3.93**			

The results indicate that <u>the Continental HYBUILD system has a lightly negative effect, it can be still be socially accepted, but some social improvements are needed.</u> Results similar to the ones of the Mediterranean system can be observed. Indeed, also in this case, the first life cycle stages of the system provide a lower social impact, whilst the EoL stages provide high social impacts, contributing to the social worsening of the entire system life cycle. In particular, in the production stage, the average of the impacts related to the single stakeholders is around 3 for all the components considered. This means that the social behaviour is almost equal with respect to the stakeholders categories. For the other stages, indeed, there is not a homogeneous behaviour with regards to the stakeholder categories, which can also vary from 2 to 4.5. Generally, the lowest impacts are related to the value chain actors category. Therefore, the highest contributions to the S-LCA impacts in the EoL stages are related to the "local community", "consumers", "workers" and "society" stakeholder categories. Again, it can be notices that the companies involved in the EoL stages are outside the HYBUILD consortium; therefore, if the EoL stages are performed by other companies, this could lead to a better overall social life cycle assessment result.

5 Additional considerations

5.1 Impact of the country data

As previously highlighted, the questionnaires include some country specific data that, in some cases, have a specific influence on the overall assessment of the social impacts, therefore the analyses have been updated excluding the contributions of such country data.

The results of such analysis for the Mediterranean HYBUILD system are summarized in Table 15 and show a slight decrease of the overall social impacts but confirm the heaviest impacts deriving from the EoL stages.

Table 15. Social Impact of the Mediterranean HYBUILD system

S-LCA Results - Mediterranean HYBUILD System								
		A1-A3	A4-A5	B4	C1	C2	C3	C4
Components	DC-Bus							
	Master controller							
	Batteries							
	Low temperature latent heat thermal energy storage	3.25	3	3.33	3	4	5	5
	Solar field of Fresnel collectors							
	Heat pump							
	Sorption storage (sorption module + evaporator condenser)							
	Sensible heat storage (decentralized PINK tank)							
TOTAL Social Impact				**3.80**				

Also for the Continental system, the questionnaires include some country specific data that, in some cases, have a specific influence on the overall assessment of the social impacts, therefore the overall analysis has been updated excluding the contributions of such country data.

The results of such analysis are summarized in Table 16.

Table 16. Social Impact of the Continental HYBUILD system

S-LCA Results - Continental HYBUILD System								
		A1-A3	A4-A5	B4	C1	C2	C3	C4
Components	DC-BUS							
	Compression DC-driven Chiller – Heat Pump							
	Master controller							
	Batteries	2.83	2	3	3	4	5	5
	High temperature latent heat thermal energy storage							
	Sensible heat storage (decentralized PINK tank)							
TOTAL Social Impact					**3.55**			

In the case of the Continental System, the national data bear a mayor share of social impacts, in fact the results show a decrease of the social impacts on all the initial stages while confirming the heaviest impacts deriving from the EoL stages also for the Continental HYBUILD system.

5.2 Impact of the company dimension

Another analysis has been performed taking into account the company dimension: the different indicators giving the heaviest Social Impacts have been analysed taking into account the Questionnaires provided by the SMEs and by the Large Enterprises.

The results highlight that SMEs usually have higher social Impacts than Large Enterprise and also that SMEs have high Social Impacts on the basis of the same Sub Categories and usually of the same indicator or set of indicators.

In the case of the **Local Community** Stakeholder Category the Sub Categories with the higher impact for SMEs are the ones related to _Community Engagement_, _Local Employment_ and _Access to material resources_: analysing the answers to the questionnaires, the reasons of such high impact is usually due to the fact that SMEs do not usually have formal involvement on issues such as _meetings with community stakeholders_, or _Organizational support (volunteer-hours or financial) for community initiatives_, either they do not have the necessary economic strength or time to be involved in local initiatives or they do it in an informal, not structured, way.

Other Indicators with heavy impacts for the SMEs are the ones related to _organizational risk assessment for material resource conflict_ or to the participation in _infrastructures improvements_; also in this case the high impacts are related to the lower economic strength of SMEs.

In the case of the **Value Chain Actors** Stakeholder Category the Sub Categories with the higher impact for SMEs are the ones related to _Fair competition_ and _Social Responsibility_: analysing the answers to the questionnaires, the reasons of such high impact is usually due to the lack of explicit codes of conduct or to the lack of a formal company policy on such issues more than on the lack of Fair Competition or of real Social Responsibility.

In the case of the **Consumers** Stakeholder Category the Sub Categories with the higher impact for SMEs are the ones related to _Feedback mechanism_ and _Transparency_: analysing the answers to the questionnaires, the reasons of such high impact is, also in this case, the lack of explicit mechanism or codified measures to receive feedback from customers or the lack of Certification labels and related communication. In this case probably the improvements are possible also in small enterprises through an increased awareness on sustainability issues and with an external support by expert advisor.

In the case of the **Workers** Stakeholder Category the Sub Categories with the higher impact for SMEs are the ones related to _Equal opportunities/discrimination_ and _Composition of governance bodies_: analysing the answers to the questionnaires, the reasons of such high impact is the lack of formal policies that, in some cases, Large Enterprises formally include in their codes of conduct.

In the case of the **Society** Stakeholder Category the Sub Category with the higher impact for SMEs is the one related to _Corruption_: analysing the answers to the questionnaires, the reasons of such high impact is the lack of a formalized commitment of the organization to prevent corruption.

6 Conclusions

In the present deliverable, the Social Life Cycle Assessments of the Mediterranean and the Continental HYBUILD system have been performed, in order to provide the social impacts generated by the systems during each step of their life-cycle. These results, together with the Life Cycle Assessment (LCA) and the Life Cycle Costing (LCC), complete the sustainability assessment, aiming to give an overall sustainability vision of the developed systems.

Firstly, an introduction has been made in order to describe the aim of this work and indicate the contributions of the consortium partners.

Then, the methodology for the S-LCA has been described with regards to the S-LCA UNEP/SETAC "Guidelines for Social Life Cycle Assessment of products" [1] [2], the Impact Assessment methodology developed by Ciroth et al. [5] and the main international standards ISO 14040: 2006 [3] e ISO 14044: 2006 [4].

The assessment has been performed with the help of internal and external partners, who compiled an S-LCA questionnaire prepared for the collection of the social data. The questionnaire is related to specific themes of social interest, the so called "subcategories", which are classified with respect to the different stakeholders involved in the systems life-cycle stages. According to the S-LCA [1] and the Impact Assessment [5] methodologies, the social performances (PA) of all involved companies have been evaluated. The PAs have been then converted in social impacts (Impact Assessment, IA), considering the six impact categories, the relation criteria among the subcategories and the impact categories, their correlation and, finally, the PA-to-IA conversion rules.

The final score, assessed for each company, has been initially evaluated for the single stakeholder group, as the average assessment for each subcategory and, at the end, for the entire company, as the average assessment for each stakeholder.

In addition to these considerations, another important rule has been applied: in case the average assessment is lower than the worse score minus 1, the latter is considered.

This rule is applied in order not to weaken the effects of very negative impacts.

Finally, the scores of all the companies are then reported in a table for each systems life cycle stage (Table 10 and Table 14) as the average of all the components and companies, in order to guarantee the confidentiality relationships among STRESS, who collected the social data, and the involved partners. A last average considering each step of the systems life cycle is then evaluated, being the final S-LCA score, ranging from 1 (positive effect) to 6 (very negative effect).

From the social life cycle assessment, similar conclusions can be made for both the Mediterranean and the Continental HYBUILD systems.

Indeed, the social life cycle impact of the Mediterranean system is equal to 4.06, while the impact of the Continental systems is equal to 3.93 for the Continental system, considering a scale ranging from 1 (positive effect) to 6 (very negative effect).

Going in detail, it can be underlined that the initial life-cycle stages, i.e. the production, the installation and the replacement stages, have a better social impact, compared to the End-of-Life stages. This observation has a positive effect on the overall S-LCA because the EoL companies involved in the assessment are from outside the HYBUILD consortium and have been asked to collaborate have not really participated in the project.

It can also be observed that the social behaviour is homogeneous among the stakeholder categories when the production stage is considered; whilst, for the other life-cycle stages, the behaviour towards the Value Chain Actors is always better than the behaviour towards the other

stakeholder categories, meaning that, for reducing the social impacts in the installation, use and EoL stages, improvements are needed towards the following stakeholder categories: local community, consumers, workers, society.

A further analysis has been performed to understand country specific data effects on the SLCA Impact Assessment, in both Mediterranean and Continental Systems. The single company questionnaires were analysed excluding the assessment scores related to the specific countries. In both cases a decrease on the overall impacts has been achieved, meaning that the impacts of the companies involved in the HYBUILD project are negatively influenced by the countries in which there are established.

Another analysis, based on the company dimension, has highlighted that in most cases the Social Impacts of SMEs is negatively influenced not directly by their negative behaviours but by the lack of adoption of formal policies related to specific Stakeholder Categories or Sub Categories.

Finally, it can be concluded that the results here described are useful in case a social improvement is requested, because they provide information on how and where to intervene in order to reduce the overall social impacts.

References

[1] UNEP – SETAC – Life Cycle Initiative – Guidelines for Social Life Cycle Assessment of Products, United Nations Environment Programme, 2009

[2] UNEP – SETAC – Life Cycle Initiative – The methodological sheets for sub-categories in Social Life Cycle Assessment (S-LCA), United Nations Environment Programme and SETAC, 2013

[3] ISO 14040:2006 "Environmental management - Life cycle assessment - Principles and framework"

[4] ISO 14044:2006 "Environmental management - Life cycle assessment - Requirements and guidelines"

[5] A. Ciroth and J. Franze, LCA of an Ecolabeled Notebook: Consideration of Social and Environmental Impacts Along the Entire Life Cycle. Lulu. com, 2011

[6] UNEP, 2020. Guidelines for Social Life Cycle Assessment of Products and Organizations 2020. Benoît Norris, C., Traverso, M., Neugebauer, S., Ekener, E., Schaubroeck, T., Russo Garrido, S., Berger, M., Valdivia, S., Lehmann, A., Finkbeiner, M., Arcese, G. (eds.). United Nations Environment Programme (UNEP)

[7] EN 15978:2011 "Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method"

[8] ISO 26000:2010 - Guidance on social responsibility

Annex – Social Life Cycle Impact Assessment of the companies involved in the HYBUILD systems life-cycle stages

The following figures show the IA of each company involved in both the HYBUILD systems life-cycle stages. In order to assure the confidentiality, the companies replies are omitted, together with the identification of the company for each IA assessment and result.

Table A1. S-LCA Final scores of each company

Company	S-LCA Final Score
Internal Partner 1	3
Internal Partner 2	4
Internal Partner 3	3
Internal Partner 4	5
Internal Partner 5	2
Internal Partner 6	3
Internal Partner 7	3
Internal Partner 8	4
Internal Partner 9	3
Internal Partner 10	2
External Partner 1	3
External Partner 2	4
External Partner 3	5

Stakeholder	Sub-Categories	Indicators	Inventory	Performance Assessment (PA)	WC	HS	HR	SER	IR	G	Impact Assessment (IA)	TOTAL STAKEHOLDER
Local Community	Delocalization and Migration	International Migrants as a Percentage of Population	4	3	✓	(✓)	(✓)	✓	✓	(✓)	3	2
		Direct or indirect contribution of the organization to migration of individuals	2									
		Number of individuals who resettle, voluntarily or involuntarily, because of the organization	-									
		Strength of organizational procedures for integrating migrant workers into the community	1									
	Community engagement	Public Trust on Politicians	1	2	(✓)	✓	(✓)	✓	(✓)	✓	1	
		Strength of written policies on community engagement at organization level	-									
		Diversity of community stakeholder groups that engage with the organization	1									
		Number of meetings with community stakeholders	1									
		Organizational support (volunteer-hours or financial) for community initiatives	2									
	Local employment	Unemployment Statistics by Country	1	2	✓	(✓)	(✓)	✓	✓	✓	1	
		Poverty and Working Poverty by Country	-									
		Percentage of workforce hired locally	-									
		Strength of policies on local hiring preferences (organization-specific indicator)	1									
		Presence of policies on spending on locally-based suppliers	3									
		Percentage on spending on locally-based suppliers	-									
	Access to immaterial resources	Patent Filings	1	1	(✓)	(✓)	✓	✓	(✓)	✓	1	
		Annual arrests connected to protests of organization actions	1									
		Do policies related to intellectual property respect moral and economic rights of the community?	1									
		Presence/strength of community education initiatives	1									
	Access to material resources	Strength of organizational risk assessment with regard to potential for material resource conflict	2	2	-	(✓)	✓	✓	✓	(✓)	2	
		Does the organization engage with local community over sustainable methods for sharing resources?	2									
		Does the organization have a certified environmental management system	1									
		Has the organization caused infrastructures improvements (e.g. roadways, waste disposal systems) having long term effects?	3									
	Safe and healthy living conditions	Burden of Disease by Country	1	1	✓	✓	✓	✓	(✓)	(✓)	1	
		Pollution Levels by Country	1									
		Does the organization measure air/water/earth pollution?	1									
		Presence/Strength of Laws on Construction Safety Regulations	1									
		Management oversight of structural integrity	-									
		Organization efforts to strengthen community health (e.g. through shared community access to organization health resources)	1									
		Management effort to minimize use of hazardous substances	1									
	Secure living conditions	Strength of Public Security in Country of operation	1	2	(✓)	✓	✓	(✓)	(✓)	(✓)	2	
		Management policies related to private security personnel	3									
		Number of legal complaints per year occurred against the organization with regard to security concerns	1									
		Number of causalities and injuries per year ascribed to the organization	1									
Value Chain Actors	Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	2	2	✓	✓	✓	✓	-	✓	1	2
		Employee awareness of the importance of compliance with competition legislation and fair competition.	1									
		Legal actions pending or completed during the reporting period regarding anti-competitive behaviour and violations of anti-trust and monopoly legislation in which the reporting organization has been identified as a participant	1									
	Respect of intellectual property rights	General intellectual property rights and related issues associated with the economic sector	1	1	(✓)	-	-	✓	-	✓	2	
		Organization's policy and practice with regards to the respect of intellectual property rights	1									

Category	Subcategory	Indicator	Score	Agg	✓1	✓2	✓3	✓4	✓5	✓6	Agg2	Cat	Final
Workers	Freedom of association & collective bargaining	Evidence of Country non respect or support to Freedom of association and Collective bargaining	1	1	✓	✓	✓	✓	✓	✓	1	3	
		Evidence of restriction to Freedom of association and Collective bargaining	1										
		Presence of unions within the organization is adequately supported	1										
		Workers are free to join unions of their choosing	1										
		Employee/union representatives are invited to contribute to planning of larger changes in the company, which will affect the working conditions	1										
		Workers have access to a neutral, binding and independent dispute resolution procedure	1										
	Child labour	Percentage of children working by country and sector	1	1	✓	✓	✓	✓	✓	✓	1		
		Absence of working children under the legal age or 15 years old	1										
		Children are not performing work during the night	1										
		Records on all workers, stating names, ages and date of birth are kept on file	1										
	Fair salary	Minimum wage by country	-	1	✓	(✓)	✓	✓	-	✓	1		
		Percentage of workers receiving the lowest paid	1										
		The lowest paid workers are considering their wages meets their needs	1										
		Presence of suspicious deductions on wages	1										
		Regular and documented payment of workers	1										
	Working hours	Maximum number of working hours	1	1	✓	✓	✓	✓	-	✓	1		
		Number of hours effectively worked by employees (at each level of employment)	1										
		Number of holidays effectively used by employees (at each level of employment).	1										
		Respect of contractual agreements concerning overtime	1										
		Clear communication of working hours and overtime arrangements	1										
		The organization provides flexibility	1										
	Equal opportunities/discrimination	Women in the Labour force participation rate by country	2	2	✓	✓	✓	✓	✓	✓	1		
		Country gender index ranking	1										
		Presence of formal policies on equal opportunities	1										
		Announcement of open positions happen through national/regional newspapers, public job databases on internet, employment services or other publicly available media ensuring a broad announcement	1										
		Total numbers of incidents of discrimination and actions taken	1										
		Composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity	3										
		Ratio of basic salary of men to women by employee category	3										
	Health and safety	Occupational accident rate by country	5	4	✓	✓	✓	✓	-	✓	4		
		Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	2										
		Presence of a formal policy concerning health and safety	1										
		Adequate general occupational safety measures are taken	1										
		Preventive measures and emergency protocols exist regarding accidents & injuries	1										
		Preventive measures and emergency protocols exist regarding pesticides and chemical exposure	1										
		Appropriate protective gear required in all applicable situation present	1										
		Number of occupational safety and health administration violations reported within the past 3 years and status of violations	1										
		Education, training, counselling, prevention and risk control programs in place to assist workforce members, their families or community members regarding serious diseases	1										
	Social benefits/social security	Social security expenditure by country and branches of social security (e.g. Healthcare, sickness, maternity)	3	2	✓	✓	✓	✓	✓	(✓)	1		
		List and provide short description of social benefits provided to the workers (eg. Health insurance, pension fund, child care, education, accommodation etc.)	1										
		Evidence of violations of obligations to workers under labour or social security laws and employment regulations.	1										
		Percentage of permanent workers receiving paid time-off	1										
Society	Public commitments to sustainable issues	Presence of publicly available documents as promises or agreements on sustainability issues	2	2	(✓)	(✓)	-	(✓)	-	✓	2	2	
		Complaints issued related to the non-fulfilment of promises or agreements by the organization by the local community or other stakeholders	1										
		Presence of mechanisms to follow-up the realisation of promises	1										
	Prevention and mitigation of conflicts	Is the organization doing business in a region with ongoing conflicts?	1	1	(✓)	✓	✓	✓	✓	✓	1		
		Is the organization doing business in a sector that features linkages to conflicts (e.g. where the depletion of resources allows significant profits - extractive industries, forestry, fishery)?	1										
		Is the organization doing business in a sector otherwise linked to the escalation or de-escalation of conflicts (e.g. conflict escalation by massive pollution, de-escalation by trade beyond conflict boundaries)?	1										
		Organization's role in the development of conflicts	1										
		Disputed products	1										
	Contribution to Economic Development	Economic situation of the country/region (GDP, economic growth, unemployment, …)	1	2	✓	(✓)	(✓)	✓	(✓)	✓	1		
		Contribution of the organization contribute to the economic progress	2										
	Technology development	Sector efforts in technology development	1	1	✓	✓	(✓)	✓	-	✓	1		
		Involvement in technology transfer program or projects	1										
		Partnerships in research and development	1										
		Investments in technology development/ technology transfer	1										

Figure A1. S-LCA Impact Assessment of Internal Partner 1 – FINAL SCORE 3

Stakeholder	Sub-Categories	Indicators	Inventory	Performance Assessment (PA)	WC	HS	HR	SER	IR	G	Impact Assessment (IA)	TOTAL STAKEHOLDER
Local Community	Delocalization and Migration	International Migrants as a Percentage of Population	3	4	✓	(✓)	(✓)	✓	✓	(✓)	4	5
		Direct or indirect contribution of the organization to migration of individuals	4									
		Number of individuals who resettle, voluntarily or involuntarily, because of the organization	-									
		Strength of organizational procedures for integrating migrant workers into the community	-									
	Community engagement	Public Trust on Politicians	2	5	(✓)	✓	(✓)	✓	(✓)	✓	6	
		Strength of written policies on community engagement at organization level	-									
		Diversity of community stakeholder groups that engage with the organization	-									
		Number of meetings with community stakeholders	6									
		Organizational support (volunteer-hours or financial) for community initiatives	1									
	Local employment	Unemployment Statistics by Country	1	2	✓	(✓)	(✓)	✓	✓	✓	1	
		Poverty and Working Poverty by Country	1									
		Percentage of workforce hired locally	1									
		Strength of policies on local hiring preferences (organization-specific indicator)	2									
		Presence of policies on spending on locally-based suppliers	2									
		Percentage on spending on locally-based suppliers	3									
	Access to immaterial resources	Patent Filings	1	1	(✓)	(✓)	✓	✓	(✓)	✓	1	
		Annual arrests connected to protests of organization actions	1									
		Do policies related to intellectual property respect moral and economic rights of the community?	-									
		Presence/strength of community education initiatives	-									
	Access to material resources	Strength of organizational risk assessment with regard to potential for material resource conflict	5	4	-	(✓)	✓	✓	✓	(✓)	4	
		Does the organization engage with local community over sustainable methods for sharing resources?	1									
		Does the organization have a certified environmental management system	2									
		Has the organization caused infrastructures improvements (e.g. roadways, waste disposal systems) having long term effects?	2									
	Safe and healthy living conditions	Burden of Disease by Country	1	1	✓	✓	✓	✓	(✓)	(✓)	1	
		Pollution Levels by Country	1									
		Does the organization measure air/water/earth pollution?	-									
		Presence/Strength of Laws on Construction Safety Regulations	-									
		Management oversight of structural integrity	-									
		Organization efforts to strengthen community health (e.g. through shared community access to organization health resources)	-									
		Management effort to minimize use of hazardous substances	-									
	Secure living conditions	Strength of Public Security in Country of operation	1	1	(✓)	✓	✓	(✓)	(✓)	(✓)	1	
		Management policies related to private security personnel	1									
		Number of legal complaints per year occurred against the organization with regard to security concerns	1									
		Number of causalities and injuries per year ascribed to the organization	-									
Value Chain Actors	Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	5	4	✓	✓	✓	✓	-	✓	4	5
		Employee awareness of the importance of compliance with competition legislation and fair competition.	1									
		Legal actions pending or completed during the reporting period regarding anti-competitive behaviour and violations of anti-trust and monopoly legislation in which the reporting organization has been identified as a participant	1									
	Respect of intellectual property rights	General intellectual property rights and related issues associated with the economic sector	-	-	(✓)	-	-	✓	-	✓	-	
		Organization's policy and practice with regards to the respect of intellectual property rights	-									
	Supplier relationships	Absence of coercive communication with suppliers	-	1	(✓)	(✓)	(✓)	✓	-	✓	1	
		Sufficient lead time	-									
		Reasonable volume fluctuations	-									
		Payments on time to suppliers	1									
	Promoting social responsibility	Industry codes of conduct in the sector	-	5	✓	✓	✓	(✓)	(✓)	✓	6	
		Presence of an explicit code of conduct that protect human rights of workers among suppliers	5									
		Percentage of suppliers that the organization has audited with regard to social responsibility along the supply chain	-									
		Membership in initiatives that promotes social responsibility along the supply chain	-									
		Integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures	-									
		Support to suppliers in terms of consciousness-raising and counselling concerning the social responsibility issues	-									

Category	Subcategory	Indicator	Score	Sum	C1	C2	C3	C4	C5	C6	Sum2	Total
Consumers	Health and safety	Presence of consumer complaints (at national, sectorial, organizational level)	1	1	-	✓	(✓)	✓	-	✓	1	4
		Quality of or number of information/signs on product health and safety	-									
		Presence of consumer complaints (at national, sectorial, organizational level)	1									
		Presence of management measures to assess costumer health and safety	1									
		Presence of labels of health and safety requirements	1									
	Feedback mechanism	Presence of a mechanism for customers to provide feedback	1	1	(✓)	(✓)	✓	✓	-	✓	1	
		Management measures to improve feedback mechanisms	1									
		Practices related to customer satisfaction, including results of surveys measuring customer satisfaction	-									
	Consumer privacy	Country ranking related to regulations on data-sharing	1	1	-	-	✓	(✓)	-	✓	1	
		Strength of internal management system to protect consumer privacy	-									
		Number of consumer complains related to breach of privacy or loss of data within the last year	1									
		Number of complaints by regulatory bodies related to breach on consumer privacy or loss of data within the last year	1									
	Transparency	Presence of a law or norm regarding transparency	1	4	(✓)	✓	✓	✓	(✓)	✓	5	
		Non-compliance with regulations regarding transparency	1									
		Consumers complaints regarding transparency	1									
		Publication of a sustainability report	5									
		Communication of the results of social and environmental life cycle impact assessment	5									
		Certifications/labels the organization obtained for the product under investigation	3									
	End-of-Life Responsibility	Do internal management systems ensure that clear information is provided to consumers on end-of-life options?	1	1	✓	✓	✓	✓	✓	✓	1	
		Annual incidents of non-compliance with regulatory labelling requirements in one year?	1									
Workers	Freedom of association & collective bargaining	Evidence of Country non respect or support to Freedom of association and Collective bargaining	1	4	✓	✓	✓	✓	✓	✓	5	5
		Presence of unions within the organization is adequately supported	1									
		Workers are free to join unions of their choosing	1									
		Employee/union representatives are invited to contribute to planning of larger changes in the company, which will affect the working conditions	5									
		Workers have access to a neutral, binding and independent dispute resolution procedure	1									
	Fair salary	Living Wages	1	1	✓	(✓)	✓	✓	-	✓	1	
		Minimum wage by country	1									
		Percentage of workers receiving the lowest paid	1									
		The lowest paid workers are considering their wages meets their needs	1									
		Presence of suspicious deductions on wages	1									
		Regular and documented payment of workers	1									
	Working hours	Maximum number of working hours	1	1	✓	✓	✓	✓	-	✓	1	
		Number of hours effectively worked by employees (at each level of employment)	1									
		Number of holidays effectively used by employees (at each level of employment).	1									
		Respect of contractual agreements concerning overtime	1									
		Clear communication of working hours and overtime arrangements	1									
		The organization provides flexibility	1									
	Forced labour	Percentage (estimate) of forced labour by region	2	1	✓	✓	✓	✓	✓	✓	1	
		Workers voluntarily agree upon employment terms	1									
		Employment contracts are comprehensible to the workers and are kept on file	1									
		Employment contracts stipulate wage, working time, holidays and terms of resignation	1									
		Birth certificate, passport, identity card, work permit or other original documents belonging to workers are not retained or kept for safety reasons by the organization	1									
		Workers are free to terminate their employment within the prevailing limits	1									
		Workers are bonded by debts exceeding legal limits to the employer	1									
	Equal opportunities/discrimination	Women in the Labour force participation rate by country	2	4	✓	✓	✓	✓	✓	✓	5	
		Country gender index ranking	2									
		Presence of formal policies on equal opportunities	5									
		Announcement of open positions happen through national/regional newspapers, public job databases on internet, employment services or other publicly available media ensuring a broad announcement	1									
		Total numbers of incidents of discrimination and actions taken	1									
		Composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity	-									
		Ratio of basic salary of men to women by employee category	1									
	Health and safety	Occupational accident rate by country	5	4	✓	✓	✓	✓	-	✓	4	
		Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	4									
		Presence of a formal policy concerning health and safety	1									
		Adequate general occupational safety measures are taken	1									
		Preventive measures and emergency protocols exist regarding accidents & injuries	1									
		Preventive measures and emergency protocols exist regarding pesticides and chemical exposure	1									
		Appropriate protective gear required in all applicable situation present	1									
		Number of occupational safety and health administration violations reported within the past 3 years and status of violations	4									
		Education, training, counselling, prevention and risk control programs in place to assist workforce members, their families or community members regarding serious diseases	1									
	Social benefits/social security	Social security expenditure by country and branches of social security (e.g. Healthcare, sickness, maternity)	2	2	✓	✓	✓	✓	✓	(✓)	1	
		List and provide short description of social benefits provided to the workers (eg. Health insurance, pension fund, child care, education, accommodation etc.)	2									
		Evidence of violations of obligations to workers under labour or social security laws and employment regulations.	1									
		Percentage of permanent workers receiving paid time-off	1									

Stakeholder	Sub-Categories	Indicators	Inventory	PA	WC	HS	HR	SER	IR	G	IA	TOTAL
Society	Public commitments to sustainable issues	Presence of publicly available documents as promises or agreements on sustainability issues	-	1	(✓)	(✓)	-	(✓)	-	✓	1	1
		Complaints issued related to the non-fulfilment of promises or agreements by the organization by the local community or other stakeholders	1									
		Presence of mechanisms to follow-up the realisation of promises	-									
	Contribution to Economic Development	Economic situation of the country/region (GDP, economic growth, unemployment, …)	1	1	✓	(✓)	(✓)	✓	(✓)	✓	1	
		Contribution of the organization to the economic progress	1									
	Technology development	Sector efforts in technology development	-	1	✓	✓	(✓)	✓	-	✓	1	
		Involvement in technology transfer program or projects	-									
		Partnerships in research and development	1									
		Investments in technology development/ technology transfer	1									

Figure A2. S-LCA Impact Assessment of Internal Partner 2 – FINAL SCORE 4

Stakeholder	Sub-Categories	Indicators	Inventory	Performance Assessment (PA)	WC	HS	HR	SER	IR	G	Impact Assessment (IA)	TOTAL STAKEHOLDER
Local Community	Local employment	Unemployment Statistics by Country	1	4	✓	(✓)	(✓)	✓	✓	✓	4	3
		Poverty and Working Poverty by Country	1									
		Percentage of workforce hired locally	-									
		Strength of policies on local hiring preferences (organization-specific indicator)	3									
		Presence of policies on spending on locally-based suppliers	3									
		Percentage on spending on locally-based suppliers	5									
	Safe and healthy living conditions	Burden of Disease by Country	1	3	✓	✓	✓	✓	(✓)	(✓)	3	
		Pollution Levels by Country	1									
		Does the organization measure air/water/earth pollution?	1									
		Presence/Strength of Laws on Construction Safety Regulations	1									
		Management oversight of structural integrity	-									
		Organization efforts to strengthen community health (e.g. through shared community access to organization health resources)	4									
		Management effort to minimize use of hazardous substances	1									
	Secure living conditions	Strength of Public Security in Country of operation	2	2	(✓)	✓	✓	(✓)	(✓)	(✓)	2	
		Management policies related to private security personnel	3									
		Number of legal complaints per year occurred against the organization with regard to security concerns	1									
		Number of causalities and injuries per year ascribed to the organization	1									
Value Chain Actors	Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	1	1	✓	✓	✓	✓	-	✓	1	3
		Employee awareness of the importance of compliance with competition legislation and fair competition.	1									
		Legal actions pending or completed during the reporting period regarding anti-competitive behaviour and violations of anti-trust and monopoly legislation in which the reporting organization has been identified as a participant	1									
	Respect of intellectual property rights	Organization's policy and practice with regards to the respect of intellectual property rights	1	1	(✓)	-	-	✓	-	✓	2	
	Supplier relationships	Absence of coercive communication with suppliers	1	2	(✓)	(✓)	(✓)	✓	-	✓	2	
		Sufficient lead time	3									
		Reasonable volume fluctuations	2									
		Payments on time to suppliers	1									
	Promoting social responsibility	Industry codes of conduct in the sector	1	4	✓	✓	✓	(✓)	(✓)	✓	4	
		Presence of an explicit code of conduct that protect human rights of workers among suppliers	1									
		Percentage of suppliers that the organization has audited with regard to social responsibility along the supply chain	1									
		Membership in initiatives that promotes social responsibility along the supply chain	5									
		Integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures	1									
		Support to suppliers in terms of consciousness-raising and counselling concerning the social responsibility issues	5									

Category	Subcategory	Indicator	Value	Score	Checks	Score	Final
Workers	Freedom of association & collective bargaining	Evidence of Country non respect or support to Freedom of association and Collective bargaining	1	1	✓ ✓ ✓ ✓ ✓ ✓	1	3
		Presence of unions within the organization is adequately supported	1				
		Workers are free to join unions of their choosing	1				
		Employee/union representatives are invited to contribute to planning of larger changes in the company, which will affect the working conditions	1				
		Workers have access to a neutral, binding and indipendent dispute resulution procedure	1				
	Child labour	Percentage of children working by country and sector	1	1	✓ ✓ ✓ ✓ ✓ ✓	1	
		Absence of working children under the legal age or 15 years old	1				
		Children are not performing work during the night	1				
		Records on all workers, stating names, ages and date of birth are kept on file	1				
	Fair salary	Minimum wage by country	1	1	✓ (✓) ✓ ✓ - ✓	1	
		Percentage of workers receiving the lowest paid	1				
		The lowest paid workers are considering their wages meets their needs	-				
		Presence of suspicious deductions on wages	1				
		Regular and documented payment of workers	1				
	Working hours	Maximum number of working hours	1	1	✓ ✓ ✓ ✓ ✓ ✓	1	
		Number of hours effectively worked by employees (at each level of employment)	1				
		Number of holidays effectively used by employees (at each level of employment).	1				
		Respect of contractual agreements concerning overtime	1				
		Clear communication of working hours and overtime arrangements	1				
		The organization provides flexibility	1				
	Forced labour	Percentage (estimate) of forced labour by region	2	2	✓ ✓ ✓ ✓ ✓ ✓	1	
		Workers voluntarily agree upon employment terms	1				
		Employment contracts are comprehensible to the workers and are kept on file	1				
		Employment contracts stipulate wage, working time, holidays and terms of resignation	1				
		Birth certificate, passport, identity card, work permit or other original documents belonging to workers are not retained or kept for safety reasons by the organization	1				
		Workers are free to terminate their employment within the prevailing limits	1				
		Workers are bonded by debts exceeding legal limits to the employer	1				
	Equal opportunities/discrimination	Women in the Labour force participation rate by country	2	2	✓ ✓ ✓ ✓ ✓ ✓	1	
		Country gender index ranking	2				
		Presence of formal policies on equal opportunities	1				
		Announcement of open positions happen through national/regional newspapers, public job databases on internet, employment services or other publicly available media ensuring a broad announcement	1				
		Total numbers of incidents of discrimination and actions taken	1				
		Composition of governance bodies and breakdown of employees per category according to gender, age group,	2				
		Ratio of basic salary of men to women by employee category	1				
	Health and safety	Occupational accident rate by country	5	4	✓ ✓ ✓ ✓ - ✓	4	
		Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	1				
		Presence of a formal policy concerning health and safety	1				
		Adequate general occupational safety measures are taken	1				
		Preventive measures and emergency protocols exist regarding accidents & injuries	1				
		Preventive measures and emergency protocols exist regarding pesticides and chemical exposure	1				
		Appropriate protective gear required in all applicable situation present	1				
		Number of occupational safety and health administration violations reported within the past 3 years and status of violations	-				
		Education, training, counselling, prevention and risk control p	1				
	Social benefits/social security	Social security expenditure by country and branches of social security (e.g. Healthcare, sickness, maternity)	2	2	✓ ✓ ✓ ✓ ✓ (✓)	1	
		List and provide short description of social benefits provided to the workers (e.g. Health insurance, pension fund, child care, education, accommodation etc.)	2				
		Evidence of violations of obligations to workers under labour or social security laws and employment regulations.	1				
		Percentage of permanent workers receiving paid time-off	1				
Society	Public commitments to sustainable issues	Presence of publicly available documents as promises or agreements on sustainability issues	2	2	(✓) (✓) - (✓) - ✓	2	3
		Complaints issued related to the non-fulfilment of promises or agreements by the organization by the local community or other stakeholders	1				
		Presence of mechanisms to follow-up the realisation of promises	1				
	Technology development	Sector efforts in technology development	-	3	✓ ✓ (✓) ✓ - ✓	3	
		Involvement in technology transfer program or projects	4				
		Partnerships in research and development	1				
		Investments in technology development/ technology transfer	1				

Figure A3. S-LCA Impact Assessment of Internal Partner 3 – FINAL SCORE 3

Stakeholder	Sub-Categories	Indicators	Inventory	Performance Assessment (PA)	Performance Assessment (PA)	WC	HS	HR	SER	IR	G	Impact Assessment (IA)	Impact Assessment (IA)
Local Community	Delocalization and Migration	International Migrants as a Percentage of Population	3	3	3	✓	(✓)	(✓)	✓	✓	(✓)	3	3
	Community engagement	Public Trust on Politicians	2	2	5	(✓)	✓	(✓)	✓	(✓)	✓	1	6
		Organization contribution to local development	- 1										
		Diversity of community stakeholder groups that engage with the organization	- 1										
		Number of meetings with community stakeholders	- -										
		Organizational support (volunteer-hours or financial) for community initiatives	- 6										
	Local employment	Unemployment Statistics by Country	1	5	5	✓	(✓)	(✓)	✓	✓	✓	6	6
		Poverty and Working Poverty by Country	1										
		Percentage of workforce hired locally	2 5										
		Strength of policies on local hiring preferences (organization-specific indicator)	6 6										
		Presence of policies on spending on locally-based suppliers	6 6										
		Percentage on spending on locally-based suppliers	5 1										
	Access to immaterial resources	Patent Filings	1	1	1	(✓)	(✓)	✓	✓	(✓)	✓	1	1
	Safe and healthy living conditions	Burden of Disease by Country	1	1	1	✓	✓	✓	✓	(✓)	(✓)	1	1
		Pollution Levels by Country	1										
	Secure living conditions	Strength of Public Security in Country of operation	1	1	1	(✓)	✓	✓	(✓)	(✓)	(✓)	1	1
Value Chain Actors	Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	6 -	5	-	✓	✓	✓	✓	-	✓	6	-
		Employee awareness of the importance of compliance with competition legislation and fair competition.	1 -										
		Legal actions pending or completed during the reporting period regarding anti-competitive behaviour and violations of anti-trust and monopoly legislation in which the reporting organization has been identified as a participant	1 -										
	Respect of intellectual property rights	General intellectual property rights and related issues associated with the economic sector	1 -	1	-	(✓)	-	-	✓	-	✓	1	-
		Organization's policy and practice with regards to the respect of intellectual property rights	1 -										
	Supplier relationships	Absence of coercive communication with suppliers	1 -	1	-	(✓)	(✓)	(✓)	✓	-	✓	1	-
		Sufficient lead time	1 -										
		Reasonable volume fluctuations	1 -										
		Payments on time to suppliers	1 -										
	Promoting social responsibility	Industry codes of conduct in the sector	- -	6	-	✓	✓	✓	(✓)	(✓)	✓	6	-
		Presence of an explicit code of conduct that protect human rights of workers among suppliers	6 -										
		Percentage of suppliers that the organization has audited with regard to social responsibility along the supply chain	6 -										
		Membership in initiatives that promotes social responsibility along the supply chain	6 -										
		Integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures	6 -										
		Support to suppliers in terms of consciousness-raising and counselling concerning the social responsibility issues	6 -										

Category	Subcategory	Indicator	Wt	A	B	c1	c2	c3	c4	c5	c6	C	D
Consumers	Health and safety	Presence of consumer complaints (at national, sectorial, organizational level)	1	1	1	-	✓	(✓)	✓	-	✓	1	1
		Quality of or number of information/signs on product health and safety	1										
		Number of consumer complaints (at national, sectorial, organizational level)	1										
		Presence of management measures to assess costumer health and safety	-										
			-										
		Presence of labels of health and safety requirements	1 / 1										
	Feedback mechanism	Presence of a mechanism for customers to provide feedback	6 / 6	5	5	(✓)	(✓)	✓	✓	-	✓	5	5
		Management measures to improve feedback mechanisms	6 / 6										
		Practices related to customer satisfaction, including results of surveys measuring customer satisfaction	2 / 2										
	Consumer privacy	Country ranking related to regulations on data-sharing	1	1	1	-	-	✓	(✓)	-	✓	1	1
	Transparency	Presence of a law or norm regarding transparency	1	5	4	(✓)	✓	✓	✓	(✓)	✓	6	4
		Non-compliance with regulations regarding transparency	2 / 2										
		Consumers complaints regarding transparency	1 / 1										
		Publication of a sustainability report	5 / 5										
		Communication of the results of social and environmental life cycle impact assessment	5 / 5										
		Certifications/labels the organization obtained for the product under investigation	6 / -										
	End-of-Life Responsibility	Do internal management systems ensure that clear information is provided to consumers on end-of-life options?	1 / -	1	-	✓	✓	✓	✓	✓	✓	1	
		Annual incidents of non-compliance with regulatory labelling requirements in one year?	1 / -										
Workers	Freedom of association & collective bargaining	Evidence of Country non respect or support to Freedom of association and Collective bargaining	1	1	1	✓	✓	✓	✓	✓	✓	1	1
	Child labour	Percentage of children working by country and sector	1	1	1	✓	✓	✓	✓	✓	✓	1	1
	Fair salary	Living Wages	1	1	1	✓	(✓)	✓	✓	-	(✓)	1	1
		Minimum wage by country	1										
		Percentage of workers receiving the lowest paid	1 / 1										
		The lowest paid workers are considering their wages meets their needs	1 / 1										
		Presence of suspicious deductions on wages	1 / 1										
		Regular and documented payment of workers	1 / 1										
	Working hours	Maximum number of working hours	1	2	2	✓	✓	✓	✓	✓	✓	1	1
		Number of hours effectively worked by employees (at each level of employment)	3 / 3										
		Number of holidays effectively used by employees (at each level of employment).	1 / 1										
		Respect of contractual agreements concerning overtime	1 / 1										
		Clear communication of working hours and overtime arrangements	1 / 1										
		The organization provides flexibility	1 / 1										
	Forced labour	Percentage (estimate) of forced labour by region	2	2	2	✓	✓	✓	✓	✓	✓	1	1
		Workers voluntarily agree upon employment terms	1 / 1										
		Employment contracts are comprehensible to the workers and are kept on file	1 / 1										
		Employment contracts stipulate wage, working time, holidays and terms of resignation	1 / 1										
		Birth certificate, passport, identity card, work permit or other original documents belonging to workers are not retained or kept for safety reasons by the organization	1 / 1										
		Workers are free to terminate their employment within the prevailing limits	1 / 1										
		Workers are bonded by debts exceeding legal limits to the employer	1 / 1										
	Equal opportunities/discrimination	Women in the Labour force participation rate by country	2	5	5	✓	✓	✓	✓	✓	✓	6	6
		Country gender index ranking	2										
		Presence of formal policies on equal opportunities	6 / 6										
		Announcement of open positions happen through national/regional newspapers, public job databases on internet, employment services or other publicly available media ensuring a	1 / 1										
		Total numbers of incidents of discrimination and actions taken	1 / 1										
		Composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity	- / -										
		Ratio of basic salary of men to women by employee category	- / -										
		Occupational accident rate by country	5										
		Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	4 / 1										
		Presence of a formal policy concerning health and safety	1 / 1										

Society	Contribution to Economic Development	Economic situation of the country/region (GDP, economic growth, unemployment, …)	1	1	1	✓	(✓)	(✓)	✓	(✓)	✓	1	1
		Contribution of the organization to the economic progress	1										
			1										
	Corruption	Risk of corruption in the country and/or sub-region	2	5	5	✓	✓	✓	✓	✓	✓	6	6
		Risk of corruption in the sector	6										
			6										
		Formalized commitment of the organization to prevent corruption	6										
			6										
		The organization carries out an anti-corruption program	1										
			1										
		The organization installs or cooperates with internal and external controls to prevent corruption	6										
			6										
		Written documents on active involvement of the organization in corruption and bribery	1										
			1										
		Financial damages	-										
			-										
	Technology development	Sector efforts in technology development	1	5	5	✓	✓	(✓)	✓	-	✓	6	6
			1										
		Involvement in technology transfer program or projects	6										
			6										
		Partnerships in research and development	1										
			1										
		Investments in technology development/ technology transfer	1										
			1										

Figure A4. S-LCA Impact Assessment of Internal Partner 4 – <u>FINAL SCORE 5</u>

Stakeholder	Sub- Categories	Indicators	Inventory	Performance Assessment (PA)	WC	HS	HR	SER	IR	G	Impact Assessment (IA)	TOTAL STAKEHOLDER
Local Community	Delocalization and Migration	International Migrants as a Percentage of Population	2	3	✓	(✓)	(✓)	✓	✓	✓	3	3
		Direct or indirect contribution of the organization to migration of individuals	4									
		Number of individuals who resettle, voluntarily or involuntarily, because of the organization	-									
		Strength of organizational procedures for integrating migrant workers into the community	-									
	Community engagement	Public Trust on Politicians	5	4	(✓)	✓	(✓)	✓	(✓)	✓	4	
		Contribution of the organization to the local development	-									
		Diversity of community stakeholder groups that engage with the organization	1									
		Number of meetings with community stakeholders	-									
		Organizational support (volunteer-hours or financial) for community initiatives	1									
	Cultural heritage	Strength of policies in place to protect cultural heritage	1	1	-	-	(✓)	✓	✓	✓	1	
		Presence/strength of organizational programs to include cultural heritage expression in the product design/production										
	Local employment	Unemployment Statistics by Country	2	2	✓	(✓)	(✓)	✓	✓	✓	1	
		Poverty and Working Poverty by Country	1									
		Percentage of workforce hired locally	-									
		Strength of policies on local hiring preferences (organization-specific indicator)	-									
		Presence of policies on spending on locally-based suppliers	-									
		Percentage on spending on locally-based suppliers	-									
	Access to immaterial resources	Patent Filings	3	3	(✓)	(✓)	✓	✓	(✓)	✓	3	
		Annual arrests connected to protests of organization actions	-									
		Do policies related to intellectual property respect moral and economic rights of the community?	-									
		Presence/strength of community education initiatives	-									
	Access to material resources	Does the organization engage with local community over sustainable methods for sharing resources?	-	2	-	(✓)	✓	✓	✓	(✓)	2	
		Does the organization have a certified environmental management system	1									
		Has the organization caused infrastructures improvements (e.g. roadways, waste disposal systems) having long term effects?	2									
	Safe and healthy living conditions	Burden of Disease by Country	1	2	✓	✓	✓	✓	(✓)	(✓)	1	
		Pollution Levels by Country	3									
		Does the organization measure air/water/earth pollution?	-									
		Presence/Strength of Laws on Construction Safety Regulations	-									
		Organization efforts to strengthen community health (e.g. through shared community access to organization health resources)	1									
		Management effort to minimize use of hazardous substances	-									
	Secure living conditions	Strength of Public Security in Country of operation	3	3	(✓)	✓	✓	(✓)	(✓)	(✓)	3	
		Management policies related to private security personnel	-									
		Number of legal complaints per year occurred against the organization with regard to security concerns	-									
		Number of causalities and injuries per year ascribed to the organization	-									
Value Chain Actors	Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	-	-	✓	✓	✓	✓	-	✓	-	1
		Employee awareness of the importance of compliance with competition legislation and fair competition.	-									
		Legal actions pending or completed during the reporting period regarding anti-competitive behaviour and violations of anti-trust and monopoly legislation in which the reporting organization has been identified as a participant	-									
	Respect of intellectual property rights	General intellectual property rights and related issues associated with the economic sector	1	1	(✓)	-	-	✓	-	✓	1	
		Organization's policy and practice with regards to the respect of intellectual property rights	-									
	Supplier relationships	Absence of coercive communication with suppliers	1	1	(✓)	(✓)	(✓)	✓	-	✓	1	
		Sufficient lead time	-									
		Reasonable volume fluctuations	-									
		Payments on time to suppliers	-									
	Promoting social responsibility	Industry codes of conduct in the sector	-	-	✓	✓	✓	(✓)	(✓)	✓	-	
		Presence of an explicit code of conduct that protect human rights of workers among suppliers	-									
		Percentage of suppliers that the organization has audited with regard to social responsibility along the supply chain	-									
		Membership in initiatives that promotes social responsibility along the supply chain	-									
		Integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures	-									
		Support to suppliers in terms of consciousness-raising and counselling concerning the social responsibility issues	-									

Stakeholder	Subcategory	Indicator	Value	Agg	C1	C2	C3	C4	C5	C6	Score	Total
Consumers	Health and safety	Presence of consumer complaints (at national, sectorial, organizational level)	1	1	-	✓	(✓)	✓	-	✓	1	2
		Quality of or number of information/signs on product health and safety	-									
		Presence of consumer complaints (at national, sectorial, organizational level)	-									
		Presence of management measures to assess costumer health and safety	-									
		Presence of labels of health and safety requirements	-									
	Feedback mechanism	Presence of a mechanism for customers to provide feedback	-	-	(✓)	(✓)	✓	✓	-	✓	-	
		Management measures to improve feedback mechanisms	-									
		Practices related to customer satisfaction, including results of surveys measuring customer satisfaction	-									
	Consumer privacy	Country ranking related to regulations on data-sharing	2	2	-	-	✓	(✓)	-	✓	2	
		Strength of internal management system to protect consumer privacy	1									
		Number of consumer complains related to breach of privacy or loss of data within the last year	-									
		Number of complaints by regulatory bodies related to breach on consumer privacy or loss of data within the last year	-									
	Transparency	Presence of a law or norm regarding transparency	1	1	(✓)	✓	✓	✓	(✓)	✓	1	
		Non-compliance with regulations regarding transparency	1									
		Consumers complaints regarding transparency	-									
		Publication of a sustainability report	-									
		Communication of the results of social and environmental life cycle impact assessment	-									
		Certifications/labels the organization obtained for the product under investigation	-									
	End-of-Life Responsibility	Do internal management systems ensure that clear information is provided to consumers on end-of-life options?	-	-	✓	✓	✓	✓	✓	✓	-	
		Annual incidents of non-compliance with regulatory labelling requirements in one year?	-									
Workers	Freedom of association & collective bargaining	Evidence of Country non respect or support to Freedom of association and Collective bargaining	1	1	✓	✓	✓	✓	✓	✓	1	2
		Evidence of restriction to Freedom of association and Collective bargaining	1									
		Presence of unions within the organization is adequately supported	1									
		Workers are free to join unions of their choosing	1									
		Employee/union representatives are invited to contribute to planning of larger changes in the company, which will affect the working conditions	-									
		Workers have access to a neutral, binding and independent dispute resolution procedure	-									
	Child labour	Percentage of children working by country and sector	1	1	✓	✓	✓	✓	✓	✓	1	
		Absence of working children under the legal age or 15 years old	1									
		Children are not performing work during the night	1									
		Records on all workers, stating names, ages and date of birth are kept on file	1									
		Working children younger than 15 and under local compulsory age are attending school	1									
	Fair salary	Minimum wage by country	-	2	✓	(✓)	✓	✓	-	✓	1	
		Living wage	2									
		Percentage of workers receiving the lowest paid	-									
		The lowest paid workers are considering their wages meets their needs	-									
		Presence of suspicious deductions on wages	-									
		Regular and documented payment of workers	1									
	Working hours	Maximum number of working hours	-	1	✓	✓	✓	✓	-	✓	1	
		Number of hours effectively worked by employees (at each level of employment)	-									
		Number of holidays effectively used by employees (at each level of employment)	-									
		Respect of contractual agreements concerning overtime	1									
		Clear communication of working hours and overtime arrangements	1									
		The organization provides flexibility	1									
	Forced labour	Percentage (estimate) of forced labour by region	2	2	✓	✓	✓	✓	✓	✓	1	
		Workers voluntarily agree upon employment terms	1									
		Employment contracts are comprehensible to the workers and are kept on file	1									
		Employment contracts stipulate wage, working time, holidays and terms of resignation	1									
		Birth certificate, passport, identity card, work permit or other original documents belonging to workers are not retained or kept for safety reasons by the organization	-									
		Workers are free to terminate their employment within the prevailing limits	-									
	Equal opportunities/ discrimination	Women in the Labour force participation rate by country	4	3	✓	✓	✓	✓	✓	✓	2	
		Country gender index ranking	2									
		Presence of formal policies on equal opportunities	-									
		Announcement of open positions happen through national/regional newspapers, public job databases on internet, employment services or other publicly available media ensuring a broad announcement	1									
		Total numbers of incidents of discrimination and actions taken	1									
		Composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity	-									
		Ratio of basic salary of men to women by employee category	-									
	Health and safety	Occupational accident rate by country	3	2	✓	✓	✓	✓	-	✓	1	
		Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	-									
		Hours of injuries per level of employees	-									
		Presence of a formal policy concerning health and safety	1									
		Adequate general occupational safety measures are taken	1									
		Preventive measures and emergency protocols exist regarding accidents & injuries	1									
		Preventive measures and emergency protocols exist regarding pesticides and chemical exposure	1									
		Appropriate protective gear required in all applicable situation present	1									
		Number of occupational safety and health administration violations reported within the past 3 years and status of violations	-									
		Education, training, counselling, prevention and risk control programs in place to a	-									
	Social benefits/social security	Social security expenditure by country and branches of social security (e.g. Healthcare, sickness, maternity)	2	2	✓	✓	✓	✓	✓	(✓)	1	
		List and provide short description of social benefits provided to the workers (eg. Health insurance, pension fund, child care, education, accommodation etc.)	2									
		Evidence of violations of obligations to workers under labour or social security laws and employment regulations.	-									
		Percentage of permanent workers receiving paid time-off	1									

Society	Prevention and mitigation of armed conflicts	Is the organization doing business in a region with ongoing conflicts?	-		-	(✓)	✓	✓	✓	✓	✓	-	75	
		Is the organization doing business in a sector that features linkages to conflicts (e.g. where the depletion of resources allows significant profits - extractive industries, forestry, fishery)?	-											
	Contribution to Economic Development	Economic situation of the country/region (GDP, economic growth, unemployment, ...)	4		3	✓	(✓)	(✓)	✓	(✓)	✓	3		2
		Contribution of the organization contribute to the economic progress	1											
	Corruption	Risk of corruption in the country and/or sub-region	3		3	✓	✓	✓	✓	✓	✓	2		
		Risk of corruption in the sector	-											
		Formalized commitment of the organization to prevent corruption	-											
		The organization carries out an anti-corruption program	-											
		The organization installs or cooperates with internal and external controls to prevent corruption	-											
		Written documents on active involvement of the organization in corruption and bribery	-											
		Financial damages	-											
	Technology development	Sector efforts in technology development	1		1	✓	✓	(✓)	✓	-	✓	1		
		Involvement in technology transfer program or projects	1											
		Partnerships in research and development	1											
		Investments in technology development/ technology transfer	1											

Figure A5. S-LCA Impact Assessment of Internal Partner 5 – <u>FINAL SCORE 2</u>

Stakeholder	Sub- Categories	Indicators	Inventory	Performance Assessment (PA)	WC	HS	HR	SER	IR	G	Impact Assessment (IA)	TOTAL STAKEHOLDER
Local Community	Delocalization and Migration	International Migrants as a Percentage of Population	1	3	✓	(✓)	(✓)	✓	✓	(✓)	3	2
		Direct or indirect contribution of the organization to migration of individuals	4									
		Number of individuals who resettle, voluntarily or involuntarily, because of the organization	2									
		Strength of organizational procedures for integrating migrant workers into the community	1									
	Community engagement	Public Trust on Politicians	2	2	(✓)	✓	(✓)	✓	(✓)	✓	1	
		Organization contribution to local development	1									
		Diversity of community stakeholder groups that engage with the organization	-									
		Number of meetings with community stakeholders	-									
		Organizational support (volunteer-hours or financial) for community initiatives	1									
	Respect of indigenous rights	Indigenous land rights conflicts/land claims	-	2	(✓)	(✓)	✓	(✓)	✓	(✓)	2	
		Strength of policies in place to protect the rights of indigenous community members	-									
		Annual meetings held with indigenous community members	2									
	Local employment	Unemployment Statistics by Country	1	2	✓	(✓)	(✓)	✓	✓	✓	1	
		Poverty and Working Poverty by Country	-									
		Percentage of workforce hired locally	2									
		Strength of policies on local hiring preferences (organization-specific	-									
		Presence of policies on spending on locally-based suppliers	-									
		Percentage on spending on locally-based suppliers	-									
	Access to immaterial resources	Patent Filings	1	1	(✓)	(✓)	✓	✓	(✓)	✓	1	
		Annual arrests connected to protests of organization actions	-									
		Do policies related to intellectual property respect moral and economic rights of the community?	1									
		Presence/strength of community education initiatives	1									
	Access to material resources	Strength of organizational risk assessment with regard to potential for material resource conflict	1	1	-	(✓)	✓	✓	✓	(✓)	1	
		Does the organization engage with local community over sustainable methods for sharing resources?	1									
		Does the organization have a certified environmental management system	1									
		Has the organization caused infrastructures improvements (e.g.	-									
	Safe and healthy living conditions	Burden of Disease by Country	1	2	✓	✓	✓	✓	(✓)	(✓)	1	
		Pollution Levels by Country	2									
		Does the organization measure air/water/earth pollution?	2									
		Presence/Strength of Laws on Construction Safety Regulations	-									
		Organization efforts to strengthen community health (e.g. through shared community access to organization health resources)	1									
		Management effort to minimize use of hazardous substances	1									
	Secure living conditions	Strength of Public Security in Country of operation	1	1	(✓)	✓	✓	(✓)	(✓)	(✓)	1	
		Management policies related to private security personnel	-									
		Number of legal complaints per year occurred against the organization with regard to security concerns	-									
		Number of causalities and injuries per year ascribed to the organization	-									
Value Chain Actors	Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	2	2	✓	✓	✓	✓	-	✓	1	1
		Employee awareness of the importance of compliance with competition legislation and fair competition.	-									
		Legal actions pending or completed during the reporting period regarding anti-competitive behaviour and violations of anti-trust and monopoly legislation in which the reporting organization has been identified as a participant	-									
	Respect of intellectual property rights	General intellectual property rights and related issues associated with the economic sector	1	1	(✓)	-	-	✓	-	✓	1	
		Organization's policy and practice with regards to the respect of intellectual property rights	1									
	Supplier relationships	Absence of coercive communication with suppliers	1	1	(✓)	(✓)	(✓)	✓	-	✓	1	
		Sufficient lead time	1									
		Reasonable volume fluctuations	1									
		Payments on time to suppliers	1									
	Promoting social responsibility	Industry codes of conduct in the sector	1	1	✓	✓	✓	(✓)	(✓)	✓	1	
		Presence of an explicit code of conduct that protect human rights of workers among suppliers	1									
		Percentage of suppliers that the organization has audited with regard to social responsibility along the supply chain	-									
		Membership in initiatives that promotes social responsibility along the supply chain	1									
		Integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures	1									
		Support to suppliers in terms of consciousness-raising and counselling concerning the social responsibility issues	1									

Category	Subcategory	Indicator	Score	Sum							Sum	Overall
Consumers	Health and safety	Presence of consumer complaints (at national, sectorial, organizational level)	1	1	-	✓	(✓)	✓	-	✓	1	1
		Quality of or number of information/signs on product health and safety	1									
		Presence of consumer complaints (at national, sectorial, organizational level)	-									
		Presence of management measures to assess costumer health and	1									
		Presence of labels of health and safety requirements	1									
	Feedback mechanism	Presence of a mechanism for customers to provide feedback	1	1	(✓)	(✓)	✓	✓	-	✓	1	
		Management measures to improve feedback mechanisms	1									
		Practices related to customer satisfaction, including results of surveys measuring customer satisfaction	1									
	Consumer privacy	Country ranking related to regulations on data-sharing	1	1	-	-	✓	(✓)	-	✓	1	
		Strength of internal management system to protect consumer privacy	1									
		Number of consumer complains related to breach of privacy or loss of data within the last year	-									
		Number of complaints by regulatory bodies related to breach on consumer privacy or loss of data within the last year	-									
	Transparency	Presence of a law or norm regarding transparency	1	1	(✓)	✓	✓	✓	(✓)	✓	1	
		Non-compliance with regulations regarding transparency	1									
		Consumers complaints regarding transparency	-									
		Publication of a sustainability report	1									
		Communication of the results of social and environmental life cycle impact assessment	1									
		Certifications/labels the organization obtained for the product under investigation	1									
	End-of-Life Responsibility	Do internal management systems ensure that clear information is provided to consumers on end-of-life options?	1	1	✓	✓	✓	✓	✓	✓	1	
Workers	Freedom of association & collective bargaining	Evidence of Country non respect or support to Freedom of association and Collective bargaining	2	2	✓	✓	✓	✓	✓	✓	1	2
		Presence of unions within the organization is adequately supported	1									
		Workers are free to join unions of their choosing	1									
		Employee/union representatives are invited to contribute to planning of larger changes in the company, which will affect the working conditions	1									
		Workers have access to a neutral, binding, and independent dispute resolution procedure	-									
	Child labour	Percentage of children working by country and sector	1	1	✓	✓	✓	✓	✓	✓	1	
		Absence of working children under the legal age or 15 years old	1									
		Children are not performing work during the night	1									
		Records on all workers, stating names, ages and date of birth are	-									
		Working children younger than 15 and under local compulsory age	1									
	Fair salary	Living Wages	-	2	✓	(✓)	✓	✓	-	✓	1	
		Minimum wage by country	2									
		Percentage of workers receiving the lowest paid	3									
		The lowest paid workers are considering their wages meets their	-									
		Presence of suspicious deductions on wages	-									
		Regular and documented payment of workers	1									
	Working hours	Maximum number of working hours	1	2	✓	✓	✓	✓	-	✓	1	
			1									
		Number of hours effectively worked by employees (at each level of employment)	-									
		Number of holidays effectively used by employees (at each level of employment).	2									
		Respect of contractual agreements concerning overtime	1									
		Clear communication of working hours and overtime arrangements	2									
		The organization provides flexibility	1									
	Forced labour	Workers voluntarily agree upon employment terms	1	1	✓	✓	✓	✓	✓	✓	1	
		Employment contracts are comprehensible to the workers and are	-									
		Employment contracts stipulate wage, working time, holidays and terms of resignation	-									
		Birth certificate, passport, identity card, work permit or other original documents belonging to workers are not retained or kept for safety reasons by the organization	-									
		Workers are free to terminate their employment within the prevailing limits	-									
		Workers are bonded by debts exceeding legal limits to the employer	-									
	Equal opportunities/discrimination	Women in the Labour force participation rate by country	3	3	✓	✓	✓	✓	✓	✓	2	
		Country gender index ranking	3									
		Presence of formal policies on equal opportunities	1									
		Announcement of open positions happen through national/regional	1									
		Total numbers of incidents of discrimination and actions taken	-									
		Composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity	4									
		Ratio of basic salary of men to women by employee category	-									
	Health and safety	Occupational accident rate by country	4	3	✓	✓	✓	✓	-	✓	3	
		Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	2									
		Presence of a formal policy concerning health and safety	1									
		Adequate general occupational safety measures are taken	1									
		Preventive measures and emergency protocols exist regarding accidents & injuries	1									
		Preventive measures and emergency protocols exist regarding pesticides and chemical exposure	1									
		Appropriate protective gear required in all applicable situation	1									
		Number of occupational safety and health administration violations	-									
		Education, training, counselling, prevention and risk control programs in place to assist workforce members, their families or	1									
	Social benefits/social security	Social security expenditure by country and branches of social security (e.g. Healthcare, sickness, maternity)	2	2	✓	✓	✓	✓	✓	(✓)	1	
		List and provide short description of social benefits provided to the workers (eg. Health insurance, pension fund, child care, education,	1									
		Evidence of violations of obligations to workers under labour or	-									
		Percentage of permanent workers receiving paid time-off	-									

				Inventory									
Society	Public commitments to sustainable issues	Presence of publicly available documents as promises or agreements on sustainability issues	2		2	(✓)	(✓)	-	(✓)	-	✓	2	4
		Complaints issued related to the non-fulfilment of promises or agreements by the organization by the local community or other stakeholders	-										
		Presence of mechanisms to follow-up the realisation of promises	1										
	Prevention and Mitigation of Conflicts	Is the organization doing business in a region with ongoing conflicts?	-		2	(✓)	✓	✓	✓	✓	✓	1	
		Is the organization doing business in a sector that features linkages to conflicts (e.g. where the depletion of resources allows significant profits - extractive industries, forestry, fishery)?	2										
		Is the organization doing business in a sector otherwise linked to the escalation or de-escalation of conflicts (e.g. conflict escalation by massive pollution, de-escalation by trade beyond conflict boundaries)?	-										
		Organization's role in the development of conflicts	2										
		Disputed products	-										
	Contribution to Economic Development	Economic situation of the country/region (GDP, economic growth, unemployment, …)	2		2	✓	(✓)	(✓)	✓	(✓)	✓	1	
		Contribution of the organization to the economic progress	1										
	Corruption	Risk of corruption in the country and/or sub-region	2		4	✓	✓	✓	✓	✓	✓	5	
		Risk of corruption in the sector	6										
		Formalized commitment of the organization to prevent corruption	1										
		The organization carries out an anti-corruption program	1										
		The organization installs or cooperates with internal and external controls to prevent corruption	1										
		Written documents on active involvement of the organization in corruption and bribery	1										
		Financial damages	-										
	Technology development	Sector efforts in technology development	1		1	✓	✓	(✓)	✓	-	✓	1	
		Involvement in technology transfer program or projects	1										
		Partnerships in research and development	1										
		Investments in technology development/ technology transfer	1										

Figure A6. S-LCA Impact Assessment of Internal Partner 6 – FINAL SCORE 3

Stakeholder	Sub- Categories	Indicators	Inventory	Performance Assessment (PA)	WC	HS	HR	SER	IR	G	Impact Assessment (IA)	TOTAL STAKEHOLDER
Local Community	Delocalization and Migration	International Migrants as a Percentage of Population	3	3	✓	(✓)	(✓)	✓	✓	(✓)	3	3
		Direct or indirect contribution of the organization to migration of individuals	1									
		Strength of organizational procedures for integrating migrant workers into the community	3									
	Community engagement	Public Trust on Politicians	1	4	(✓)	✓	(✓)	✓	(✓)	✓	4	
		Organizational support (volunteer-hours or financial) for community initiatives	5									
		Collaboration with community stakeholders	2									
	Local employment	Unemployment Statistics by Country	1	2	✓	(✓)	(✓)	✓	✓	✓	1	
		Poverty and Working Poverty by Country	1									
		Strength of policies on local hiring preferences (organization-specific indicator)	3									
		Contribution to the reduction of local unemployment	1									
	Access to immaterial resources	Patent Filings	2	3	(✓)	(✓)	✓	✓	(✓)	✓	3	
		Presence/strength of community education initiatives	4									
		Guarantee freedom of expression of the local community	1									
	Access to material resources	Has the organization caused infrastructures improvements (e.g. roadways, waste disposal systems) having long term effects?	3	2	-	(✓)	✓	✓	✓	(✓)	1	
		Commitment in minimizing the resources consumption	1									
	Safe and healthy living conditions	Burden of Disease by Country	1	2	✓	✓	✓	✓	(✓)	(✓)	1	
		Pollution Levels by Country	1									
		Commitment in strengthening community health and minimise the environmental pollution	2									
		Presence of policies/regulations for safety	1									
	Secure living conditions	Strength of Public Security in Country of operation	2	2	(✓)	✓	✓	(✓)	(✓)	(✓)	2	
		Management policies related to private security personnel	-									
		Number of causalities and injuries per year ascribed to the organization	1									
Value Chain Actors	Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	2	2	✓	✓	✓	✓	-	✓	1	3
		Employee awareness of the importance of compliance with competition legislation and fair competition.	1									
	Respect of intellectual property rights	Approach to general intellectual property rights and related issues associated with the economic sector	1	1	(✓)	-	-	✓	-	✓	1	
		Organization's policy and practice with regards to the respect of intellectual property rights	1									
	Supplier relationships	Mutual co-operation with the suppliers	1	1	(✓)	(✓)	(✓)	✓	-	✓	1	
		Fair behaviour with the suppliers (absence of coercive communication, sufficient lead time, reasonable volume fluctuation, payments on time)	1									
	Promoting social responsibility	Presence of an explicit code of conduct that protect human rights of workers among suppliers	4	4	✓	✓	✓	(✓)	(✓)	✓	4	
		Percentage of suppliers that the organization has audited with regard to social responsibility along the supply chain	4									
		Integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures	4									

Category	Subcategory	Indicator	Weight	Score								Score	Overall
Consumers	Health and safety	Presence of consumer complaints (at national, sectorial, organizational level)	1	3	-	✓	(✓)	✓	-	✓		3	2
		Quality of or number of information/signs on product health and safety	1										
		Presence of management measures to assess costumer health and safety	4										
	Feedback mechanism	Presence of a mechanism for customers to provide feedback	2	2	(✓)	(✓)	✓	✓	-	✓		2	
		Practices related to customer satisfaction, including results of surveys measuring customer satisfaction	2										
	Consumer privacy	Country ranking related to regulations on data-sharing	1	1	-	-	✓	(✓)	-	✓		1	
		Strength of internal management system to protect consumer privacy	1										
		Number of consumer complains related to breach of privacy or loss of data within the last year	-										
	Transparency	Presence of a law or norm regarding transparency	1	1	(✓)	✓	✓	✓	(✓)	✓		1	
		Clear information to enable the consumer choice (e.g. presence of product certifications/labels, publication of annual sustainable reports, communication of results of social and environmental life cycle impact assessment)	1										
		Communications regarding the product and social responsibility in a transparent way	1										
	End-of-Life Responsibility	Do internal management systems ensure that clear information is provided to consumers on end-of-life options?	3	3	✓	✓	✓	✓	✓	✓		2	
		Presence of systems for the product take back	3										
Workers	Freedom of association & collective bargaining	Evidence of Country non respect or support to Freedom of association and Collective bargaining	1	1	✓	✓	✓	✓	✓	✓		1	3
		Evidence of restriction to freedom of association and collective bargaining	1										
		Workers are free to join unions of their choosing and the presence of unions within the organization is adequately supported	1										
	Child labour	Percentage of children working by country and sector	1	1	✓	✓	✓	✓	✓	✓		1	
		Absence of working children under the legal age or 15 years old	1										
	Fair salary	Living Wages	1	1	✓	(✓)	✓	✓	-	✓		1	
		Minimum wage by country	1										
		Presence of suspicious deductions on wages	-										
		Regular and documented payment of workers	1										
		Guarantee that wage levels ensure a decent standard of living	1										
	Working hours	Maximum number of working hours	1	1	✓	✓	✓	✓	-	✓		1	
		Number of holidays effectively used by employees (at each level of employment).	1										
		Maximum number of hours worked by employees and possible difference with the maximum number of hours effectively worked	1										
	Forced labour	Percentage (estimate) of forced labour by region	2	2	✓	✓	✓	✓	✓	✓		1	
		Employment contracts stipulate wage, working time, holidays and terms of resignation	1										
		Workers voluntarily agree upon employment terms and are free to terminate their employment within the prevailing limits	1										
	Equal opportunities/discrimination	Women in the Labour force participation rate by country	2	3	✓	✓	✓	✓	✓	✓		2	
		Country gender index ranking	2										
		Presence of formal policies on equal opportunities	1										
		Composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity	4										
		Absence of any kinds of discrimination	1										
	Health and safety	Occupational accident rate by country	5	4	✓	✓	✓	✓	-	✓		4	
		Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	2										
		Adequate management system for health and safety, so that the risk of workers is low	1										
	Social benefits/social security	Social security expenditure by country and branches of social security (e.g. Healthcare, sickness, maternity)	2	2	✓	✓	✓	✓	✓	(✓)		1	
		List and provide short description of social benefits provided to the workers (eg. Health insurance, pension fund, child care, education, accommodation etc.)	2										
Society	Public commitments to sustainable issues	Presence of publicly available documents as promises or agreements on sustainability issues	4	4	(✓)	(✓)	-	(✓)	-	✓		3	4
		Presence of mechanisms to follow-up the realisation of promises	4										
	Contribution to Economic Development	Economic situation of the country/region (GDP, economic growth, unemployment, …)	1	1	✓	(✓)	(✓)	✓	(✓)	✓		1	
		Contribution to the local economic progress, through different aspects (e.g. payment of wages, purchase of raw materials and supplies, investments, …)	1										
	Corruption	Risk of corruption in the country and/or sub-region	2	4	✓	✓	✓	✓	✓	✓		5	
		Formalized commitment of the organization to prevent corruption/presence of an anti-corruption program	5										
		Involvement in cases of corruption	-										
	Technology development	Involvement in technology transfer program or projects	1	1	✓	✓	(✓)	✓	-	✓		1	
		Engagement in the development of efficient and environmental sound technologies	1										
		Investments in technology development/ technology transfer	1										

Figure A7. S-LCA Impact Assessment of Internal Partner 7 – FINAL SCORE 3

Stakeholder	Sub- Categories	Indicators	Inventory	Performance Assessment (PA)	WC	HS	HR	SER	IR	G	Impact Assessment (IA)	TOTAL STAKEHOLDER
Local Community	Delocalization and Migration	International Migrants as a Percentage of Population	2	2	✓	(✓)	(✓)	✓	✓	(✓)	1	3
		Direct or indirect contribution of the organization to migration of individuals	2									
		Number of individuals who resettle, voluntarily or involuntarily, because of the organization	-									
		Strength of organizational procedures for integrating migrant workers into the community	-									
	Community engagement	Public Trust on Politicians	5	4	(✓)	✓	(✓)	✓	(✓)	✓	4	
		Contribution of the organization to the local development	1									
		Diversity of community stakeholder groups that engage with the organization	1									
		Number of meetings with community stakeholders	-									
		Organizational support (volunteer-hours or financial) for community initiatives	1									
	Cultural Heritage	Cultural Heritage in Urgent Need of Safeguarding		1	-	-	(✓)	✓	✓	✓	1	
		Prevalence of Racial Discrimination										
		Strength of policies in place to protect cultural heritage	1									
		Presence/strength of organizational programs to include cultural heritage expression in the product design/production	-									
	Respect of indigenous rights	Indigenous land rights conflicts/land claims	-	1	(✓)	(✓)	✓	(✓)	✓	(✓)	1	
		Strength of policies in place to protect the rights of indigenous community members	1									
		Annual meetings held with indigenous community members	-									
	Local employment	Unemployment Statistics by Country	2	2	✓	(✓)	(✓)	✓	✓	✓	1	
		Poverty and Working Poverty by Country	-									
		Percentage of workforce hired locally	2									
		Strength of policies on local hiring preferences (organization-specific indicator)	-									
		Presence of policies on spending on locally-based suppliers	-									
		Percentage on spending on locally-based suppliers	-									
	Access to immaterial resources	Patent Filings	3	2	(✓)	(✓)	✓	✓	(✓)	✓	1	
		Annual arrests connected to protests of organization actions	-									
		Do policies related to intellectual property respect moral and economic rights of the community?	1									
		Presence/strength of community education initiatives	1									
	Access to material resources	Strength of organizational risk assessment with regard to potential for material resource conflict	2	2	-	(✓)	✓	✓	✓	(✓)	2	
		Does the organization engage with local community over sustainable methods for sharing resources?	-									
		Does the organization have a certified environmental management system	1									
		Has the organization caused infrastructures improvements (e.g. roadways, waste disposal systems) having long term effects?	-									
	Safe and healthy living conditions	Burden of Disease by Country	1	2	✓	✓	✓	✓	(✓)	(✓)	1	
		Pollution Levels by Country	3									
		Does the organization measure air/water/earth pollution?	1									
		Presence/Strength of Laws on Construction Safety Regulations	1									
		Organization efforts to strengthen community health (e.g. through shared community access to organization health resources)	2									
		Management effort to minimize use of hazardous substances	1									
	Secure living conditions	Strength of Public Security in Country of operation	4	4	(✓)	✓	✓	(✓)	(✓)	(✓)	4	
		Management policies related to private security personnel	-									
		Number of legal complaints per year occurred against the organization with regard to security concerns	-									
		Number of causalities and injuries per year ascribed to the organization	-									
Value Chain Actors	Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	-	1	✓	✓	✓	✓	-	✓	1	1
		Employee awareness of the importance of compliance with competition legislation and fair competition.	1									
		Legal actions pending or completed during the reporting period regarding anti-competitive behaviour and violations of anti-trust and monopoly legislation in which the reporting organization has been identified as a participant	1									
	Respect of intellectual property rights	General intellectual property rights and related issues associated with the economic sector	1	1	(✓)	-	-	✓	-	✓	1	
		Organization's policy and practice with regards to the respect of intellectual property rights	1									
	Supplier relationships	Absence of coercive communication with suppliers	1	1	(✓)	(✓)	(✓)	✓	-	✓	1	
		Sufficient lead time	-									
		Reasonable volume fluctuations	1									
		Payments on time to suppliers	1									
	Promoting social responsibility	Industry codes of conduct in the sector	-	1	✓	✓	✓	(✓)	(✓)	✓	1	
		Presence of an explicit code of conduct that protect human rights of workers among suppliers	1									
		Percentage of suppliers that the organization has audited with regard to social responsibility along the supply chain	-									
		Membership in initiatives that promotes social responsibility along the supply chain	1									
		Integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures	1									
		Support to suppliers in terms of consciousness-raising and counselling concerning the social responsibility issues	1									

Stakeholder	Subcategory	Indicator	Score	Sub	1	2	3	4	5	6	Sub	Overall
Consumers	Health and safety	Presence of consumer complaints (at national, sectorial, organizational level)	1	1	-	✓	(✓)	✓	-	✓	1	2
		Quality of or number of information/signs on product health and safety	1									
		Presence of consumer complaints (at national, sectorial, organizational level)	-									
		Presence of management measures to assess costumer health and safety	1									
		Presence of labels of health and safety requirements	1									
	Feedback mechanism	Presence of a mechanism for customers to provide feedback	1	1	(✓)	(✓)	✓	✓	-	✓	1	
		Management measures to improve feedback mechanisms	1									
		Practices related to customer satisfaction, including results of surveys measuring customer satisfaction	1									
	Consumer privacy	Country ranking related to regulations on data-sharing	2	2	-	-	✓	(✓)	-	(✓)	3	
		Strength of internal management system to protect consumer privacy	1									
		Number of consumer complains related to breach of privacy or loss of data within the last year	-									
		Number of complaints by regulatory bodies related to breach on consumer privacy or loss of data within the last year	-									
	Transparency	Presence of a law or norm regarding transparency	1	1	(✓)	✓	✓	✓	(✓)	✓	1	
		Non-compliance with regulations regarding transparency	1									
		Consumers complaints regarding transparency	-									
		Publication of a sustainability report	1									
		Quality and comprehensiveness of the information available in the sustainability report or in other documents regarding social and environmental performances of the organization	1									
		Communication of the results of social and environmental life cycle impact assessment	1									
		Certifications/labels the organization obtained for the product under investigation	1									
	End-of-Life Responsibility	Do internal management systems ensure that clear information is provided to consumers on end-of-life options?	-	-	✓	✓	✓	✓	✓	✓	-	
		Annual incidents of non-compliance with regulatory labelling requirements in one year?	-									
Workers	Freedom of association & collective bargaining	Evidence of Country non respect or support to Freedom of association and Collective bargaining	1	1	✓	✓	✓	✓	✓	✓	1	1
		Evidence of restriction to Freedom of association and Collective bargaining	1									
		Presence of unions within the organization is adequately supported	1									
		Workers are free to join unions of their choosing	-									
		Employee/union representatives are invited to contribute to planning of larger changes in the company, which will affect the working conditions	1									
		Workers have access to a neutral, binding and independent dispute resolution procedure	1									
	Child labour	Percentage of children working by country and sector	1	1	✓	✓	✓	✓	✓	✓	1	
		Absence of working children under the legal age or 15 years old	1									
		Children are not performing work during the night	1									
		Records on all workers, stating names, ages and date of birth are kept on file	-									
		Working children younger than 15 and under local compulsory age are attending school	1									
	Fair salary	Minimum wage by country	3	2	✓	(✓)	✓	✓	-	✓	1	
		Living wage	2									
		Percentage of workers receiving the lowest paid	-									
		The lowest paid workers are considering their wages meets their needs	-									
		Presence of suspicious deductions on wages	1									
		Regular and documented payment of workers	1									
	Working hours	Maximum number of working hours	-	1	✓	✓	✓	✓	-	✓	1	
		Number of hours effectively worked by employees (at each level of employment)	-									
		Number of holidays effectively used by employees (at each level of employment)	-									
		Respect of contractual agreements concerning overtime	1									
		Clear communication of working hours and overtime arrangements	1									
		The organization provides flexibility	1									
	Forced labour	Percentage (estimate) of forced labour by region	2	2	✓	✓	✓	✓	✓	✓	1	
		Workers voluntarily agree upon employment terms	1									
		Employment contracts are comprehensible to the workers and are kept on file	1									
		Employment contracts stipulate wage, working time, holidays and terms of resignation	1									
		Birth certificate, passport, identity card, work permit or other original documents belonging to workers are not retained or kept for safety reasons by the organization	-									
		Workers are free to terminate their employment within the prevailing limits	1									
	Equal opportunities/discrimination	Women in the Labour force participation rate by country	3	2	✓	✓	✓	✓	✓	✓	1	
		Country gender index ranking	3									
		Presence of formal policies on equal opportunities	1									
		Announcement of open positions happen through national/regional newspapers, public job databases on internet, employment services or other publicly available media ensuring a broad announcement	-									
		Total numbers of incidents of discrimination and actions taken	-									
		Composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity	3									
		Ratio of basic salary of men to women by employee category	1									
	Health and safety	Occupational accident rate by country	1	2	✓	✓	✓	✓	-	✓	2	
		Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	2									
		Hours of injuries per level of employees	-									
		Presence of a formal policy concerning health and safety	1									
		Adequate general occupational safety measures are taken	1									
		Preventive measures and emergency protocols exist regarding accidents & injuries	1									
		Preventive measures and emergency protocols exist regarding pesticides and chemical exposure	1									
		Appropriate protective gear required in all applicable situation present	1									
		Number of occupational safety and health administration violations reported within the past 3 years and status of violations	-									
		Education, training, counselling, prevention and risk control programs in place to assist workforce members, their families or community members regarding serious diseases	1									
	Social benefits/social security	Social security expenditure by country and branches of social security (e.g. Healthcare, sickness, maternity)	2	2	✓	✓	✓	✓	✓	(✓)	1	
		List and provide short description of social benefits provided to the workers (eg. Health insurance, pension fund, child care, education, accommodation etc.)	2									
		Evidence of violations of obligations to workers under labour or social security laws and employment regulations.	1									
		Percentage of permanent workers receiving paid time-off	-									

Stakeholder	Sub-Categories	Indicators	Inventory		(✓)	(✓)	-	(✓)	-	✓		
Society	Public commitments to sustainable issues	Presence of publicly available documents as promises or agreements on sustainability issues	-									
		Complaints issued related to the non-fulfilment of promises or agreements by the organization by the local community or other stakeholders at OECD contact points or Global Reporting Initiative.	1	1	(✓)	(✓)	-	(✓)	-	✓	1	
		Presence of mechanisms to follow-up the realisation of promises	-									
	Prevention and mitigation of armed conflicts	Is the organization doing business in a region with ongoing conflicts?	-									
		Is the organization doing business in a sector that features linkages to conflicts (e.g. where the depletion of resources allows significant profits - extractive industries, forestry, fishery)?	1	1	(✓)	✓	✓	✓	✓	✓	1	5
		Is the organization doing business in a sector otherwise linked to the escalation or de-escalation of conflicts (e.g. conflict escalation by massive pollution, de-esclation by trade beyond conflict boundaries)?	1									
		Organization's role in the development of conflicts	-									
		Disputed products	-									
	Contribution to Economic Development	Economic situation of the country/region (GDP, economic growth, unemployment, ...)	4	3	✓	(✓)	(✓)	✓	(✓)	✓	3	
		Contribution of the organization to the economic progress	1									
	Corruption	Risk of corruption in the country and/or sub-region	3									
		Risk of corruption in the sector	6									
		Formalized commitment of the organization to prevent corruption	1	5	✓	✓	✓	✓	✓	✓	6	
		The organization carries out an anti-corruption program	1									
		The organization installs or cooperates with internal and external controls to prevent corruption	1									
		Written documents on active involvement of the organization in corruption and bribery	-									
		Financial damages	-									
	Technology development	Sector efforts in technology development	-									
		Involvement in technology transfer program or projects	1	1	✓	✓	(✓)	✓	-	✓	1	
		Partnerships in research and development	1									
		Investments in technology development/ technology transfer	1									

Figure A8. S-LCA Impact Assessment of Internal Partner 8 – <u>FINAL SCORE 4</u>

Stakeholder	Sub-Categories	Indicators	Inventory	Performance Assessment (PA)	WC	HS	HR	SER	IR	G	Impact Assessment (IA)	TOTAL STAKEHOLDER
Local Community	Delocalization and Migration	International Migrants as a Percentage of Population	3	3	✓	(✓)	(✓)	✓	✓	(✓)	3	3
		Direct or indirect contribution of the organization to migration of individuals	2									
		Strength of organizational procedures for integrating migrant workers into the community	2									
	Community engagement	Public Trust on Politicians	2	3	(✓)	✓	(✓)	✓	(✓)	✓	3	
		Organizational support (volunteer-hours or financial) for community initiatives	2									
		Collaboration with community stakeholders	3									
	Cultural heritage	Policies in place to protect cultural heritage and/or programs to include cultural heritage expression in the product design/production	2	2	-	-	(✓)	✓	✓	✓	2	
		Respect of cultural customs and traditions	1									
	Local employment	Unemployment Statistics by Country	1	2	✓	(✓)	(✓)	✓	✓	✓	1	
		Poverty and Working Poverty by Country	1									
		Strength of policies on local hiring preferences (organization-specific indicator)	3									
		Contribution to the reduction of local unemployment	3									
	Access to immaterial resources	Patent Filings	1	1	(✓)	(✓)	✓	✓	(✓)	✓	1	
		Presence/strength of community education initiatives	1									
		Guarantee freedom of expression of the local community	1									
	Access to material resources	Has the organization caused infrastructures improvements (e.g. roadways, waste disposal systems) having long term effects?	5	4	-	(✓)	✓	✓	✓	(✓)	4	
		Commitment in minimizing the resources consumption	1									
	Safe and healthy living conditions	Burden of Disease by Country	1	2	✓	✓	✓	✓	(✓)	(✓)	1	
		Pollution Levels by Country	1									
		Commitment in strengthening community health and minimise the environmental pollution	1									
		Presence of policies/regulations for safety	3									
	Secure living conditions	Strength of Public Security in Country of operation	1	1	(✓)	✓	✓	(✓)	(✓)	(✓)	1	
		Management policies related to private security personnel	-									
		Number of causalities and injuries per year ascribed to the organization	1									
Value Chain Actors	Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	2	2	✓	✓	✓	✓	-	✓	1	3
		Employee awareness of the importance of compliance with competition legislation and fair competition.	1									
	Respect of intellectual property rights	Approach to general intellectual property rights and related issues associated with the economic sector	1	2	(✓)	-	-	✓	-	✓	2	
		Organization's policy and practice with regards to the respect of intellectual property rights	3									
	Supplier relationships	Mutual co-operation with the suppliers	1	1	(✓)	(✓)	(✓)	✓	-	✓	1	
		Fair behaviour with the suppliers (absence of coercive communication, sufficient lead time, reasonable volume fluctuation, payments on time)	1									
	Promoting social responsibility	Presence of an explicit code of conduct that protect human rights of workers among suppliers	2	4	✓	✓	✓	(✓)	(✓)	✓	4	
		Percentage of suppliers that the organization has audited with regard to social responsibility along the supply chain	2									
		Integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures	5									

Category	Subcategory	Indicator	Weight	Score							Score	Overall
Consumers	Health and safety	Presence of consumer complaints (at national, sectorial, organizational level)	1	2	-	✓	(✓)	✓	-	✓	2	2
		Quality of or number of information/signs on product health and safety	1									
		Presence of management measures to assess costumer health and safety	2									
	Feedback mechanism	Presence of a mechanism for customers to provide feedback	2	2	(✓)	(✓)	✓	✓	-	✓	2	
		Practices related to customer satisfaction, including results of surveys measuring customer satisfaction	1									
	Consumer privacy	Country ranking related to regulations on data-sharing	1	1	-	-	✓	(✓)	-	✓	1	
		Strength of internal management system to protect consumer privacy	2									
		Number of consumer complains related to breach of privacy or loss of data within the last year	1									
	Transparency	Presence of a law or norm regarding transparency	1	3	(✓)	✓	✓	✓	(✓)	✓	3	
		Clear information to enable the consumer choice (e.g. presence of product certifications/labels, publication of annual sustainable reports, communication of results of social and environmental life cycle impact assessment)	1									
		Communications regarding the product and social responsibility in a transparent way	4									
	End-of-Life Responsibility	Do internal management systems ensure that clear information is provided to consumers on end-of-life options?	1	1	✓	✓	✓	✓	✓	✓	1	
		Presence of systems for the product take back	-									
Workers	Freedom of association & collective bargaining	Evidence of Country non respect or support to Freedom of association and Collective bargaining	1	1	✓	✓	✓	✓	✓	✓	1	3
		Evidence of restriction to freedom of association and collective bargaining	1									
		Workers are free to join unions of their choosing and the presence of unions within the organization is adequately supported	1									
	Child labour	Percentage of children working by country and sector	1	1	✓	✓	✓	✓	✓	✓	1	
		Absence of working children under the legal age or 15 years old	1									
	Fair salary	Living Wages	1	1	✓	(✓)	✓	✓	-	✓	1	
		Minimum wage by country	1									
		Presence of suspicious deductions on wages	1									
		Regular and documented payment of workers	1									
		Guarantee that wage levels ensure a decent standard of living	1									
	Working hours	Maximum number of working hours	1	1	✓	✓	✓	✓	-	✓	1	
		Number of holidays effectively used by employees (at each level of employment).	1									
		Maximum number of hours worked by employees and possible difference with the maximum number of hours effectively worked	1									
	Forced labour	Percentage (estimate) of forced labour by region	2	2	✓	✓	✓	✓	✓	✓	1	
		Employment contracts stipulate wage, working time, holidays and terms of resignation	1									
		Workers voluntarily agree upon employment terms and are free to terminate their employment within the prevailing limits	1									
	Equal opportunities/discrimination	Women in the Labour force participation rate by country	2	3	✓	✓	✓	✓	✓	✓	2	
		Country gender index ranking	2									
		Presence of formal policies on equal opportunities	3									
		Composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity	3									
		Absence of any kinds of discrimination	1									
	Health and safety	Occupational accident rate by country	5	4	✓	✓	✓	✓	-	✓	4	
		Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	2									
		Adequate management system for health and safety, so that the risk of workers is low	2									
	Social benefits/social security	Social security expenditure by country and branches of social security (e.g. Healthcare, sickness, maternity)	2	2	✓	✓	✓	✓	✓	(✓)	1	
		List and provide short description of social benefits provided to the workers (eg. Health insurance, pension fund, child care, education, accommodation etc.)	1									
Society	Public commitments to sustainable issues	Presence of publicly available documents as promises or agreements on sustainability issues	1	1	(✓)	(✓)	-	(✓)	-	✓	1	1
		Presence of mechanisms to follow-up the realisation of promises	1									
	Contribution to Economic Development	Economic situation of the country/region (GDP, economic growth, unemployment, …)	1	1	✓	(✓)	(✓)	✓	(✓)	✓	1	
		Contribution to the local economic progress, through different aspects (e.g. payment of wages, purchase of raw materials and supplies, investments, …)	1									
	Corruption	Risk of corruption in the country and/or sub-region	2	2	✓	✓	✓	✓	✓	✓	1	
		Formalized commitment of the organization to prevent corruption/presence of an anti-corruption program	-									
		Involvement in cases of corruption	1									
	Technology development	Involvement in technology transfer program or projects	1	1	✓	✓	(✓)	✓	-	✓	1	
		Engagement in the development of efficient and environmental sound technologies	1									
		Investments in technology development/ technology transfer	1									

Figure A9. S-LCA Impact Assessment of Internal Partner 9 – FINAL SCORE 3

Stakeholder	Sub-Categories	Indicators	Inventory	Performance Assessment (PA)	WC	HS	HR	SER	IR	G	Impact Assessment (IA)	TOTAL STAKEHOLDER
Local Community	Delocalization and Migration	International Migrants as a Percentage of Population	2	2	✓	(✓)	(✓)	✓	✓	(✓)	1	3
		Direct or indirect contribution of the organization to migration of individuals	2									
		Strength of organizational procedures for integrating migrant workers into the community	2									
	Community engagement	Public Trust on Politicians	5	4	(✓)	✓	(✓)	✓	(✓)	✓	4	
		Organizational support (volunteer-hours or financial) for community initiatives	1									
		Collaboration with community stakeholders	1									
	Cultural heritage	Policies in place to protect cultural heritage and/or programs to include cultural heritage expression in the product design/production	1	1	-	-	(✓)	✓	✓	✓	1	
		Respect of cultural customs and traditions	-									
	Respect of indigenous rights	Policies in place to protect the rights of indigeneous community members	-	1	(✓)	(✓)	✓	(✓)	✓	(✓)	1	
		Respect of indigenous rights, including the rights to lands, resources, cultural integrity, self-determination, and self-government	1									
	Local employment	Unemployment Statistics by Country	2	2	✓	(✓)	(✓)	✓	✓	✓	1	
		Poverty and Working Poverty by Country	2									
		Strength of policies on local hiring preferences (organization-specific indicator)	1									
		Contribution to the reduction of local unemployment	1									
	Access to immaterial resources	Patent Filings	3	3	(✓)	(✓)	✓	✓	(✓)	✓	3	
		Presence/strength of community education initiatives	2									
		Guarantee freedom of expression of the local community	-									
	Access to material resources	Has the organization caused infrastructures improvements (e.g. roadways, waste disposal systems) having long term effects?	1	1	-	(✓)	✓	✓	✓	(✓)	1	
		Commitment in minimizing the resources consumption	1									
	Safe and healthy living conditions	Burden of Disease by Country	1	1	✓	✓	✓	✓	(✓)	(✓)	1	
		Pollution Levels by Country	1									
		Commitment in strengthening community health and minimise the environmental pollution	1									
		Presence of policies/regulations for safety	-									
	Secure living conditions	Strength of Public Security in Country of operation	1	1	(✓)	✓	✓	(✓)	(✓)	(✓)	1	
		Management policies related to private security personnel	-									
		Number of casualities and injuries per year ascribed to the organization	-									
Value Chain Actors	Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	1	1	✓	✓	✓	✓	-	✓	1	1
		Employee awareness of the importance of compliance with competition legislation and fair competition.	1									
	Respect of intellectual property rights	Approach to general intellectual property rights and related issues associated with the economic sector	1	1	(✓)	-	-	✓	-	✓	1	
		Organization's policy and practice with regards to the respect of intellectual property rights	1									
	Supplier relationships	Mutual co-operation with the suppliers	1	1	(✓)	(✓)	(✓)	✓	-	✓	1	
		Fair behaviour with the suppliers (absence of coercive communication, sufficient lead time, reasonable volume fluctuation, payments on time)	1									
	Promoting social responsibility	Presence of an explicit code of conduct that protect human rights of workers among suppliers	1	1	✓	✓	✓	(✓)	(✓)	✓	1	
		Percentage of suppliers that the organization has audited with regard to social responsibility along the supply chain	-									
		Integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures	1									

Category	Subcategory	Indicator											
Consumers	Health and safety	Presence of consumer complaints (at national, sectorial, organizational level)	1	1	-	✓	(✓)	✓	-	✓	1	1
		Quality of or number of information/signs on product health and safety	1									
		Presence of management measures to assess costumer health and safety	1									
	Feedback mechanism	Presence of a mechanism for customers to provide feedback	1	1	(✓)	(✓)	✓	✓	-	✓	1	
		Practices related to customer satisfaction, including results of surveys measuring customer satisfaction	1									
	Consumer privacy	Country ranking related to regulations on data-sharing	1	1	-	-	✓	(✓)	-	✓	1	
		Strength of internal management system to protect consumer privacy	1									
		Number of consumer complains related to breach of privacy or loss of data within the last year	-									
	Transparency	Presence of a law or norm regarding transparency	1	1	(✓)	✓	✓	✓	(✓)	✓	1	
		Clear information to enable the consumer choice (e.g. presence of product certifications/labels, publication of annual sustainable reports, communication of results of social and environmental life cycle impact assessment)	1									
		Communications regarding the product and social responsibility in a transparent way	1									
	End-of-Life Responsibility	Do internal management systems ensure that clear information is provided to consumers on end-of-life options?	1	1	✓	✓	✓	✓	✓	✓	1	
		Presence of systems for the product take back	-									
Workers	Freedom of association & collective bargaining	Evidence of Country non respect or support to Freedom of association and Collective bargaining	1	1	✓	✓	✓	✓	✓	✓	1	3
		Evidence of restriction to freedom of association and collective bargaining	1									
		Workers are free to join unions of their choosing and the presence of unions within the organization is adequately supported	1									
	Child labour	Percentage of children working by country and sector	1	1	✓	✓	✓	✓	✓	✓	1	
		Absence of working children under the legal age or 15 years old	1									
	Fair salary	Living Wages	2	2	✓	(✓)	✓	✓	-	✓	1	
		Minimum wage by country	2									
		Presence of suspicious deductions on wages	1									
		Regular and documented payment of workers	1									
		Guarantee that wage levels ensure a decent standard of living	1									
	Working hours	Maximum number of working hours	2	2	✓	✓	✓	✓	-	✓	1	
		Number of holidays effectively used by employees (at each level of employment).	1									
		Maximum number of hours worked by employees and possible difference with the maximum number of hours effectively worked	1									
	Forced labour	Percentage (estimate) of forced labour by region	2	2	✓	✓	✓	✓	✓	✓	1	
		Employment contracts stipulate wage, working time, holidays and terms of resignation	1									
		Workers voluntarily agree upon employment terms and are free to terminate their employment within the prevailing limits	1									
	Equal opportunities/discrimination	Women in the Labour force participation rate by country	2	2	✓	✓	✓	✓	✓	✓	1	
		Country gender index ranking	2									
		Presence of formal policies on equal opportunities	1									
		Composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity	3									
		Absence of any kinds of discrimination	1									
	Health and safety	Occupational accident rate by country	5	4	✓	✓	✓	✓	-	✓	4	
		Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	2									
		Adequate management system for health and safety, so that the risk of workers is low	1									
	Social benefits/social security	Social security expenditure by country and branches of social security (e.g. Healthcare, sickness, maternity)	2	2	✓	✓	✓	✓	✓	(✓)	1	
		List and provide short description of social benefits provided to the workers (eg. Health insurance, pension fund, child care, education, accommodation etc.)	2									
Society	Public commitments to sustainable issues	Presence of publicly available documents as promises or agreements on sustainability issues	1	1	(✓)	(✓)	-	(✓)	-	✓	1	1
		Presence of mechanisms to follow-up the realisation of promises	-									
	Prevention and mitigation of conflicts	In case the organization is located in regions with a high risk of conflicts due to resource depletion, massive pollution or poor working standards, does it try to reduce the risk by dint of appropriate measures	-	-	(✓)	✓	✓	✓	✓	✓	-	
	Contribution to Economic Development	Economic situation of the country/region (GDP, economic growth, unemployment, …)	1	1	✓	(✓)	(✓)	✓	(✓)	✓	1	
		Contribution to the local economic progress, through different aspects (e.g. payment of wages, purchase of raw materials and supplies, investments, …)	-									
	Corruption	Risk of corruption in the country and/or sub-region	3	2	✓	✓	✓	✓	✓	✓	1	
		Formalized commitment of the organization to prevent corruption/presence of an anti-corruption program	1									
		Involvement in cases of corruption	1									
	Technology development	Involvement in technology transfer program or projects	1	1	✓	✓	(✓)	✓	-	✓	1	
		Engagement in the development of efficient and environmental sound technologies	1									
		Investments in technology development/ technology transfer	1									

Figure A10. S-LCA Impact Assessment of Internal Partner 10 – <u>FINAL SCORE 2</u>

Stakeholder	Sub-Categories	Indicators	Inventory	Performance Assessment (PA)	WC	HS	HR	SER	IR	G	Impact Assessment (IA)	TOTAL STAKEHOLDER
Local Community	Delocalization and Migration	International Migrants as a Percentage of Population	2	2	✓	(✓)	(✓)	✓	✓	(✓)	1	4
		Direct or indirect contribution of the organization to migration of individuals	1									
		Strength of organizational procedures for integrating migrant workers into the community	-									
	Community engagement	Public Trust on Politicians	5	4	(✓)	✓	(✓)	✓	(✓)	✓	5	
		Organizational support (volunteer-hours or financial) for community initiatives	1									
		Collaboration with community stakeholders	1									
	Cultural heritage	Policies in place to protect cultural heritage and/or programs to include cultural heritage expression in the product design/production	1	1	-	-	(✓)	✓	✓	✓	1	
		Respect of cultural customs and traditions	1									
	Local employment	Unemployment Statistics by Country	2	2	✓	(✓)	(✓)	✓	✓	✓	1	
		Poverty and Working Poverty by Country	1									
		Strength of policies on local hiring preferences (organization-specific indicator)	1									
		Contribution to the reduction of local unemployment	1									
	Access to immaterial resources	Patent Filings	3	2	(✓)	(✓)	✓	✓	(✓)	✓	1	
		Presence/strength of community education initiatives	-									
		Guarantee freedom of expression of the local community	1									
	Access to material resources	Has the organization caused infrastructures improvements (e.g. roadways, waste disposal systems) having long term effects?	5	4	-	(✓)	✓	✓	✓	(✓)	4	
		Commitment in minimizing the resources consumption	1									
	Safe and healthy living conditions	Burden of Disease by Country	1	2	✓	✓	✓	✓	(✓)	(✓)	1	
		Pollution Levels by Country	3									
		Commitment in strengthening community health and minimise the environmental pollution	1									
		Presence of policies/regulations for safety	1									
	Secure living conditions	Strength of Public Security in Country of operation	3	2	(✓)	✓	✓	(✓)	(✓)	(✓)	2	
		Management policies related to private security personnel	-									
		Number of causalities and injuries per year ascribed to the organization	1									
Value Chain Actors	Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	1	1	✓	✓	✓	✓	-	✓	1	1
		Employee awareness of the importance of compliance with competition legislation and fair competition.	1									
	Respect of intellectual property rights	Approach to general intellectual property rights and related issues associated with the economic sector			(✓)	-	-	✓	-	✓		
		Organization's policy and practice with regards to the respect of intellectual property rights										
	Supplier relationships	Mutual co-operation with the suppliers	1	1	(✓)	(✓)	(✓)	✓	-	✓	1	
		Fair behaviour with the suppliers (absence of coercive communication, sufficient lead time, reasonable volume fluctuation, payments on time)	1									
	Promoting social responsibility	Presence of an explicit code of conduct that protect human rights of workers among suppliers	1	2	✓	✓	✓	(✓)	(✓)	✓	1	
		Percentage of suppliers that the organization has audited with regard to social responsibility along the supply chain	2									
		Integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures	1									

Stakeholder	Subcategory	Indicator	Weight	Score	c1	c2	c3	c4	c5	c6	Score	Final
Consumers	Health and safety	Presence of consumer complaints (at national, sectorial, organizational level)	1	1	-	✓	(✓)	✓	-	✓	1	2
		Quality of or number of information/signs on product health and safety	1									
		Presence of management measures to assess costumer health and safety	1									
	Feedback mechanism	Presence of a mechanism for customers to provide feedback	1	1	(✓)	(✓)	✓	✓	-	✓	1	
		Practices related to customer satisfaction, including results of surveys measuring customer satisfaction	1									
	Consumer privacy	Country ranking related to regulations on data-sharing	2	2	-	-	✓	(✓)	-	✓	2	
		Strength of internal management system to protect consumer privacy	1									
		Number of consumer complains related to breach of privacy or loss of data within the last year	1									
	Transparency	Presence of a law or norm regarding transparency	1	1	(✓)	✓	✓	✓	(✓)	✓	1	
		Clear information to enable the consumer choice (e.g. presence of product certifications/labels, publication of annual sustainable reports, communication of results of social and environmental life cycle impact assessment)	1									
		Communications regarding the product and social responsibility in a transparent way	1									
	End-of-Life Responsibility	Do internal management systems ensure that clear information is provided to consumers on end-of-life options?	-	2	✓	✓	✓	✓	✓	✓	1	
		Presence of systems for the product take back	2									
Workers	Freedom of association & collective bargaining	Evidence of Country non respect or support to Freedom of association and Collective bargaining	1	1	✓	✓	✓	✓	✓	✓	1	4
		Evidence of restriction to freedom of association and collective bargaining	1									
		Workers are free to join unions of their choosing and the presence of unions within the organization is adequately supported	2									
	Child labour	Percentage of children working by country and sector	1	1	✓	✓	✓	✓	✓	✓	1	
		Absence of working children under the legal age or 15 years old	1									
	Fair salary	Living Wages	2	2	✓	(✓)	✓	✓	-	✓	1	
		Minimum wage by country	-									
		Presence of suspicious deductions on wages	1									
		Regular and documented payment of workers	1									
		Guarantee that wage levels ensure a decent standard of living	1									
	Working hours	Maximum number of working hours	1	1	✓	✓	✓	✓	-	✓	1	
		Number of holidays effectively used by employees (at each level of employment).	1									
		Maximum number of hours worked by employees and possible difference with the maximum number of hours effectively worked	1									
	Forced labour	Percentage (estimate) of forced labour by region	2	2	✓	✓	✓	✓	✓	✓	1	
		Employment contracts stipulate wage, working time, holidays and terms of resignation	1									
		Workers voluntarily agree upon employment terms and are free to terminate their employment within the prevailing limits	1									
	Equal opportunities/discrimination	Women in the Labour force participation rate by country	4	4	✓	✓	✓	✓	✓	✓	5	
		Country gender index ranking	2									
		Presence of formal policies on equal opportunities	5									
		Composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity	4									
		Absence of any kinds of discrimination	1									
	Health and safety	Occupational accident rate by country	3	2	✓	✓	✓	✓	-	✓	1	
		Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	1									
		Adequate management system for health and safety, so that the risk of workers is low	1									
	Social benefits/social security	Social security expenditure by country and branches of social security (e.g. Healthcare, sickness, maternity)	2	4	✓	✓	✓	✓	✓	(✓)	5	
		List and provide short description of social benefits provided to the workers (eg. Health insurance, pension fund, child care, education, accommodation etc.)	5									

Category	Subcategory	Indicator	Value	Score								Score	Final
Society	Public commitments to sustainable issues	Presence of publicly available documents as promises or agreements on sustainability issues	5	5	(✓)	(✓)	-	(✓)	-	✓		5	4
		Presence of mechanisms to follow-up the realisation of promises	5										
	Prevention and mitigation of conflicts	In case the organization is located in regions with a high risk of conflicts due to resource depletion, massive pollution or poor working standards, does it try to reduce the risk by dint of appropriate measures	-	-	(✓)	✓	✓	✓	✓	✓			
	Contribution to Economic Development	Economic situation of the country/region (GDP, economic growth, unemployment, …)	4	3	✓	(✓)	(✓)	✓	(✓)	✓		3	
		Contribution to the local economic progress, through different aspects (e.g. payment of wages, purchase of raw materials and supplies, investments, …)	1										
	Corruption	Risk of corruption in the country and/or sub-region	3	4	✓	✓	✓	✓	✓	✓		5	
		Formalized commitment of the organization to prevent corruption/presence of an anti-corruption program	5										
		Involvement in cases of corruption	1										
	Technology development	Involvement in technology transfer program or projects	1	1	✓	✓	(✓)	✓	-	✓		1	
		Engagement in the development of efficient and environmental sound technologies	1										
		Investments in technology development/ technology transfer	1										

Figure A11. S-LCA Impact Assessment of External Partner 1 – <u>FINAL SCORE 3</u>

Category	Subcategory	Indicator	Value	Score								Score	Final
Local Community	Delocalization and Migration	International Migrants as a Percentage of Population	2	2	✓	(✓)	(✓)	✓		✓	(✓)	1	3
		Direct or indirect contribution of the organization to migration of individuals	1										
		Strength of organizational procedures for integrating migrant workers into the community	1										
	Community engagement	Public Trust on Politicians	5	4	(✓)	✓	(✓)	✓	(✓)	✓		4	
		Organizational support (volunteer-hours or financial) for community initiatives	1										
		Collaboration with community stakeholders	1										
	Cultural heritage	Policies in place to protect cultural heritage and/or programs to include cultural heritage expression in the product design/production	3	4	-	-	(✓)	✓	✓	✓		4	
		Respect of cultural customs and traditions	5										
	Local employment	Unemployment Statistics by Country	2	2	✓	(✓)	(✓)	✓	✓	✓		1	
		Poverty and Working Poverty by Country	2										
		Strength of policies on local hiring preferences (organization-specific indicator)	1										
		Contribution to the reduction of local unemployment	1										
	Access to immaterial resources	Patent Filings	3	2	(✓)	(✓)	✓	✓	(✓)	✓		1	
		Presence/strength of community education initiatives	1										
		Guarantee freedom of expression of the local community	1										
	Access to material resources	Has the organization caused infrastructures improvements (e.g. roadways, waste disposal systems) having long term effects?	2	3	-	(✓)	✓	✓	✓	(✓)		3	
		Commitment in minimizing the resources consumption	3										
	Safe and healthy living conditions	Burden of Disease by Country	1	1	✓	✓	✓	✓	(✓)	(✓)		1	
		Pollution Levels by Country	1										
		Commitment in strengthening community health and minimise the environmental pollution	1										
		Presence of policies/regulations for safety	1										
	Secure living conditions	Strength of Public Security in Country of operation	1	2	(✓)	✓	✓	(✓)	(✓)	(✓)		2	
		Management policies related to private security personnel	3										
		Number of causalities and injuries per year ascribed to the organization	1										
Value Chain Actors	Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	4	3	✓	✓	✓	✓	-	✓		3	3
		Employee awareness of the importance of compliance with competition legislation and fair competition.	1										
	Respect of intellectual property rights	Approach to general intellectual property rights and related issues associated with the economic sector	2	2	(✓)	-	-	✓	-	✓		2	
		Organization's policy and practice with regards to the respect of intellectual property rights	2										
	Supplier relationships	Mutual co-operation with the suppliers	1	1	(✓)	(✓)	(✓)	✓	-	✓		1	
		Fair behaviour with the suppliers (absence of coercive communication, sufficient lead time, reasonable volume fluctuation, payments on time)	1										
	Promoting social responsibility	Presence of an explicit code of conduct that protect human rights of workers among suppliers	3	4	✓	✓	✓	(✓)	(✓)	✓		4	
		Percentage of suppliers that the organization has audited with regard to social responsibility along the supply chain	5										
		Integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures	4										

Category	Subcategory	Indicator	Score									
Consumers	Health and safety	Presence of consumer complaints (at national, sectorial, organizational level)	1	1	-	✓	(✓)	✓	-	✓	1	3
		Quality of or number of information/signs on product health and safety	-									
		Presence of management measures to assess costumer health and safety	1									
	Feedback mechanism	Presence of a mechanism for customers to provide feedback	1	4	(✓)	(✓)	✓	✓	-	✓	4	
		Practices related to customer satisfaction, including results of surveys measuring customer satisfaction	5									
	Consumer privacy	Country ranking related to regulations on data-sharing	1	1	-	-	✓	(✓)	-	✓	1	
		Strength of internal management system to protect consumer privacy	1									
		Number of consumer complains related to breach of privacy or loss of data within the last year	1									
	Transparency	Presence of a law or norm regarding transparency	1	3	(✓)	✓	✓	✓	(✓)	✓	3	
		Clear information to enable the consumer choice (e.g. presence of product certifications/labels, publication of annual sustainable reports, communication of results of social and environmental life cycle impact assessment)	1									
		Communications regarding the product and social responsibility in a transparent way	4									
	End-of-Life Responsibility	Do internal management systems ensure that clear information is provided to consumers on end-of-life options?	1	1	✓	✓	✓	✓	✓	✓	1	
		Presence of systems for the product take back	-									
Workers	Freedom of association & collective bargaining	Evidence of Country non respect or support to Freedom of association and Collective bargaining	1	1	✓	✓	✓	✓	✓	✓	1	3
		Evidence of restriction to freedom of association and collective bargaining	1									
		Workers are free to join unions of their choosing and the presence of unions within the organization is adequately supported	1									
	Child labour	Percentage of children working by country and sector	1	1	✓	✓	✓	✓	✓	✓	1	
		Absence of working children under the legal age or 15 years old	1									
	Fair salary	Living Wages	2	2	✓	(✓)	✓	✓	-	✓	1	
		Minimum wage by country	2									
		Presence of suspicious deductions on wages	1									
		Regular and documented payment of workers	1									
		Guarantee that wage levels ensure a decent standard of living	1									
	Working hours	Maximum number of working hours	2	2	✓	✓	✓	✓	-	✓	1	
		Number of holidays effectively used by employees (at each level of employment).	1									
		Maximum number of hours worked by employees and possible difference with the maximum number of hours effectively worked	2									
	Forced labour	Percentage (estimate) of forced labour by region	2	2	✓	✓	✓	✓	✓	✓	1	
		Employment contracts stipulate wage, working time, holidays and terms of resignation	1									
		Workers voluntarily agree upon employment terms and are free to terminate their employment within the prevailing limits	1									
	Equal opportunities/discrimination	Women in the Labour force participation rate by country	2	2	✓	✓	✓	✓	✓	✓	1	
		Country gender index ranking	2									
		Presence of formal policies on equal opportunities	1									
		Composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity	1									
		Absence of any kinds of discrimination	1									
	Health and safety	Occupational accident rate by country	5	4	✓	✓	✓	✓	-	✓	4	
		Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	1									
		Adequate management system for health and safety, so that the risk of workers is low	1									
	Social benefits/social security	Social security expenditure by country and branches of social security (e.g. Healthcare, sickness, maternity)	2	2	✓	✓	✓	✓	✓	(✓)	2	
		List and provide short description of social benefits provided to the workers (eg. Health insurance, pension fund, child care, education, accommodation etc.)	2									
Society	Public commitments to sustainable issues	Presence of publicly available documents as promises or agreements on sustainability issues	5	5	(✓)	(✓)	-	(✓)	-	✓	5	4
		Presence of mechanisms to follow-up the realisation of promises	5									
	Prevention and mitigation of conflicts	In case the organization is located in regions with a high risk of conflicts due to resource depletion, massive pollution or poor working standards, does it try to reduce the risk by dint of appropriate measures	-	-	(✓)	✓	✓	✓	✓			
	Contribution to Economic Development	Economic situation of the country/region (GDP, economic growth, unemployment, …)	1	1	✓	(✓)	(✓)	✓	(✓)	✓	1	
		Contribution to the local economic progress, through different aspects (e.g. payment of wages, purchase of raw materials and supplies, investments, …)	1									
	Corruption	Risk of corruption in the country and/or sub-region	3	3	✓	✓	✓	✓	✓	✓	2	
		Formalized commitment of the organization to prevent corruption/presence of an anti-corruption program	4									
		Involvement in cases of corruption	1									
	Technology development	Involvement in technology transfer program or projects	1	1	✓	✓	(✓)	✓	-	✓	1	
		Engagement in the development of efficient and environmental sound technologies	1									
		Investments in technology development/ technology transfer	1									

Figure A12. S-LCA Impact Assessment of External Partner 2 – FINAL SCORE 4

Stakeholder	Sub-Categories	Indicators	Inventory	Performance Assessment (PA)	WC	HS	HR	SER	IR	G	Impact Assessment (IA)	TOTAL STAKEHOLDER
Local Community	Delocalization and Migration	International Migrants as a Percentage of Population	2	5	✓	(✓)	(✓)	✓	✓	(✓)	6	5
		Direct or indirect contribution of the organization to migration of individuals	1									
		Strength of organizational procedures for integrating migrant workers into the community	6									
	Community engagement	Public Trust on Politicians	5	5	(✓)	✓	(✓)	✓	(✓)	✓	6	
		Organizational support (volunteer-hours or financial) for community initiatives	6									
		Collaboration with community stakeholders	1									
	Cultural heritage	Policies in place to protect cultural heritage and/or programs to include cultural heritage expression in the product design/production	6	5	-	-	(✓)	✓	✓	✓	5	
		Respect of cultural customs and traditions	1									
	Local employment	Unemployment Statistics by Country	2	5	✓	(✓)	(✓)	✓	✓	✓	6	
		Poverty and Working Poverty by Country	2									
		Strength of policies on local hiring preferences (organization-specific indicator)	6									
		Contribution to the reduction of local unemployment	1									
	Access to immaterial resources	Patent Filings	3	2	(✓)	(✓)	✓	✓	(✓)	✓	1	
		Presence/strength of community education initiatives	1									
		Guarantee freedom of expression of the local community	1									
	Access to material resources	Has the organization caused infrastructures improvements (e.g. roadways, waste disposal systems) having long term effects?	1	1	-	(✓)	✓	✓	✓	(✓)	1	
		Commitment in minimizing the resources consumption	1									
	Safe and healthy living conditions	Burden of Disease by Country	1	1	✓	✓	✓	✓	(✓)	(✓)	1	
		Pollution Levels by Country	1									
		Commitment in strengthening community health and minimise the environmental pollution	1									
		Presence of policies/regulations for safety	1									
	Secure living conditions	Strength of Public Security in Country of operation	1	2	(✓)	✓	✓	(✓)	(✓)	(✓)	2	
		Management policies related to private security personnel	3									
		Number of causalities and injuries per year ascribed to the organization	-									
Value Chain Actors	Fair competition	Documented statement or procedures (policy, strategy etc.) to prevent engaging in or being complicit in anticompetitive behaviour	1	1	✓	✓	✓	✓	-	✓	1	1
		Employee awareness of the importance of compliance with competition legislation and fair competition.	1									
	Respect of intellectual property rights	Approach to general intellectual property rights and related issues associated with the economic sector	1	1	(✓)	-	-	✓	-	✓	1	
		Organization's policy and practice with regards to the respect of intellectual property rights	1									
	Supplier relationships	Mutual co-operation with the suppliers	1	1	(✓)	(✓)	(✓)	✓	-	✓	1	
		Fair behaviour with the suppliers (absence of coercive communication, sufficient lead time, reasonable volume fluctuation, payments on time)	1									
	Promoting social responsibility	Presence of an explicit code of conduct that protect human rights of workers among suppliers	1	1	✓	✓	✓	(✓)	(✓)	✓	1	
		Percentage of suppliers that the organization has audited with regard to social responsibility along the supply chain	1									
		Integration of ethical, social, environmental and gender-equality criterions in purchasing policy, distribution policy and contract signatures	1									

Category	Subcategory	Indicator	Score	Agg							Res	Final
Consumers	Health and safety	Presence of consumer complaints (at national, sectorial, organizational level)	1	3	-	✓	(✓)	✓	-	✓	3	5
		Quality of or number of information/signs on product health and safety	4									
		Presence of management measures to assess costumer health and safety	1									
	Feedback mechanism	Presence of a mechanism for customers to provide feedback	1	1	(✓)	(✓)	✓	✓	-	✓	1	
		Practices related to customer satisfaction, including results of surveys measuring customer satisfaction	1									
	Consumer privacy	Country ranking related to regulations on data-sharing	1	1	-	-	✓	(✓)	-	✓	1	
		Strength of internal management system to protect consumer privacy	1									
		Number of consumer complains related to breach of privacy or loss of data within the last year	1									
	Transparency	Presence of a law or norm regarding transparency	1	3	(✓)	✓	✓	✓	(✓)	✓	3	
		Clear information to enable the consumer choice (e.g. presence of product certifications/labels, publication of annual sustainable reports, communication of results of social and environmental life cycle impact assessment)	1									
		Communications regarding the product and social responsibility in a transparent way	4									
	End-of-Life Responsibility	Do internal management systems ensure that clear information is provided to consumers on end-of-life options?	6	6	✓	✓	✓	✓	✓	✓	6	
		Presence of systems for the product take back	-									
Workers	Freedom of association & collective bargaining	Evidence of Country non respect or support to Freedom of association and Collective bargaining	1	1	✓	✓	✓	✓	✓	✓	1	5
		Evidence of restriction to freedom of association and collective bargaining	1									
		Workers are free to join unions of their choosing and the presence of unions within the organization is adequately supported	1									
	Child labour	Percentage of children working by country and sector	1	1	✓	✓	✓	✓	✓	✓	1	
		Absence of working children under the legal age or 15 years old	1									
	Fair salary	Living Wages	2	2	✓	(✓)	✓	✓	-	✓	1	
		Minimum wage by country	2									
		Presence of suspicious deductions on wages	1									
		Regular and documented payment of workers	1									
		Guarantee that wage levels ensure a decent standard of living	1									
	Working hours	Maximum number of working hours	2	2	✓	✓	✓	✓	-	✓	1	
		Number of holidays effectively used by employees (at each level of employment).	1									
		Maximum number of hours worked by employees and possible difference with the maximum number of hours effectively worked	1									
	Forced labour	Percentage (estimate) of forced labour by region	2	2	✓	✓	✓	✓	✓	✓	1	
		Employment contracts stipulate wage, working time, holidays and terms of resignation	1									
		Workers voluntarily agree upon employment terms and are free to terminate their employment within the prevailing limits	1									
	Equal opportunities/discrimination	Women in the Labour force participation rate by country	2	2	✓	✓	✓	✓	✓	✓	1	
		Country gender index ranking	2									
		Presence of formal policies on equal opportunities	1									
		Composition of governance bodies and breakdown of employees per category according to gender, age group, minority, group membership and other indicators of diversity	3									
		Absence of any kinds of discrimination	1									
	Health and safety	Occupational accident rate by country	5	4	✓	✓	✓	✓	-	✓	4	
		Number/percentage of injuries or fatal accidents in the organization by job qualification inside the company	3									
		Adequate management system for health and safety, so that the risk of workers is low	1									
	Social benefits/social security	Social security expenditure by country and branches of social security (e.g. Healthcare, sickness, maternity)	2	5	✓	✓	✓	✓	✓	(✓)	6	
		List and provide short description of social benefits provided to the workers (eg. Health insurance, pension fund, child care, education, accommodation etc.)	6									
Society	Public commitments to sustainable issues	Presence of publicly available documents as promises or agreements on sustainability issues	6	6	(✓)	(✓)	-	(✓)	-	✓	6	5
		Presence of mechanisms to follow-up the realisation of promises	6									
	Contribution to Economic Development	Economic situation of the country/region (GDP, economic growth, unemployment, …)	1	1	✓	(✓)	(✓)	✓	(✓)	✓	1	
		Contribution to the local economic progress, through different aspects (e.g. payment of wages, purchase of raw materials and supplies, investments, …)	1									
	Corruption	Risk of corruption in the country and/or sub-region	3	2	✓	✓	✓	✓	✓	✓	1	
		Formalized commitment of the organization to prevent corruption/presence of an anti-corruption program	1									
		Involvement in cases of corruption	1									
	Technology development	Involvement in technology transfer program or projects	6	5	✓	✓	(✓)	✓	-	✓	6	
		Engagement in the development of efficient and environmental sound technologies	1									
		Investments in technology development/ technology transfer	6									

Figure A13. S-LCA Impact Assessment of External Partner 3 – FINAL SCORE 5