Why ESGSignals®?

Corporates focused on improving their ESG rating scores in 2021, should begin by **analyzing whether company signals are actually alpha** or there is something that internal assessment methods are missing.

ESGSignals® is a business intelligence tool for corporates that provides companies access to the same underlying asset-level data and analysis upon which index providers and ratings agencies are building their ESG models, improving corporates' chances to **identify risks and opportunities for performance improvement and competitive advantage**.

ESGSignals® Asset-Level Data

8	**20**	**5**
ENVIRONMENTAL THEMES	STANDARDIZED ENVIRONMENTAL IMPACT METRICS	RISK EXPOSURE SCORES

ESGSignals® Product Highlights

+ Independent and frequent assessments using satellite data on company operations and consistent metrics to compare a company's ESG performance across time and industry peers

+ Monitoring and reporting change in deviation from expected emission rates at company owned/operated facilities. Use baseline emissions provided by the company to detect changes and benchmarking against peers with similar asset type.

+ Monthly water stress risk update by basin and 6 -9 month forecast based on weather, ground and surface water levels.

+ Monthly/quarterly biodiversity risk metrics based on vegetation index, changes to land cover type and proximity to end

+ Access to material environmental & physical risk metrics in the company's supply chain (Scope 2 emissions) reducing exposure and reputational risk issues

Metrics Coverage

Metrics Monitored

Environmental Impact	GHG Emissions (SO_2, NO_2, CO, HCHO, CH_4 & Aerosol Index)	Biodiversity (Land Usage, Land cover type & Vegetation Index)	Water Stress (Water stress proximity, Score & Quality)
Physical Risks	Wildfire Tracking & Risk Score	Hurricane & Flood Risk Score	Sea Level Rise
On-Site Activity	Raw Material Stockpiles	Product inventory	Construction & Employment Trends
Transition Risk	Renewable Energy Development	Stranded Assets	

How does ESGSignals® work?

ESGSignals® sources data from several sources, including aerial and satellite (optical & radar) imagery, weather, aqueduct, land cover, bio-diversity data, methane flaring data sets and processes them through its PaaS solution. This generates comparable environmental metrics across companies and sectors which offers companies **independent, verifiable, and objective** *datasets which can be used to benchmark and improve sustainability performance at an asset level and provide confidence to management and investors around corporate sustainability performance.*

Platform-as-a-Service (PAAS)

DATA EXTRACTION ENGINE

Platform for pattern recognition and data extraction from structured and unstructured sources using intelligent, heuristic algorithms.

• Computer Vision
• Machine Learning

WORKFLOW ENGINE

Workflow system with hybrid (human-AI) feedback loop to provide highly accurate results representing real-world behaviour

APPLICATION ENGINE

Generating meaningful user reports based on data from workflow engine which are ready-to-be-used for decision making

Global Trackers	GHG Emission	Land Usage Change	Water Stress Variability	Climate Physical Risk
Dash-boards	Asset GHG Emissions	Land Usage Vegetation	Basin Water Risk	Climate Physical Risk
Data Feeds	Imagery Data	Structured Data Feeds	Live Data Feeds	Historical Data Feeds

Structured Data

Unstructured Data

Other Data

DATA INTEGRATION & CONSOLIDATION

ESG Index Providers
Custom sustainable investment indices for passive investment strategies and benchmarking

ESG Ratings Providers
Company level environmental impact and exposure metrics for enhanced ESG Ratings

ESG Analytics Providers
Integration of asset level metrics into environmental data products

**ESGSignals®
Asset Level Metrics**

Vendor selection & Imagery Management

Integration, Model Selection & Verification and Scaling

ESG Metrics (Environmental Impact & Physical Risks)

Image Acquisition (Optical & Radar Satellite, Drone & Aerial)

Image Management

Image Processing & Data Extraction

Data Integration (Geo-location, Weather, Emissions, Flaring, Aqueduct, Ground water levels, Biodiversity hotspots)

Quantitative Modeling (Emissions dispersion modeling, Land usage change & classification, Water stress risk assessment)

Accuracy at Scale (AI+ML+QC)

Custom Reports by Company (Environmental impact indicators & Physical risk exposure metrics)

Competitor Benchmarking (Global & regional asset-level data comparison)

Supply Chain Analysis (Scope 2 emissions & supplier physical risk metrics exposure)

ESGSignals® for Corporates

- **Enhanced CSAs**: CSA (Corporate Sustainability Assessments) through asset-level reporting on environmental & physical risk metrics across all your assets for TCFD, CDP and PRI.

- **Benchmarking**: Asset-level environmental and operational metrics against competition.

- **Headline Risk Management**: Real-time geospatial intelligence helping to stay informed of facilities' performance and potential headline risk threats.

- **ESG Monitoring**: Automated asset-level monitoring and reporting for company assets reducing the need for dedicated internal resources.

Mapped assets are monitored on a weekly, monthly, annual basis to track changes. These can be rolled up to a company level to track operational and geographic segment risk.

Global tracking provides proactive asset-level, company, and industry ESG alerts for material changes in emissions, water stress and land usage change.

Asset-Level Emissions and Methane Tracker

Republic Services' landfill in **Stockton** shows elevated levels of methane emissions benchmarked against its other locations and its competitor, **Waste Management.** This represents a reputational risk and cost (given California's carbon pricing) but also an opportunity for abatement and potential RNG sales.


Methane Emissions Rates (kg/hr) -- Landfill Locations
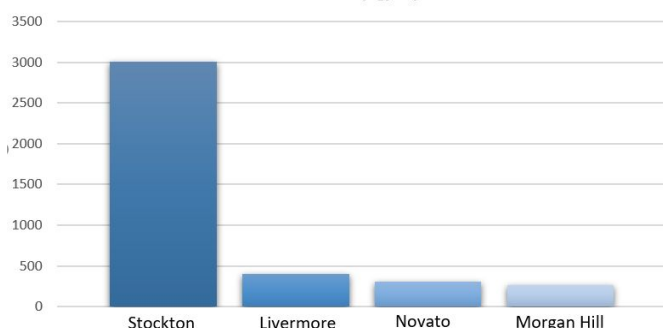
Asset-Level Land Usage Metrics and Impact on Biodiversity

Alcoa Group aluminum operations average land usage is 768 sq meters lower than peers and industry average (1310 sq meters) despite being one of the largest producers of aluminum which results in reduced environmental impact.

Rio Tinto operating assets are closer to biodiversity hotspots significantly increasing impact on environment and exposure to reputation & operational risks.
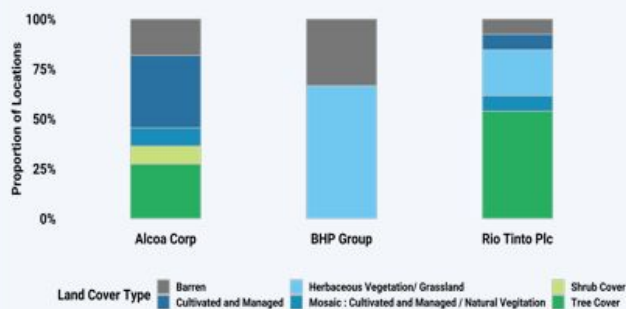
Source: RS Metrics Metals & Mining ESG Case Study - Land Usage Metrics

Portland Aluminum Smelter - Alcoa

Asset-Level Water Stress Metrics & Scores

Rio Tinto group operates in significantly higher water stressed areas compared to its peers with some of its assets scoring over 85 (water stress scale 0-100), increasing its exposure to production disruptions. Majority of the assets exposed to higher water stress risk are in Australia, meaning drought conditions in Australia could pose a material threat.
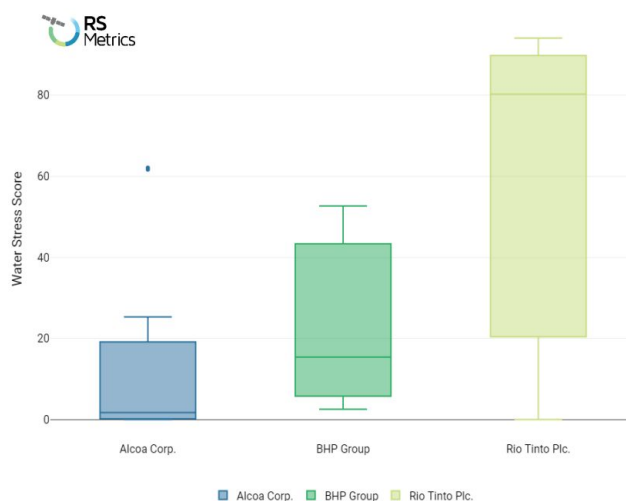
Asset-Level Environmental Impact
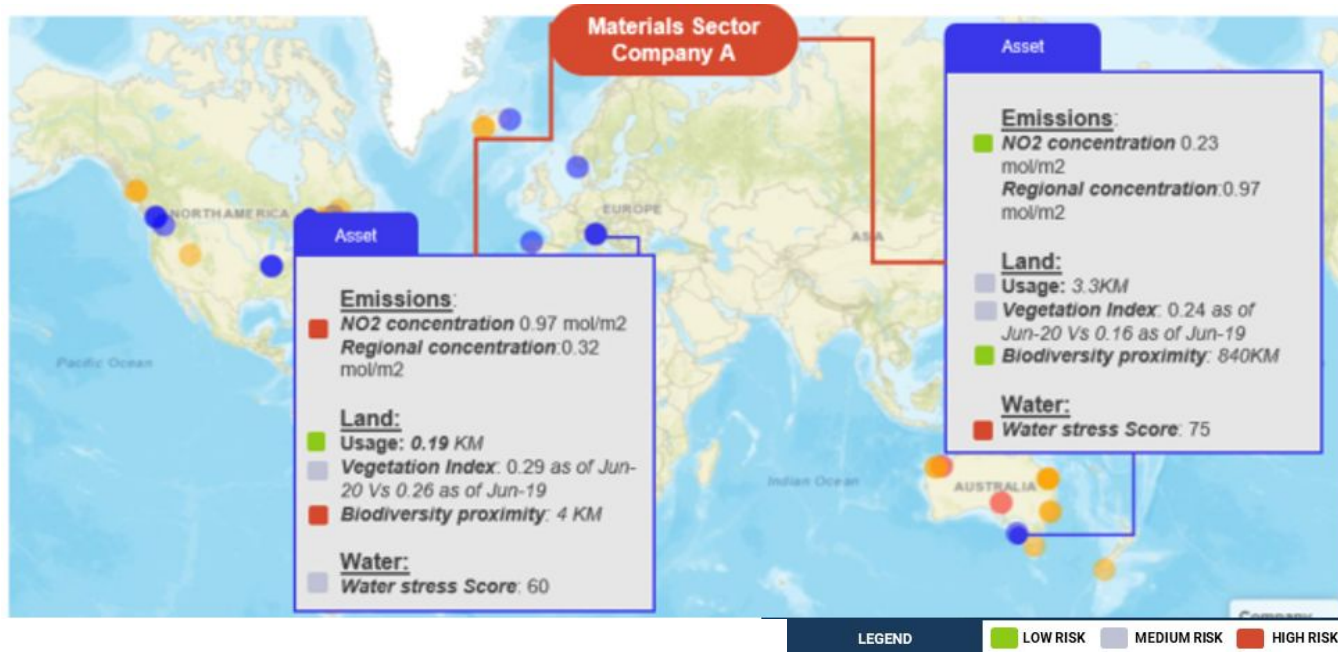
+ **ESGSignals**® shows diverging risk profiles for similar assets owned by the same company operating in the materials sector.
+ **ESGSignals**® shows asset in Australia has a higher water stress risk profile which could result in production disruptions while the asset in Europe has higher emissions risk profile increasing its exposure to carbon pricing.

RS Metrics

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ASSET-LEVEL ESG

Indexes - Metrics – Insights

Satellite Analytics - AI - Machine Learning

Objective – Realtime - Verified