User Guide – in4mo Claim emission data extract & Emission Estimatics by in4mo

15.4

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Overview

Welcome to the guide for the in4mo claim emission reporting, powered by the insurance industry revolutionizing Emission Estimatics. Emission Estimatics is a new in4mo service, designed for property claims to manage their environmental impact. The Emissions Estimatics tool is the world's first ISO-certified carbon emission calculator for accurately and reliably determining the greenhouse gas emission of material usage in property repair claims.

In this document we will introduce the process of how the material emission calculations are triggered from in4mo and carried out by the Emission Estimatics tool. We will also present the in4mo reporting mechanism presenting the results supplied by Emission Estimatics.

in4mo Case Emission Reporting

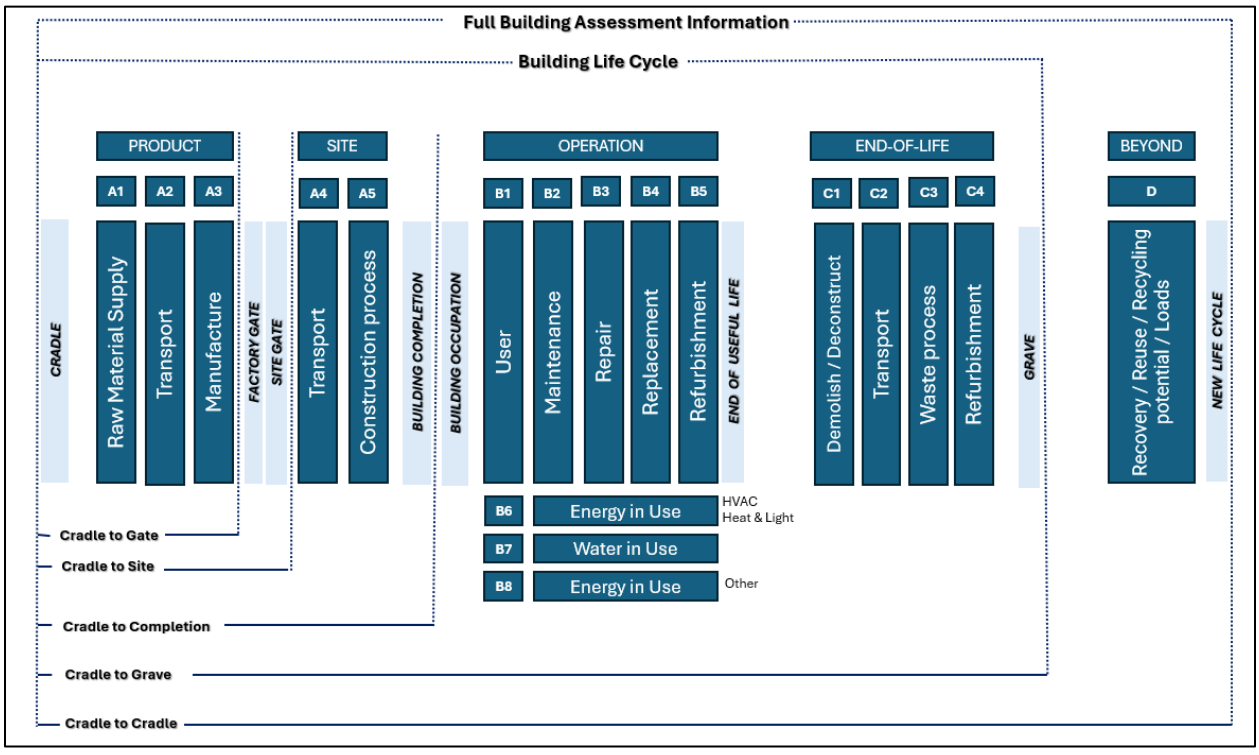
in4mo reports both on the emission of installation of the new material, as well as the removal and waste handling of the old material. Emission reporting is done on work item material level, calculated for the material usage of each work item with a material (supplier/custom/reused). The report incorporates all closed cases with their material emission calculations for a fixed time period.

1. Triggering Emission Estimatics

Emission Estimatics is connected to in4mo via API calls. The API call is triggered when a case is closed in in4mo, and all work items that have materials are sent to the calculator to estimate their carbon emission, respective to their amount as defined in in4mo.

2. Emission Estimatics Calculations & Results

Emission Estimatics returns the material's emission values of each work item, broken down respective to the different life cycle stages as well as providing the sum. See the possible life cycle stages of a material introduced in the below diagram.



There are 5 Life Cycle Stages: *Product*, *Site*, *Operation*, *End-Of-Life* and *Beyond*, and each life cycle stage consists of 1 or several modules.

Product
Emissions caused by production of the end-product. In the case of the in4mo emission calculator this is the used material, but in other contexts it can be a whole building for example. This consists of the following modules:

- A1: Raw material supply
- A2: Transport (to manufacturing site)
- A3: Manufacturing

Site
Emissions caused by using the material in construction or repair work. This consists of the following modules:

- A4: Transport (to construction site)
- A5: Construction installation process

Operation
Emissions caused during the service life of the product. This consists of the following modules:

- B1: Use
- B2: Maintenance
- B3: Repair
- B4: Replacement
- B5: Refurbishment
- B6: Operational energy use
- B7: Operational water use

End Of Life
Emissions caused by material disposal during demolition and deconstruction. This consists of the following modules:

- C1 Deconstruction / Demolition
- C2 Transport (from usage site)
- C3 Waste processing
- C4 Disposal

Beyond
Emissions caused by the potential waste management of the product. This consists of the following modules:

- D: Recovery / Reuse / Recycling potential / Loads

Calculation Logic

Emission Estimatics utilizes emission factors per life cycle stage for each material. This so called EPD (Environmental Product Declaration) data is multiplied by the amount of material used in a work item in in4mo, according to the API request, in order to accurately calculate carbon emission for the material usage in4mo cases.

Currently emission factors are reported under the new 2019 EU standard (EN 15804:2012+A2:2019). We also provide so called IOBC* corrected emission values to meet the Norway specific regulations around emission reporting, which excludes the uptake of biogenic carbon.

To provide better coverage Emission Estimatics also derives a secondary set of EPD data from generic EU compliant emission data, by removing the biogenic components.

Furthermore, Emission Estimatics treats reused materials as zero emission, providing zero as the emission value for each life cycle stage of reused materials.

Emission Estimatics also calculates emission factors based on historical data from the past 2 years, of materials used per work item (referred to activity in the Emission Estimatics documentation), or material group. These values are used when exact EPD data cannot be found in our database.

Previously emission factors were also reported using the old 2013 EU standard (EN 15804:2012+A1:2013). Emission Estimatics uses this to further calculate activity and material group level emission factors drawing from the 2013 data, which could be used in the absence of any other emission values, exact or calculated.

Emission Estimatics results are returned along with the quality of the calculation, depending on the accuracy of the best available emission factors that the calculator was able to apply for the material in question. See below the calculation qualities from best to worst:

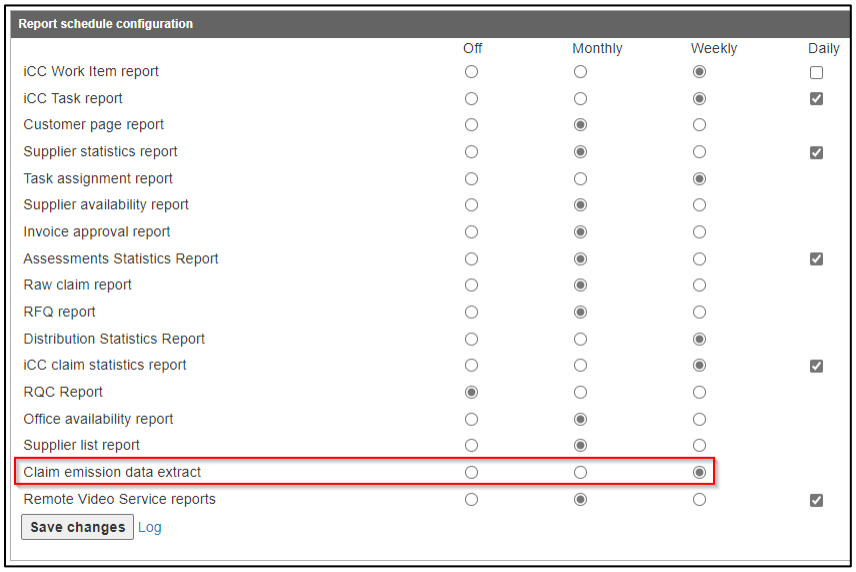
1. ***EXACT***: Specific EPD data (IOBC corrected)
2. ***DERIVED***: IOBC corrected emissions derived from general data using EN 15804:2012+A2:2019 standard
3. ***ACTIVITY***: Calculated arithmetic activity average (IOBC corrected)
4. ***GROUP***: Calculated arithmetic material group average (IOBC corrected)
5. ***DERIVED_ACTIVITY***: IOBC corrected emissions derived from the calculated activity average
6. ***DERIVED_GROUP***: IOBC corrected emissions derived from the calculated group average
7. ***ACTIVITY***: Activity average of emission data using the EN 15804:2012+A1:2013 standard (IOBC corrected)
8. ***GROUP***: Group average of emission data using the EN 15804:2012+A1:2013 standard (IOBC corrected)
9. ***NOT_AVAILABLE***: Calculation was inconclusive (*Status = NOT_CALCULATED*), as no emission data was available

*IOBC= International Organization for Biological Control

3. Case Emission Data Extract

The *Case emission data extract* is the newest CSV report in in4mo's reporting structure, which can be configured to be generated weekly or monthly, generating the emission data of all cases closed in the past week/month respectively.

If the insurance company has SFTP transfer in use for reports, that will work also for this report.



Case Emission Data Extract Description

The purpose of the *Case emission data extract* is to provide data on the material emission of closed cases on work item level. It details material emission as a lump sum as well as per life-cycle-stage of the material, in CO_2e (CO_2 equivalent) per unit measure.

Note that not all materials have available unit emission factors for each life cycle stage. Hence, considering the quality and the coverage of emission values, some report fields might be empty for a specific material. For materials without any available emission data, the calculation result will conclude as 'NOT_CALCULATED' with empty cells in the report in all result fields.

Every approved activity with a material in closed cases will be listed as a new row with the following columns in the CSV extract:

Field Name:	Description:	Data type:	Length

			in characters
Date of Extraction	The date the report was generated	Datetime	19
Case ID	The unique ID of the case, created by in4mo	Integer	10
Case number	The identifier defined by insurance company	Varchar	256
Case closing date	The date (timestamp) the case was closed in in4mo	Datetime	19
Carbon emission estimation received	The date (timestamp) when the emission calculation was received by in4mo for the work item	Datetime	19
Work item type ID	Shows the ID of the specific work item. There can be several items in a workplan with the same WI ID	Varchar	40
Planitem ID	The unique ID of the work item. There can only be one WI with this ID	Integer	10
Work item name	The name of the work item	Varchar	1000
Emission type	Type of emission calculation. Always Material	Varchar	256
Amount	The material amount subject for emission calculation. Might be mismatched from in4mo work plan, in case of work items with material, which have identical units, hence in in4mo the work item amount was automatically copied to the material as well, without the waste percentage. Waste percentage is added before requesting emission calculation for the item, which amount is displayed in the 'Case emission data extract' (amount + waste)	Decimal	21
Unit	The material unit, e.g. m, m^2, EUR, Hours	Varchar	32
Material ID	The ID of a specific material (NOBB in Norway)	Varchar	20
Material name	The name of the material	Varchar	256
Material provider	The material supplier list that the material was selected from in in4mo	Varchar	256
Status	If the calculation was completed or not: CALCULATED / NOT_CALCULATED	Varchar	256
Quality	The Quality of the calculation based on the type of emission data used in the process: EXACT / DERIVED / ACTIVITY / GROUP… etc.	Varchar	256
Reuse type	If the material is reused, or new: NEW / REUSED … etc.	Varchar	256
IOBC corrected	'Y' if the calculation request was with IOBC corrected (Norway specific) emission data. Always 'Y' in Norway. IOBC corrected emission data excludes the biogenic component in each life cycle stage and module.	Character	1
Carbon emission standard	The emission standard applied for the emission data in the calculation: EN 15804:2012+A2:2019/EN 15804:2012+A1:2013	Varchar	21
Emission data source	The data source ID of the emission information. *1.) EPD registration number for EXACT results* *2.) in4mo for REUSED materials* *3.) ID of the calculation record in EES for the various GROUP / ACTIVITY results*	Varchar	256

Result total	The sum of all available life cycle stage emission values of the material: *Product* total + *Site* total + *Operation* total + *End-of-life* total + *Beyond* total	Big Decimal	256
Result biogenic	The sum of all available biogenic components of the life cycle stage emission values of the material: *Product* biogenic + *Site* biogenic + *Operation* biogenic + *End-of-life* biogenic + *Beyond* biogenic	Big Decimal	256
Result fossil	The sum of all available fossil components of the life cycle stage emission values of the material: *Product* fossil + *Site* fossil + *Operational* fossil + *End-of-life* fossil + *Beyond* fossil	Big Decimal	256
Result luluc*	The sum of all available luluc components of life cycle stage emission values of the material: *Product* luluc + *Site* luluc + *Operational* luluc + *End-of-life* luluc + *Beyond* luluc	Big Decimal	256
Product total	The sum of all available *Product* life cycle stage module emission values of the material (A1 total -A3 total)	Big Decimal	256
Product biogenic	The sum of all available biogenic components of the *Product* life cycle stage module emission values of the material (A1 biogenic + A2 biogenic + A3 biogenic)	Big Decimal	256
Product fossil	The sum of all available fossil components of the *Product* life cycle stage module emission values of the material (A1 fossil + A2 fossil + A3 fossil)	Big Decimal	256
Product luluc	The sum of all available biogenic components of the *Product* life cycle stage module emission values of the material (A1 luluc + A2 luluc + A3 luluc)	Big Decimal	256
Site total	The sum of all available *Site* life cycle stage module emission values of the material (A4 total +A5 total)	Big Decimal	256
Site biogenic	The sum of all available biogenic components of the *Site* life cycle stage module emission values of the material (A4 biogenic + A5 biogenic)	Big Decimal	256
Site fossil	The sum of all available fossil components of the *Site* life cycle stage module emission values of the material (A4 fossil + A5 fossil)	Big Decimal	256
Site luluc	The sum of all available luluc components of the *Site* life cycle stage module emission values of the material (A4 luluc + A5 luluc)	Big Decimal	256
Operation total	The sum of all available *Operation* life cycle stage module emission values of the material (B1 to B5)	Big Decimal	256
Operation biogenic	The sum of all available biogenic components of the *Operation* life cycle stage module emission values of the material (B1 biogenic to B5 biogenic)	Big Decimal	256
Operation fossil	The sum of all available fossil components of the *Operation* life cycle stage module emission values of the material (B1 fossil to B5 fossil)	Big Decimal	256
Operation luluc	The sum of all available luluc components of the *Operation* life cycle stage module emission values of the material (B1 luluc to B5 luluc)	Big Decimal	256

End-of-life total	The sum of all available *End-of-life* stage module emission values of the material (C1 to C4)	Big Decimal	256

*LULUC(F) = Land Use, Land Use Change (and Forestry), which affect the levels of greenhouse gases in the atmosphere.

End-of-life biogenic	The sum of all available biogenic components of the *End-of-life* stage module emission values of the material (C1 biogenic to C4 biogenic)	Big Decimal	256
End-of-life fossil	The sum of all available fossil components of the *End-of-life* stage module emission values of the material (C1 fossil to C4 fossil)	Big Decimal	256
End-of-life luluc	The sum of all available luluc components of the *End-of-life* stage module emission values of the material (C1 luluc to C4 luluc)	Big Decimal	256
Beyond total	The sum of the *Beyond* life cycle -stage module emission value of the material (equivalent to D module)	Big Decimal	256
Beyond biogenic	The sum of the biogenic components of the *Beyond* life cycle stage module emission value of the material (equivalent to D module biogenic)	Big Decimal	256
Beyond fossil	The sum of the fossil components of the *Beyond* life cycle stage module emission value of the material (equivalent to D module fossil)	Big Decimal	256
Beyond luluc	The sum of the luluc components of the *Beyond* life cycle stage module emission value of the material (equivalent to D module luluc)	Big Decimal	256
A1 total	A1 module emission of the material	Big Decimal	256
A1 biogenic	Biogenic component of the A1 module emission of the material	Big Decimal	256
A1 fossil	Fossil component of the A1 module emission of the material	Big Decimal	256
A1 luluc	Luluc component of the A1 module emission of the material	Big Decimal	256
A2 total	A2 module emission of the material	Big Decimal	256
A2 biogenic	Biogenic component of the A2 module emission of the material	Big Decimal	256
A2 fossil	Fossil component of the A2 module emission of the material	Big Decimal	256
A2 luluc	Luluc component of the A2 module emission of the material	Big Decimal	256
A3 total	A3 module emission of the material	Big Decimal	256
A3 biogenic	Biogenic component of the A3 module emission of the material	Big Decimal	256
A3 fossil	Fossil component of the A3 module emission of the material	Big Decimal	256
A3 luluc	Luluc component of the A3 module emission of the material	Big Decimal	256
A4 total	A4 module emission of the material	Big Decimal	256
A4 biogenic	Biogenic component of the A4 module emission of the material	Big Decimal	256

A4 fossil	Fossil component of the A4 module emission of the material	Big Decimal	256
A4 luluc	Luluc component of the A4 module emission of the material	Big Decimal	256
A5 total	A5 module emission of the material	Big Decimal	256
A5 biogenic	Biogenic component of the A5 module emission of the material	Big Decimal	256
A5 fossil	Fossil component of the A5 module emission of the material	Big Decimal	256
A5 luluc	Luluc component of the A5 module emission of the material	Big Decimal	256
B1 total	B1 module emission of the material	Big Decimal	256
B1 biogenic	Biogenic component of the B1 module emission of the material	Big Decimal	256
B1 fossil	Fossil component of the B1 module emission of the material	Big Decimal	256
B1 luluc	Luluc component of the B1 module emission of the material	Big Decimal	256
B2 total	B2 module emission of the material	Big Decimal	256
B2 biogenic	Biogenic component of the B2 module emission of the material	Big Decimal	256
B2 fossil	Fossil component of the B2 module emission of the material	Big Decimal	256
B2 luluc	Luluc component of the B2 module emission of the material	Big Decimal	256
B3 total	B3 module emission of the material	Big Decimal	256
B3 biogenic	Biogenic component of the B3 module emission of the material	Big Decimal	256
B3 fossil	Fossil component of the B3 module emission of the material	Big Decimal	256
B3 luluc	Luluc component of the B3 module emission of the material	Big Decimal	256
B4 total	B4 module emission of the material	Big Decimal	256
B4 biogenic	Biogenic component of the B4 module emission of the material	Big Decimal	256
B4 fossil	Fossil component of the B4 module emission of the material	Big Decimal	256
B4 luluc	Luluc component of the B4 module emission of the material	Big Decimal	256
B5 total	B5 module emission of the material	Big Decimal	256
B5 biogenic	Biogenic component of the B5 module emission of the material	Big Decimal	256
B5 fossil	Fossil component of the B5 module emission of the material	Big Decimal	256
B5 luluc	Luluc component of the B5 module emission of the material	Big Decimal	256
B6 total	B6 module emission of the material	Big Decimal	256

B6 biogenic	Biogenic component of the B6 module emission of the material	Big Decimal	256
B6 fossil	Fossil component of the B6 module emission of the material	Big Decimal	256
B6 luluc	Luluc component of the B6 module emission of the material	Big Decimal	256
B7 total	B7 module emission of the material	Big Decimal	256
B7 biogenic	Biogenic component of the B7 module emission of the material	Big Decimal	256
B7 fossil	Fossil component of the B7 module emission of the material	Big Decimal	256
B7 luluc	Luluc component of the B7 module emission of the material	Big Decimal	256
C1 total	C1 module emission of the material	Big Decimal	256
C1 biogenic	Biogenic component of the C1 module emission of the material	Big Decimal	256
C1 fossil	Fossil component of the C1 module emission of the material	Big Decimal	256
C1 luluc	Luluc component of the C1 module emission of the material	Big Decimal	256
C2 total	C2 module emission of the material	Big Decimal	256
C2 biogenic	Biogenic component of the C2 module emission of the material	Big Decimal	256
C2 fossil	Fossil component of the C2 module emission of the material	Big Decimal	256
C2 luluc	Luluc component of the C2 module emission of the material	Big Decimal	256
C3 total	C3 module emission of the material	Big Decimal	256
C3 biogenic	Biogenic component of the C3 module emission of the material	Big Decimal	256
C3 fossil	Fossil component of the C3 module emission of the material	Big Decimal	256
C3 luluc	Luluc component of the C3 module emission of the material	Big Decimal	256
C4 total	C4 module emission of the material	Big Decimal	256
C4 biogenic	Biogenic component of the C4 module emission of the material	Big Decimal	256
C4 fossil	Fossil component of the C4 module emission of the material	Big Decimal	256
C4 luluc	Luluc component of the C4 module emission of the material	Big Decimal	256
D total	D module emission of the material	Big Decimal	256
D biogenic	Biogenic component of the D module emission of the material	Big Decimal	256
D fossil	Fossil component of the D module emission of the material	Big Decimal	256
D luluc	Luluc component of the D module emission of the material	Big Decimal	256