Type of document
Specification
Subject
Environmental impact resource file
specification

Environmental impact resource
File specification

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Environmental impact resource file specification

The file specification of the environmental impact of resources defines the structure and field and values of the information of resource data. The data is generic building resources and generic climate impact data for energy and fuels.

The specification is used and maintained by the national building code agencies of Sweden and Finland.

Any queries pertaining to the actual data in the files should be directed to the data owner, i.e. the national building code agency that has published the data.

This document

The environmental impact resource file specification exists to help developers understand the content and structure of the generic resource climate data file.

This document might have translated versions. **Any discrepancies between interpretations of different language versions should be resolved against the English version.**

The structure of the document is built loosely on the structure of the file.

In examples the JSON or XML code can be abbreviated with required fields omitted. Such abbreviations are marked with three dots, "`...`".

Background

Sweden and Finland are planning to introduce requirements for climate declarations. To make it easier for the construction industry to make a climate declaration, each country has developed a national open climate database with generic climate data.

Sweden and Finland have collaborated in the development of climate data and the IT system for the database. It has resulted in a web interface that is similar and a common file format for downloading climate data digitally from each country's climate database.

Climate data is provided in Sweden in Json and xml file formats and in Finland in Json file format. As Finland has a broader system boundary than Sweden in the climate declaration, there are data fields in the files that only Finland will use. The file specification is a document on how the common Json and xml file are structured.

File structure

The file is a JSON file, or a plain XML file. While this document focuses on the JSON file structure, the generic structure and field information is valid for both types.

As there are no requirement for data publishers to publish in both formats, there are no guarantee that all published generic resource climate data will be available in both formats.

When used from an API the corresponding output might be a single Resource node or an array of Resource objects. In such case the Root object as described here will not be in the resulting return, and the fields in the root object will be nested within the actual Resource object.

Root object

The JSON file consists of a root object with one or two objects and three fields.

```
{
  "Location": "SE",
  "Culture": "sv-se",
  "Publisher": "Boverket, Sweden",
  "Version": "01.00.000",
  "PublishDate": "2021-01-02T02:00:03.23Z",
  "Categories": [
        ...
  ],
  "Resources": [
        ...
  ]
}
```
The root object of the file.

Fields

Categories

Content
One object is Categories which holds an array of category objects for category systems that are not defined elsewhere.

For any Category in the file the file describes the data as a whole. The specification has no provisions for partial data objects.

Not required
The Categories node is NOT required.

Resources

Content
The other object is named Resources and contains an array of the exported generic climate resource data.

For any resource in the file the file describes the data as a whole. The specification has no provisions for partial data objects.

Not required
The Resources node in NOT required, though, it can be considered to be required, even though it is not formally designated as such by this specification; a file that defines generic resources that has no resources might be a bit pointless.

However, any external parsing of the file must accept that neither of these might exist in a file.

Culture

Content
The culture field is a string conforming to one of the language and culture codes of RFC 4646. The RFC 4646 format for the culture name is <language-code2>-<country/regioncode2>, where <languagecode2> is the language code and <country/regioncode2> is the subculture code. For example, es-CL for Spanish (Chile), en-US for English (United States), and en-AU for English (Australia). RFC 4646 is a combination of an ISO 639 two-letter culture code associated with a language and an ISO 3166 two-letter subculture code associated with a country or region.

At the writing of the current revision of this document, the actually used codes are confined to one of 'fi-fi', 'sv-se' and 'en-gb'.

One deviation from the RFC 4646 is allowed; the entire culture code can be in any case. That is; sv-se, SV-se and sv-SE are all considered equal and accepted in this specification, even though RFC 4646 only accepts the last example.

Not required
The field is not required. However, if this field is omitted the corresponding fields for Culture are required on all Category and Resource objects within the file.

Version

Content
The field contain the published version identifier on the format major.minor.revision, where the major and minor has two digits and the revision has three digits.

As how the version number is produced is left to the publisher and hence not defined in this document. However, it is a requirement that one published version that follows another published version has a higher version number than the previous one.

```
"Version": "01.00.000",
```
Example of Version. The example denotes a major version of 1, a minor version of zero and no revisions.

Not required
The Version field is NOT required. However, if this field is omitted the corresponding fields for Version are required on all Category and Resource objects within the file.

PublishDate

Content
The field contain the date of the published version in ISO8601 format (adopted in Sweden as SS-ISO 8601:2011 and in Finland as SFS-EN 28601).

```
"PublishDate": "2021-01-02T02:00:03.23Z",
```
Example of PublishDate.

Not required
The PublishDate field is NOT required. However, if this field is omitted the corresponding fields for PublishDate are required on all Category and Resource objects within the file.

Location

Content
The field contain the ISO 3166 two-letter subculture code associated with a country or region of the country or region that the dataset is valid for. "FI" for Finland or "SE" for Sweden.

Not required
The Location field is NOT required. However, if this field is omitted the corresponding fields for Location are required on all Resource objects within the file.

Publisher

Content

The field is a string with max length 50 characters in UTF-8 that in a short form describes the publisher.

Not required

The Publisher field is NOT required. However, if this field is omitted the corresponding fields for Publisher are required on all Resource objects within the file.

Categories

The Categories node is an array that holds zero or more Category objects.

Category

The Category objects describes a category. Each category can have list of sub categories, as well as a number of fields that describes the category item.

```json
{
  ...
  "Categories": [
    {
      "Id": 1,
      "Culture": "fi-fi",
      "ClassificationType": "Talos2000",
      "Code": "271",
      "Title": "Insulation and water proofing",
      "Description": "",
      "Children": [
        {
          "Id": 2,
          "Culture": "fi-fi",
          "ClassificationType": "Talos2000",
          "Code": "271.42",
          "Title": "EPS-eristeet",
          "Description": "",
        }
      ]
    }
  ]
}
```

Example of categories.

Fields

The fields of a Category are generally not required in this specification. However each category system described have other specifications which can yield that certain fields are required.

Id

Content
The Id field is an integer, a number between 1 and 4,294,967,295 that serves as an identifier within the ClassificationType or CategorySystem. This is typically a Primary Key in a database.

Required
The Id field is the only required field in the Category object.

Culture

Content
The Culture field holds information on the language used for the Category object, i.e. which language the Title is presented in. For more information on the format, see Culture on page 13.

Not required
The Culture field is NOT required, if the Root object has a Culture field, otherwise it is required.

CategorySystem

Content
The CategorySystem field is a string with up to 127 characters. The encoding follows from the standard for JSON and XML (UTF-8).

Not required
This field is NOT required, although it is advisable to provide at least one of the fields CategorySystem and ClassificationType.

ClassificationType

Content
The ClassificationType field is a string with up to 127 characters. The encoding follows from the standard for JSON and XML (UTF-8).

Not required
This field is NOT required, although it is advisable to provide at least one of the fields CategorySystem and ClassificationType.

Code

Content
The Code field contains a code associated with the current category. It is a string with a length of maximum 50 characters in UTF-8.

Not required
The Code field is NOT required.

Title

Content
The Title field is the name, title, heading or other significant human readable text associated with the current category. It is a string with a length of maximum 255 characters in UTF-8.

Not required
The Title field is NOT required.

Description

Content
The Description field is a text that describes the current category. It is a string with a length of maximum 4096 characters in UTF-8.

Not required
The Title field is NOT required.

Children

Content
The Children node is an array that contains zero or more Category objects. This is used to build a hierarchy of categories given the category system or classification type being used.

Not required
The Children node is NOT required.

Resources

The Resources node is an array that holds zero or more Resource objects.

Resource

The Resource object describes a generic resource in respect of climate and environmental impacts. The Resource object is comprised of a large number of fields.

This object can also be delivered standalone through API, if and when the national publisher hosts an API solution. Any API related information is out of the scope for this specification.

```
...
  {
    "ResourceId": 6000000007,
    "SourceVersion": "02.01.018",
    "ProductSystemId": 6,
    "ProductSystemResourceId": "21c597b4-4105-43cb-
b868-b6cb3e998c60",
    "Location": "SE",
    "Publisher": "Boverket, Sweden",
    "Version": "01.00.000",
    "PublishDate": "2021-01-02T02:00:03.23Z",
    "ValidStartYear": 2020,
    "ValidEndYear": 2025,
    "Copyright": true,
    "Name": "Sawn timber, u 16%, 455 kg/m3",
    "Names": {
        "EN": "Sawn timber, u 16%, 455 kg/m3",
        "SV": "Sågad vara, u 16%, 455 kg/m3"
    },
    "StdName": "EN 14915:2013+A2:2020",
    "StdDescription": "- Solid wood panelling and clad-
ding - Characteristics, requirements and marking",
    "StdCalc": "EN 15804:A1",
...
```

An excerpt of an example of the Resource object.

Fields

ResourceId

Content

The ResourceId field is generally used as a key in a database. It is an un-signed 8 byte integer (U_INT64), comprising of 10 digits where the first digit is the ProductSystemId. The ResourceId is a value between 1 and 18,446,744,073,709,551,615.

Required

The ResourceId field is required.

SourceVersion

Content

The version field is a string that describes the version of the reference data of the Resource. The version is on the format major.minor.revision, where the major and minor has two digits and the revision has three digits. For example "02.01.018". Generally, the Version field is to be used for version control as the SourceVersion field generally is a version holder for reference data.

As how the version number is produced is left to the publisher and hence not defined in this document. However, it is a requirement that one published version that follows another published version has a higher version number than the previous one.

Required

The SourceVersion is required, if the resource is stand alone or if the Version field on the Root object is omitted. If the both the SourceVersion and the Root Object Version are present, the resource's SourceVersion takes precedent.

ProductSystemId

Content

The ProductSystemId field is an integer between 1 and 20 that describes the type of data and the sender. Currently two ProductSystemResources are used for generic data; 6 and 7 where 6 is Swedish average, published by The Swe-dish National Board of Housing, Building and Planning, and 7 is Finnish aver-age, published by Finnish Environment Institute (SYKE).

Required

The ProductSystemId field is required.

ProductSystemResourceId

Content

The ProductSystemResourceId field is an UUID, Universally unique identifier, of the resource. This is meant to be used as a resource identifier for systems that rely on a UUID (or Guid) for keeping identity and can hence be seen as an alternative key.

Required

The ProductSystemResourceId field is required and must be universally unique.

Version

Content

The field contain the published version identifier on the format major.minor.revision, where the major and minor has two digits and the revision has three digits. This is the published version, rather than the version of the resource. The SourceVersion may differ from the Version field in some cases, and in generic terms the Version field is the field to be used for versioning.

As how the version number is produced is left to the publisher and hence not defined in this document. However, it is a requirement that one published version that follows another published version has a higher version number than the previous one.

```
"Version": "01.00.000",
```
Example of Version. The example denotes a major version of 1, a minor version of zero and no revisions.

Not required

The Version field is NOT required. However, if this field is omitted the corresponding field for Version is required on the root object of the file.

PublishDate

Content

The field contain the date of the published version in ISO8601 format (adopted in Sweden as SS-ISO 8601:2011 and in Finland as SFS-EN 28601).

```
"PublishDate": "2021-01-02T02:00:03.23Z",
```
Example of PublishDate.

Not required

The PublishDate field is NOT required. However, if this field is omitted the corresponding field for PublishDate is required on the root object of the file.

Location

Content
The field contain the ISO 3166 two-letter subculture code associated with a country or region of the country or region that the dataset is valid for. "FI" for Finland or "SE" for Sweden.

Not required
The Location field is NOT required. However, if this field is omitted the corresponding field for Location is required on the root object of the file.

Publisher

Content
The field is a string with max length 50 characters in UTF-8 that in a short form describes the publisher.

Not required
The Publisher field is NOT required. However, if this field is omitted the corresponding field for Publisher is required on the root object of the file.

Name

Content
The field is a string with max length 80 characters in UTF-8 that in a short form describes the resource.

Required
The Name field is required.

Names

Content
The field is an array of Names, with a key-value pair of a string of 2 characters for the key and a value string with max length 80 characters in UTF-8 that in a short form describes the resource. The key is an ISO 639 two-letter culture code associated with a language and the value is the name of the resource in the keys language.

Not required
The Names field is NOT required. Typically, the Names field will always exist, but implemented usages of the format must accept resources without a Names field.

StdName

Content
The field is a string with max length 30 characters in UTF-8 that holds the product standard for the resource. Not all products or product groups have a product standard. This is connected to the CE standard.

Not required
The StdName field is NOT required.

StdDescription

Content
The field is a string with max length 4096 characters in UTF-8 that in a short form describes the product standard.

Not required
The StdDescription field is NOT required.

StdCalc

Content
The field is a string with max length 30 characters in UTF-8 that have the standard used for calculating the environmental data of the resource. This is typically the same for any given product group.

Not required
The StdCalc field is NOT required.

ValidStartYear

Content
The field is an integer between 2000 and 3000 that describes the start year for the validity of the data.

Not required
The ValidStartYear field is NOT required. If omitted the timespan of the validity of the data is governed by national rules.

ValidEndYear

Content
The field is an integer between 2000 and 3000 that describes the end year for the validity of the data.

Not required
The ValidEndYear field is NOT required. If omitted the timespan of the validity of the data is governed by national rules.

. . .

```
    "UseAdviceForDataSet": "The sawn dried tim-
ber is mainly used as raw material in planed wood pro-
duction. Sawn timber can be used di-
rectly as it is and used as source for treated tim-
ber or when planned used for other wood based prod-
ucts.  ",
    "TechnologicalApplicability": "The sawn dried tim-
ber is mainly used as raw material in planed wood pro-
duction. Sawn timber can be used di-
rectly as it is and used as source for treated tim-
ber or when planned used for other wood based prod-
ucts.  ",
    "GeneralComment": "The impact is based on a sec-
tor EPD (No S-P-01325) that cover 58 % of the to-
tal sawn softwood timber in Sweden. Input are col-
lected from 44 sawmills and cover the produc-
tion of 10 190 000 m3 sawn dried timber. Data to pro-
duce sawn wood is collected from a representative se-
lection of sawmills in Sweden and weighted to an aver-
age. Sawn dried timber is produced in Swe-
den manly based on domestic logs. The GWP-GHG (A1-
A3) for sawn timbers varies between 24-
37 kg CO2e/m3 for the companies that are in-
volved (and based on the methodoly and inven-
tory data used) .",
    "Synonyms": "Sawn lumber, Så-
gat virke, Virke, Bräda, Plank, List",
...
```

A continuation of the excerpt of an example of the Resource object.

UseAdviceForDataSet

Content
The field is a string with max length 500 characters in UTF-8 that describes how the dataset is meant to be used and its conditions.

Not required
The UseAdviceForDataSet field is NOT required.

TechnologicalApplicability

Content

The field is a string with max length 500 characters in UTF-8 that describes how the resource is typically used within a building, during transport or at the building site.

Not required

The TechnologicalApplicability field is NOT required.

GeneralComment

Content

The field is a string with max length 500 characters in UTF-8 that describes the sources and background data that has been used to calculate the climate data of the resource.

Not required

The GeneralComment field is NOT required.

Synonyms

Content

The field is a string with max length 500 characters in UTF-8 as a comma separated list that lists alternative expressions that can describe the resource. This can be used as an extra search field for finding resources.

Not required

The Synonyms field is NOT required.

```
...
    "TechnologyDescriptionAndInclud-
edProcesses": "Dried sawn timber has an average den-
sity of 455 kg/m3 and a moisture con-
tent of 16 %. Sawn dried timber of spruce has an aver-
age den-
sity of 470 kg/m3 and 440 kg/m3 for pine. The mois-
ture content for the dried wood is about 12-18%. Bio-
genic carbon storage is 715kg CO2/m3.",
    "GeographicalRepresentativenessDescription": "Rep-
resentative data for products purchased by the con-
struction sector in Sweden",
    "TimeRepresentativenessDescrip-
tion": "The data is representative for the major pro-
ducers and thereby the major consumption of sawn tim-
ber used in Sweden. These data repre-
sent the year 2016, i.e. before reduction die-
sel was implemented why the GWP reported is lower to-
day.",
...
```
A continuation of the excerpt of an example of the Resource object.

TechnologyDescriptionAndIncludedProcesses

Content
The field is a string with max length 500 characters in UTF-8 that describes the properties of the resource, what kind of materials this product is comprised of and how the manufacturing process works.

Not required
The TechnologyDescriptionAndIncludedProcesses field is NOT required.

GeographicalRepresentativenessDescription

Content
The field is a string with max length 500 characters in UTF-8 that describes where, geographically, the data set is representative. This description is a description of where the source data has been collected and **not** a description of where the data is legally used.

Not required
The GeographicalRepresentativenessDescription field is NOT required.

TimeRepresentativenessDescription

Content

The field is a string with max length 500 characters in UTF-8 that describes when the background data was collected.

Not required

The TimeRepresentativenessDescription field is NOT required.

```
...
    "UpdatedTime": "2020-12-06T20:50:28.673Z",
    "InventoryUnit": "kg",
    "CalculatedBiogenicCarbon": 0.43,
    "ConservativeDataConversionFactor": 1.25,
    "WasteFactor": 1.1,
    "RefServiceLifeNormal": ">50 years",
    "RefServiceLifeNormalComment": "The ser-
vice life of wood indoors is normally equal to the con-
struction of which it is a part. Wood in other environ-
ments normally needs maintenance and a replace-
ment may be required during these 50 years",
    "ComparativeProperty": "When concrete prod-
ucts are compared with other materials or material com-
binations, the assessment must be made in the in-
tended use and in a life cycle perspective.",
...
```

A continuation of the excerpt of an example of the Resource object.

UpdatedTime

Content

The field contain the date of when the resource was last updated in ISO8601 format (adopted in Sweden as SS-ISO 8601:2011 and in Finland as SFS-EN 28601). This field can be used to check if a new version of a resource has changed in respect to the previous version of the resource.

Required

The UpdatedTime field is required.

InventoryUnit

Content

The field contains the unit used for the measurements of the resource. This value is typically used as the "per" part of the GWP data, for example kg

CO_2e/**kg** (where the bold kg is the InventoryUnit). Examples include kg, MJ and m2.

Required
The InventoryUnit field is required.

ResourceType

Content
The ResourceType field is used to separate resources from process materials. It can only contain one of "Material", "Process" and "Scenario".

Not Required
The ResourceType field is not required.

CalculatedBiogenicCarbon

Content
The field is a float larger than or equal to 0 that describes the resources calculated biogenic carbon.

Not required
The CalculatedBiogenicCarbon field is NOT required.

ConservativeDataConversionFactor

Content
The field is a float larger than 0 that describes the factor used to calculate the conservative GWP value. If the resource has a DataItem/DataValueItem object with a DataModuleCode of "A1-A3 Conservative" or "A1-A3 Typical" the generic average A1-A3 value can be derived by taking that DataValueItem field Value and divide with the ConservativeDataConversionFactor. If you have a DataModuleCode of "A1-A3 Average" and want to calculate the conservative value you multiply its Value field with the ConservativeDataConversionFactor.

Not required
The ConservativeDataConversionFactor field is NOT required.

WasteFactor

Content
The field is a float of 1 or larger that describes the generic relation of waste on the building site. This is used to calculate the A5 value by multiplying the A1-A3 Conservative value with (WasteFactor - 1). In the example of this file the A1-A3 Conservative value is 0.0863 $kgCO_2$/kg and the WasteFactor is 1.1, then the A5 GWP value is 0.0863 · (1.1 - 1) $kgCO_2$/kg = 0.0863 · 0.1 $kgCO_2$/kg = 0.00863 $kgCO_2$/kg.

Not required

The WasteFactor field is NOT required.

RefServiceLifeNormal

Content

The field is a string of characters in UTF-8 of the format "sxx years" where s is on of "<", ">" or omitted, xx is a number and the last part describes the unit of time, typically years. The unit of time is translated to the culture of the resource (or root object if it is omitted in the resource). The field can also contain the phrase "Not applicable" or an equivalent translated phrase. This field describes the technical life span of the resource when used in a normal fashion. To verify whether this is an applicable field for the resource the second character can be checked. If it is a number the resource has an applicable reference service life value set, otherwise it is not applicable for the resource.

Not required

The RefServiceLifeNormal field is NOT required, and might hold a phrase of "Not applicable" or equivalent in a localized form.

RefServiceLifeNormalComment

Content

The field is a string of characters in UTF-8 with a max length of 500 characters. It describes the technical life span of the resource, its use and what a normal fashion of use is for the resource.

Not required

The RefServiceLifeNormalComment field is NOT required.

ComparativeProperty

Content

The field is a string of characters in UTF-8 with a max length of 500 characters. It describes how the resource can be used when comparing to other resources, generic or specific.

Not required

The ComparativeProperty field is NOT required.

```
...
    "A4ValueBackground": "The im-
pact is based on a transport with a lorry (1 MJ/ton km)
, 300 km and 40 km lorry (1,5 MJ/ton km). The im-
pact is based on a transport with a lorry (1 MJ/ton km)
, 400 km and 40 km lorry (1,5 MJ/ton km). Swedish re-
duction diesel mix is used.",
    "AnnualSupplyOrProductionVolume": "Consump-
tion in Sweden is dominated by national produc-
ers, which is why the background data used from Swe-
dish sawmills can be considered representa-
tive of this consumption.",
...
```

A continuation of the excerpt of an example of the Resource object.

A4ValueBackground

Content
The field is a string of characters in UTF-8 with a max length of 500 charac-
ters. It describes how the A4 value of the resource was calculated.

Not required
The A4ValueBackground field is NOT required.

AnnualSupplyOrProductionVolume

Content
The field is a string of characters in UTF-8 with a max length of 500 characters
that describes how the resource's market situation was at the time of data col-
lection for the calculations of the resource's data.

Not required
The AnnualSupplyOrProductionVolume field is NOT required.

ServiceLife

Content
The field is an array of ServiceLifeItem objects. Used as values to calculate
the factor when the service life used in different use service classes.

Not required
The Notes field is NOT required.

Report

Content

The field is a string of characters in UTF-8 with a max length of 127 characters that contains the file name of the environmental impact report for the generic resource.

Not required

The Report field is NOT required.

ReportURL

Content

The field is a string of characters in UTF-8 with a max length of 512 characters that contains a unified resource locator, (URL) to the environmental impact report for the generic resource.

Not required

The ReportURL field is NOT required.

```
...
    "Conversions": [
        {
            "Field": "Volume",
            "Unit": "m3",
            "Value": 455.0
        },
        {
            "Field": "Area",
            "Unit": "m2",
            "Value": ""
        },
        {
            "Field": "Length",
            "Unit": "m",
            "Value": ""
        }
    ],
...
```

A continuation of the excerpt of an example of the Resource object, the Conversions array.

Conversions

The Conversions array is an array of up to four conversion objects, where the four objects represents how to convert to the InventoryUnit given either density, area or length.

Not required

The Conversions field is NOT required, and it might be empty.

Conversion object fields

The conversion object has up to four fields.

Field

Content

The field is a string of characters in UTF-8 with a max length of 10 characters. It is one of "Volume", "Area", "Length", "Unit" and "Note".

Required

The Field field is required.

Unit

Content

The field is a string of characters in UTF-8 with a max length of 2 characters. It is one of "m3" (meaning m^3), "m2" (meaning m^2), "m" and "unit" (in the meaning "per piece").

Required

The Unit field is required unless the Field field is "Note".

Value

Content

For objects that have a Field content that is not "Note", the field is a float that is used for conversions from a volume, area or length to the weight, to be used for calculating a GWP value given this resource. No other uses are intended. When the object has a Field content that is "Note", the Value is a UTF-8 character string of a maximum length of 512 characters.

Required

The Value field is required.

Notes

Content

The field is a string of characters in UTF-8 with a max length of 255 characters. It contains any notes of the conversion value, unit or process.

Not required
The Notes field is NOT required.

Resources environmental values

```
...
    "DataItems": [
      {
        "PropertyId": 1845,
        "PropertyName": "Global Warming potential",
        "PropertyCode": "GWP GHG AR4",
        "PropertyUnitCode": "kg CO2e/kg",
        "DataValueItems": [
          {
            "DataModuleCode": "A1-A3 Conservative",
            "Value": 0.0863
          },
          {
            "DataModuleCode": "A4",
            "Value": 0.032384
          }
        ]
      }
    ],
...
```

A continuation of the excerpt of an example of the Resource object, the DataItems and DataValueItems arrays.

DataItems
The DataItems is an array of DataItem objects.

Required
The DataItems array is required.

DataItem
The DataItem contains information on environmental data for the resource.

PropertyId

Content
The field is an integer typically used as a key in a database. It is also a key to in a simplistic way find the correct data value items for a specific environmental value.

Required
The PropertyId field is required.

PropertyUUID

Content
This field holds the UUID of the property, if available.

Not Required
The PropertyUUID field is not required.

PropertyName

Content
The field is a UTF-8 encoded string with a max length of 50 characters. It can be used to find the correct data value items for a specific environmental value.

Required
The PropertyName field is required.

PropertyCode

Content
The field is a UTF-8 encoded string of a maximum of 20 characters that contains the code for the property.

Not Required
The PropertyCode is not required.

PropertyUnitCode

Content
The field is a UTF-8 encoded string of a maximum of 20 characters that has the unit of the calculated values.

Required
The PropertyUnitCode is required.

DataValueItems
This is an array of DataValueItem objects.

Required

The DataValueItems is required.

PropertyCalculationRule

This is the rule for how the properties have calculations.

Not required

The PropertyCalculationRule is NOT required.

DataValueItem

A data value item has five fields.

DataModuleCode

Content

The field is a string in UTF-8 encoding of a maximum of 30 characters. It contains the kind of value that the Value field has.

Required

The DataModuleCode field is required.

Value

Content

The field is a float. It is the actual environmental value.

Required

The Value field is required.

ScenarioId

Content

The field is an integer. It is an ID for the scenario. Scenarios are used to describe a data value change over a specified unit, for example decades. Typically a ScenarioId is used multiple times per DataItem. It represents a specific scenario and might be used on multiple resources as well.

Not Required

The ScenarioId field is not required. If omitted the ScenarioValue and ScenarioUnit is invalid. If it exists, ScenarioValue is required.

ScenarioName

Content

The field is a UTF-8 encoded string with a max length of 50 characters. It can be used to shortly describe the scenario. Scenarios are used to describe a data value change over a specified unit, for example decades. Typically a

ScenarioName is used multiple times per DataItem. It represents a specific scenario and might be used on multiple resources as well.

Not Required

The ScenarioName field is not required.

ScenarioValue

Content

The field is a UTF-8 encoded string of a maximum of 20 characters that contains the value that describes the scenario data item value. For example "2020", "2030", etc for decades.

Not Required

The ScenarioValue field is not required and invalid (must not exist), unless ScenarioId exists, in which case it must exist.

ScenarioUnit

Content

The field is a UTF-8 encoded string of a maximum of 20 characters that contains the unit of the ScenarioValue field, if needed. For example "decade".

Not Required

The ScenarioUnit field is not required. And must not exist if ScenarioId is omitted.

```
{
    "DataModuleCode": "A1-A3 Conservative",
    "ScenarioId": "701",
    "ScenarioValue": "2020",
    "ScenarioUnit": "decade",
    "Value": 0.4875
},
{
    "DataModuleCode": "A1-A3 Conservative",
    "ScenarioId": "701",
    "ScenarioValue": "2030",
    "ScenarioUnit": "decade",
    "Value": 0.4775
},
{
    "DataModuleCode": "A1-A3 Conservative",
    "ScenarioId": "701",
    "ScenarioValue": "2040",
    "ScenarioUnit": "decade",
    "Value": 0.4675
```

```
        },
```

An example of the DataValueItems objects, with a 30 year scenario of value changes, per decade. In this example the Id is 701, which is used to differentiate between multiple scenarios, for example.

```
...
    "Categories": [
      {
        "CategorySystem": "Boverket",
        "Title": "Trävaror"
      },
      {
        "ClassificationType": "BK04",
        "Code": "02001",
        "Title": "Fabrikssågat virke"
      }
...
```

A continuation of the excerpt of an example of the Resource object, the Categories array.

Resources categories

Categories
The Categories is an array of ResourceCategory objects.

Required
The Categories array is required.

ResourceCategory
The ResourceCategory can have up to five fields.

ClassificationType

Content
The field is a string in UTF-8 encoding of a maximum of 127 characters. It is the type of classification used.

Not required
The ClassificationType field is NOT required. However, one of Classification and CategorySystem must be present. Both can be present.

CategorySystem

Content
The field is a string in UTF-8 encoding of a maximum of 127 characters. It describes what category system that is used.

Not required
The CategorySystem field is NOT required. However, one of Classification and CategorySystem must be present. Both can be present.

Code

Content
The Code field contains a code associated with the current category. It is a string with a length of maximum 50 characters in UTF-8.

Not required
The Code field is NOT required.

Title

Content
The Title field is the name, title, heading or other significant human readable text associated with the current category. It is a string with a length of maximum 255 characters in UTF-8.

Not required
The Title field is NOT required.

Group

Content
The Group field is the name, title, heading or other significant human readable text associated with the parent of the current category. It is a string with a length of maximum 255 characters in UTF-8.

Not required
The Group field is NOT required.

Material
This array contains information on materials used and end-of-life scenario (i.e. demolition, dismantling, etc.).

Content
The Material field contains a MaterialItem.

Not required
The Material field is NOT required.

MaterialItem
The MaterialItem object has four fields. All fields are floats that represent a percentage (between 0 and 100, inclusive), or, for the SVHC field also the string "<0.1".

Renewables

Content
This is the percentage of renewable materials in the resource.

Nor required
The Renewables field is NOT required.

Recycled

Content
This is the percentage of recycled materials in the resource.

Not required
The Recycled field is NOT required.

```
...
    "Material": {
      "Renewables": 0,
      "Recycled": 0,
      "SVHC": "<0.1",
      "End_of_life_scenario": {
        "Reuse": 0,
        "Recycled": 0,
        "Energy": 0,
        "Final": 0,
        "Hazardous": 0
      }
    },
...
```
An example of the Material field.

SVHC

Content
This is the percentage of hazardous materials in the resource.

Not required
The SVHC field is NOT required.

End_of_life_scenario

Content
This field contains an EndOfLifeScenarioItem object.

Not required
The End_of_life_scenario field is NOT required.

EndOfLifeScenarioItem
The EndOfLifeScenarioItem object has five fields. All fields are floats that represent a percentage (between 0 and 100, inclusive).

Reuse

Content
This describes the reusability of the resource.

Not required
The Reuse field is NOT required.

Recycled

Content
This describes the recyclability of the resource.

Not required
The Recycled field is NOT required.

Energy

Content
This describes to which extent the resource can be energy recycled.

Not required
The Energy field is NOT required.

Final

Content
This is the percentage that cannot be recycled in any way and will end up on a landfill.

Not required
The Final field is NOT required.

Hazardous

Content
This is the percentage of hazardous materials in the resource that will need special handling.

Not required
The Hazardous field is NOT required.

ServiceLifeItem
The conversion object has four fields.

Class

Content
The field is a string of characters in UTF-8 with a max length of 35 characters. It holds the use class of the resource service life item.

Required
The Class field is required.

Unit

Content
The field is a string of characters in UTF-8 with a max length of 12 characters. It is usually "years", but could also be "months" or "decades".

Required
The Unit field is required unless the Class field is "Note".

Value

Content
The field is a float that is denoting a time.

Required
The Value field is required.

Notes

Content
The field is a string of characters in UTF-8 with a max length of 255 characters. It contains any notes of the conversion value, unit or process.

Not required
The Notes field is NOT required.

Closing remarks

This document has been developed jointly by CGI, Boverket (Sweden) and SYKE (Finland). The document is free to download and use, and can be used for derivate specifications. The original specification, though, must not be changed without a joint agreement from Boverket and SYKE.

Any inquiries regarding the document should be directed to Boverket in Sweden and SYKE in Finland.