









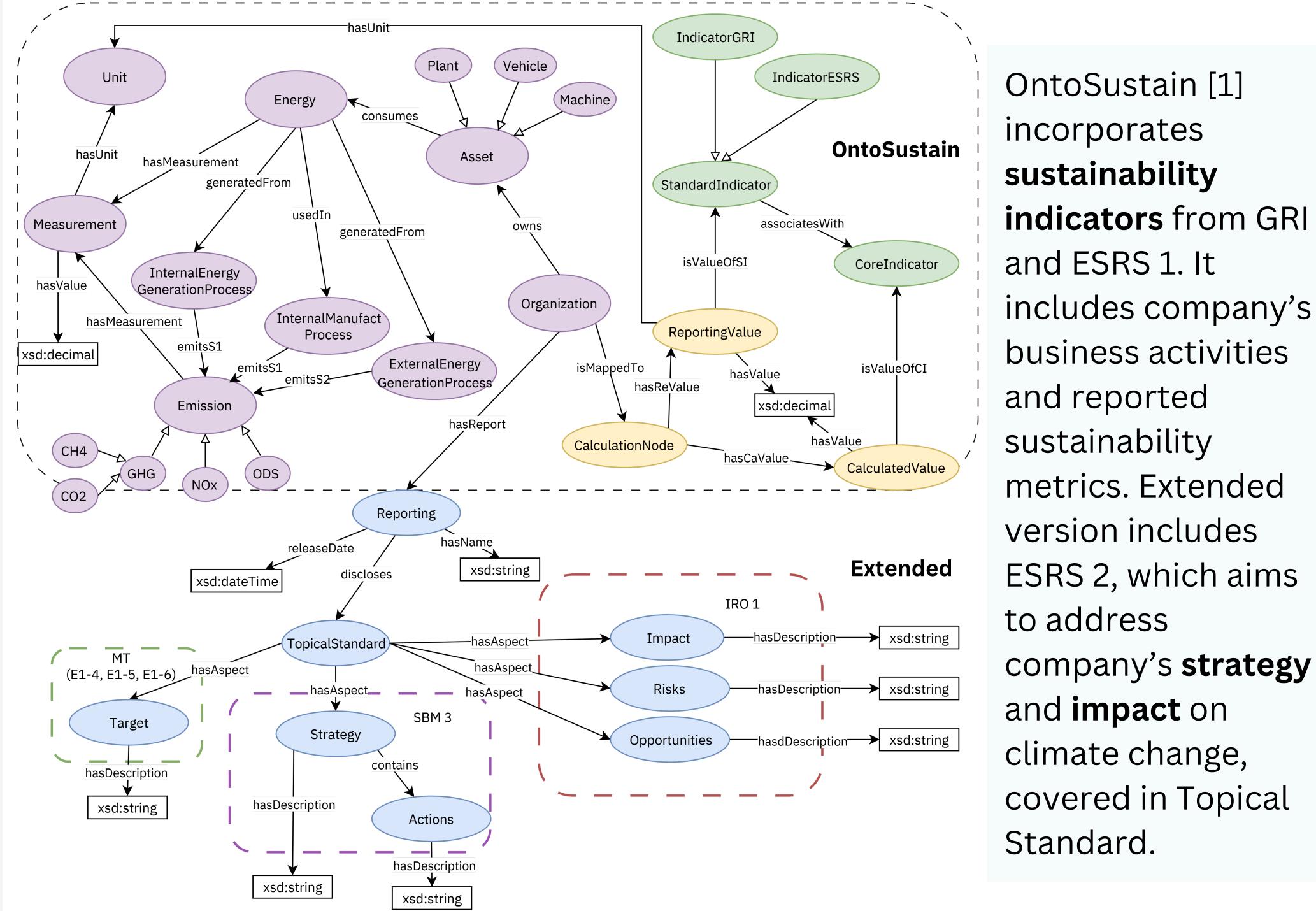
Structuring Sustainability Reports for Environmental Standards with LLMs guided by Ontology

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OntoSustain EXTENDED

- 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	s 0.74	0.24
Strategy	0.95	0.24
Actions	0.90	0.14
Targets	0.69	0.31

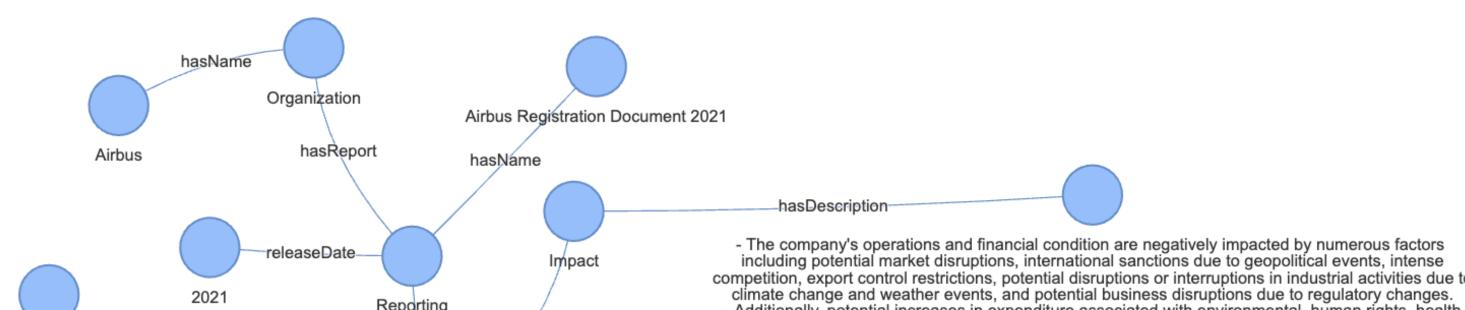
covered in Topical

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. Enguix, and Kusum Lata.

2023. Text2kgbench: A

benchmark for ontology-

driven knowledge graph

generation from text.

CONCLUSION

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

Additionally, potential increases in expenditure associated with environmental, numan rights, nealtr hasAspect and safety regulations, problems with insurance coverage, product liability, and potential damage Targets to the company's reputation all present risks to the company's operations and financial condition. discloses hasDescription hasAspect hasDescriptior hasAspec' Risks - The company faces substantial material risks due to climate change impact such as financial market and business-related risks, operational disruptions, cybersecurity Topical\$tandard threats, increased competition, and technological challenges. - The company strives to lead the journey towards a clean and sustainable Additional risks include potential losses on pension assets, negative effects on equity, aerospace industry with a particular focus on reducing CO2 emissions, improving weakened economic conditions globally, fluctuations in exchange rates, and regulatory risks hasAspect hasAspect waste management, and optimising energy use across its operations. including the risk of harsher laws, potential bans, and increased costs of compliance. It aims to introduce the world's first zero-emission commercial aircraft by 2035, leverage renewable and low-carbon energy across all European sites by 2024, and hasDescription champion innovation, efficiency, and competitiveness in line with its sustainable growth strategy. Opportunities - Financial materiality indicates the significance of financial, environmental, and social hasDescription impacts of the company's activities, which are essential for stakeholders' decisions. Increasing regulatory pressure for energy transition, climate change engagement, Strategy and increased demand for sustainable aviation indicates that climate change can affect the company's opportunities and risks, driving the need for innovation, efficient resource use, and the development of sustainable technologies. The company's strategy revolves around remaining competitive and financially resilient by investing in R&D, hedging against market uncertainties, and managing a diverse business hasDescription portfolio, with a strong focus on advancing technological innovation, maintaining high-quality safety standards, and integrating sustainable practices across their operations. - Their business model involves manufacturing technologically advanced products and services, often secured through risk-sharing partnerships, customer advances, and government advances, while seeking growth in commercial and military aviation, the unmanned systems market, and defense all while moving towards a sustainable economy through the development of sustainable aviation fuels, zero-emission aircraft, and solutions for climate-neutral commercial aviation.

- The company implements risk management measures, complies with legal and ethical business principles, and mitigates financial risks through maintaining liquidity buffers and hedging strategies. The company is also adhering to health and safety measures amid the CÓVID-19 pandemic, managing logistical challenges adapting production rates, investing in research and development, defending legal proceedings, complying with environmental laws and regulations, and investing in sustainable technologies and business strategies. - In terms of resources, the company utilises diverse funding sources, has a hedging portfolio, maintains significant amounts of liquid cash and credit facilities, continually reviews and updates credit exposure limits, and invests in research and development. The company also leverages partnerships, insurance markets, patent applications, and its business strategy, and is committed to maintaining a sustainable and resilient business through strategic asset allocation, diversification, legal compliance, and environmental protection efforts.



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