

# Integrating data reported using various standards

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- XBRL International

# Same data. Three names. A machine cannot tell.

All three concepts below mean the same thing: Gross Scope 1 GHG Emissions.

ESRS

`esrs:GrossScope1GreenhouseGasEmissions`

ISSB

`ifrs-sds:AbsoluteGrossScope1GHGEmissions`

GRI

`gri:GrossDirectScope1GHGEmissions`

Without a concordance, a machine comparing these three reports cannot know these are the same fact.

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# A concordance maps facts between taxonomies

## Example 1: 1:1 numeric -- machine resolves the name difference automatically

```
{ "type": "concordance:numericAssertionType", "assistance": "none",  
  "source": { "concept": "ifrs-sds:AbsoluteGrossScope1GHGEmissions" },  
  "target": { "concept": "esrs:GrossScope1GreenhouseGasEmissions" } }
```

## Example 2: M:1 sum -- ESRS mandates Scope 1 and Scope 2 separately; ISSB permits reporting them combined

```
{ "type": "concordance:numericAssertionType", "assistance": "none",  
  "sources": [ { "concept": "esrs:GrossScope1GreenhouseGasEmissions", "calculation_id": 1 },  
               { "concept": "esrs:GrossLocationBasedScope2GreenhouseGasEmissions", "calculation_id": 2 } ],  
  "target": { "concept": "ifrs-sds:AbsoluteGrossScope1And2GHGEmissions", "calculation": "[1]+[2]" } }
```

The concordance is infrastructure for interoperability -- not a statement that any standard is superior. ESRS, ISSB and GRI each remain authoritative in their own domain.

# Six assertion types cover every mapping situation

Each assertion type describes the structural relationship between source and target fact-spaces.

<b>numericAssertionType</b>	1:1, M:1 sum, 1:M split, unit conversion
Numeric facts -- same or different units	<code>ifrs-sds:AbsoluteGrossScope1GHGEmissions -&gt; esrs:GrossScope1GreenhouseGasEmissions</code>
<b>nonNumericAssertionType</b>	Same concept, different name; methodology descriptions
Text blocks or strings -- 1:1 correspondence	<code>ifrs-sds:ApproachUsedToMeasureGHGEmissions -&gt; esrs:DisclosureOfMethodologies...</code>
<b>textBlockAssertionType</b>	1:M split (one text into several); M:1 merge (several into one)
Text blocks that need splitting or merging	<code>esrs:MethodologyTextBlock -&gt; gri:Scope1Methodology + gri:Scope2Methodology</code>
<b>textToNonTextAssertionType</b>	Read prose to extract a boolean, integer or enumeration
Text block to structured value	<code>ifrs-sds:WhetherRemunerationLinked... (textBlock) -&gt; esrs:ClimateRemunExists (boolean)</code>
<b>nonTextToTextAssertionType</b>	Render boolean + integer + enum as a coherent narrative
Structured values combined into a text block	<code>esrs:CarbonPricingApplied (bool) + Price -&gt; ifrs-sds:ExplanationTextBlock</code>
<b>nullAssertionType</b>	Documents a coverage gap -- not a missing value, an explicit absence
No equivalent exists in the target taxonomy	GRI has no carbon price concept; ISSB has no governance gender concept

# Every assertion carries an assistance hint

The hint is a contract with consuming tools -- it says not just what to do, but how much help is needed.

**AUTO**

**Machine applies the assertion automatically**

1:1 numeric, M:1 addition, unit conversion, explicit dimension member

**ASSISTED**

**AI assistance recommended but not essential**

Merging multiple text blocks, entity-extension lookups, typedToExplicit where labels are unambiguous

**REQUIRED**

**AI or human must act -- machine cannot proceed alone**

textBlock to boolean, typed dimension with non-obvious values (e.g. Feminino), 1:M disaggregation

Note: nullAssertionType has no assistance level -- it is a distinct assertion type documenting an explicit absence, not a difficulty level.

# Example reports

Company	Country	Taxonomy	Sub-sector
<b>Nordvik Foods AS</b>	Norway	ESRS	Dairy processing
<b>Iberian Harvest SA</b>	Spain	ESRS	Olive oil and preserved vegetables
<b>Meridian Beverages Ltd</b>	UK	ISSB	Soft drinks and juice
<b>Sakura Foods KK</b>	Japan	ISSB	Packaged snacks and instant noodles
<b>Prairie Grain Co.</b>	USA	GRI	Grain milling and flour production
<b>Verde Alimentos Ltda</b>	Brazil	GRI	Coffee processing and export

# Demo concordance app ...

Concordance Explorer

127.0.0.1:8000

CONCORDANCE EXPLORER

FOOD AND BEVERAGE · 6 COMPANIES · 3 TAXONOMIES · 7 METRICS

ESRS ESGRI RAW DATA WITH CONCORDANCE TABLE CHART

! RAW MODE -- concept names differ by taxonomy. Some values are blank where no single structured concept exists. Toggle to WITH CONCORDANCE to align.

COMPANY	Scope 1 GHG (tCO <sub>2</sub> e)	Scope 2 (location) (tCO <sub>2</sub> e)	Scope 3 GHG (tCO <sub>2</sub> e)	Total Energy (MWh)	% Female Governance	% Climate Remuneration	Carbon Price (EUR/t)	Scope 1+2 Combined (tCO <sub>2</sub> e)
Nordvik Foods (NO) ESRS	28,400	12,600	485,000	185,000	42%	15%	55	41,000
Iberian Harvest (ES) ESRS	4,200	1,800	98,000	28,000	35%	8%	NO MAPPING	6,000
Meridian Beverages (US) ISSB	8,900	3,400	312,000	62,000	NO MAPPING	18%	40	12,300
Sakura Foods (Japan) ESRS	NO	NO	528,000	298,000	NO MAPPING	0%	NO MAPPING	73,300
Prairie Grain Co. (US) GRI	11.3	8.7	187	266,400	44.4%	AI NEEDED	NO MAPPING	20,000
Verde Alimentos (Brazil) ISSB	2,100	380	94,000	11,200	31.2%	AI NEEDED	NO MAPPING	2,480

Legend: AUTO (machine applies automatically), ASSISTED (AI assistance suggested), REQUIRED (AI or human must act)



Concordance Explorer

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ESRS ESGRI RAW DATA WITH CONCORDANCE TABLE CHART

\* CONCORDANCE ACTIVE -- assertions identify which facts correspond across taxonomies. No taxonomy is transformed into another. Click any cell to trace the assertion.

COMPANY	Scope 1 GHG (tCO <sub>2</sub> e)	Scope 2 (location) (tCO <sub>2</sub> e)	Scope 3 GHG (tCO <sub>2</sub> e)	Total Energy (MWh)	% Female Governance	% Climate Remuneration	Carbon Price (EUR/t)	Scope 1+2 Combined (tCO <sub>2</sub> e)
Nordvik Foods (NO) ESRS	28,400 (AUTO)	12,600 (AUTO)	485,000 (AUTO)	185,000 (ASSISTED)	42% (REQUIRED)	15% (REQUIRED)	55 (AUTO)	41,000 (AUTO)
Iberian Harvest (ES) ESRS	4,200 (AUTO)	1,800 (AUTO)	98,000 (AUTO)	28,000 (AUTO)	35% (AUTO)	8% (AUTO)	NO MAPPING (AUTO)	6,000 (AUTO)
Meridian Beverages (US) ISSB	8,900 (AUTO)	3,400 (AUTO)	312,000 (AUTO)	62,000 (ASSISTED)	NO MAPPING (AUTO)	18% (AUTO)	40 (AUTO)	12,300 (AUTO)
Sakura Foods (Japan) ESRS	NO (REQUIRED)	NO (REQUIRED)	528,000 (AUTO)	298,000 (ASSISTED)	NO MAPPING (AUTO)	0% (AUTO)	NO MAPPING (AUTO)	73,300 (AUTO)
Prairie Grain Co. (US) GRI	11,300 (AUTO)	8,700 (AUTO)	187,000 (AUTO)	74,000 (ASSISTED)	44.4% (REQUIRED)	AI NEEDED (REQUIRED)	NO MAPPING (AUTO)	20,000 (AUTO)
Verde Alimentos (Brazil) ISSB	2,100 (AUTO)	380 (AUTO)	94,000 (AUTO)	11,200 (ASSISTED)	31.2% (REQUIRED)	AI NEEDED (REQUIRED)	NO MAPPING (AUTO)	2,480 (AUTO)

Legend: AUTO (machine applies automatically), ASSISTED (AI assistance suggested), REQUIRED (AI or human must act)

ASSERTION TRACE: Prairie Grain Co. - GRI (REQUIRED)

SOURCE (GRI): gri:DescriptionOfRemunerationPolicyRelatedToImpacts (textBlock)

ASSERTION: textToNonTextAssertionType (assistance: required)

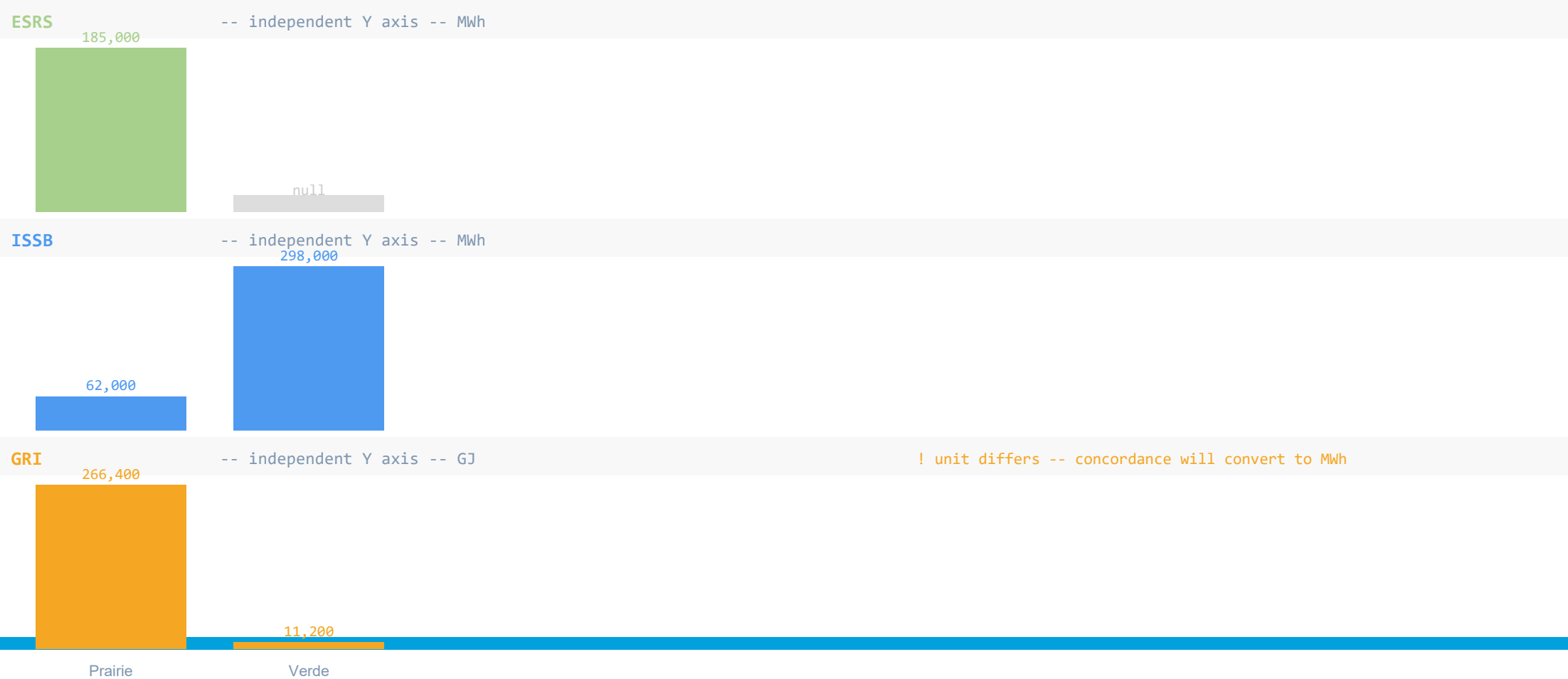
TARGET CONCEPT: esrs:PercentageOfRemunerationLinkedToClimate (REQUIRES AI (textBlock source))

GRI reports remuneration policy as textBlock narrative only. In RAW mode this is blank. In concordance mode it is marked as requiring AI assistance -- AI must read the prose and extract the climate-specific percentage. This is the textToNonText assertion type in action.

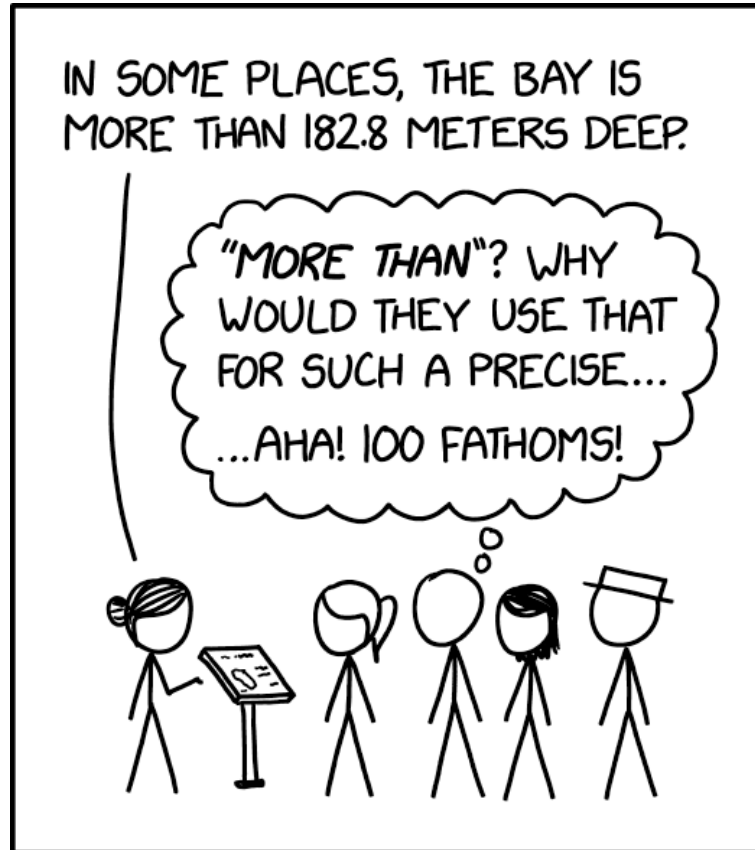
Legend: AUTO (machine applies automatically), ASSISTED (AI assistance suggested), REQUIRED (AI or human must act)

# Without concordance: three separate, incomparable charts

Total Energy Consumption -- RAW mode -- Y axes independent -- Iberian: null (no total concept) -- Prairie: GJ not MWh



There's always an XKCD ...



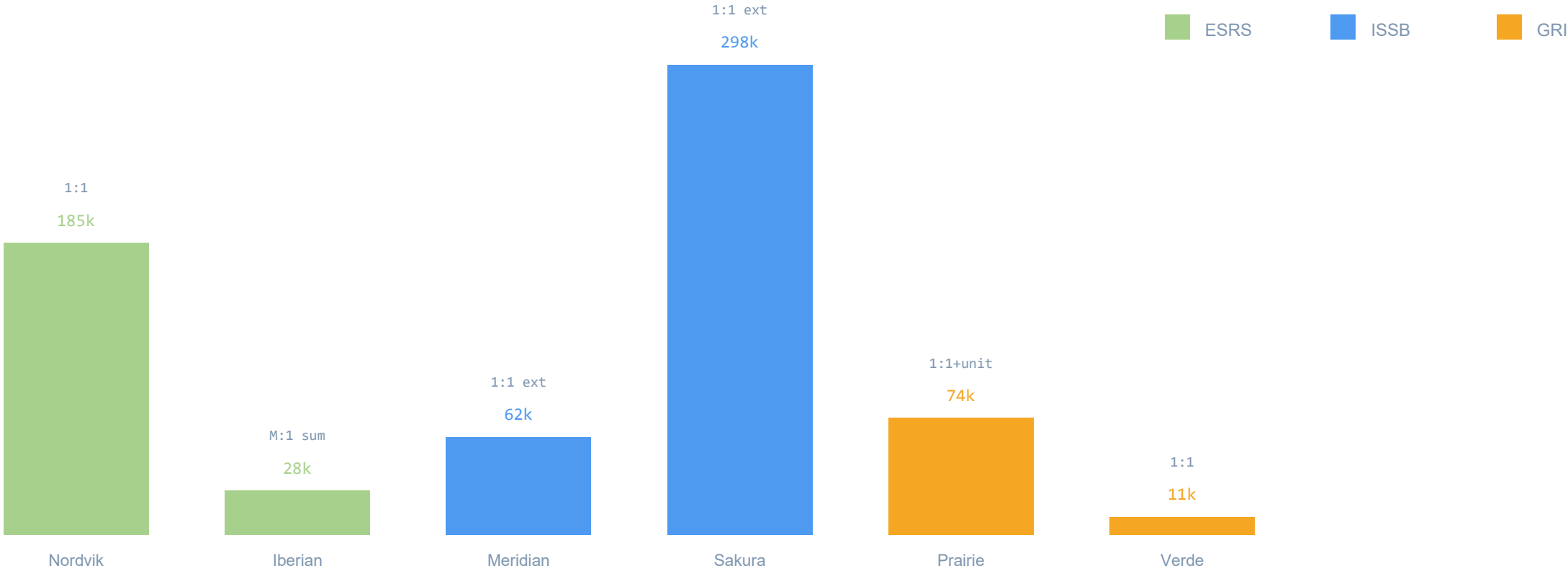
MY HOBBY: REVERSE-  
ENGINEERING ORIGINAL UNITS

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# With concordance: one unified chart, shared axis

Total Energy Consumption -- CONCORDANCE mode -- GJ to MWh conversion applied -- M:1 sum for ESRS reporters

MWh



# Every aligned value is traceable through its assertion

Two ISSB reporters, same taxonomy, different reporting choice -- same output metric, different concordance path.

## Meridian Beverages (ISSB)

```
SOURCE
AbsoluteGrossScope1G
HG Emissions
(8,900 tCO2e)
+
AbsoluteGrossLocatio
nbasedScope2
(3,400 tCO2e)
```



```
AUTO
numericAssertionType
M:1 sum
[1]+[2]
assistance: none
```



```
TARGET CONCEPT
AbsoluteGrossScope1A
nd2
GHG Emissions
= 12,300 tCO2e
```

Meridian reported both individual concepts. M:1 sum is fully automatic.

## Sakura Foods (ISSB)

```
SOURCE
AbsoluteGrossScope1A
nd2
GHG Emissions
= 73,300 tCO2e
(only concept
reported)
```



```
REQUIRED
numericAssertionType
1:M disaggregation
CANNOT SPLIT
assistance: required
```



```
TARGET CONCEPT
GrossScope1Greenhous
e
Gas Emissions
= CANNOT DERIVE
```

Sakura reported only the combined figure. Individual Scope 1 cannot be disaggregated.

## Prairie Grain Co. (GRI) -- Scope 1 -- unit conversion chain

```
gri:GrossDirectScope1GHG Emissions [11.3 ktCO2e] → unitMapping ktCO2e→tCO2e (x1000) [AUTO] → esrs:GrossScope1GHG Emissions = 11,300 tCO2e
```

GRI reporters commonly use ktCO<sub>2</sub>e (kilotonnes). The concordance unitMapping converts automatically (x1000). Without this, 11.3 appears incomparable to ESRS values in the tens of thousands.

# Hard case: the ISSB governance gender gap

ISSB (ifrs-sds:) has no structured concept for governance body gender diversity -- a real coverage gap.

<p><b>Nordvik</b></p> <p>ESRS</p> <pre>esrs:BoardsGenderDiversityRatio [esrs:FemaleMember]</pre> <p><b>42%</b></p> <p>Explicit member -- AUTO</p>	<p><b>Meridian</b></p> <p>ISSB</p> <pre>-- no ifrs-sds: governance gender concept --</pre> <p><b>ABSENT</b></p> <p>nullAssertionType ISSB coverage gap</p>	<p><b>Prairie</b></p> <p>GRI</p> <pre>gri:PctGovernanceBodies [typedAxis: "Female"]</pre> <p><b>44.4%</b></p> <p>typedToExplicit assistance: REQUIRED</p>
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The concordance does not paper over this gap. nullAssertionType explicitly documents that no ifrs-sds: concept exists -- not a missing value, a known absence. Sakura Foods (ISSB) reported 18% in a MetricsAxis extension but without a structured concept the concordance cannot map it reliably.

# Hard case: typed dimensions and language

GRI uses a typed (reporter-defined) GenderAxis. Verde Alimentos reported in Portuguese.

## ESRS -- explicit dimension

```
esrs:FemaleMember  
esrs:MaleMember  
esrs:GenderOtherThanFemaleAndMaleMember  
esrs:GenderNotReportedMember
```

Members are fixed and known. Concordance can pre-specify target strings.  
assistance: recommended

```
ESRS -> GRI: esrs:FemaleMember -> "Female"
```

## GRI -- typed (reporter-defined)

```
Prairie: "Female"  
Verde: "Feminino"  
(could be: "Women", "F", "fem", ...)
```

Strings are unknown until a specific report is read. Matching requires language awareness.  
assistance: required

```
GRI -> ESRS: "Feminino" -> esrs:FemaleMember (AI needed)
```

**Taxonomy design implication:** explicit dimensions make concordance reliably automatic. Typed dimensions (and entity defined explicit) give reporters flexibility but shift effort to consumers. Both are valid choices -- but the concordance must be honest about the difference.

# The concordance is infrastructure for interoperability

## Preparers

Already reported under GRI?

- Your concordance shows which concepts map to ESRS automatically
- and which need review -- before you start writing.
- Reduce duplicate effort across reporting cycles.

## Consumers

Comparing companies across a sector?

- Six companies, three taxonomies, one analysis.
- Unit conversions, structural gaps, and coverage differences
- are documented -- not silently wrong.

## AI tools

Building automation on top of XBRL data?

The assistance hint tells a tool exactly where:

- it can act mechanically
- and where to ask a human.

Meaning:

- No guesswork
- No silent errors.

**Write the concordance once. Use it everywhere.**

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# Thank you

## About the dataset

Claude was fed:

- the 3 real taxonomies converted to a draft version of the OIM Taxonomy JSON
- The concordance requirements in markdown with JSON samples

Claude generated (with a little steering):

- All the concordance pairs (ISSB to GRI; ESRS to ISSB ...)
- All the samples as xBRL-JSON
- The demo app

## Get in touch

Happy to catch up in person or by email.

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Questions?