

# Structuring Sustainability Reports for Environmental Standards with LLMs guided by Ontology

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## BACKGROUND

- Corporate reports are large pieces of texts, understood by experts
- Reporting European Sustainability Reporting Standard (**ESRS**) is mandatory in 2025 for EU companies. It aims to disclose the company's strategy to mitigate negative impact on climate change
- ESRS 2 more detailed than GRI and includes **Topical Standard**: impact, risks, opportunities, strategy, actions and targets
- Ontology is the best way to represent domain knowledge
- Storing corporate information in KG offers easy search, monitoring and data collection

## RESEARCH QUESTIONS

- How can we align GRI and ESRS reports via KGs?
- How to make climate action claims transparent?

## RESULTS

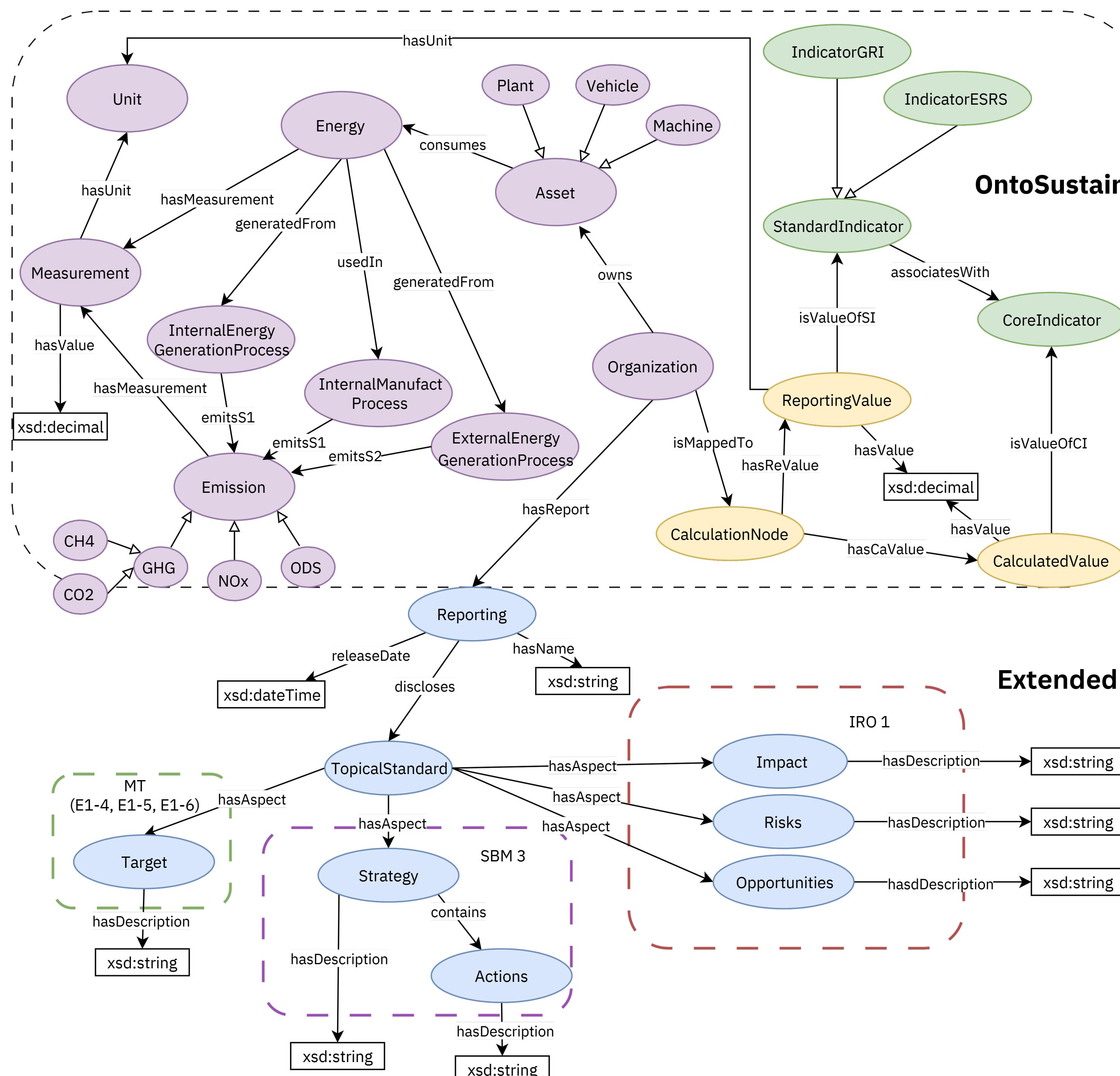
Annotators evaluate if the extracted knowledge matches aspect description and how vague it is (claims lack concrete steps)

Aspect	Match	Vagueness
Impact	0.69	0.21
Risks	0.95	0.47
Opportunities	0.74	0.24
Strategy	0.95	0.24
Actions	0.90	0.14
Targets	0.69	0.31

## CONCLUSION

- Structured representation offers **transparency** and **reusability** for further analysis and comparison
- Potential for **human-in-the-loop** approach

## OntoSustain EXTENDED



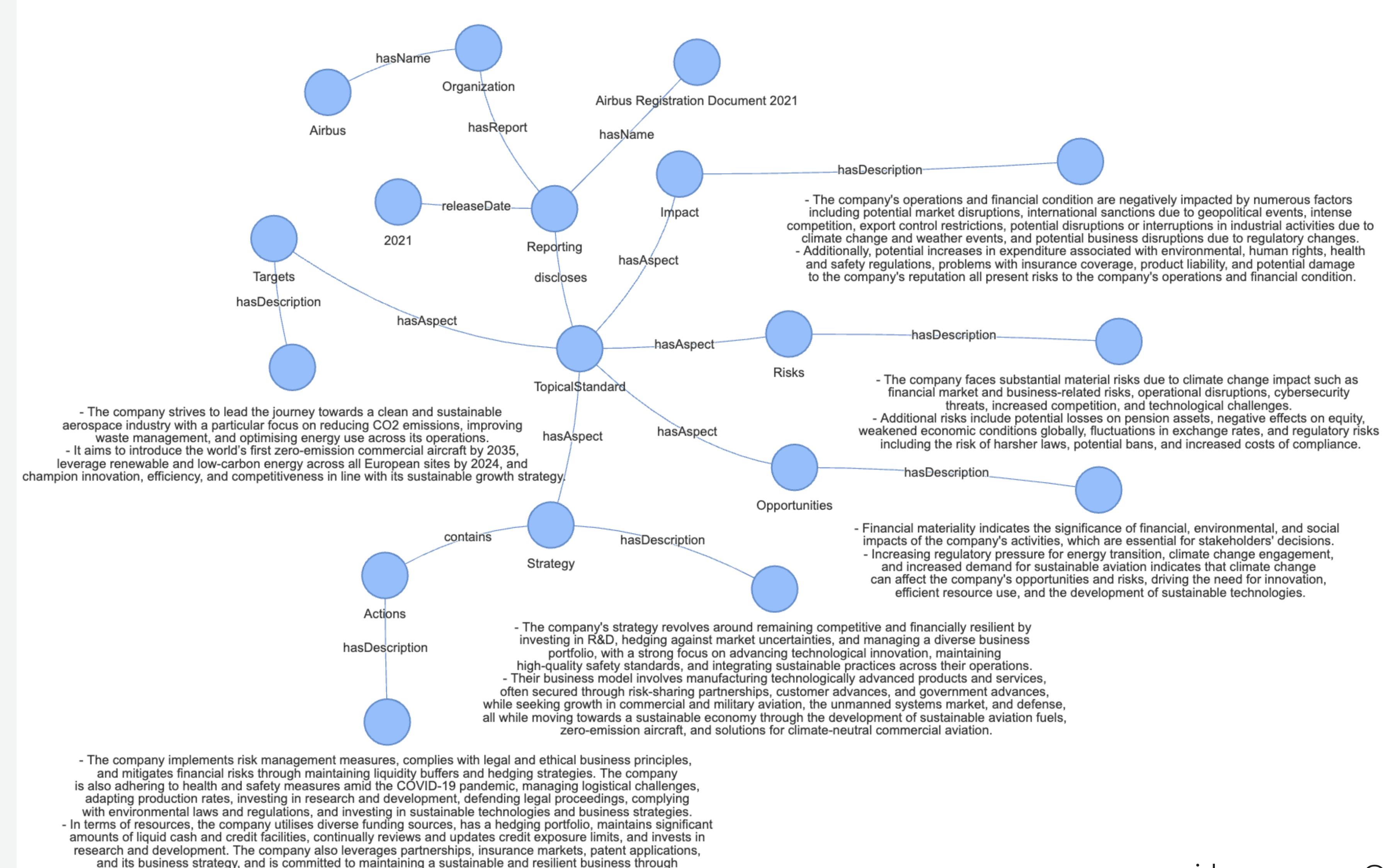
OntoSustain [1] incorporates **sustainability indicators** from GRI and ESRS 1. It includes company's business activities and reported sustainability metrics. Extended version includes ESRS 2, which aims to address company's **strategy** and **impact** on climate change, covered in Topical Standard.

## KNOWLEDGE EXTRACTION and KG CONSTRUCTION

- Automatic prompt generated with descriptive example and ontology description to guide the extraction process [2]. Prompt construction:

**TASK + CONTEXT** (ontology description) + **EXAMPLE** (input/output) + **TEST**

- Extracted knowledge is summarized per aspect for final KG
- Final KGs are evaluated by annotators per aspect



[1] Yuchen Zhou and Alexander Perzylo. 2023. Ontosustain: Towards an ontology for corporate sustainability reporting.  
[2] Nandana Mihindukulasooriya, Sanju Tiwari, Carlos F. Enguita, and Kusum Lata. 2023. Text2kgbench: A benchmark for ontology-driven knowledge graph generation from text.

