



**ESG**  
Signals®

Global Asset-Level  
Environmental  
Physical Risk  
Reference Data  
Metrics and Indexes





## Disclosure Gaps in Released Data

- Most firms only report a limited number of environmental and physical risk metrics
- Many private firms, and even public firms, do not disclose any data
- Disclosures are often inconsistent and outdated



## Shortage of Quality and Comparable Data

- ESG data that is available is typically based on estimates
- Proprietary internal processes for data collection fall far short of the rigor required to make fully informed capital allocation decisions using the provided data



## Lack of Granularity and Data Consistency

- ESG data that is available is often reported at a corporate level, with little to no insights at the asset level
- There are vast variabilities in ESG disclosures among ESG Rating Providers

# The Solution

---

*"Geospatial analytics is the only feasible way to measure environmental performance and climate and physical risk in an objective and comparable manner for assets within public and private markets"*

Maneesh Sagar  
Chairman & CEO  
RS Metrics



## Objective and Comprehensive

Covers MSCI ACWI (stock index providing a broad measure of global equity market performance) and expands to the private company universe with no dependency on company disclosures



## Accurate Baseline & Benchmarking

Built to scale and provides comparable temporal measurements across globally situated assets, regardless of corporate ownership



## Granularity through Geospatial

Allows investors, corporates, partners, vendors, customers, and other stakeholders to monitor company's operations at a level of detail beyond what is available even from regulated financial reporting



# Technology Architecture & Asset-Level Methodology





Business Intelligence Visualization and Dashboard layer powered by GCP BigQuery enables Usage-based Pricing



BI Partners



Tableau



Looker



Data Sheets



Data Apps



2019

- Applied computer vision and financial modeling to 500+ global smelters, terminals, and storage sites
- Accurate estimates of inventory and price direction for major commodities



2020

- World's 1<sup>st</sup> asset-level EV Production tracker, expanding to cover the whole transportation sector in '22
- Accurate production estimates for leading EV producers such as Tesla, NIO, Kandi, GM, Ford, Xpeng, Ludic, CATL, etc



2021

- Leveraged geospatial data acquisition expertise and proliferation of climate specific satellites to bring emissions, land usage, water stress, biodiversity data sets into a single platform
- A single source for all asset level environmental and physical risk metrics



2015

- Proprietary database that serves as the System of Record for MSCI ACWI locations globally
- Geospatial data mapped to company, industry, sector, and ultimately a security (Stock, Corporate Bonds, Municipal Bonds, SPV)
- Millions of asset locations, allowing all stakeholders to upload their own data and share it via Blockchain or API

**Business Intelligence  
Visualisation and Dashboard Layer**  
*powered by GCP BigQuery, DataStudio enables  
asset-level usage-based access and pricing*



BI Partners

looker Looker



Data Apps



Data Studio



Data Sheets



Tableau

**Direct Data Storage /  
Access Options via Multiple Clouds**



BigQuery  
+ API

RS Metrics  
API  
(JSON / CSV)

AWS S3

**RS Metrics' Data Products**



Asset  
Tracker®



MetalSignals™

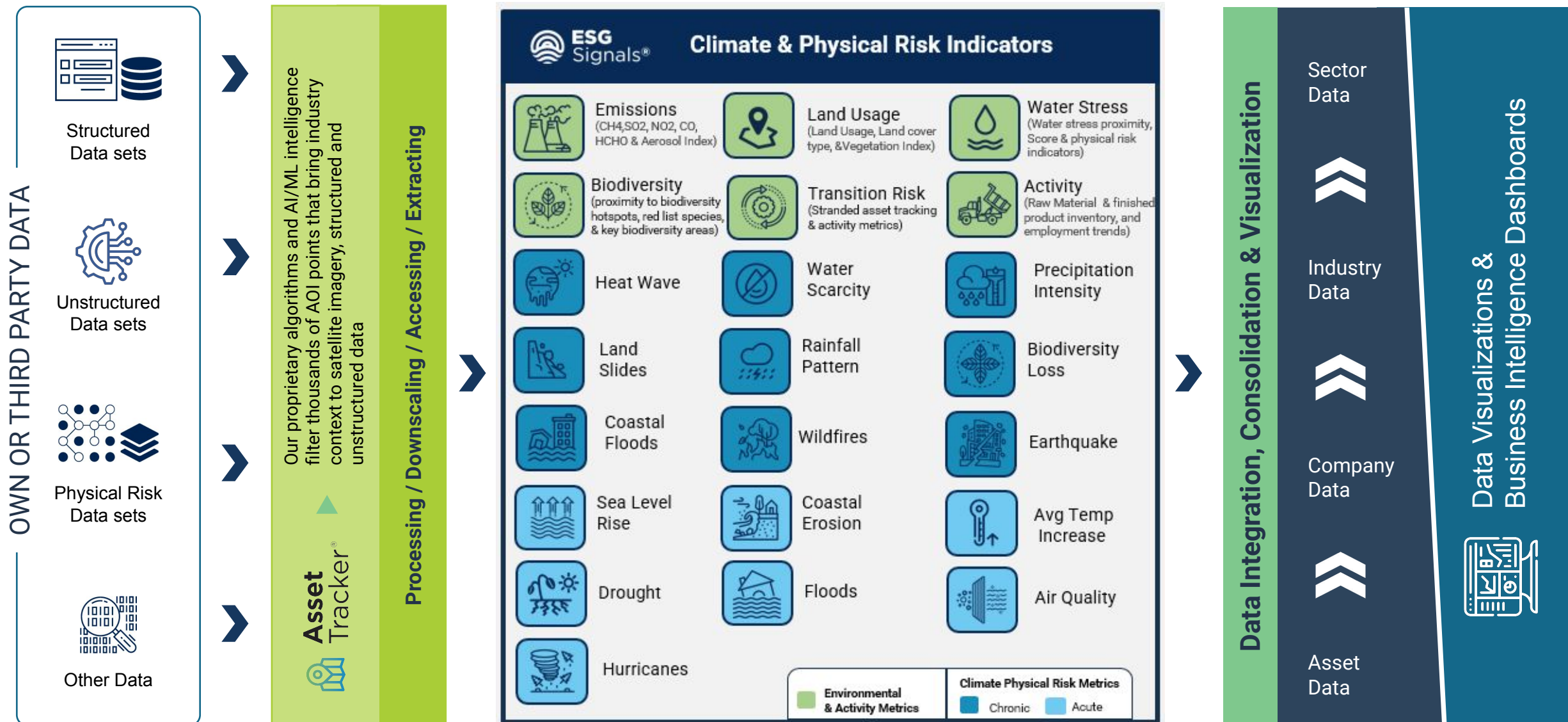


EV Tracker™



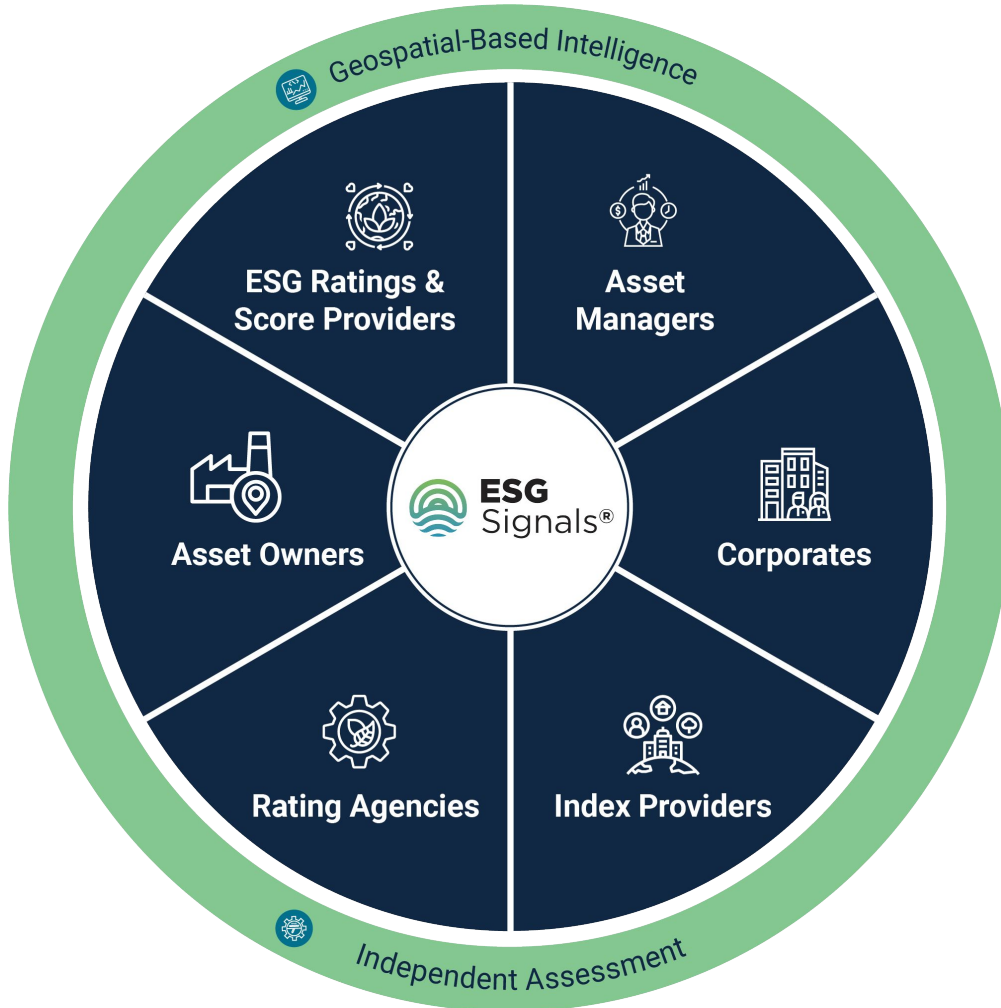
ESGSignals®





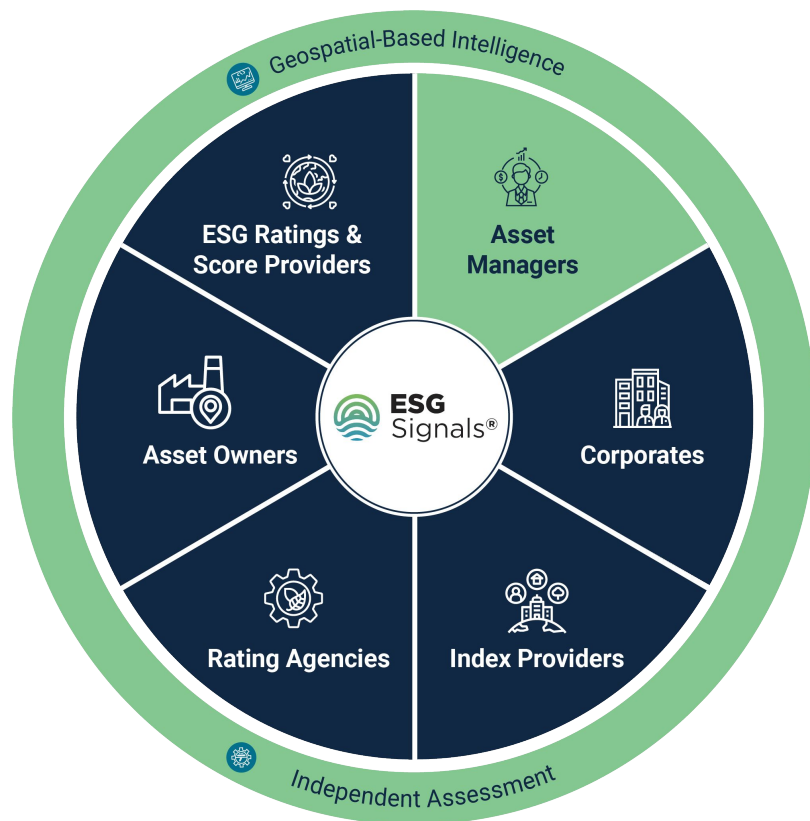
# Customer Segments & Use Cases





## Baselining and Benchmarking through Foundational Asset-Level Environmental and Physical Risk Data and Metrics

- Reference data for ESG ratings & scores (**Ratings Agencies**)
- Enhanced solution for portfolio construction & analytics (**Asset Management**) and due diligence and monitoring solutions (**Private Equity**)
- Environmental sustainability assessment (**Corporates**)
- Integration for ESG indices (**Sustainability Index Providers**)
- Sustainability finance solutions (**ESG Ratings & Solution Providers**)
- Regulatory and reporting solutions for TNFD, SFDR and TCFD (**ESG Solution Providers**)



- **Impact Investments:** Receive objective information on the **past, present, and future exposure to ECP risks** for areas such as water stress, land use/land cover, biodiversity, earthquakes, landslides, coastal flooding, and more
- **Regulatory Reporting:** Use **independent and objective ESG metrics** for mandatory and voluntary sustainability disclosures
  - **EU SFDR** (Sustainable Finance Disclosure Regulation)
  - **SEC Climate Disclosures**
  - **CDP, GRI, TCFD, and TNFD (ESGSignals Biodiversity)**
- **Baseline | Benchmark | Monitor** Portfolio Companies with ESGSignals® Portfolio Modules

## ESG Integration

- Emissions
- Land usage / biodiversity
- Water stress exposure and water intensity

## Sustainability Themed Investing

- Clean energy deployment and sustainable agriculture

## Best-In-Class Screening

- Company head-to-head Comparison
- RIO vs. BHP vs. AA

## Exclusionary Screening

Sector level benchmarking to identify leaders and laggards



## ESG Integration Strategy

## Current data challenges

## ESGSignals Solution

Securities selection is based on quantitative and qualitative assessment of ESG factors, requiring in-depth company analysis and analyst expertise

- Majority of the corporates not disclosing water stress and those that do don't report on a consistent basis
- Corporates disclosing water stress metrics rely on historical water datasets
- Current ESG scores and ratings are based on estimates or rely on qualitative disclosures
- Data is measured and reported on a consistent basis across companies.
- Production weighted water stress score by combining company asset locations with industry standard hydro models

**Sector| Industry | Companies:** Materials| Metals & Mining| BHP & Glencore

**Industry Challenges:** One of the most water intensive industry. Water scarcity is a significant emerging risk with the potential to materially increase operational costs leading to shutdowns and/or impairments

**Companies Considered:** BHP and Glencore

**Metrics Considered:** Water Stress Score (0-100)

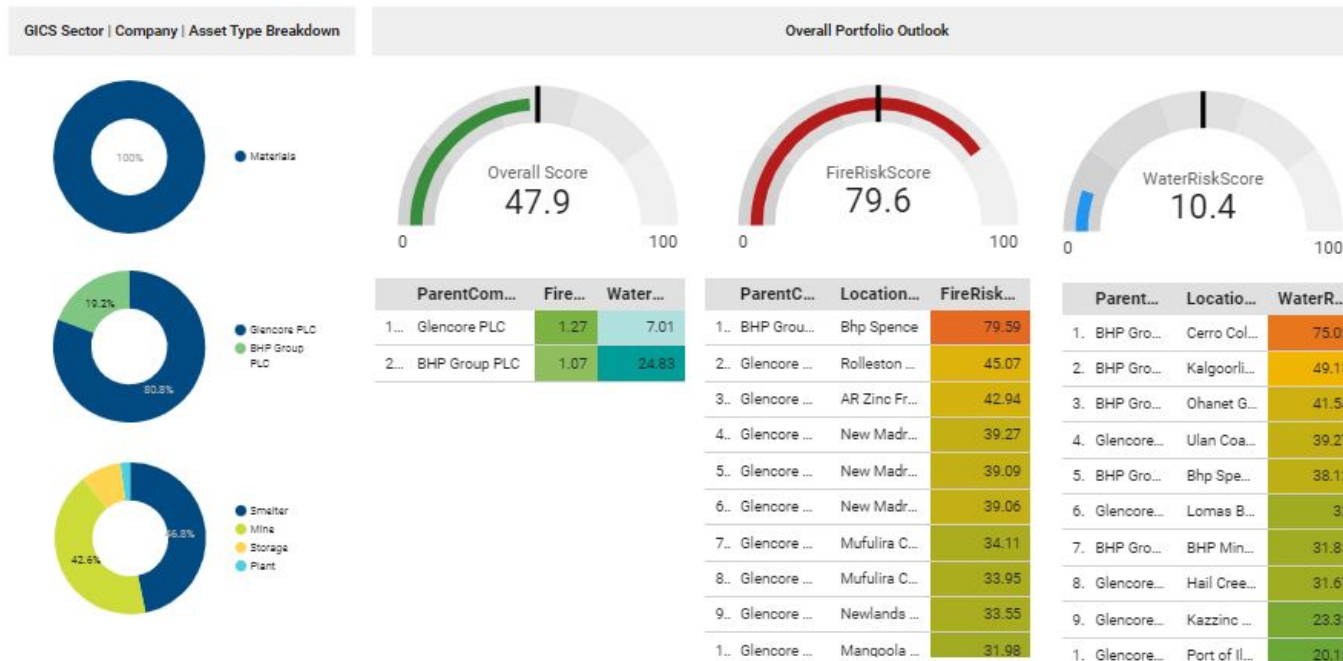
- 0 - No water Stress. 100 – High Water Stress
- Water Stress is measured as a ratio of water withdrawals to available fresh water in the proximity of the assets

## ESGSignals Water Stress Score:

- BHP – 25 (Medium Water Stress)
- Glencore – 7 (Low Water Stress)

## Asset-Level Insights:

- Cerro Colorado copper mine in Chile
- Water Stress Score – 75 (High Water Stress)
- Annual production capacity – 70k metric tons
- Financial Impact – high-levels of water stress could affect the mines \$467M operational continuity



## Portfolio Tilt based on Best-in-class Strategy

### Current data challenges

### ESGSignals Solution

Security selection based on companies outperforming peers in ESG measures predominantly using scores and ratings.  
Generally targeted around specific sectors or themes

- Majority of the corporates not disclosing water stress and those that do don't report on a consistent basis
- Current ESG scores and ratings are based on estimates or rely on qualitative disclosures
- Data is measured and reported on a consistent basis across companies.
- Production weighted water stress score by combining company asset locations with industry standard hydro models

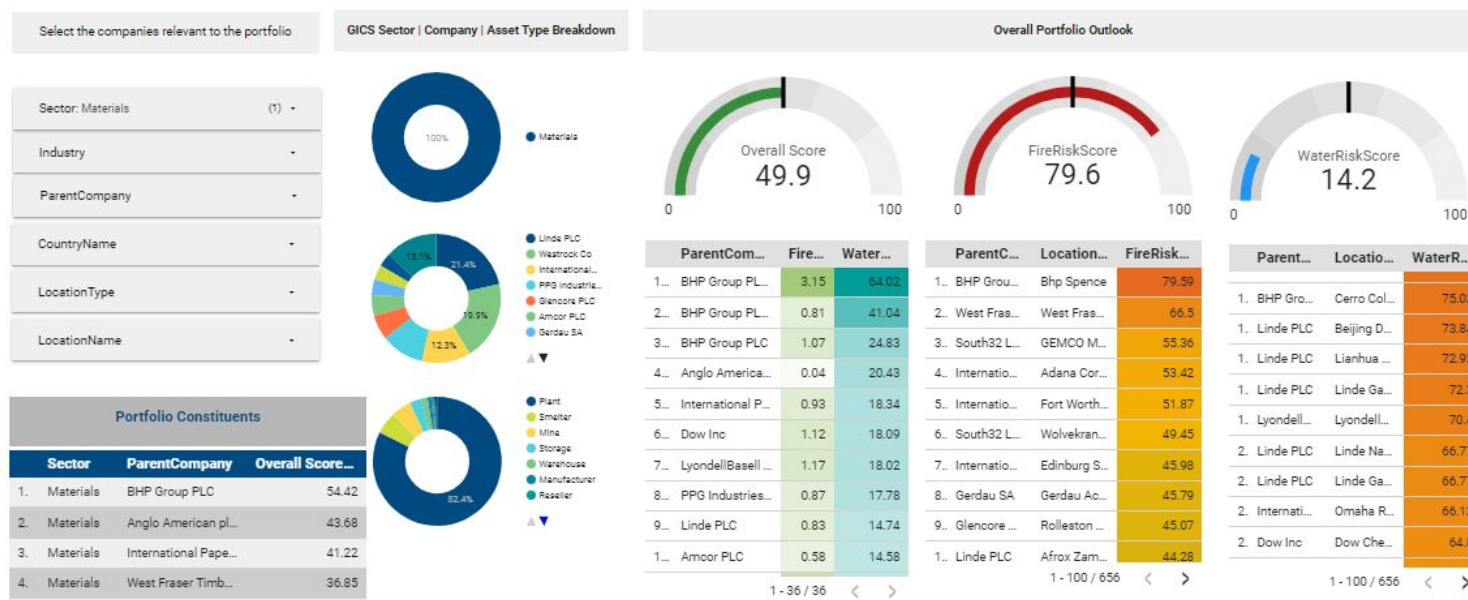
**Sector| Industry:** Materials| Metals & Mining (MSCI ACWI)

**Industry Challenges :** One of the most water intensive industry. Water scarcity is a significant emerging risk with the potential to materially increase operational costs leading to shutdowns and/or impairments

**Metrics Considered:** Water Stress Score (0-100)

- 0 - No water Stress. 100 – High Water Stress
- Water Stress is measured as a ratio of water withdrawals to available fresh water in the proximity of the assets

**Financial Impact:** Recent CDP report highlights water related financial impacts exceeding \$20 billion for the extractives sector. 30% to 50% of copper, gold, iron ore and zinc production is concentrated in areas with high water stress.





### ESG Integration Strategy

### Current data challenges

### ESGSignals Solution

Securities selection is based on quantitative and qualitative assessment of ESG factors, requiring in-depth company analysis and analyst expertise

- Majority of the corporates not disclosing exposure to fire risk and those that do don't report on a consistent basis
- Current ESG scores and ratings are based on estimates or rely on qualitative disclosures
- Asset-level water stress score based on updated water stress data at the basin-level
- Fire Risk score by combining company asset locations with historical fire events, proximity and intensity of fire

**Sector| Industry | Companies:** Materials| Metals & Mining| BHP & Glencore

**Industry Challenges:** Wildfires and bushfires in certain regions pose safety and operational risk for both upstream and downstream operations

**Companies Considered:** BHP and Glencore

**Metrics Considered:** Fire Risk Score (0-100)

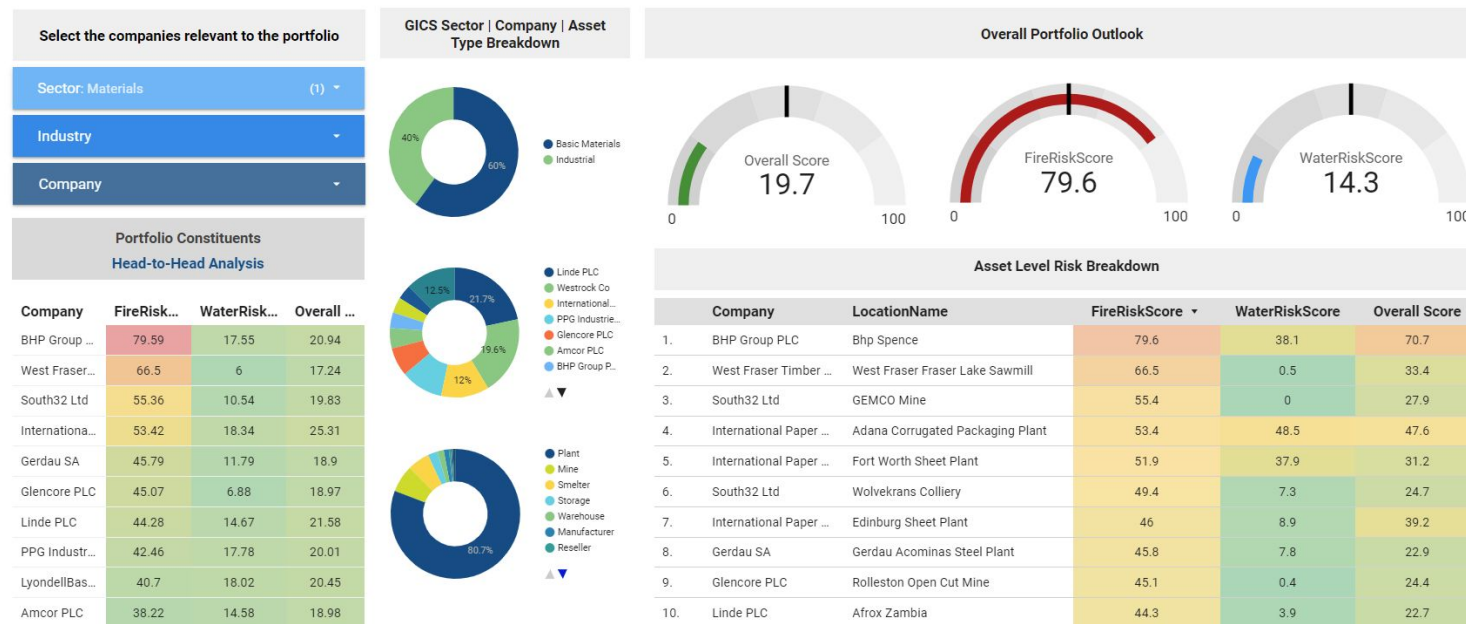
- 0 - Least likely to be Vulnerable to Wildfires.
- 100 – Most likely to be Vulnerable to Wildfires

**ESGSignals Water Stress Score:**

- BHP – 80 (High exposure to wildfires)
- Glencore – 45 (Medium exposure to wildfires)

**Asset-Level Insights:**

- Both companies' mining operations are exposed to bushfires in Australia
- Majority of the assets located in Australia have medium to high exposure to fire risk
- Economic damage was over \$3 Billion



Portfolio Tilt based on Best-in-class Strategy

Current data challenges

ESGSignals Solution

Security selection based on companies outperforming peers in ESG measures predominantly using scores and ratings.  
Generally targeted around specific sectors or themes

- Majority of the corporates not disclosing exposure to fire risk and those that do don't report on a consistent basis
- Current ESG scores and ratings are based on estimates or rely on qualitative disclosures
- Data is measured and reported on a consistent basis across companies.
- Fire Risk score by combining company asset locations with historical fire events, proximity and intensity of fire

**Sector| Industry:** Materials| Metals & Mining (MSCI ACWI)

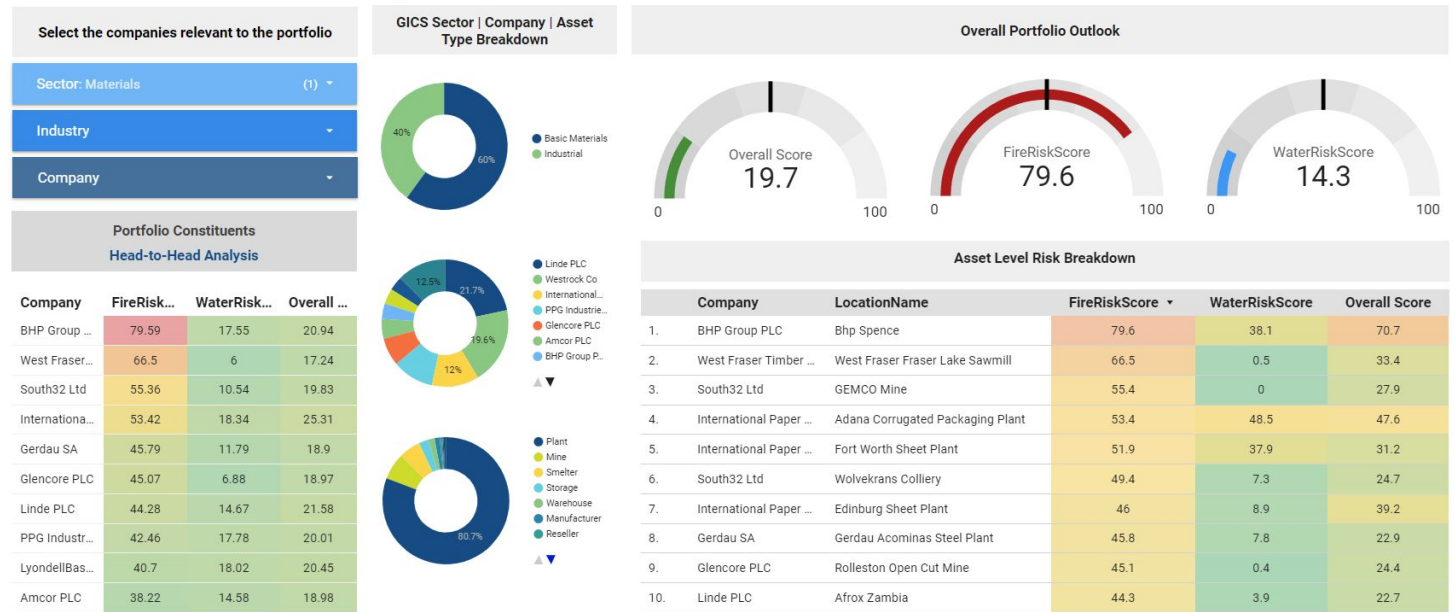
**Industry Challenges :** Wildfires and bushfires in certain regions pose safety and operational risk for both upstream and downstream operations

**Metrics Considered:** Fire Risk Score (0-100)

- 0 - Least likely to be Vulnerable to Wildfires.
- 100 – Most likely to be Vulnerable to Wildfires.

**Financial Impact:**

- Loss of critical infrastructure
- Wildfires near critical infrastructure will trigger shutdowns and pre-emptive power outages impacting operations.







## Asset Tracker®

Global System of Record for  
Fixed Assets mapped to  
Corporate Ownership

### Asset & Geographic Coverage

- Global coverage
- Asset types: Refineries, Mines, Smelters, Data Centers, Manufacturing, Assembly Plants, Ports, Offices, Hospitals....

### Global Equities Coverage (General Availability by Q3 2022)

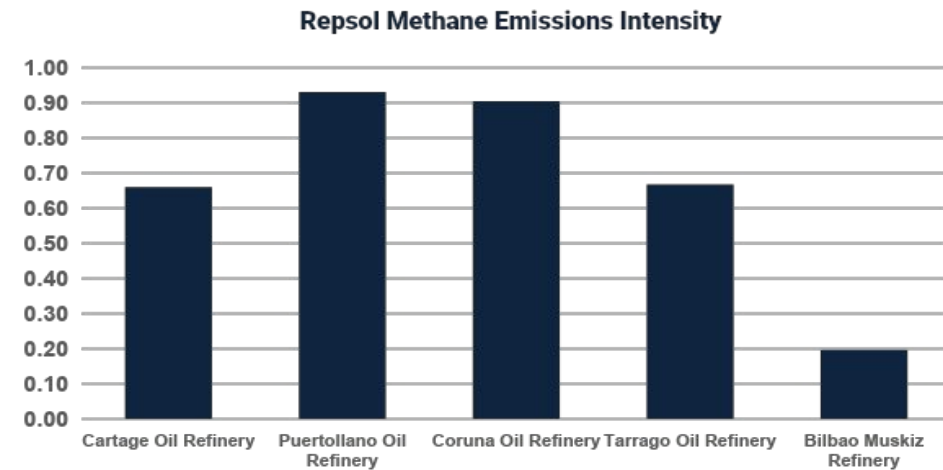
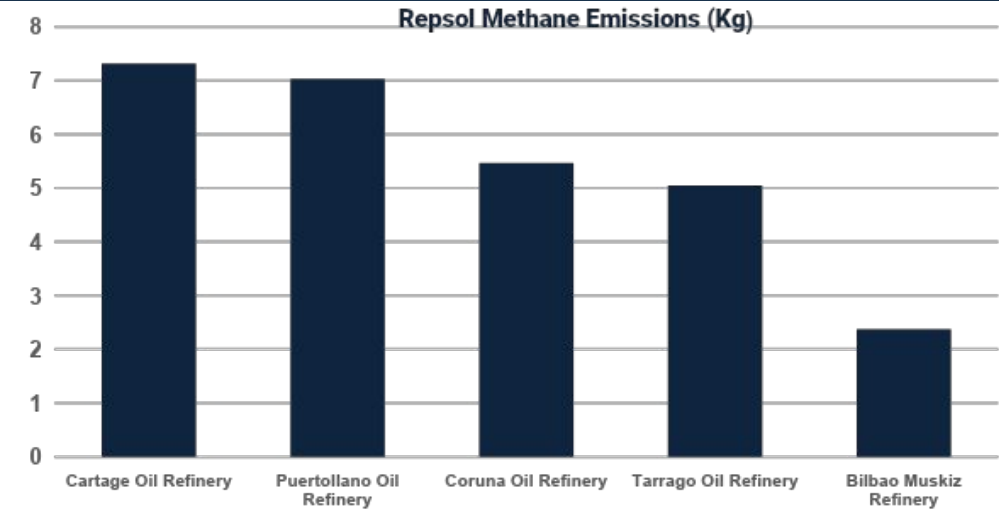
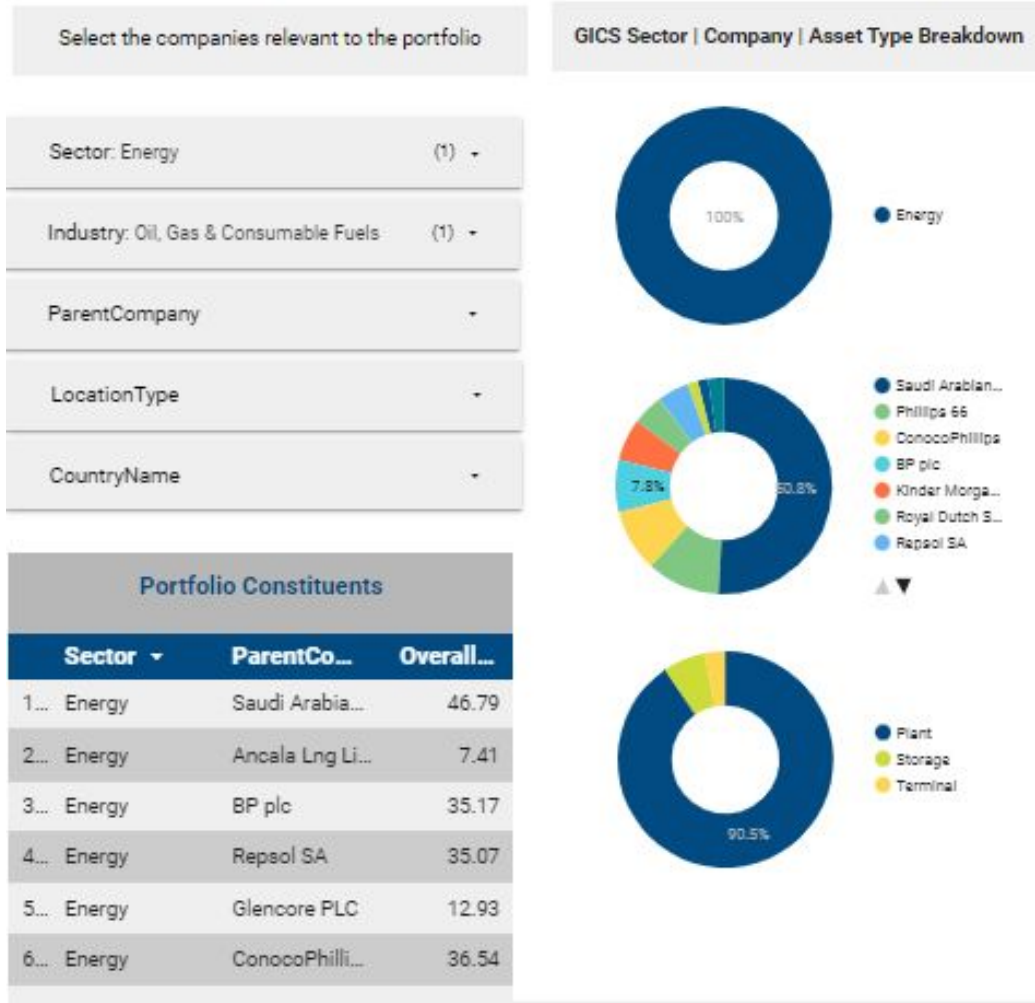
- MSCI ACWI
- ~ 3000 Companies
- Assets in Sectors Such As - Materials | Energy | Utilities | Industrials...

### PaaS (via API or as a Blockchain Token (Q4 2022))

- BYOA (Bring Your Own Assets)
- For Corporates, Consulting Firms, Auditors, and Asset Managers

# ESGSignals® + AssetTracker®

## Portfolio Analysis Use Case: *Emissions Intensity in Energy Sector*





## Business Intelligence Visualisation and Dashboard Layer

*powered by GCP BigQuery, DataStudio enables  
asset-level usage-based access and pricing*



BI Partners

looker Looker



Data Apps



Data Studio



Data Sheets



Tableau

## Direct Data Storage / Access Options via Multiple Clouds



BigQuery  
+ API

RS Metrics  
API  
(JSON / CSV)

AWS S3

## RS Metrics' Data Products



Asset  
Tracker®



MetalSignals™

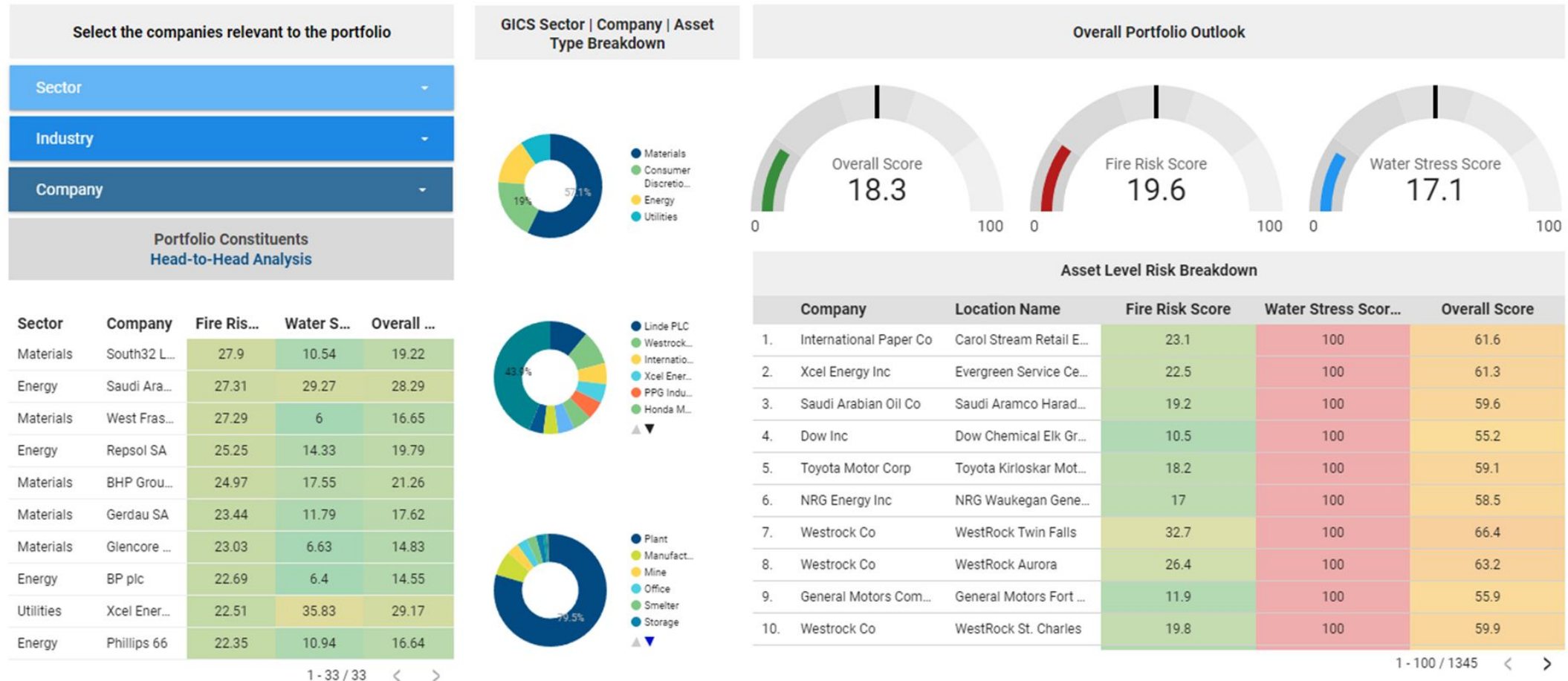


EV Tracker™



ESGSignals®

### Asset-Level Water Stress & Fire Risk Exposure



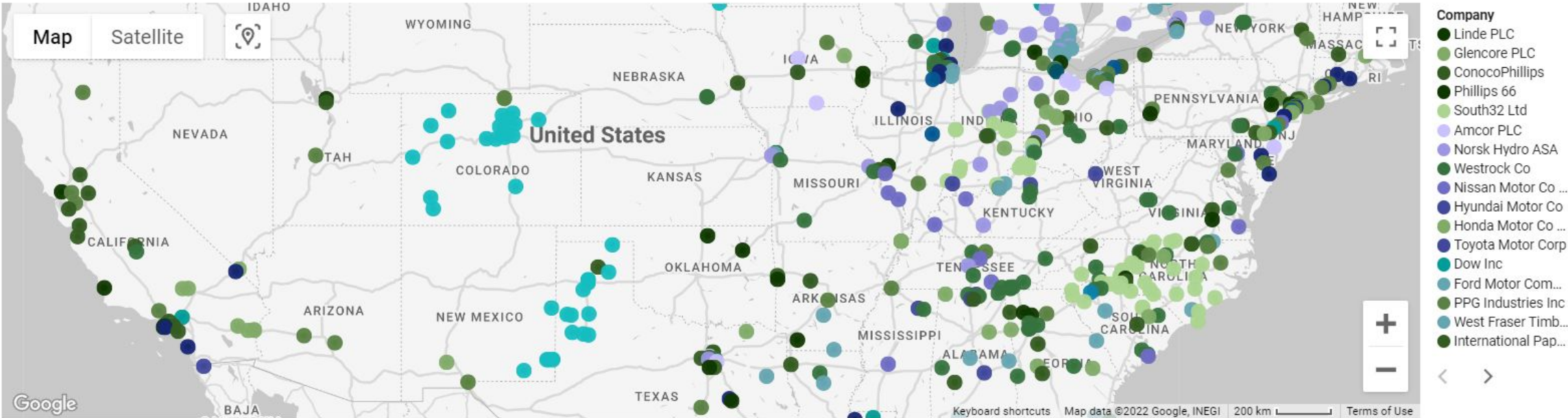
# Benchmarking and Baselining

## Understanding Sectoral vs. Geographical trends

### Sectoral Benchmark

Materials Sector	Energy Sector	Utilities Sector	Consumer Discretionary Sector
Fire Risk Score 19.19	Fire Risk Score 24.49	Fire Risk Score 20.2	Fire Risk Score 18.18
Water Stress Score 14.2	Water Stress Score 20.3	Water Stress Score 22.55	Water Stress Score 18.12
Overall Score 16.69	Overall Score 22.4	Overall Score 21.37	Overall Score 18.15

### Geographical Breakdown of the Assets





# Asset-Level: Company Comparison

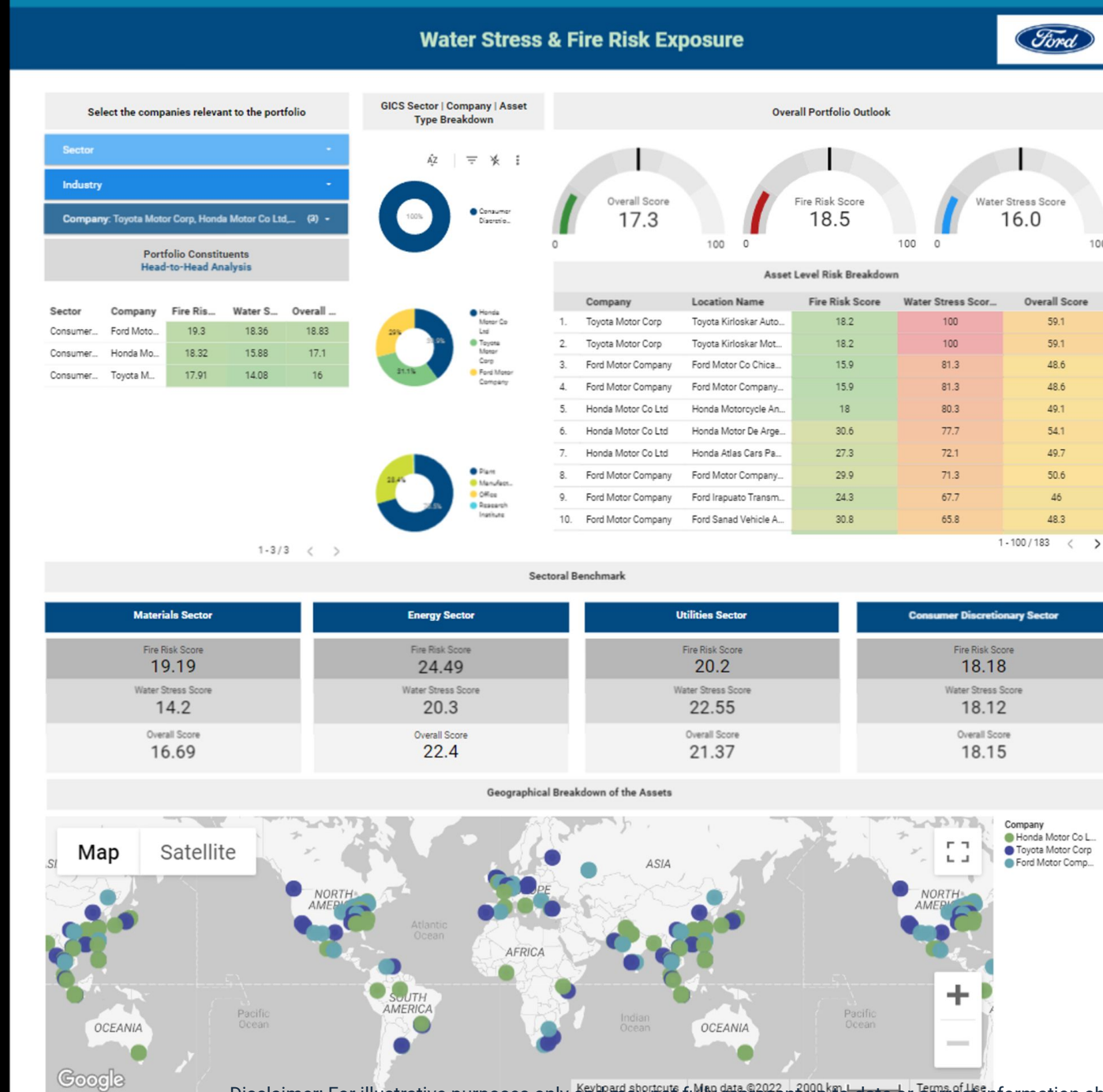
**Metrics:** Water Stress  
& Fire Risk

**Sector:** Consumer  
Discretionary

**Industry:** Automotive

**Companies:**

1. Toyota
2. Honda
3. Ford



# Asset Level: Single Company Drill-Down

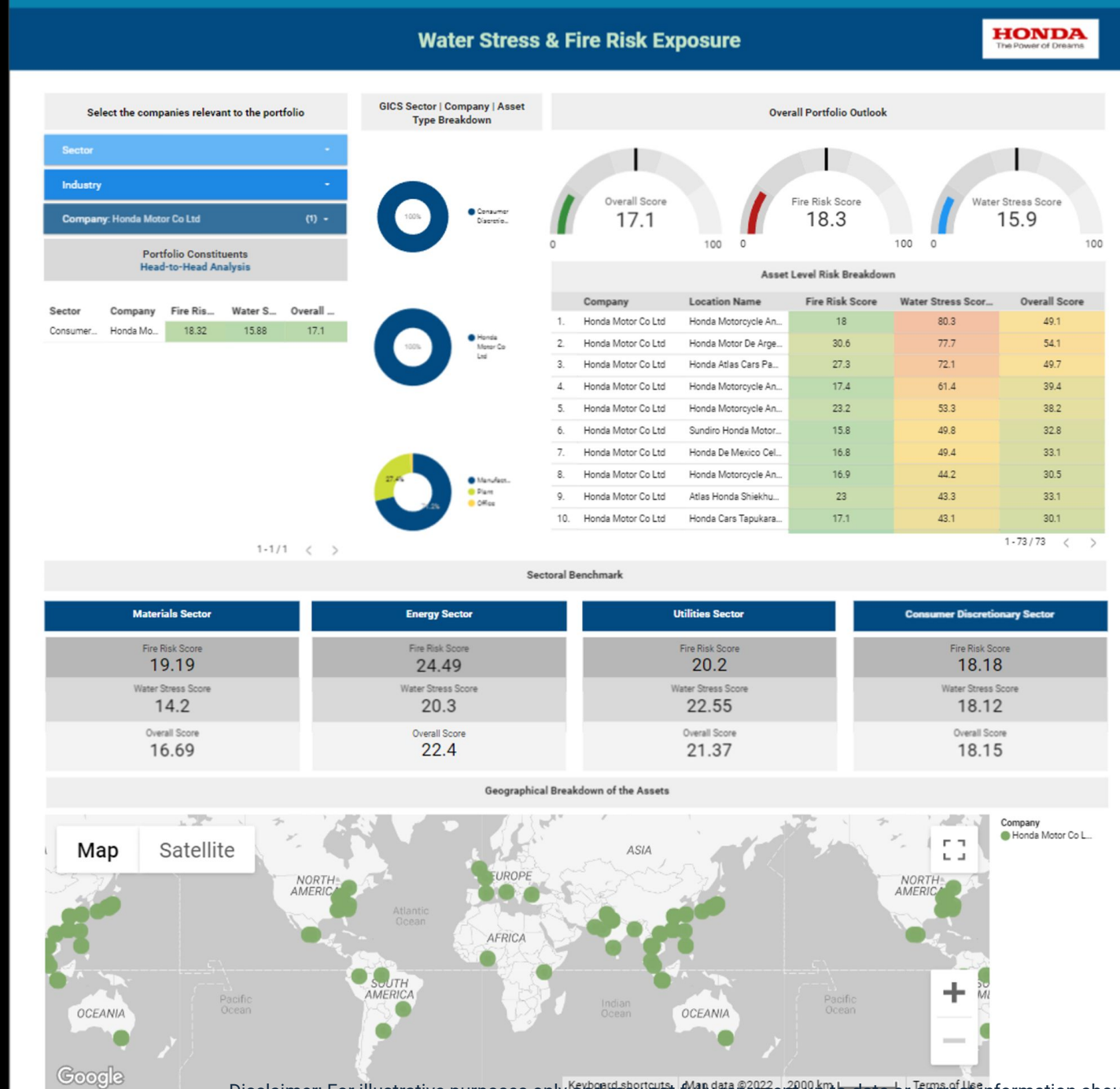
**Metrics:** Water Stress  
& Fire Risk

**Sector:** Consumer  
Discretionary

**Industry:** Automotive

**Company:**

- Honda



# Asset-Level: Intra-Company Benchmarking and Risk Analysis

**Metrics:** Water Stress  
& Fire Risk

**Sector:** Consumer  
Discretionary

**Industry:** Automotive

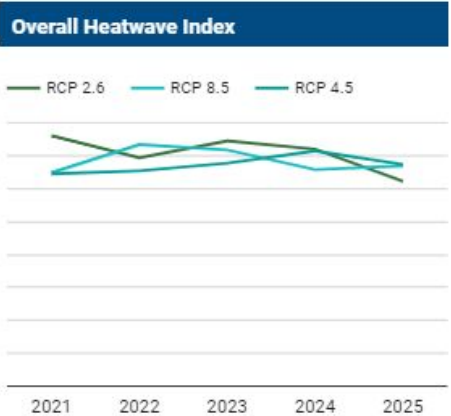
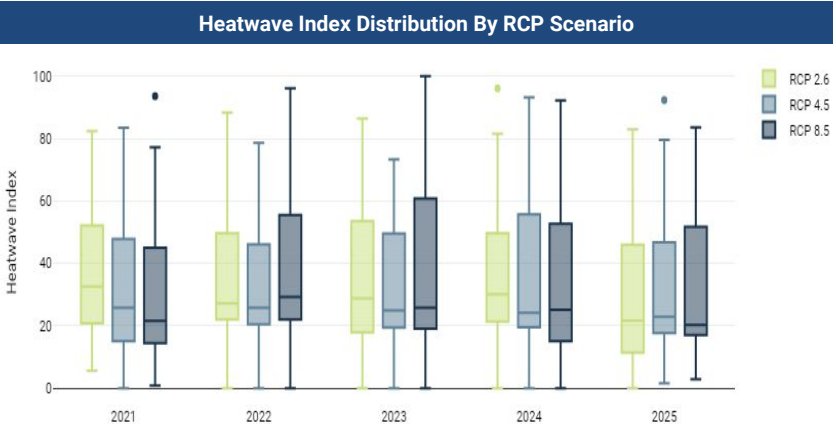
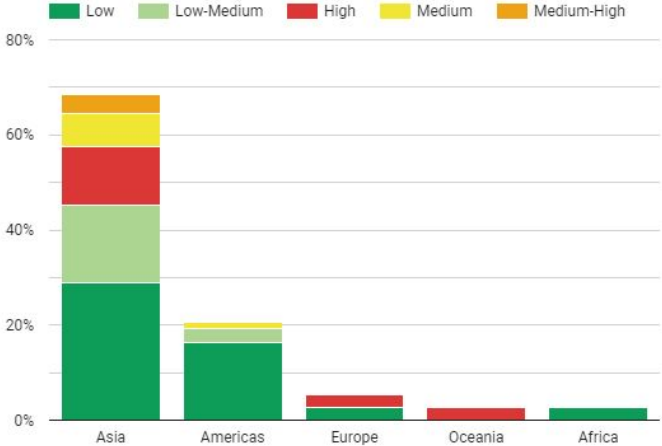
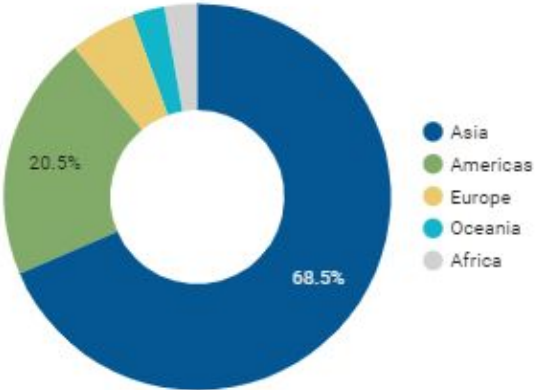
**Company:**

- Toyota





Company	Sector	Industry
Honda Motor Co Ltd	Consumer Discretionary	Automobiles



## Issues with Current Water Stress Metrics:

- Lack of data availability on the geographic location/distribution of companies.
- Quantitative water data is very scarce, poorly reported and not externally verified on all levels
- Most datasets do not consider water risks at the basin level but only at the country level
- Publicly available datasets are not updated on a frequent basis leading to asset managers using historical datasets for capital allocation and engagement.
- The majority of the corporates are not currently reporting water stress data as part of their voluntary disclosures

## ESGSignals® Solution:

- Global water stress screener combining the geolocation of the asset with the most updated basin and sub-basin level water stress indicators along with the forecast for up to 9 months for engagement and portfolio optimization.
- Historical view water stress indicators since the beginning of the engagement and monitor improvements in relation to basin-level water stress

## Investing Themes Considered:

Reducing water stress, water neutral  
portfolio  
Engagement as part of active  
ownership

## Companies::

**Sasol**

Integrated energy and chemical  
company based in Sandton, South  
Africa

## Deliverables:



Raw data



Report



Web App

# Product Segmentation Use Case: Private Equity Due Diligence

## Current Operations and Issues:

- The PE firm develops its strategic approach to ESG related matters both internally and in partnership with its portfolio companies to adapt to the evolving ESG landscape
- Screening of ESG related risks related to environmental impact:
  - methane leaks and flaring
  - high carbon intensity relative to peers and industry average
  - higher land usage intensity and proximity to biodiversity hotspots
  - operations in high water stress basins
- Environmental due diligence and ongoing monitoring of environmental and climate physical risks metrics at portfolio companies
- Current process for measuring environmental impacts is based on industry estimates, company level reporting and is only available on an annual basis.

## ESGSignals Solution:

- Continuous monitoring and measurement of methane emissions reported in tonnes/hr or Co2e from the oil & gas assets owned by the portfolio companies.
- Baselineing of methane emissions starting 2018 and benchmarking against a peer group selected by the PE firm.
- Updated monthly water stress score and forecast combined with industry and asset-level water intensity metrics.

## Themes Considered:

Tracking, quantifying, and monitoring of methane (CH<sub>4</sub>) emissions, land usage, water stress, and physical risks.

## Companies:

Largest PE firm using alternative datasets for environmental due diligence on oil & gas assets in the Bakken region.

## Deliverables:



Raw data



Report



Web App



# Product Segmentation Use Case: Accounting Firms

## Current Operations and Issues:

- Current operations consist of coking coal, copper, and zinc mining operations which result in fugitive emissions
- Fugitive emissions are losses, leaks and other releases of gases such as methane and carbon dioxide (CO<sub>2</sub>) to the atmosphere that are associated with industries producing energy and materials.
- Fugitive mine emissions are a significant component of greenhouse gas emissions accounting for approximately 8% of total global anthropogenic methane emissions.
- Methane is a highly explosive gas and a serious safety concern in mining, since methane is explosive at a concentration between 5 -15%.

## ESGSignals Solution:

- Multiple satellite data sources are used to track the spectral fingerprint of various types of GHG emissions and air pollutants.
- Weather data is integrated to adjust for wind direction and cloud cover. Emission dispersion Models are selected to address the differences in types of emissions.
- Integrated Mass Enhancement (IME) model is selected for tracking the concentration of methane emissions and also for quantification of methane emissions into tonnes/hour

**Themes Considered:**  
Tracking, quantifying, and monitoring of methane (CH<sub>4</sub>) emissions.

**Companies:**  
Who own one of the largest copper, zinc and coking coal mining operations in North America

## Deliverables:



Raw data



Report



Web App



**Maneesh Sagar**  
CEO

- 10+ Exits to Fortune 500
- Entrepreneur / CEO with 25+ years of software and VC experience
- Columbia Innovation Fellow
- MBA Columbia



**Rashmi Bomiriya**  
COO & CDS / MD-Asia

- 14+ years of multifaceted industry experience (Financial Services, Geospatial Analytics, ESG & Sustainability, Statistical Consulting)
- Experienced in product & team development, management and expansion)
- PhD in Statistics from Penn State



**Nilosha Pereira**  
Global Head of  
Operations / CEO-Asia

- 12+ years of industry experience managing distributed teams globally
- Experienced in product, software, project and team management
- MBA from London Met University



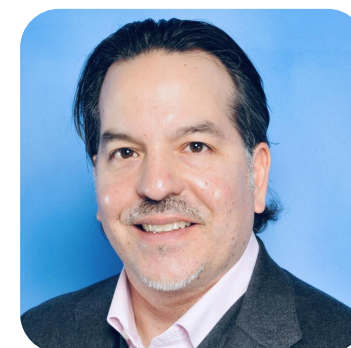
**Shayani Weeresinghe**  
Partnerships

- 10+ years ESG and Sustainability experience - most recently as Delivery Manager Moody's ESG Analytics, Public Affairs, Comms & Sustainability at Coca-Cola
- Bachelors (Honors) of Environmental Science, University of Nottingham.



**Malcolm Harris**  
Business Development

- 15+ years of ESG, advanced carbon pricing mechanisms and climate strategy and climate policy in the energy sector
- US Army Veteran
- MBA Columbia



**James Gavilan**  
Sales

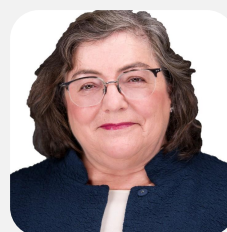
- 20+ years experience as a Wall Street veteran and global commodities
- Senior roles at JPMorgan Chase, ICBC Standard Bank, BNP Paribas and Deutsche Bank
- MBA from Baruch College



**Robert Herz**  
Ex Chairman FASB  
BOD Morgan Stanley  
BOD Fannie Mae,  
BOD Workiva  
BOD ISSB



**Olivia Albrecht**  
Head of ESG at TCW  
Prior to that spent  
over 10 years as Head  
of ESG at PIMCO



**Libby Bernick**  
CEO, Impact Cubed.  
Ex Global Head of  
ESG at Morningstar &  
S&P Global



**Richard Anfang**  
Ex- CTO, JP Morgan Asset  
Management  
Ex CTO Morgan Stanley



**Peter Neumann**  
Ex-Head of Metals  
Sales at JP Morgan,  
Salomon Phibro



BARRON'S

CRAIN'S  
CHICAGO BUSINESS.



WSJ

Seeking Alpha<sup>α</sup>

BUSINESS  
INSIDER



Bloomberg  
BusinessWeek

The Washington Post



The New York Times

SmartMoney

Institutional  
Investor

CNNMoney

Les Echos

The  
Economist

CTA Intelligence

TE TechCrunch



MetalBulletin

FT  
FINANCIAL  
TIMES



# Contact

## New York

**Maneesh Sagar**  
CEO

**+1-917-415-8400**

**[msagar@rsmetrics.com](mailto:msagar@rsmetrics.com)**

## Asia-Pac

**Nilesh Maurya**  
Corp Dev

**+91-9819117208**

**[nilesh@rsmetrics.com](mailto:nilesh@rsmetrics.com)**