Science in Brief #2

Planetary Materiality - corporate and investment impacts on the Earth system

KEY MESSAGES

The Essential Environmental Impact Variables (EEIVs) offer a method for companies to systematically assess their environmental footprint from a planetary perspective. For investors, EEIVs serve as a tool to assess and mitigate environmental risks within their portfolios.

EEIVs provide a science-backed framework that shifts the focus from self-determined environmental priorities to a comprehensive evaluation based on Planetary Materiality. This approach empowers companies and investors to make more informed decisions, aligning their business practices with the urgent need for environmental stewardship in the Anthropocene era.

As a first step, many organizations already have existing data that will give valuable insights once structured according to the Essential Environmental Impact Variables. This will also help companies stay ahead of coming regulation and demands for more transparent reporting.

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The Essential Environmental Impact Variables (EEIVs) introduce a novel method for businesses to organize their data and evaluate their environmental footprint. This science brief is designed to elucidate the concept of EEIVs for corporate leaders and investors, offering a straightforward and actionable framework for weaving this approach into their strategic planning.

By concentrating on the fifteen critical areas identified within EEIVs, companies are better positioned to understand the intricacies of their environmental impact and more precisely gauge sustainability risks. This guidance is intended for leaders and investors committed to embedding sustainability into their business operations and investment decisions, providing them with the tools to make informed choices that not only ensure the success of their ventures but also promote environmental stewardship. Adopting EEIVs paves the way for organizations to navigate towards a sustainable future, optimizing their competitive stance while contributing to the well-being of the planet.

EEIVs are a set of principles based on science, designed to help companies understand and reduce their everyday and overall environmental impact. This guide is aimed at company leaders and investors who want to make their companies or investment portfolios more sustainable.

Instead of basing environmental reporting on financial or double materiality, EEIVs provide fifteen essential reporting variables using a Planetary Materiality Assessment. This means examining a company's impact based on scientific evidence and how it relates to the planetary boundaries and the planet's overall health. This shift to Planetary Materiality is a necessary next step towards assessing companies' total impact on the planet.

The Anthropocene, a term used to describe the current era dominated by human activity, underscores the urgency of this approach. Human actions have significantly altered the Earth's atmosphere, oceans, and biosphere, making it crucial for businesses to assess their impact through a lens that acknowledges these profound changes. In this context, EEIVs serve as a critical tool for aligning business practices with the needs of a planet undergoing rapid and unprecedented transformations.

For companies, especially those in primary production sectors such as agriculture, mining, and forestry, these EEIVs offer a clear link to how their operations impact the environment. But it's also crucial for other businesses to understand their supply chain impacts. Many companies already collect data that could be used to assess their environmental footprint according to these EEIVs.

The challenge is to organize and structure this data to reflect the company's planetary impact and share it openly.

For business leaders, adopting EEIVs means making a commitment not just to profit but also to the planet. It's about understanding and minimizing your company's environmental impact through a science-based approach. This doesn't only reduce risks; it also opens up new opportunities for growth and leadership in sustainability.

Investors can use EEIVs to better understand the risks in their portfolios. By focusing on companies that measure and improve their EEIVs, investors can support a move towards a more sustainable economy while potentially reducing their exposure to environmental risks.

In summary, EEIVs offer a practical and scientific way for companies and investors to understand and improve their environmental impact. By focusing on these fifteen areas, businesses can make more informed decisions that benefit both their long-term bottom line and the health of the planet. This approach requires a shift towards more transparency and a willingness to act on the insights gained from EEIV assessments. For those ready to take on this challenge, EEIVs provide a roadmap to a more sustainable and successful future.

Many organizations already have existing data that will give valuable insights once structured according to the Essential Environmental Impact Variables. This will also help companies stay ahead of coming regulation and demands for more transparent reporting. Making this analysis is a recommended next step.

Fifteen Essential Environmental Impact Variables (EEIVs)

Level 1: Company level

1 Total company climate emissions

Greenhouse gas emissions (GHG Protocol). Scope 1,2 and 3 emissions are key for understanding impact on climate, and contributors to climate change.

Level 2: Location and Use Level

A set of variables for *each location* where the company has operations

2 Operations location/ contextualization

GPS location of each part of operations e.g. extraction or processing facilities. All impacts apart from climate are context and location dependent.

3 Area of use

Area under use at each location. Area is important for understanding the extent of habitat impact for EEIVs 4 and 5.

4 Purpose of use

Purpose of the area of use. Locations can be used for many different purposes like resource extraction, production and processing. Different facilities have different impacts.

5 Start year

The year at which this location was taken into use or acquired. Helps assess the cumulative impact over time. If fully controlled by the company, it also acknowledges the year in which responsibility for impacts began.

Level 3: Inputs

A set of variables for *each resource* used at *each location* where the company has operations

6 Input amount by type of input

Amount of input by type, for instance freshwater, manure, fertilizers, novel entities, feed, and seed. Added inputs change biogeochemical and hydrological flows and add novel entities to a location, connecting to multiple impact pathways.

7 Input use purpose/ method

Use purpose for inputs and method of administration The use purpose of inputs provides context to the weights/volumes of EEIV6. Inputs like freshwater can for instance be used for many different purposes. Method provides key information on efficiency of input uptake and thus likely dispersal of excess/not absorbed inputs.

8 Input sourcing

Either internal or external. For internal provide operations identifier, for external provide company (and operations identifier if available). Sourcing location of inputs provides information on associated impacts from production of inputs. If internal sourcing, this can be linked to all other impact data.

9 Resource extraction/ production method

Method of extraction or production provides context to impacts on habitats, and thus associated ecosystems and biodiversity, at extraction/production site.

10 Resource amount

Amount of resource extracted/produced by type (species/element, and associated breed/variety/strain). Amount of resource extracted or produced provides information on impacts on wild stocks/reservoirs (if extracted) or impact on regeneration capacity (if produced).

11 Amount of end product

Amount of end product by type. End product provides some information on the end usages of product, and thus downstream impacts. Amount of end product is needed in order to calculate intensity metrics of impact per unit of end product.

12 Management practice

Description of management/operations practices that either influence input use or that are necessary during production process (prior to extraction/harvesting). Activities and practices during operations (such as weeding, thinning, water quality management, planned fires, fishing practices) will influence impacts of the operations. Information on management practices also allows for disclosure on where management practices reduce input use.

13 Frequency/extent of disturbance event

Frequency and/or extent by type of disturbance event. Impact is created by disturbance events (such as fishing nets lost at sea, fires, escaped species, oil spills), even if outside of company control. Disclosure provides information on the cumulative and potential spill-over impacts from operations locations.

14 Non-purposefully introduced species/ varieties

Number/extent by type of non-purposefully introduced species, varieties or strains (if planned introduction of non-native species/varieties, should be provided in EEIV10) in operations location. Information on non-purposefully introduced species or varieties/strains highlights impact on biodiversity (including genetic diversity) as well as the spill-over of these impacts to non-company locations.

15 Disease/pest outbreaks

Number or extent of detected cases of disease or pest outbreaks by type of disease or pest. Disclosure provides information on the cumulative and potential spill-over impacts from operations locations. Impacts from disease and pest outbreaks primarily affect biodiversity.

Already overwhelmed by all the different reporting frameworks? EEIVs align with and improve current frameworks.

Other existing frameworks	How do EEIVs align?	How are EEIVs different and improve reporting?
TNFD Taskforce on Nature-related Financial Disclosures	Partial overlap with: C1.0, C1.1, C2.0, C2.1, C3.0, C3.1, C4.0	EEIVs is based on planetary materiality rather than a financial or double materiality. This dramatically improves our overall understanding on impacts and risks to the planet, with knock-on effects on companies. EEIVs are based only on absolute metrics which allows for analysis of aggregate impact. Only 15 EEIVs, no analysis and no "long answer" variables allow for a more streamlined and lowered reporting burden.
ESRS	Complete overlap with: E1-6, E3-4, E5-4 Partial overlap with: E2-4, E4-5	
ISSB	Complete overlap with: S2 §29a	
GRI	Complete overlap with: 305-1, 305-2, 305-3, 13.3.6-7, 13.8.2 Partial overlap with: 13.3.1, 13.11.3, 304-1, 13.23.2, 13.23.3, 13.6.1	

For more details about the alignment with other frameworks, see Table 3 in the main paper and Table S5 in the supplementary material.

A Planetary Materiality Checklist:

[ ] *Are you ready to report according to the EEIVs?*

[ ] *Do you have data for each of the 15 EEIVs for your company?*

[ ] *Can you structure it in the format of the EEIVs, based on asset level location?*

[ ] *Can you share it openly as part of your sustainability reporting?*

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