

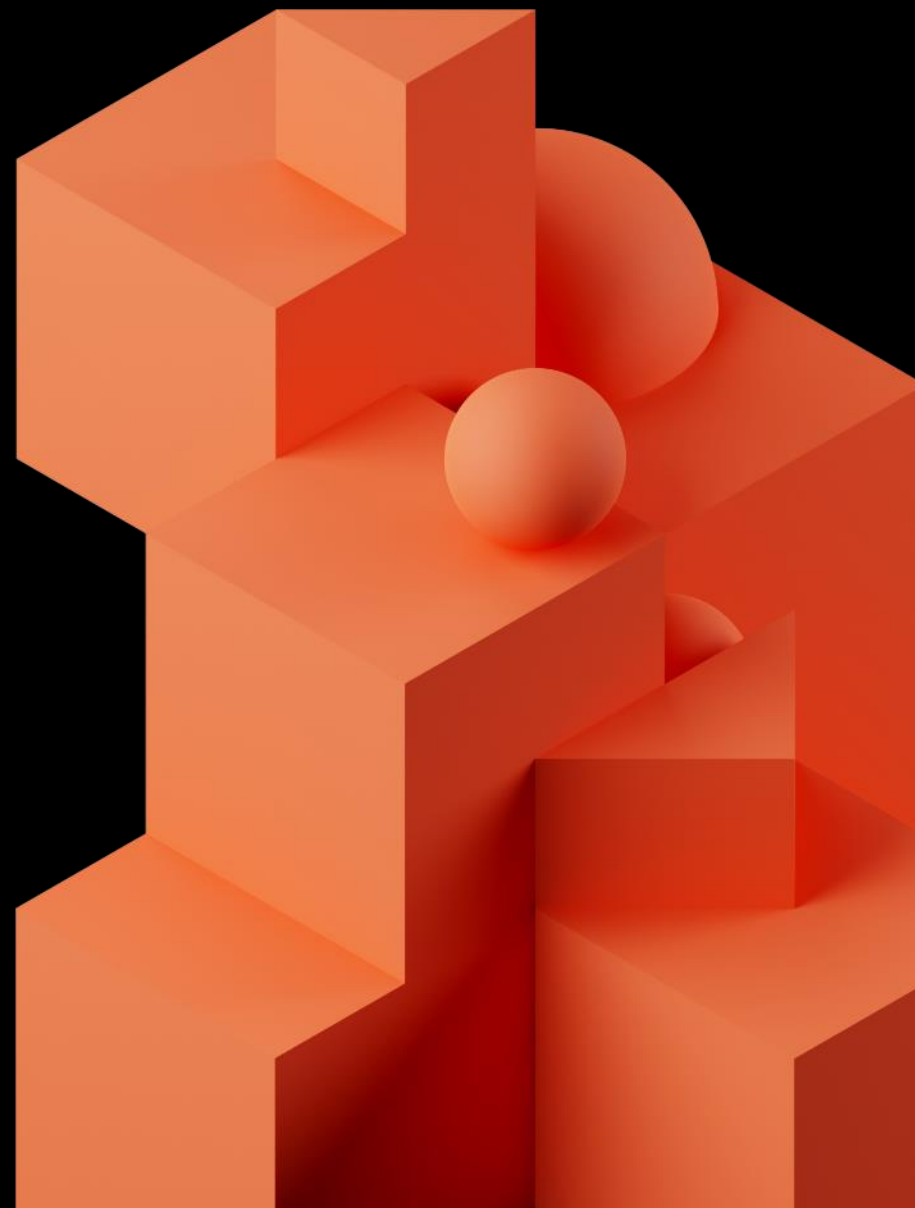
DATA+AI SUMMIT

BY  databricks

IFC's Machine Learning ESG Analyst Platform

Providing Investors Working in Emerging Markets
the Analytical Capacity to Support the
Review of ESG Issues at Scale

*Atiyah Curmally & Blaise Sandwidi
International Finance Corporation*





\$37 billion



IBRD

IDA

IFC

MIGA

ICSID





The logo for MALENA features the word in a bold, white, sans-serif font. The letter 'E' is stylized as three horizontal bars: a green bar on top, an orange bar in the middle, and a blue bar on the bottom. The background is a dark blue with a subtle, light-colored network of dots and lines.

MALENA

MACHINE LEARNING ESG ANALYST

Find Areas of Relevance

Sustainability Report 2022

Taking action to help address SA's water challenges
Some of our other water interventions during 2019 were as follows:



Donations of water wheelbarrows
We donated 120 water wheelbarrows to a water-stressed community in the Free State.



Net-zero operational water usage
Thanks to our support of the WWF-SA Water Balance Programme, which aims for the removal of alien invasive trees in key water source areas, [redacted] is effectively a net-zero operational water user.



Reductions in office water usage
In 2019 total water consumption across all our campus sites decreased by 10,30% to 254 801 kL (2018: 284 053 kL). This decrease was achieved primarily due to adherence to drastic water restriction measures that were implemented across the country and floor space consolidation. It was disappointing to note an increase in water usage per employee from 12,56 kL per employee in 2018 to 13,33 kL per employee in 2019. [redacted] received a two-star Water Star Rating certification from the City of Cape Town for water usage and compliance at the [redacted] Stocktower and Piattekloof [redacted] sites.

Spring rehabilitation – In addition to the work we are doing with the WWF in the Umzimvubu Water Catchment in the Eastern Cape (see page 22) we funded the rehabilitation of a spring that will ensure a reliable source of water throughout the year for more than 500 people in a nearby village.



WWF GREEN TRUST 

The WWF Nedbank Green Trust – Over the past five years more than R93m has been invested in 41 water and conservation projects. Altogether 11 of those projects at an investment of nearly R23m focused on water (fresh and marine).



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Highlight Context

Sustainability Report 2019

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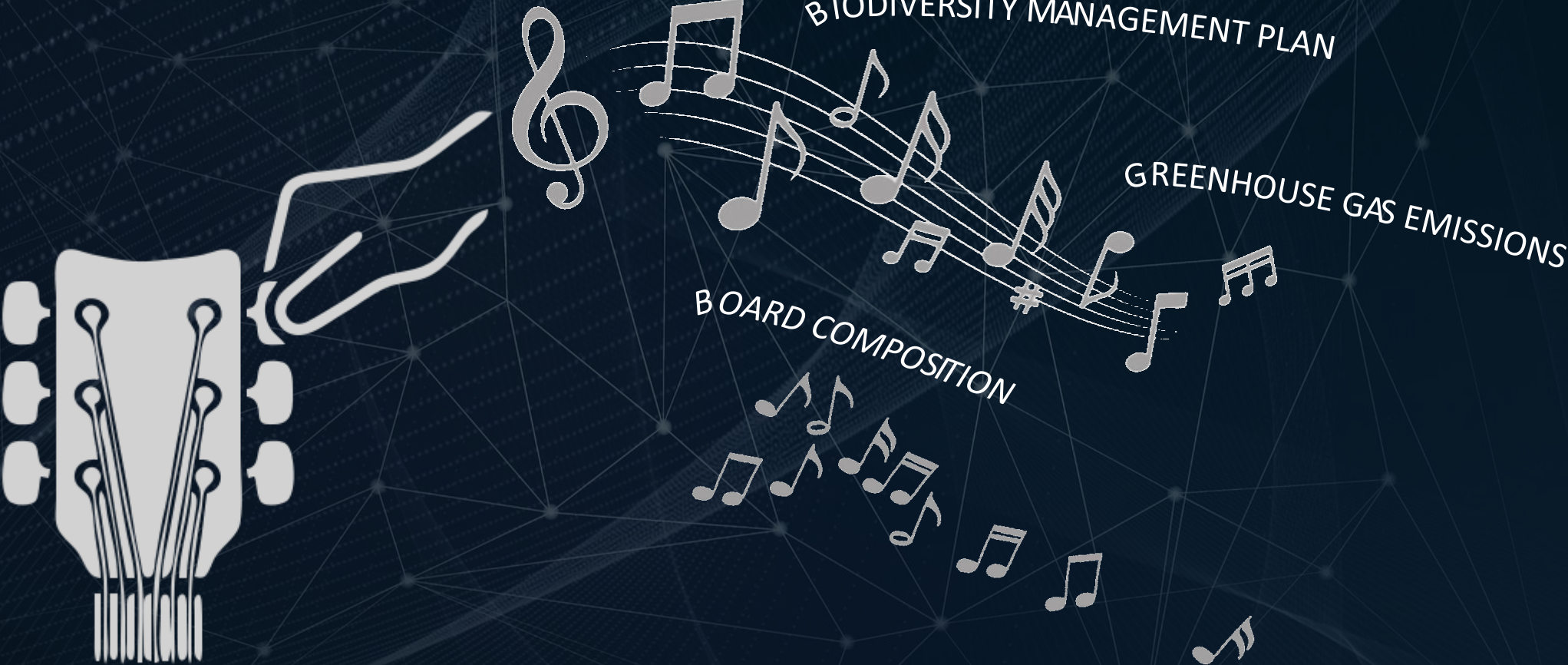


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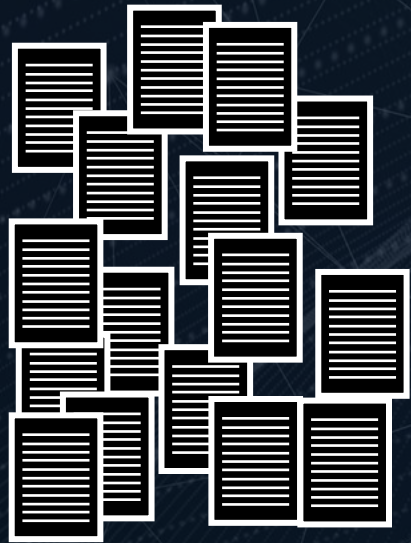
DATA

Fine-tuning MALENA



Unstructured Data Analysis

250,000
documents



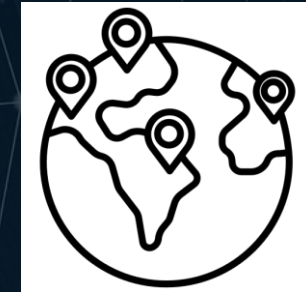
MALENA →



10,000 Companies



186 Countries



26 Sectors



Unstructured Data Analysis

250,000
documents



MALENA

32,000,000
risk terms



10,000 Companies



186 Countries




26 Sectors



19,000 sentences/minute



Sustainability Dashboard



All ▼ Search

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HOME

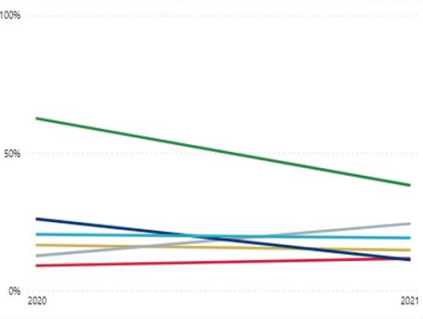
E&S
INSIGHTS

CG
INSIGHTS

COMPANY
SEARCH

SELF
SERVICE


Negative Sentiment Timeline



Top Topics

Name	Pos(+)	Neg(-)	%Neg
Climate - Weather	136	93	41%
Systematic Process to Identify and Manage Risks/Impacts and Opportunities	123	26	17%
People/Communities Involuntary Resettled or Evicted Through Force	17	22	56%
Impacts on Natural Habitats	51	21	
Transparent Working Conditions	47	20	
Worker Health and Safety	169	17	
Performance Monitoring	105	16	
Community Engagement, Feedback and	115	14	

Word Cloud




Performance Standards

Name	Pos(+)	Neg(-)	%Neg
ESG Risk Management	532	62	10%
Labor & Working Conditions	285	52	15%
Resource Efficiency & Pollution	592	143	19%
Community Health, Safety & Security	60	12	17%
Land Acquisition & Resettlement	30	28	48%
Biodiversity Conservation	121	29	19%
Indigenous Peoples	10	0	

Top 15 Risk Terms

Category	Value	Category	Value
Emissions	119	Flooding	74
Community	114	Climate	63
Safety	114	Implementation	45
		Training	55
		Waste	44
		Security	51
		Compliance	38
		Aud.	50
		Renewable Energy	38
		GHG	50
		Waste	39
		GHG	38



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Performance Standard

Multi Select

Topics

Multi Select

Risk Terms

Multi Select

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ENERJISA Energy Generation Inc.
Bandirma NGCCP EIA Report

originated from the industrial activities and fuels consumed in the vehicles. On the other hand, 20 % of the smoke is originated from fuels.

The main reasons of the **air pollution** caused by **heating** can be listed as the usage of poor quality fuels in **heating** without subjecting them to any enrichment process, the application of incorrect burning methods and not carrying out the maintenance of the used boilers regularly. This poses significant **hazard** especially in the regions where the **heating** period is longer.

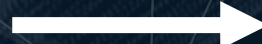
In addition to these, the rapid population concentration and the unplanned **settlement** of the cities according to the topographic structure and meteorological conditions take place a key role in the increase of **air pollution** as well.

The values of sulphur dioxide (SO₂) for the **heating** periods of 2001-2002, 2002-2003, 2003-2004 October-March in Balikesir are given in Table IV-46.

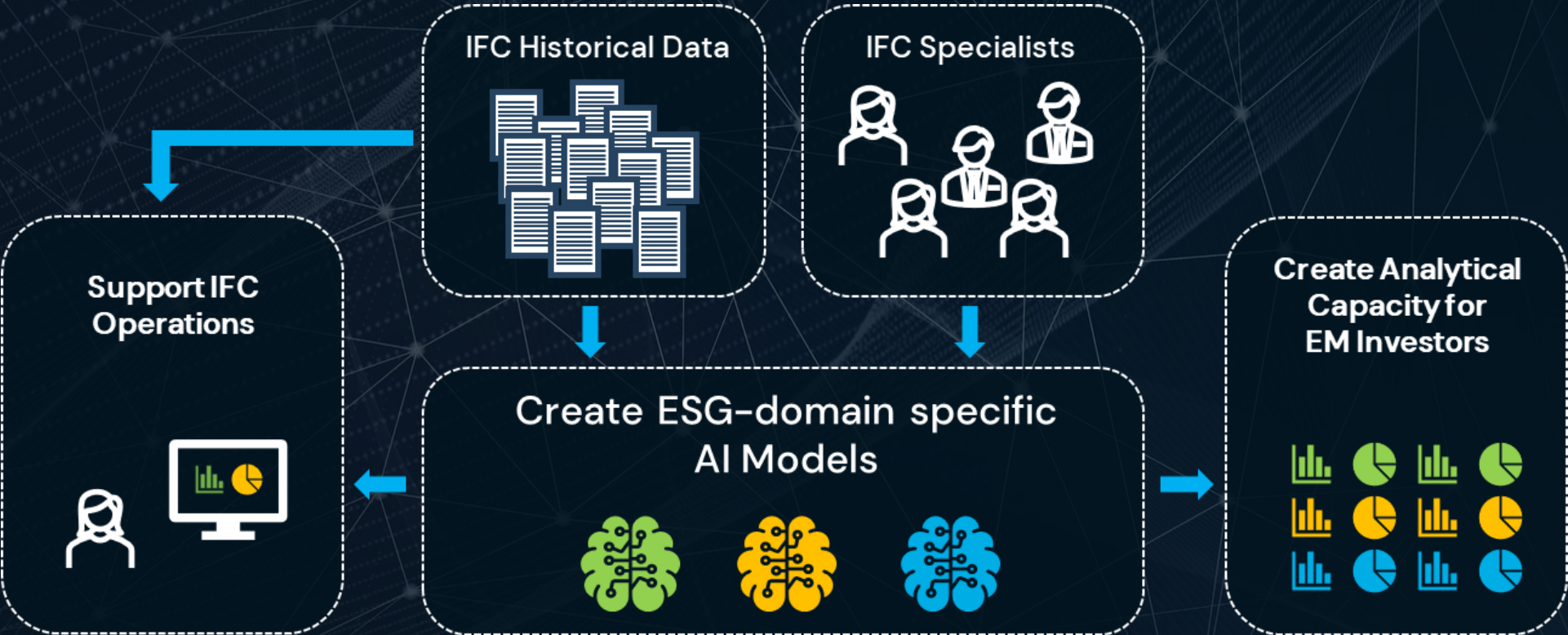
Table IV-46. Measurement Results of SO₂ for the **Heating** Period of 1995-2005 October-March

PERIODS	OCT	NOV	DEC	JAN	FEB	MAR	Average
1999-2000	61	169	203	199	127	66	137
2000-2001	36	105	66	87	65	44	67
2001-2002	18	89	124	155	129	62	96

Reduce Time on Analysis

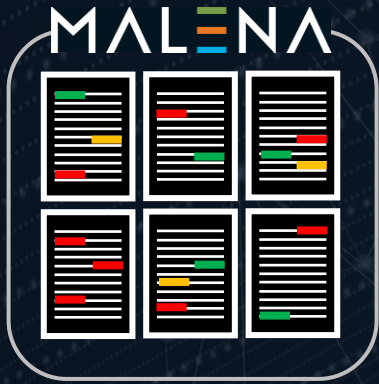


Data + AI for Development









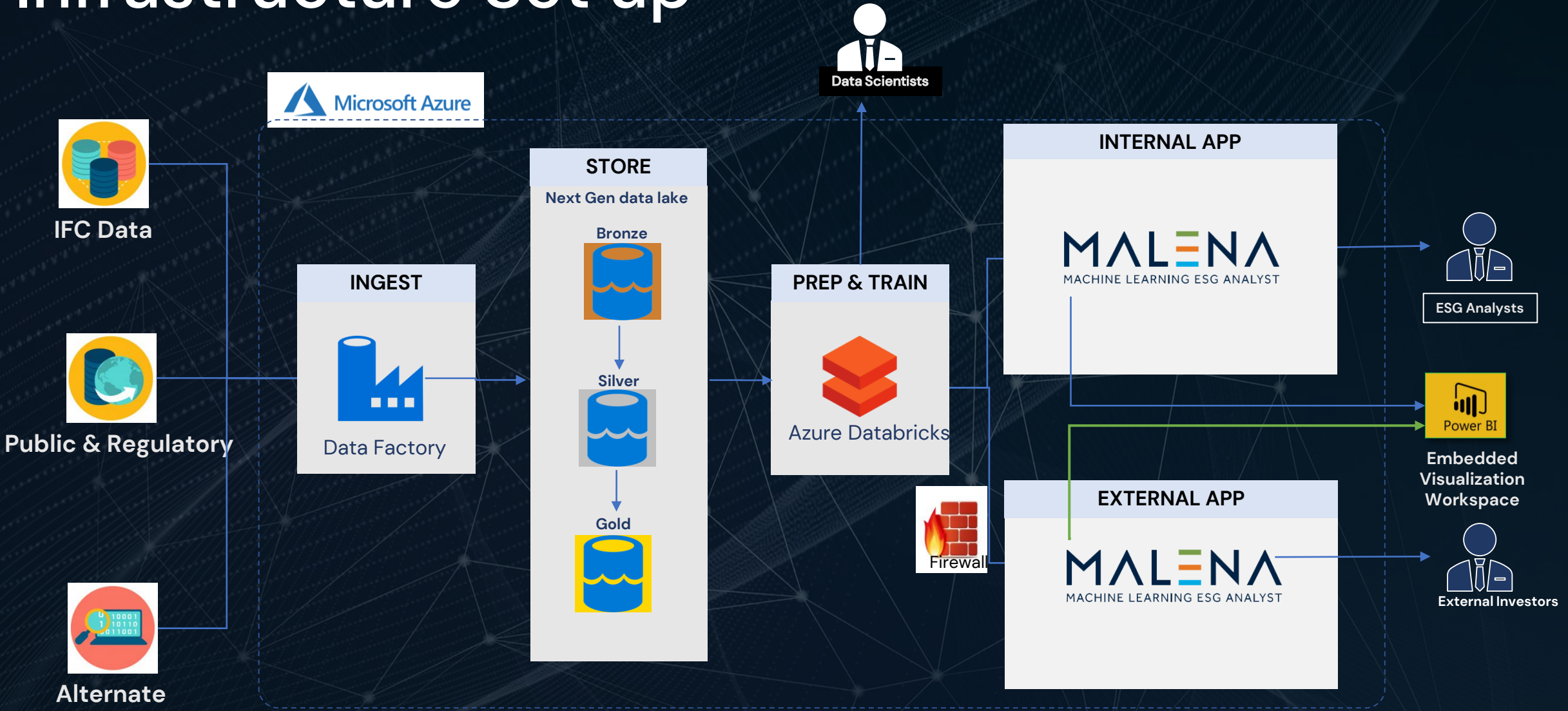
\$200 trillion



\$2 trillion



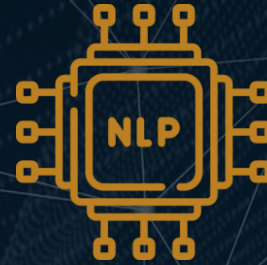
Infrastructure Set up



ESG-domain AI for Emerging Markets



Translation



Sentiment
Analysis



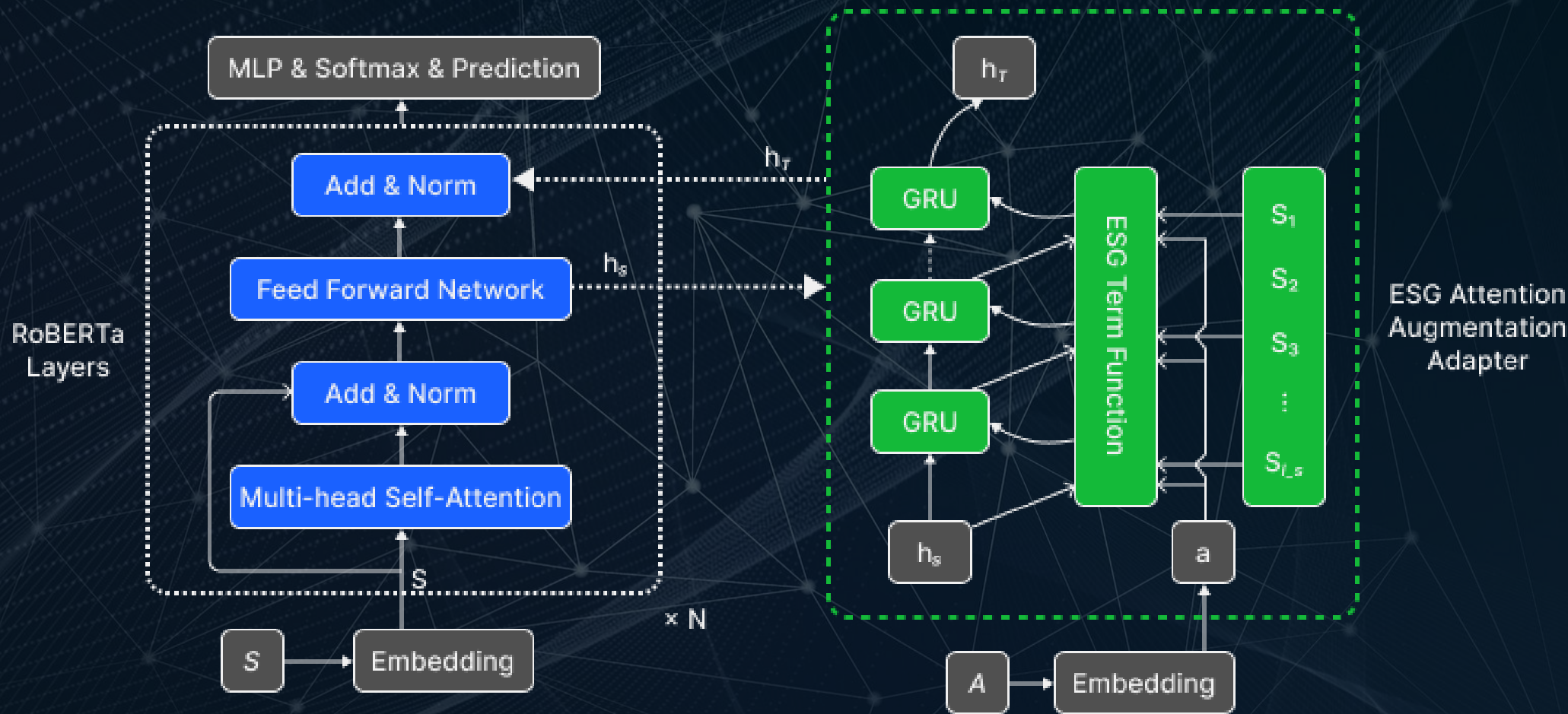
Named Entity
Recognition



Question
Answering

Model Design

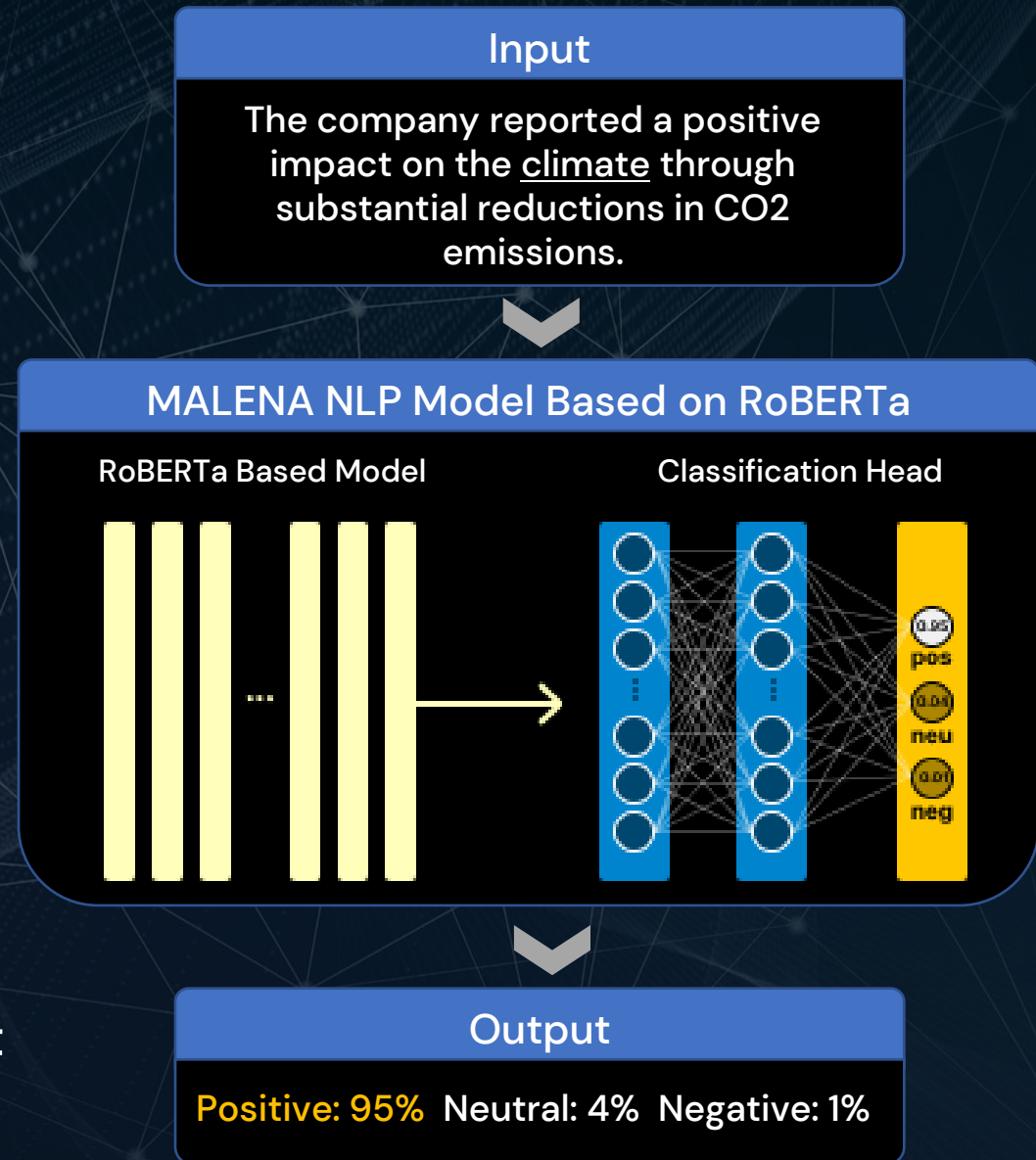
Transformer Architecture



MALENA Training Process

Supervised Machine Learning

1. Sentences with ESG risk term:
e.g.: "climate"
2. Fine-tune the base model for
ESG sentiment analysis task
3. Use MALENA to predict ESG sentiment



Data Labelling

Training data scope



150,000
Manual labels



1,200
Risk Terms



Coverage:
E&S, CG, Climate

Quality controls



Labeling guide:
Defined rules

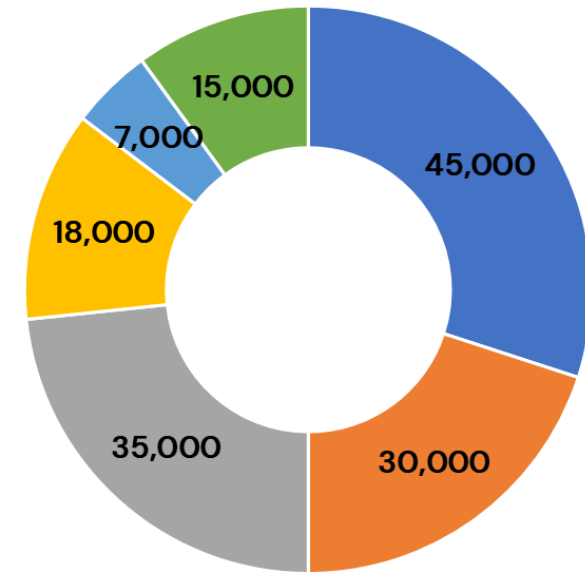


Consensus:
Labelers'
agreement



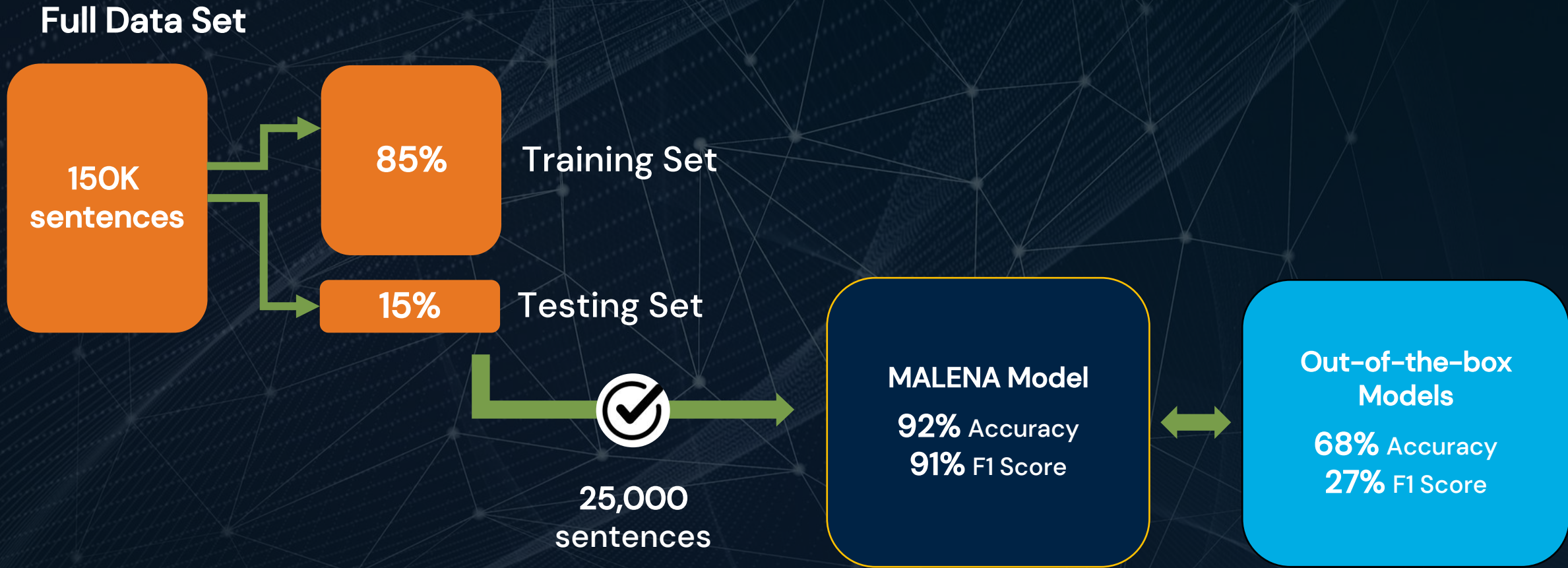
Active learning:
Continuous
feedback

Training data by source



- ESG news
- Internal project documents
- Company disclosures
- DFI disclosures
- Independent project evaluations
- User feedback

Model Evaluation



Efficiency Gains

Less time spent on data gathering & sorting = more time for analysis



Early-stage due diligence

Reduced review from
1 week to ½ day



Annual supervision

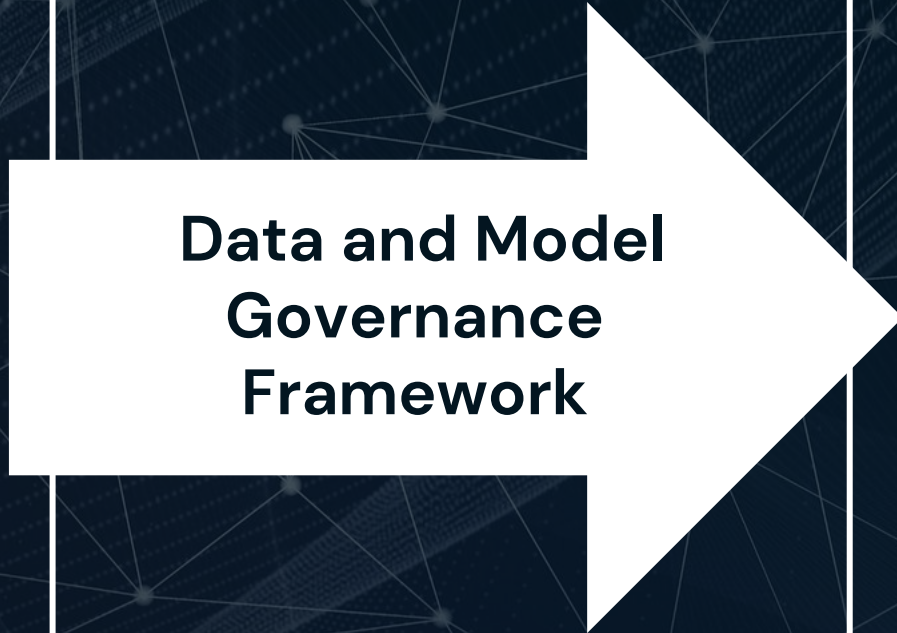
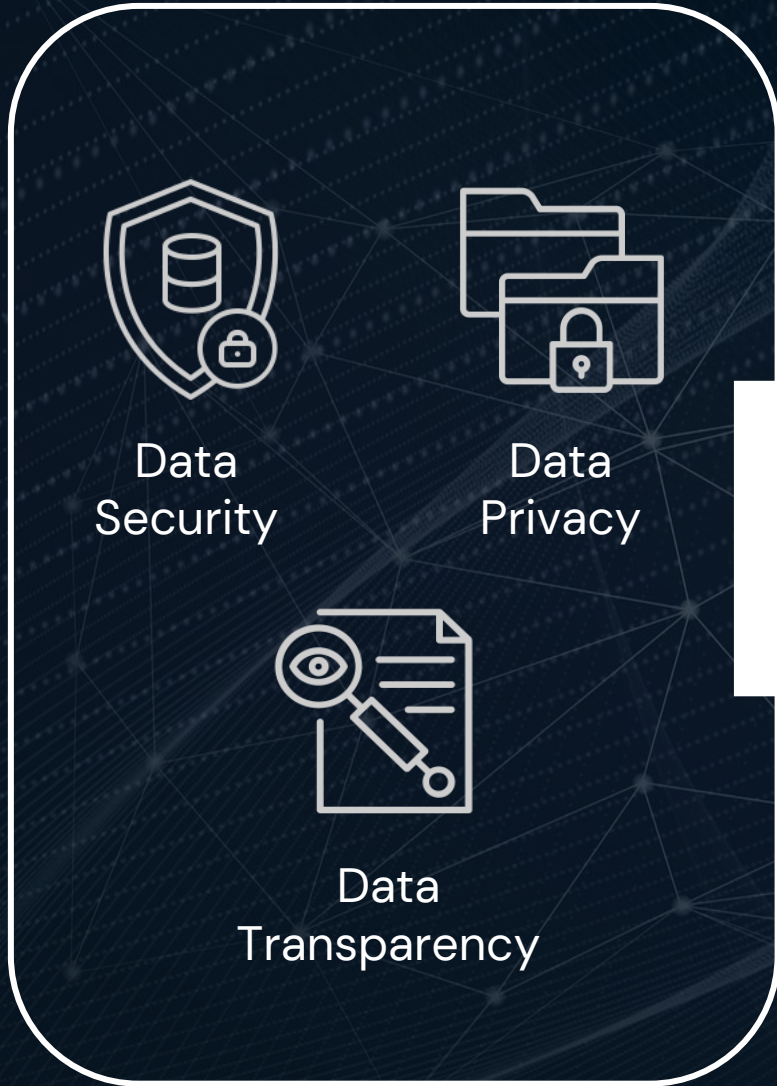
Reduced overdue
supervision text
review by 45%



Risk identification

100 legal agreements
(7K pages) reviewed
in 12 mins

Trustworthy AI



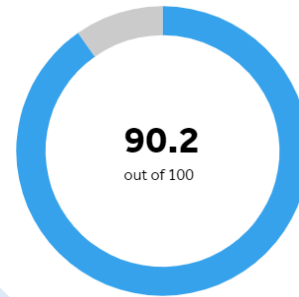
Ethical AI & Model Metrics

Transparency Dashboard

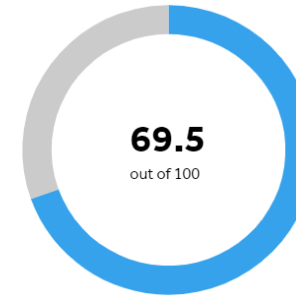
IBM
foundational
properties for AI
ethics

IBM's approach to AI ethics:
<https://www.ibm.com/artificial-intelligence/ethics>

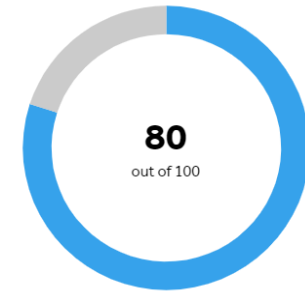
Predictive Performance



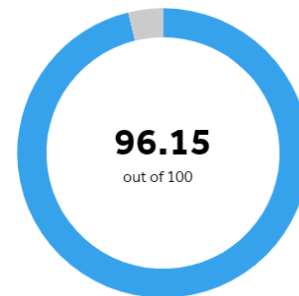
Fairness



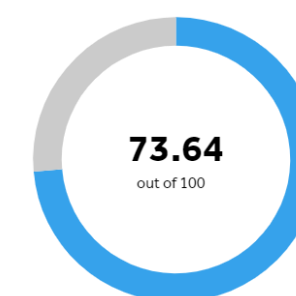
Explainability



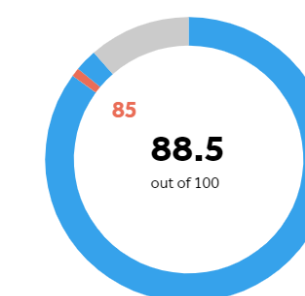
Confidence



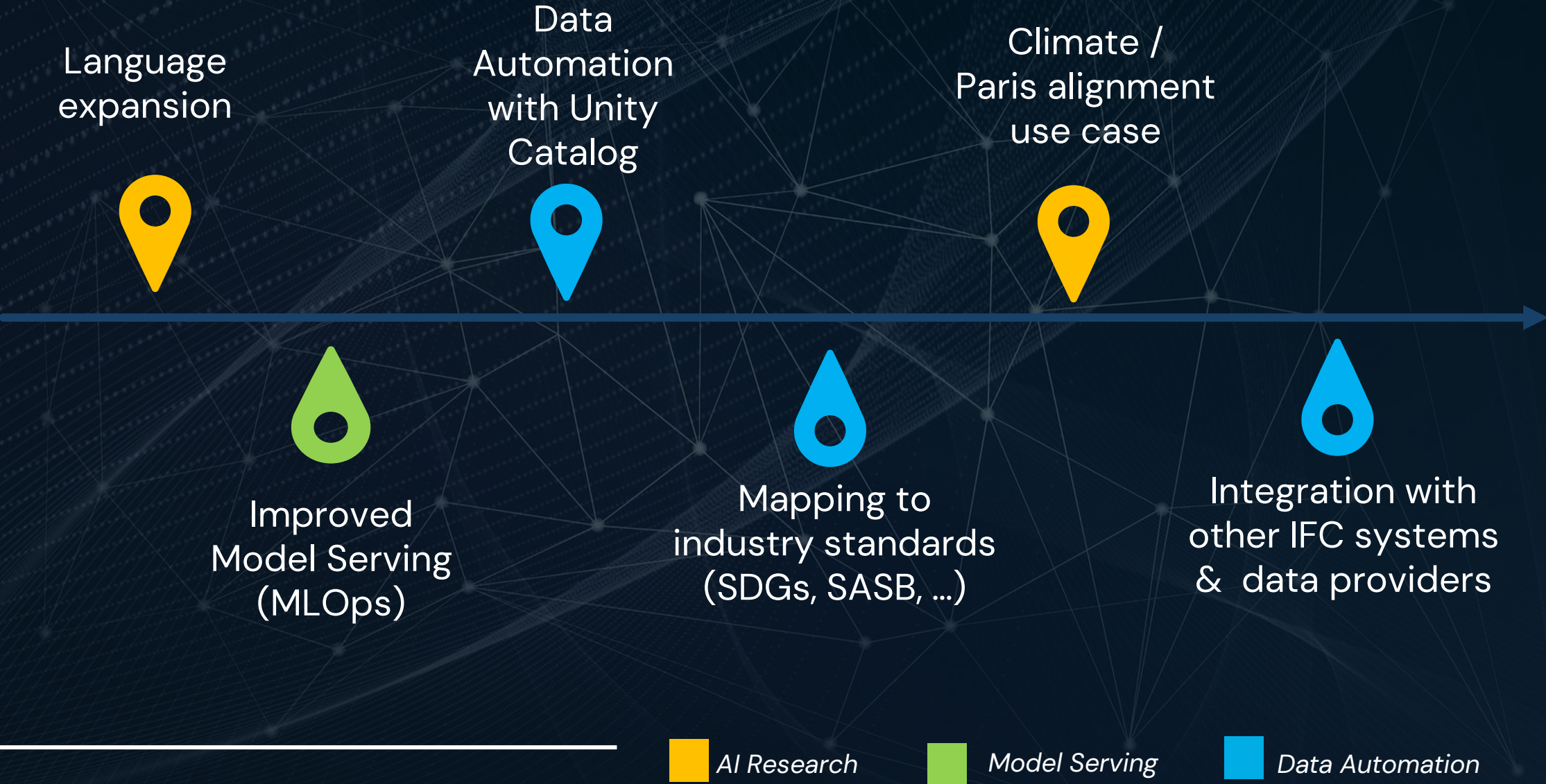
Adversarial Robustness



Model Drift



MALENA Roadmap



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MALENA

MACHINE LEARNING ESG ANALYST

Thank you !

Atiyah Curmally

Principal Environmental Specialist –
ESG Innovation Lead

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Webinar: [IFC Sustainability Webinar Series: Meet MALENA – IFC's Machine Learning ESG Analyst](#)