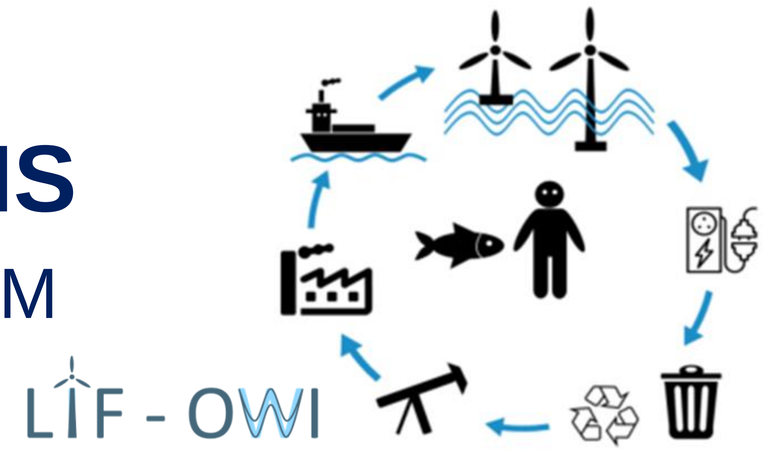
Towards Social Life Cycle Assessment of Energy Systems: case study on offshore wind farms from companies' perspective

Jérémie Lehmann, Rhoda Fofack-Garcia, Paula Pérez-López

TOWARDS SOCIAL LIFE CYCLE ASSESSMENT OF ENERGY SYSTEMS

CASE STUDY ON OFFSHORE WIND FARMS FROM COMPANIES' PERSPECTIVE



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INTRODUCTION

- Decision-makers must choose between different offshore wind power configurations considering social impacts of these energy systems
- Social impacts of energy systems can be evaluated based on Social Life Cycle Assessment (S-LCA) framework, described in UNEP Guidelines (2020)
- Prioritization needs of stakeholder categories and related social impact subcategories have already been identified and an approach has been proposed by Bouillass et al. (under review)

OBJECTIVE

- Prioritization of social subcategories and stakeholders for offshore wind farms
  - Focus on companies' perspective
  - Target data collection

METHODOLOGY

ISO 14040 / UNEP Guidelines 2020: Goal and Scope Definition → Inventory Analysis → Impact assessment → Interpretation

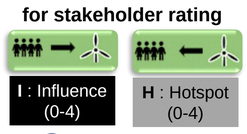
FIRST STEPS FOR S-LCA IMPLEMENTATION (based on Bouillass et al., under review)

Litterature review → **Prioritization** → Indicators data collect

Survey to companies
(7 companies, 5 months)

- First proposal of the survey:
  - Stakeholder subgroups' rating all over the offshore wind farm life cycle (A)
  - Social subcategories' ranking from the most to the least important for each stakeholders category (B)
- Co-construction of the survey:
  - Adding « Indirect workers » category (A)
  - Selection of prioritization criteria for stakeholders (A)
  - Adapting social subcategories definition for energy sector (B)

Prioritization criteria for stakeholder rating



- Survey launch, results' processing
  - Stakeholders Prioritization Indicator - % : *PI=(IMoy+HMoy)/(IMax+HMax)x100* (A)
  - Mean ranking & standard deviation to social subcategories ranking (B)

RESULTS

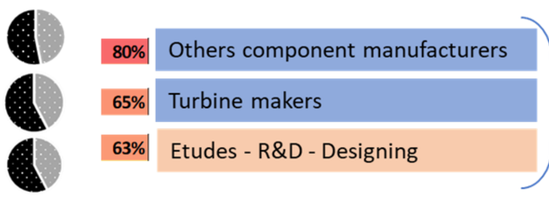
B SOCIAL SUBCATEGORIES RANKING (TOP 3)

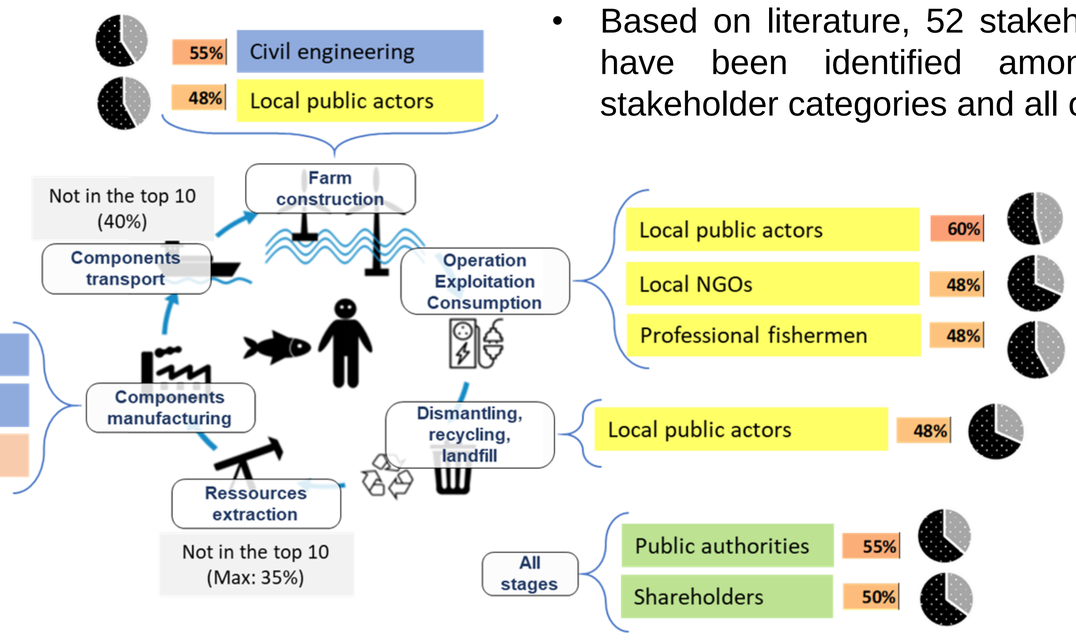
Social subcategories ranking / Stakeholder categories	RANK 1		RANK 2		RANK 3	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
DIRECT WORKERS	Health and safety		Social benefits / social security		Equal opportunities discrimination	
	1.3	0.50	3.3	2.06	4.3	3.30
INDIRECT WORKERS	Health and safety		Child labor		Fair salary	
	2.8	2.87	3.5	1.00	4.8	2.87
VALUE CHAIN	Promoting social responsibility		Fair competition		Supplier relationships	
	2.3	1.50	2.8	0.96	2.8	2.06
LOCAL COMMUNITY	Safe and healthy living conditions		Local employment		Secure living conditions	
	1.8	0.50	2.5	3.00	3.0	1.15
CONSUMERS	Health and Safety		Transparency		Consumer privacy	
	1.0	0.00	2.3	0.50	3.0	0.82
SOCIETY	Contribution to economic development		Poverty alleviation		Public commitments to sustainability	
	3.3	2.22	3.3	1.71	3.3	2.63

- The ranking may differ according the respondents. There is a great variability in the perceptions of the social subcategories among companies
- However, the dispersion indicators highlight a consensus (in red) in these perceptions
- Globally, "health and safety" social subcategories are perceived as priority issues for most of stakeholders categories.

A STAKEHOLDER SUBGROUPS RATING (TOP 10)

- Based on literature, 52 stakeholder 'subgroups' have been identified among the different stakeholder categories and all over the life cycle
- Results highlight mainly the suppliers, R&D workers, and local publics actors, according to the respondents' perspective. In contrast, feedbacks show that social issues during extraction phase are not well known





- Presence of local public and private actors stakeholders (in yellow) reflects the importance of territorial issues in offshore wind farm sector according to respondents' perspective

CONCLUSIONS AND PERSPECTIVES

- By applying the prioritization method to the offshore wind sector, this study has highlighted, from the companies' perspective:
  i) Stakeholders subgroups and
  ii) The main social issues subcategories to be taken into account in the life cycle of offshore wind projects
- However,
  i) Prioritization is only one step in the entire data collect, helping to focus on "who" and "what"
  ii) There is a need to cross these first results with other stakeholders' perceptions (external experts).

References

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- Bouillass, G., et al., under review, Step-by-step Social Life Cycle Assessment framework: A participatory approach for the identification and prioritization of impact subcategories applied to mobility scenarios
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ANR-10-IEED-0006-34

LCM 2021