

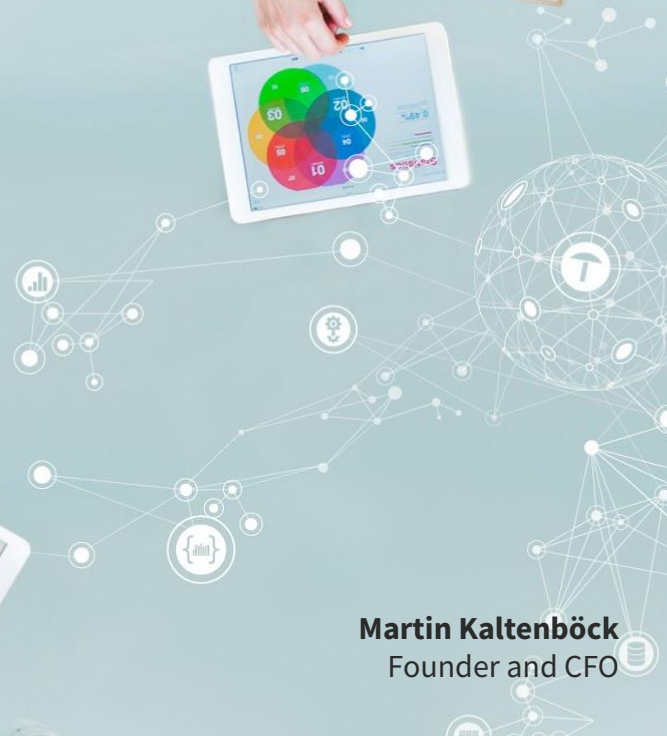


The ESG Knowledge Hub

**Artificial and Human Intelligence for
Sustainable Organizations**

The Knowledge Graph Conference 2023

Martin Kaltenböck
Founder and CFO





MARTIN KALTENBÖCK

SEMANTIC WEB COMPANY
FOUNDER & CFO

“ESG is a landscape
of complex challenges facing our
organizations today.
To master them, efficient access to
data and knowledge is crucial.”

Semantic Web Company (SWC) and PoolParty

SWC is developer/vendor of
PoolParty Semantic Suite

Most complete **Semantic
AI platform** on the market

W3C standards compliant



ISO 27001:2013
certified (since 2019)

PoolParty stands out in the
market with a **user-
friendly** interface.



Current version **9.0**

On-premises or
cloud-based



Over **180** customers
world-wide

Integrations:



Microsoft 365, Tridion
Docs & Sites, AEM,
and many more



Gartner named SWC a Visionary
in their **Magic Quadrant** for
Metadata Management Systems
2019 and 2020



KMWorld has listed SWC as
one of the **top knowledge
management companies**
continuously from **2016 - 2022**



Forrester listed SWC as sample
vendor in their **report** on *The
Document-Oriented
Text Analytics Platforms
Landscape 2022*

We work with the best in their field

Some of our customers play a crucial role in the transition to sustainability



Walmart is the world's largest company by revenue



IFC is focused exclusively on the private sector in developing countries



NASA astronaut Neil Armstrong became the first human to land on the moon



ILO promotes social justice which is essential to universal and lasting peace



The Rockefeller Foundation was coining the term "impact investing"



Google is the most popular and trusted search engine



The GCF is the world's largest fund to helping DCs respond to climate change



Takeda is Asia's largest pharmaceutical company



Microsoft is the world's largest software company by revenue



EY is one of the largest professional services networks in the world



Medtronic is the world's largest medical device company



European Central Bank is one of the world's most important central banks

ESG and SDG in a nutshell

It is a complicated matter.

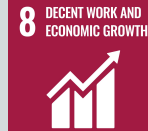
The 17 Sustainable Development Goals (SDGs)

17 PARTNERSHIPS
FOR THE GOALS



Corporate Governance

Appropriate framework conditions and corporate governance enable decent work and economic growth.



Social

Social development depends upon a protected biosphere. A balanced, equal and resilient social fabric is the prerequisite for economically healthy growth and well-being.



Environmental

Protecting the biosphere is an essential precondition for social justice and sustainable economic development.



On an individual level

In a **complex domain like ESG** where there are many questions and too many answers, readily available **intelligent assistants** have become even more central to our **workplace productivity.**



On an organizational level

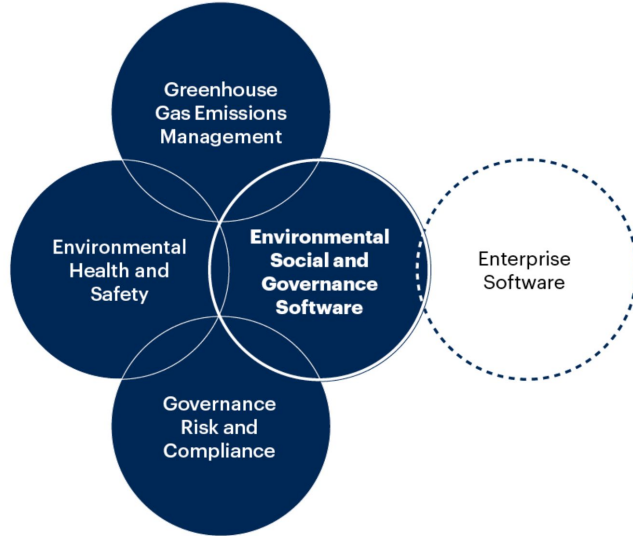
In a **highly dynamic domain** like ESG, where there are **many stakeholders** and too many documents, **controlled vocabularies, referenceable knowledge**, and the ability to link data silos have become even more important in **implementing an ESG strategy**.



ESG creates an information management challenge

Various data sources across the ecosystem are needed

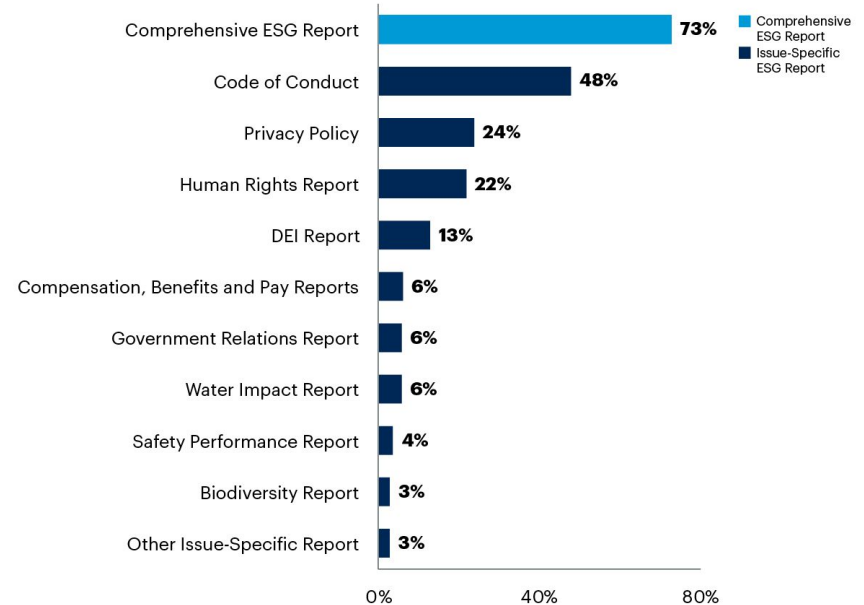
The Emerging ESG Tools and Adjacent Software Landscape



Source: Gartner
761183_C

Market Guide for Enterprise Environmental, Social and Governance Software, Gartner (2022)

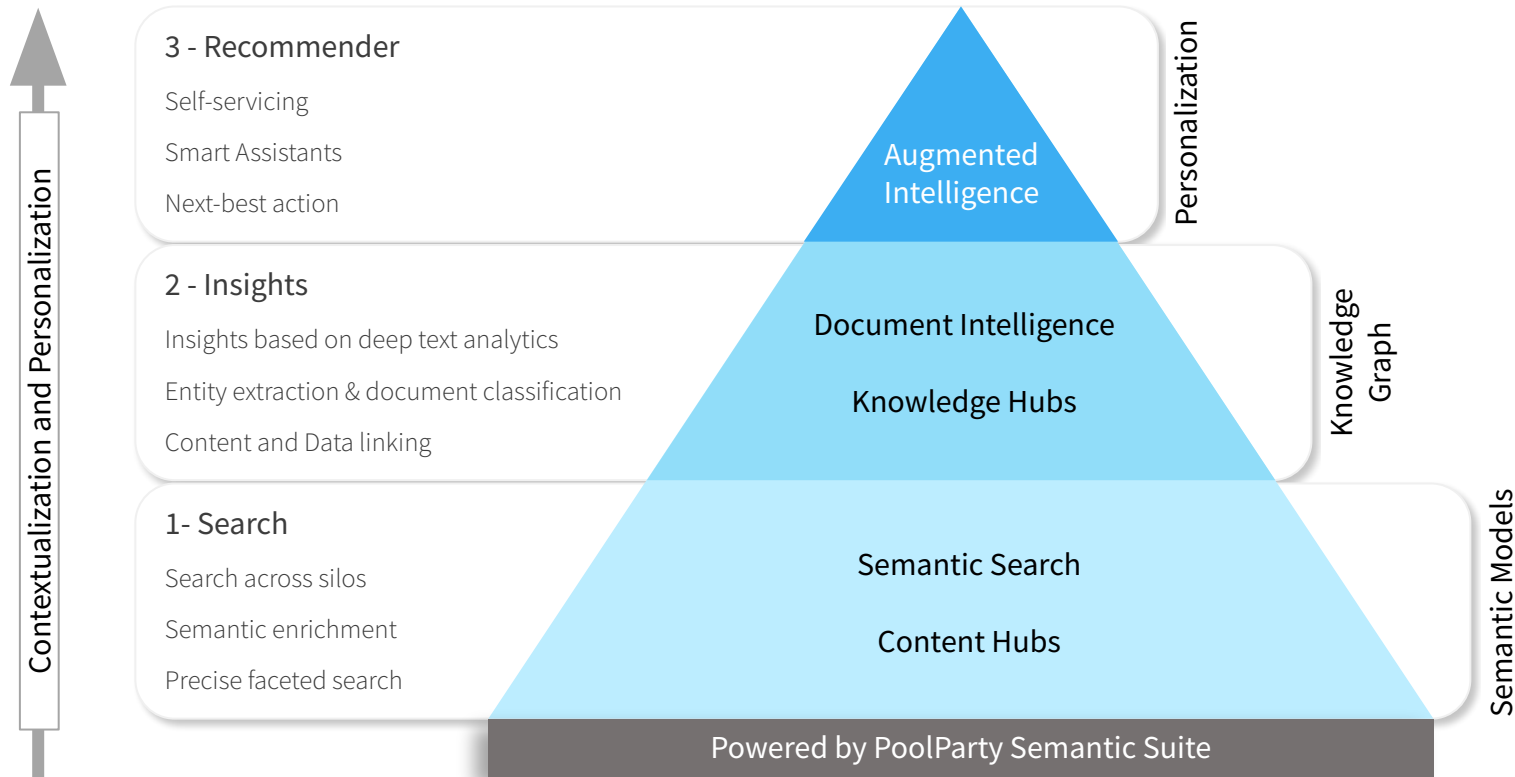
Percentage of Organizations Issuing ESG Report Types



n = 495

Source: Gartner analysis of S&P 500 companies' ESG reports
766567_C

From Search over Insights to Recommender



Example 1: Semantic Search over ESG content

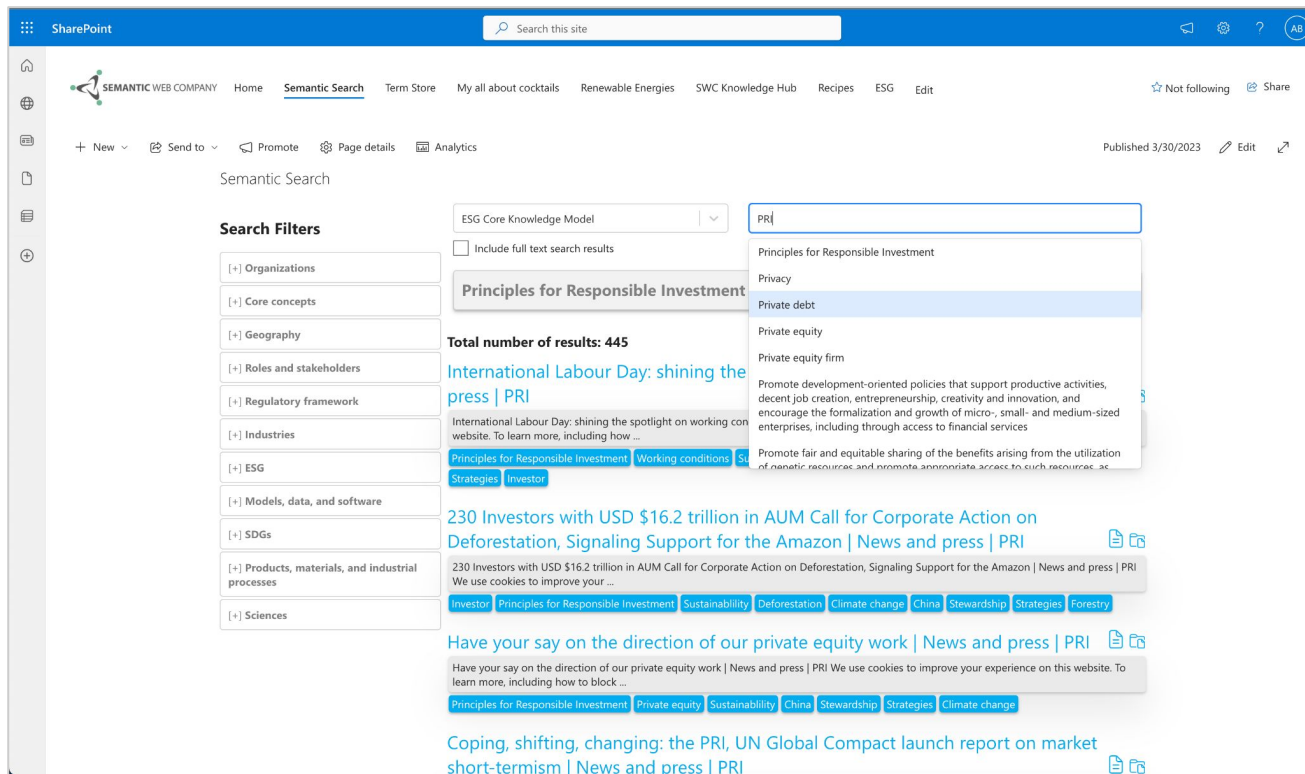
1- Search

Search across silos

Semantic enrichment

Precise faceted search

- ▶ Consistent auto-classification of documents
- ▶ Semantic Search
- ▶ Infobox for search term



The screenshot displays a SharePoint Semantic Search interface. The top navigation bar includes the SharePoint logo, a search bar, and various site links. The main content area is titled 'Semantic Search' and features a 'Search Filters' sidebar on the left with categories like Organizations, Core concepts, Geography, Roles and stakeholders, Regulatory framework, Industries, ESG, Models, data, and software, SDGs, Products, materials, and industrial processes, and Sciences. The main search results area shows a search bar with the text 'PR' and a dropdown menu listing related terms: Principles for Responsible Investment, Privacy, Private debt, Private equity, and Private equity firm. Below the search bar, the 'Total number of results: 445' is displayed. The first result is 'International Labour Day: shining the press | PRI', followed by '230 Investors with USD \$16.2 trillion in AUM Call for Corporate Action on Deforestation, Signaling Support for the Amazon | News and press | PRI', and 'Have your say on the direction of our private equity work | News and press | PRI'. Each result includes a brief description and a set of tags for further filtering.

Search Filters

[+] Core concepts

[+] Industries

[+] Products, materials, and industrial processes

[+] Regulatory framework

[+] Organizations

[+] Geography

[+] z_Blacklisted concepts

[-] ESG

- ☐ Climate risk (16)
- ☐ ESG reporting (10)
- ☐ Market risk (4)
- ☐ Physical risk (3)
- ☐ Materiality (3)
- ☐ Extreme weather (2)
- ☐ ESG risks (2)
- ☐ Flood (2)
- ☐ Transition risk (2)
- ☐ Pledge fund (1)
- ☐ Green finance (1)
- ☐ Tropical cyclone (1)
- ☐ Carbon dioxide equivalent (1)
- ☐ Corporate risk (1)
- ☐ Human rights risk (1)
- ☐ Drought (1)
- ☐ Governance risk (1)
- ☐ Weapon of mass destruction (1)

[-] Roles and stakeholders

ESG Core Knowledge Model

Risk management

☐ Include full text search results

Search

Risk management



Synonyms:

Loss control representative, DARM, Tactical Risk Management, Loss control consultant, Risk communication, Risks classification, Risk elimination, Risk assessment and management, Tactical risk management, Supplier risk, Diminution (risk management), Avoid, Control, Accept, or Transfer, Risk report, Hazard risk management, Risk Management, Risk Management Planning, Hazard prevention, Risk management device, Risk assessment, Enterprise risk management

More general concepts:

Governance aspects

More specific concepts:

Climate risk management Emergency management Social risk management Risk governance Litigation risk analysis Supply chain risk management Solar energy assessment

Related:

Risk manager ESG risk management Precautionary principle Open Risk Manual Governance, risk management, and compliance Tax risk Financial ratio

Definition: Risk management is the identification, assessment, and prioritization of risks (defined in ISO 31000 as the effect of uncertainty on objectives) followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities. Risk management's objective is to assure uncertainty does not deflect the endeavor from the business goals.

Total number of results: 50

5 takeaways from Biden's budget plan - E&E News



5 takeaways from Biden's budget plan - E&E News Skip to primary navigation Skip to main content Skip to footer Publications Energywire Climatewire E&E Daily Greenwire E&E News PM Our ...

Fossil fuel Petrochemical industry Taxation Renewable energy Hydrofluorocarbons Laws Global warming National Oceanic and Atmospheric Administration USA Treaties lead Pledge fund Green Climate Fund Consumer Environmental justice

poolparty
FOR SHAREPOINT

www.poolparty.biz/sharepoint

Example 2: ESG risk assessment

2 - Insights

Insights based on deep text analytics

Entity extraction

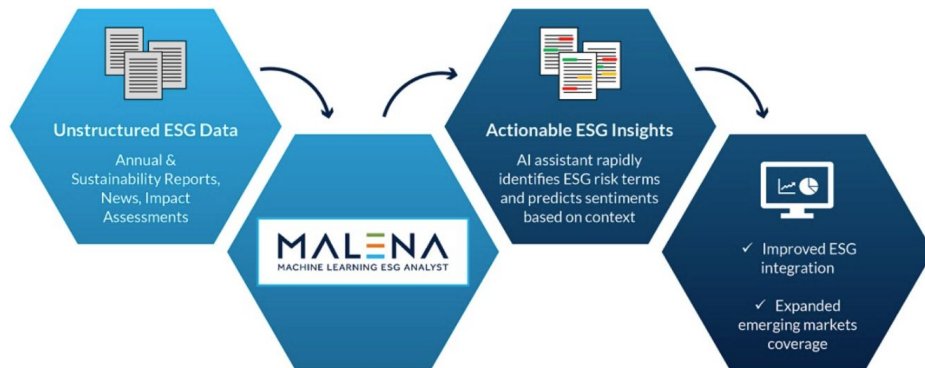
Document classification based on detected risks

WHAT IS MALENA?

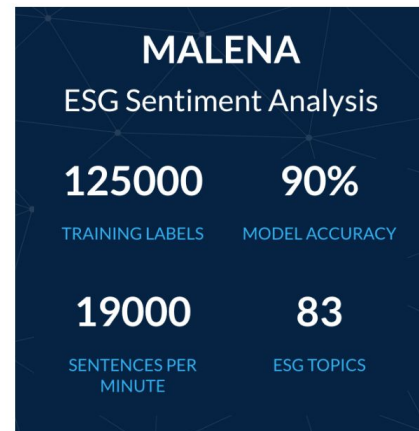
IFC's Machine Learning ESG Analyst (MALENA) is an Artificial Intelligence (AI) powered platform that extracts meaningful insights from unstructured ESG data at scale, enabling rapid analysis, increasing productivity and building investor confidence.

HOW DOES MALENA WORK?

Through Natural Language Processing (NLP) MALENA identifies relevant content using a list of over 1,200 ESG risk terms pre-determined by IFC. The NLP model assigns a positive, negative or neutral sentiment for each risk term based on its context.



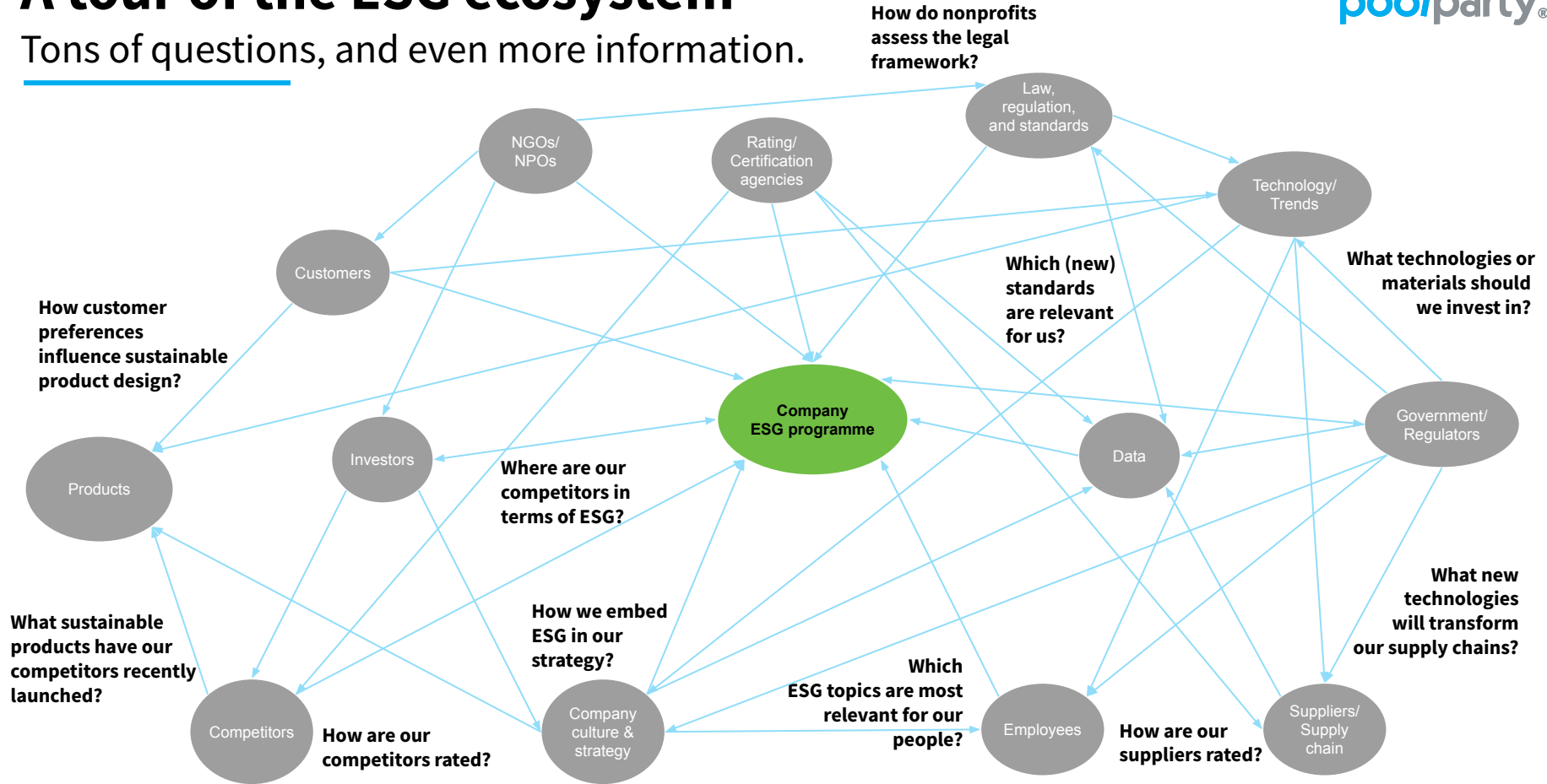
- Trained in-house by IFC, leveraging 16 years of unique historical emerging markets ESG data.
- Tested and refined by IFC subject matter experts.
- Performing at 90% accuracy.



Learn more about MALENA:
<https://www.youtube.com/watch?v=LyipLQOgiZU>

A tour of the ESG ecosystem

Tons of questions, and even more information.



Example 3: ESG Knowledge Hub

2 - Insights

Insights based on deep text analytics

Entity extraction

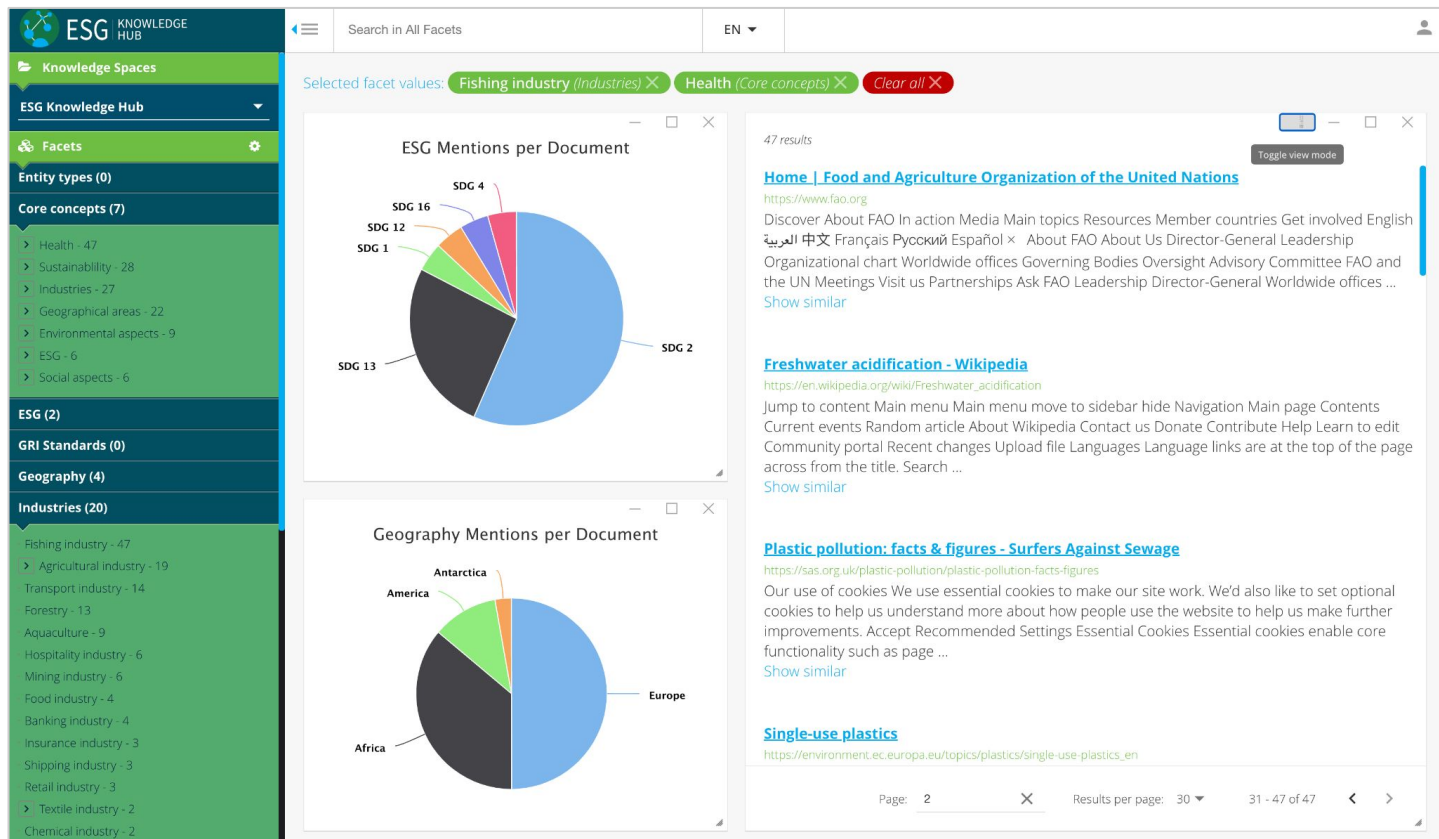
Document classification based on detected risks

3 - Recommender

Self-servicing

Smart Assistants

Next-best action



Plastic pollution: facts & figures - Surfers Against Sewage

← → Plastic pollution: facts & figures - Su...



[Link to resource](#)

CORE CONCEPTS

GEOGRAPHY

INDUSTRIES

- [Hospitality industry](#)
- [Fishing industry](#)
- [Shipping industry](#)

MODELS, DATA, AND SOFTWARE

ORGANIZATIONS

Recommended General Recommender



SDG 2



SDG 12



SDG 13



SDG 14

Recommendations: 10

See Also

Thesaurus Similarity



The Great Pacific Garbage...



The Global Electric Vehicl...



Plastic Pollution - Our Wo...



Environment



Similarities: 10

CLOSE

World Tourism Organization

← → [Winter storm](#) > [Tropical forest](#) > [Global Biodiversity Information Fa...](#) > World Tourism Organization



[Link to resource](#)

DESCRIPTION

The World Tourism Organization (UNWTO) is the United Nations specialized agency entrusted with the promotion of responsible, sustainable and universally accessible tourism. Its headquarters are in Madrid, Spain. UNWTO is the leading international organization for the promotion of tourism as a driver of economic growth, inclusive development and environmental sustainability. It provides leadership and support in advancing knowledge and tourism policies and serves as a global forum for tourism policy and a source of tourism research and knowledge. It encourages the implementation of the Global Code of Ethics for Tourism e Development, Competitiveness, Innovation & Digital Transformation, Ethics, Culture & Social Responsibility, Technical Cooperation, UNWTO Academy, and Statistics.

ENTITY TYPES

ORGANIZATIONS

IMAGE

LINKEDIN

- <https://www.linkedin.com/company/unwto-world-tourism-organization>

LOGO

THUMBNAIL

Recommended

General Recommender

No recommendations available for this document.

See Also

Thesaurus Similarity



Rainforest Alliance



United Nations Environm...



World Meteorological Org...



Intergovernmental Panel ...



ISEAL



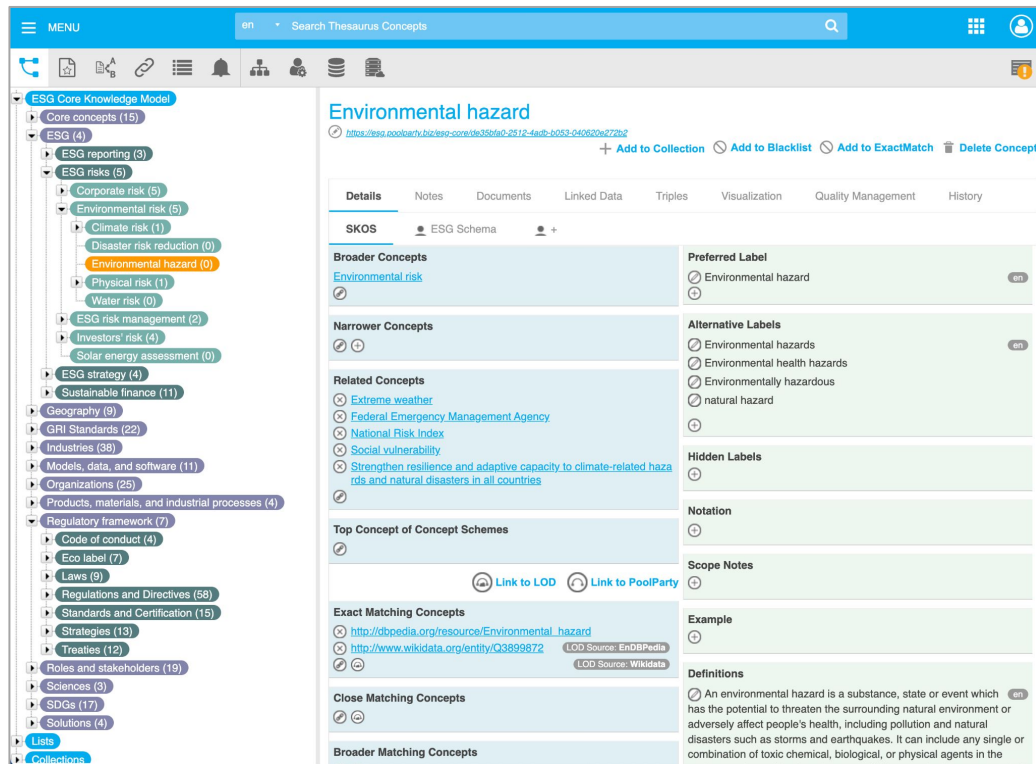
UNFCCC secretariat

Similarities: 10

CLOSE

The ESG Core Knowledge Model

Intelligent ESG Search Engines, Assistants or Knowledge Hubs benefit from Specific Domain Models



The screenshot displays the ESG Core Knowledge Model interface. On the left is a hierarchical tree structure under the heading 'ESG Core Knowledge Model'. It includes categories like 'Core concepts (15)', 'ESG (4)', 'ESG reporting (3)', 'ESG risks (5)', 'ESG strategy (4)', 'Sustainable finance (11)', 'Geography (9)', 'GRI Standards (22)', 'Industries (38)', 'Models, data, and software (11)', 'Organizations (25)', 'Products, materials, and industrial processes (4)', 'Regulatory framework (7)', 'Roles and stakeholders (19)', 'Sciences (3)', 'SDGs (17)', and 'Solutions (4)'. The 'Environmental hazard' concept is highlighted in orange. On the right, the 'Environmental hazard' concept is detailed. It shows the SKOS URI, a list of broader concepts (Environmental risk), narrower concepts (Environmental hazards, Environmental health hazards, Environmentally hazardous, natural hazard), related concepts (Extreme weather, Federal Emergency Management Agency, National Risk Index, Social vulnerability, Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries), top concept of concept schemes, exact matching concepts (dbpedia.org/resource/Environmental_hazard, wikidata.org/entity/Q3899872), close matching concepts, and broader matching concepts. The interface also includes tabs for Details, Notes, Documents, Linked Data, Triples, Visualization, Quality Management, and History.

- ▶ Standards-based (SKOS, RDF, OWL)
- ▶ Current version: 3.2 (April 26, 2023)
- ▶ Taxonomy and ontology elements
- ▶ Covers Datasets, Sectors, Directives, SDGs, GRI-Standard, EU Taxonomy, etc.
- ▶ Basis for precise text mining and data integration
- ▶ 4,500 ESG concepts and definitions
- ▶ 25,000 terms (synonyms / acronyms)
- ▶ 14,800 relations (hierarchical / non-hierarchical)
- ▶ 3,400 mappings to Wikidata / DBpedia
- ▶ 2,200 mappings to external content (LinkedIn, Wikirate, authoritative sources, etc.)

Example 4: PoolParty meets ChatGPT



ChatGPT has its limitations, but it can be remedied by a knowledge graph.

Ask our friendly PoolParty robot all your questions relating to ESG to see how a semantically enriched chat bot compares to the traditional ChatGPT.

<https://www.poolparty.biz/pp-meets-chatgpt>

Example 4: PoolParty meets ChatGPT



How could open data and knowledge graphs help to prevent critical climate tipping points?

EXAMPLES

Which form of renewable energy contributes most to the world-wide energy mix?

How is TCFD and climate change reporting developing for UK pension funds?

Does consumption of soy beans and plant-rich food mitigate deforestation?

Which role plays the CCO when rolling out an ESG strategy in a company?

ChatGPT's direct answer

Open data and knowledge graphs can play a crucial role in helping to not reach critical climate tipping points by providing a better understanding of the complex interactions between different environmental factors and their impacts on climate change. Here are some ways in which they can help:

1. Improved Climate Modeling: Open data and knowledge graphs can enable the development of more accurate climate models by providing access to a vast array of environmental data, such as temperature, precipitation, and greenhouse gas emissions. This can help researchers to better understand how different factors interact with each other and predict the potential impacts of climate change.
2. Identifying Risks and Opportunities: Open data and knowledge graphs can help identify areas that are most at risk of climate change, such as areas prone to flooding, drought, or wildfires. This information can be used to develop better land-use planning strategies, improve disaster response plans, and identify opportunities for mitigation and adaptation.
3. Promoting Public Awareness: Open data and knowledge graphs can help raise public awareness of the impacts

ChatGPT's answer when background information from the ESG graph is added

[Open data](#) and [knowledge graphs](#) can play an essential role in preventing the Earth from reaching a critical [climate tipping point](#). Here are some ways in which they can help:

1. [Semantic Web: The Semantic Web](#) is a [technology](#) that enables data to be shared and reused across applications, enterprise, and community boundaries. By using [Semantic Web](#) technologies, we can make climate data more accessible, interoperable, and machine-readable. This will help to integrate data from various sources and build a comprehensive understanding of [climate change](#).
2. [Knowledge models: Knowledge models](#) are a formal representation of knowledge that can be used to reason about complex systems. By using [Knowledge models](#), we can simulate the effects of different climate scenarios, identify potential [tipping points](#), and develop [strategies](#) to prevent them from occurring.
3. [Vocabularies and identifiers](#): Vocabularies and identifiers are essential in ensuring that data is accurately described and can be easily integrated into [knowledge graphs](#). By using standardized vocabularies and identifiers, we can ensure that data is interoperable and can be linked to other [datasets](#).

Example 4: PoolParty meets ChatGPT



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Relevant links

2030 Sustainable Development Goals

Website: <https://sdgs.un.org>

Article:

- <https://sdgs.un.org/publications>
- <https://www.stockholmresilience.org/research/research-news/2016-06-14-the-sdgs-wedding-cake.html>
- <https://simplebooklet.com/bd2l?bid=1604145757>
- <https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/mapping-to-the-sustainable-development-goals>
- https://globalcompact.at/wp-content/uploads/2022/09/gri-linkagesdg_gristandards-updatemay2022-final.pdf

The ESG Knowledge Graph (KGaaS)



Application



ESG KNOWLEDGE
HUB



Your application

Knowledge
Graph

Mappings, data ingestion from other graphs and APIs,
content crawling, document classification, entity linking

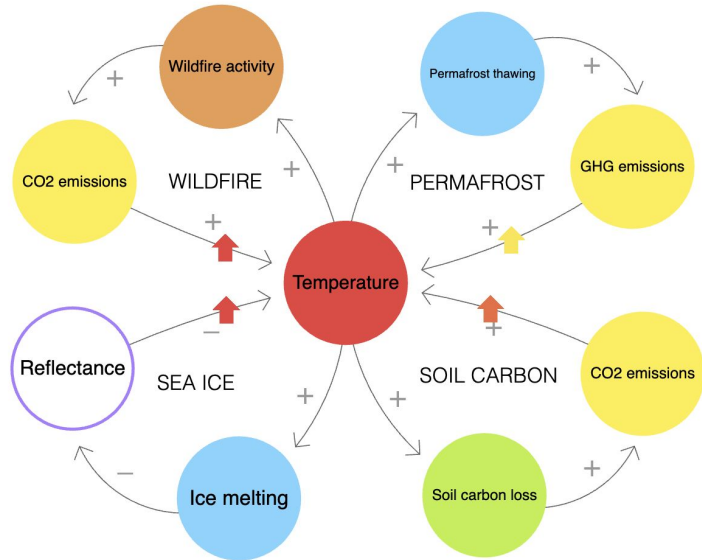
Domain Model

The ESG Core Knowledge Model

<https://esg.poolparty.biz/esg-core>

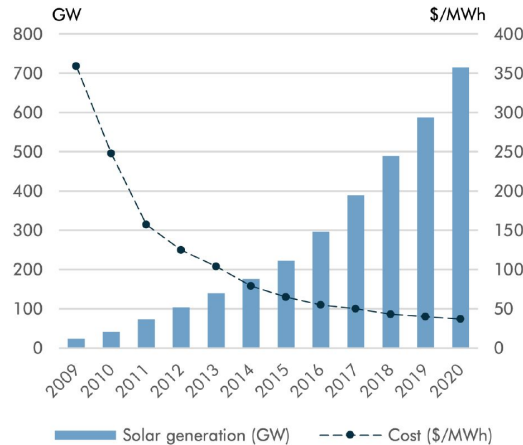
Outlook: Cause-effects, feedback loops, tipping points

We are in a race of feedback loops.



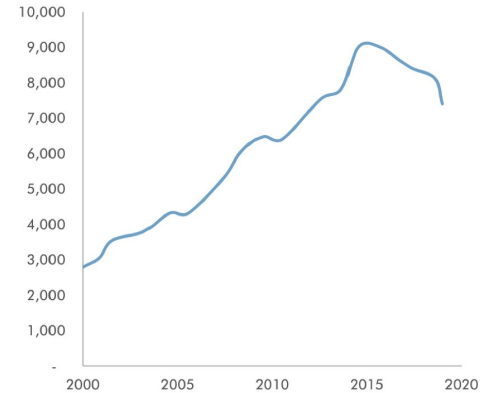
Source: https://scientistswarning.forestry.oregonstate.edu/climate_feedbacks

1.1 SOLAR COSTS AND VOLUMES

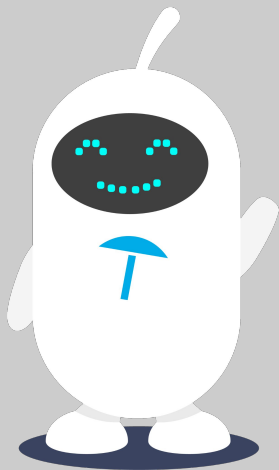


Source: IRENA, Lazard

2.2 THE TECHNOLOGICAL DEAD-END: THE GLOBAL DECLINE IN FOSSIL FUEL PATENTS



Source: EPO & IEA²⁴



PEPE

SEMANTIC WEB COMPANY
FRIENDLY ROBOT



*“We are looking for partners
collaborating with us on the extension
of the ESG Knowledge Graph”*

WWW.POOLPARTY.BIZ
LINKEDIN.COM/IN/ANDREASBLUMAUER