

Industry Brief #1

PROJECT 3.006 CERTIFICATION AND VERIFICATION TO ENABLE A SUCCESSFUL LOW- CARBON TRANSITION FOR HEAVY INDUSTRY

AUTHOR(S):

Emma Aisbett,
Project Lead, Heavy Industry Low-carbon Transition Cooperative
Research Centre, Australian National University

Hina Aslam,
Co-Project Lead, Heavy Industry Low-carbon Transition Cooperative
Research Centre, Australian National University

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Industry Brief

WHAT ARE EMBEDDED EMISSIONS ACCOUNTING FRAMEWORKS (EEFS)?

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AUTHOR(S):

Emma Aisbett

Project Lead, Heavy Industry Low-carbon Transition Cooperative Research Centre,
Australian National University

Hina Aslam

Co-Project Lead, Heavy Industry Low-carbon Transition Cooperative Research Centre,
Australian National University

ADDRESS BLOCK:

Australian National University

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1. INTRODUCTION

Emissions accounting has been a centrepiece of the United Nations Framework Convention on Climate Change (UNFCCC) from the outset. Traditionally government accounting frameworks have focused on territorial greenhouse gas (GHG) emissions and the construction of National Accounts. In Australia, this includes the National Greenhouse and Energy Reporting System (NGERS). Increasingly, however, it is becoming clear that information about the GHG emissions in a certain location is insufficient to achieve a global transition to net zero.

Today, many important approaches to the net-zero transition require information about “embedded emissions”. These approaches represent a shift from focusing on addressing emissions associated with a certain place or territory, to those associated with a certain product or supply chain. Leading public-sector initiatives reliant on embedded emissions information include trade-related climate policies (such as certification and carbon border adjustments), green industrial policies, and city- or state-level net-zero scope 3 commitments. Relevant private initiatives include consumer and investor activism and corporate net zero scope 3 commitments. Location- or entity-based accounting systems like NGERS are not fit for these purposes.

The emerging multitude of initiatives reliant on embedded emissions information is driving a corresponding proliferation of frameworks, systems and schemes to provide that information. Until recently, private initiatives have dominated. Large corporations with scope 3 emissions reductions pledges have developed their own approaches estimating emissions associated with their supply chains. Meanwhile, some upstream producers and producer organisations have established certification systems that aimed to give consumers and investors’ confidence in the emissions credentials of their products. We refer broadly to these initiatives as Embedded Emissions Accounting Frameworks (EEFs).

We define EEFs as frameworks which allow reporting entities (usually private supply chain participants, especially producers) to report specified information, and use that information to generate standardized calculation of the greenhouse gas emissions associated with a specified portion of a product’s supply chain. While both public, private and other non-government entities can establish an EEF.

To qualify as an EEF according to our definition, initiatives must:

- contribute to the creation of credible information about emissions embedded in one or more products
- help to create and provide information about product embedded emissions that is specific to products produced at a given facility, during a specified time period
- specify acceptable methods to be used in estimating embedded emissions (here “acceptable methods” may be directly specified or embedded in a scheme, or acceptable externally specified methods may be referenced).

An example of a minimalist EEF that meets only the necessary conditions above is the set of methodologies for calculating embedded emissions in hydrogen that is currently being developed by the International Partnership for the Hydrogen Economy (IPHE).

Some EEFs go further than these minimalist criteria and become schemes which certify information about the embedded emissions of products. These schemes will need to have:

- clearly specified accounting boundaries
- information systems with high integrity and traceability.

Such fully-fledged schemes may also:

- provide additional relevant information on the provenance of the product (when, where and with what technology it was produced)
- provide a database where embedded emissions accounting information is stored
- provide an interface or platform to facilitate entry information about product characteristics, including embedded emissions accounting data
- provide an interface or platform to facilitate extraction or use of information about product characteristics including embedded emissions.
- Be linked to, or interoperable with, other public EEFs (for example in different countries).

WHAT ARE EMBEDDED EMISSIONS?

“Embedded emissions” refers to greenhouse gas emissions resulting from processes required to create a product. Embedded emissions are calculated per functional unit of product- for example- per ton of steel. The exact emissions accounting boundary varies across frameworks and schemes. All include emissions directly associated with production (scope 1 and 2 emissions). Major sources of upstream emissions are also often included- for example fugitive emissions from fossil fuel extraction in the case of hydrogen. Emissions associated with transport from producer to consumer are sometimes included.

Embedded emissions are synonymously referred to as “embodied emissions” or “supply chain emissions”. They can also be referred to as “upstream scope 3 emissions”. While sometimes referred to as “lifecycle emissions” or “product footprint”, we consider these descriptions inaccurate since neither emission associated with the use, nor those associated with end-of-life, are included in the definition of embedded emissions.

Source: Aisbett et al. (2023)



hiltcrc.com.au

General enquiries
enquiries@hiltcrc.com.au

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