



# KPMG ESG IQ High Level Methodology

KPMG Products

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# 1. Introduction

## 1.1 Purpose of the Document

The document is a high level logic guide for clients explaining the concepts of “ESG IQ” in terms of the methodology overview, data processes, ESG framework and scoring methodology.

## 1.2 Executive Summary

With demand for greater accountability and regulatory scrutiny in the ESG space, companies are progressively setting sustainability goals and disclosing ESG performance metrics. However, there is growing scepticism and confusion as to their validity and application of these metrics.

ESG IQ (patent pending) is a big data analytics platform developed by KPMG data scientists and engineers. It uses a suite of advanced analytical tools to assess ESG standings across multiple frameworks (the UN SDGs, SASB, GRI and WEF IBC metrics) to enable businesses to make faster, more effective ESG decisions.

### The challenge

Assessing your portfolios, suppliers and your own performance compared to peers on ESG brings a number of challenges:

- Methodological inconsistency between the leading ESG ratings providers resulting in diverse scores for the same company
- Age of data based on annual ESG reports and questionnaires
- Difficulty in sourcing data for complex global supply chains in which smaller companies are not required by law to report on ESG factors
- Understanding the route cause of ESG risks from high level scores and how a company’s policies and actions can affect these
- Avoiding greenwashing claims from others and avoiding accusations of greenwashing.

### The solution

ESG IQ is a proprietary artificial intelligence and machine learning backed solution that helps insurers, investors, creditors and Government & public institutions gain a consistent clear methodology for evaluating ESG, carbon or credit risk. It works by providing a standardised data-driven approach, with granular detail into the underlying drivers for each score driving greater transparency and by allowing clients to choose between the self-reported and the outsider view of an organisation’s progress.

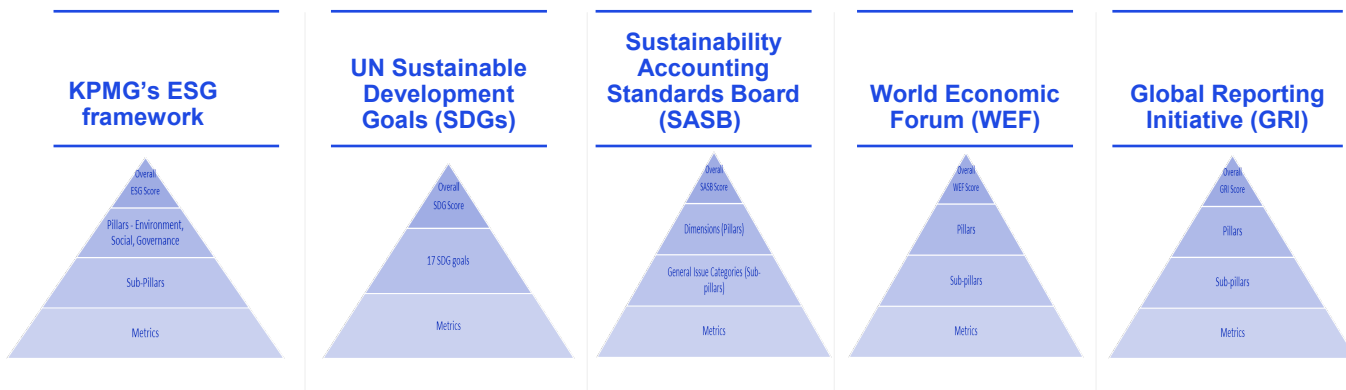




# 2. ESG Framework

KPMG’s proprietary Artificial Intelligence / Machine Learning enabled technology, computes scores for corporates and sovereigns on how they perform on Environmental, Social and Governance aspects and provides explanations of the scores by different pillars, sub-pillars and metrics.

## Reporting frameworks in ESG IQ:



ESG IQ provides an open and flexible methodology which can accommodate and provide insights and scores for the ESG reporting frameworks selected by the end user or frameworks developed by the end user.

Underlying metrics have been identified and defined, which can characterize the performance of an entity at a granular level. The metrics are then mapped to the pillars/sub-pillars defined in each ESG reporting framework so that the scores at a metric level can be easily converted into scores/insights at pillar/sub-pillar level.

The ESG score for an entity is computed relative to its peer in the same sector or to the entire universe of the entities, based on the configuration from the end user.

### 2.1 Framework Linking

Evaluation of ESG performance under multiple frameworks is done by linking different frameworks according to overlapped areas/issues and by mapping the specific metrics to the linked framework.

A common methodology can then be applied to generate scores for any selected framework and any metric dataset.



# 2. ESG Framework (cont.)

## 2.2 Metric Mapping

In order to generate the scores for all types of frameworks, each metric/topic needs to be mapped into pillar level and sub-pillar level for each framework.

A metric mapping table solution is required so that one mapping table, linking with different frameworks, allows end users to choose a framework freely.

Metrics	KPMG		SDG	SASB		WEF		GRI	
	KPMG pillars	KPMG sub-pillars	SDG goals	SASB pillars	SASB sub-pillars	WEF pillars	WEF sub-pillars	GRI pillars	GRI sub-pillars
Metric1	...	...	...	...	...	...	...	...	...
Metric2	...	...	...	...	...	...	...	...	...



Microsoft Excel Worksheet

News topic mapping



Framework linking

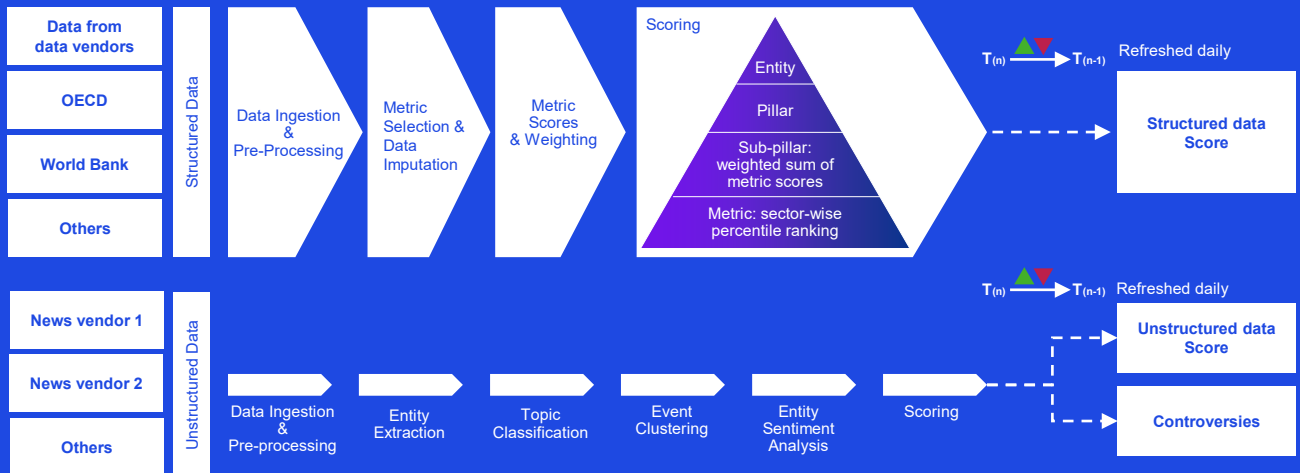


# 3. Overall Workflow

The diagram below shows the high-level workflow for the ESG IQ solution.

For structured data, the company data level data is ingested from different vendors such as Refinitiv and for country level data, we ingest data from the World Bank, UN and OECD to compute the structured ESG score following the high-level flow below.

For unstructured data, news data from different vendors such as Brandwatch are ingested to run through the unstructured scoring pipeline to get the unstructured score.



# 4. Data Sources

KPMG LLP has agreements with a number of third party ESG data providers. These are both structured and unstructured data providers. These third parties each have different methodologies for how they collect ESG data and the coverage of their data set.

These can be found in the table below.

ESG IQ performs data analytics to derive insights for clients, rather than displaying the raw data in the platform itself. If the raw data itself is required, a direct agreement is needed between KPMG's client and the third-party supplier.

KPMG takes a scheduled daily feed from all of the below data sources.

Third Party Data Source	Data type	Coverage	Methodology	Third party data update frequency
Refinitiv ESG data	Structured	Over 10,000 entities, predominantly corporates	<a href="#">ESG Scores   Refinitiv</a> Data collection from publicly available data and outreach questionnaires.	Weekly, twice-yearly major updates in line with company reporting
Brandwatch	Unstructured	1.4 trillion historical conversations back to 2010, conversations from 100 million unique sites and billions of sources	<a href="#">Brandwatch   Digital Consumer Intelligence</a>	Daily

ESG IQ also uses public data sources such as UN Sustainable Development Goals (SDG) indicators database, Organization for Economic Co-operation and Development (OECD) statistics and the World Bank ESG data bank.





# 5. Scoring Methodology

## 5.1 Score based on Structured Data

The structured data scores are automatically generated every day.

### 5.1.1 Data Pre-processing

Data cleansing and data scaling according to company size have been conducted in order to prepare data across the sources to enable further analysis and comparability.

### 5.1.2 Metric Selection & Data Imputation

A sector-specific metric selection pipeline is implemented to automatically select metrics for scoring calculation by:

- Removing metrics with too many missing values
- Deduplicating highly correlated metrics

In order to avoid any information loss, a combination of penalty based data imputation approach and a time series-based data imputation approach is implemented to impute the missing values for the selected metrics.

### 5.1.3 Metric Scoring & Weighting

A metric is the most granular measure of ESG performance.

In order to fairly reflect the performance on different metrics, numerical metrics and categorical metrics are processed separately in scoring. All scores follow a standard score range which is 0 to 100.

**Numerical metrics:** scoring for numerical metrics follows a ranking approach. For each metric, entities within the same sector/industry group are ranked according to the actual values of the metric, and each entity is scored to reflect its rank position within its sector/industry group.

**Categorical metrics:** scoring for categorical metrics follows an improved percentile principle. These categorical metrics contain 'Yes' or 'No' or Null values after data processing, and a score, reflecting the fraction of number of companies reporting the categorical metrics within the sector, is computed.

A sector-specific weighting approach based on popularity is applied to generate the weight for each metric for further framework scoring.



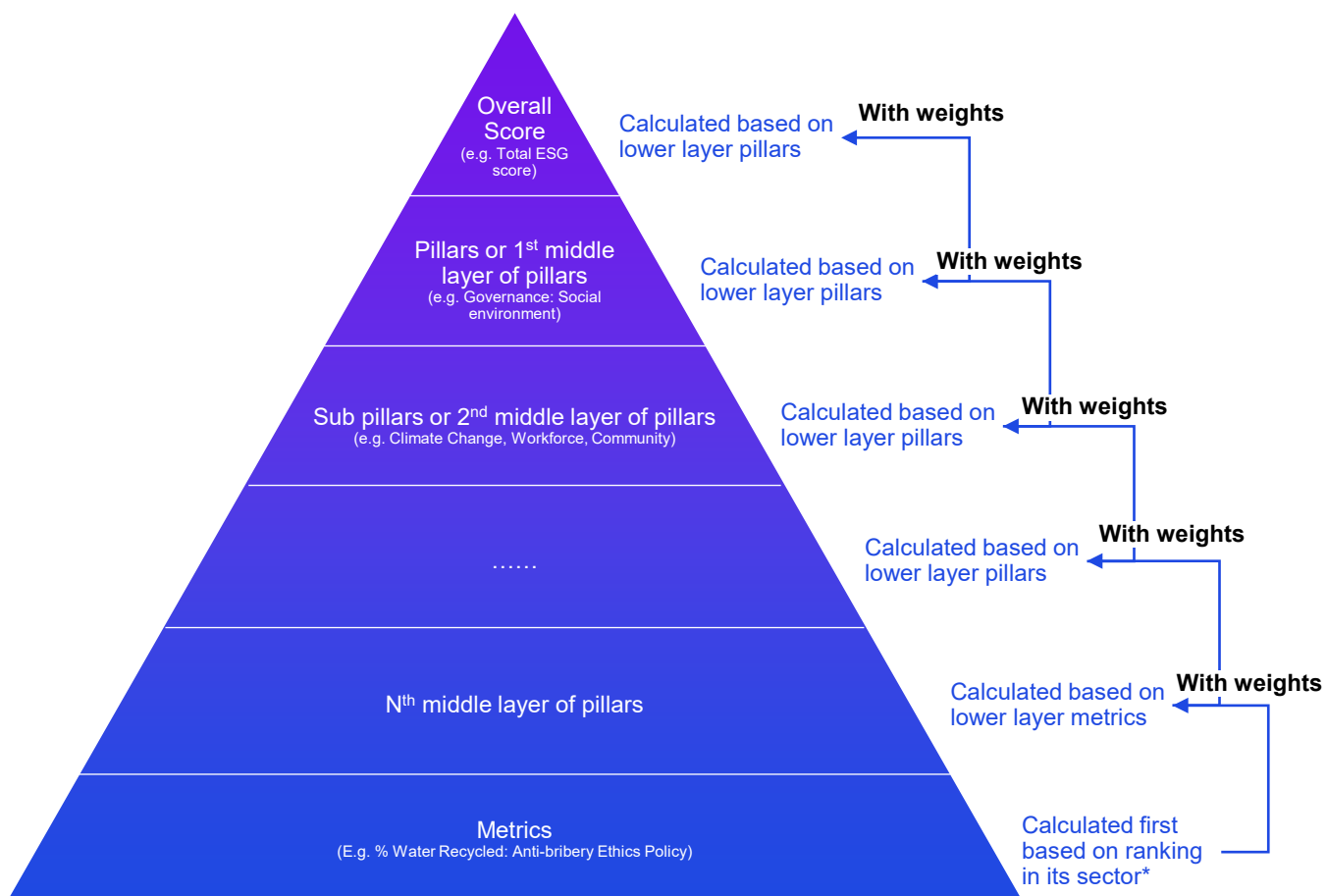
# 5. Scoring Methodology (cont.)

## 5.1.4 Framework Scoring

According to the frameworks introduced in the first section, a generic scoring model structure is generated so that scoring model components can be applied to different frameworks. In other words, given a customized framework, scoring model components can be reused and scores can be generated easily by following this scoring model structure.

The chart below is the generic scoring model structure and shows how pillar scores are calculated for different frameworks. For each entity, the scores will be generated following the order from the bottom of the structure to the top.

The weights of sub-pillars are generated based on number of and aggregated metric popularity. Pillar weights are calculated by rescaling the sum of its sub pillar weights.



\*Sector: indicates the sector / industry group that an entity sits in. For corporates, the group can be either a sector (e.g. Financials) or an industry group (e.g. Financials / Financial Services). Whether to use sector or industry group for scoring is decided based on the data availability and if we have sufficient number of entities in the considered group. For sovereigns, only one group, 'country' is considered.

# 5. Scoring Methodology (cont.)

## 5.2 Score based on Unstructured Data

The unstructured data scores are computed every day for entities that appear in the daily news data having an ESG topic.

### 5.2.1 Data Extraction

In order to extract the most relevant data from news for the required entities, data extraction and pre-processing are conducted to remove duplications and pre-filter the required entities. Entity extraction approach is also implemented to identify which organization the news is talking about.

More specifically, the news vendor databases from Brandwatch are queried with the following steps:

- Specify the time span during which the news should be extracted

- Specify the data sources, e.g., "cbsnews.com", "cnn.com" and language as English
- Filter for ESG mentions using ESG related keywords
- Filter for presence of entities of interest in the news.

On the top of the extracted data, specific data cleansing and deduplications are performed.





# 5. Scoring Methodology (cont.)

## 5.2.2 Topic Classification and Entity Sentiment Analysis

In the news data extracted we identify ESG topics for each mention of target entities. For this we use topic classification models to classify each mention into one or multiple predefined topics.

Multi-label classification is used here because a mention may talk about more than one topic, including “irrelevant” topics if the mention is not ESG related.

For topic classification models, we have used advanced deep learning techniques to train topic classification models on text corpus. Entities in the news text are scored for the type of sentiments they represent based on the news context. For this, a sophisticated entity sentiment model is used.

It is a fine-grained sentiment analysis task, which aims to determine the sentiment polarity (e.g., negative, neutral, or positive) towards the entities within the text.

We have used advanced sentiment modelling technique to train the sentiment model to disambiguate sentiments of different entities in the same sentence, having potentially different sentiment polarity.

## 5.2.3 Entity Scoring

After entity sentiments and topics are determined from the extracted news data, we use these data points to determine scores for the entities.

The entity score is computed by looking at the relative number of positive and negative news items daily for an entity for the considered category (overall ESG, pillar, sub-pillar or topic level), relative to its sector.

The daily computed score takes into consideration the historical score so as to avoid sudden change in the score magnitude due to daily changes in the news.

The algorithm will compute the score for an entity if there is sufficient data for the entity, otherwise it is computed as null.

To monitor the (semi-) real time ESG signals, the unstructured entity score shall be dynamically computed/refreshed per update period.

## Conclusion

ESG IQ’s methodology finds solutions to the many ESG data challenges clients face in integrating diverse data sets. It gives clients more control of both the inputs and outputs to fully understand how ESG scores are generated and what they really mean to your company.





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