Unlocking the Power of XBRL for ESG & AI

15 April 2025
11-12:30 CET

WEBINAR

AI performance on sustainability without and with XBRL

- Marc Houllier
- Corporatings
- Member of XBRL France

AI extraction from unstructured documents

- https://sustainabilityreportingnavigator.com/#/csrdreports (Mistral-large 24.11)

- ChatGPT 4o

- Gemini 2 Pro

AI extraction from unstructured documents

E3-4

Water consumption
1,000 m³

	2024
Total water consumption	73
Water consumption in areas at water risk	63
Water recycled and reused	0
Water stored	3
Changes in water storage	0
Total water withdrawals	323
Total water discharges	250
Water intensity (1,000 m³ consumption per mEUR revenue)	0.004
Share of the measure obtained from direct measurement, from sampling etc. (%)	99

Vestas

What was the company's water intensity ratio in 2024?

In 2024, the company's water intensity ratio was 0.4 thousand m³ per mEUR revenue.

(Vestas Wind Systems)

AI extraction from unstructured documents

Biological materials and reused or recycled materials used for manufacturing products ●

	2024
Percentage of biological materials used in manufacturing (%)	12.1%
Reused or recycled materials used in manufacturing and packaging (tonnes)	50
Reused or recycled materials used in manufacturing and packaging (%)	1.62%

Demant

What was the percentage of biological materials (and biofuels used for non-energy purposes) used to manufacture the undertaking's products and services (including packaging) that is sustainably sourced in 2024?

The percentage of biological materials used in manufacturing that is sustainably sourced in 2024 is **12.1%**.

AI extraction from unstructured documents

ESRS ref.	Resource inflows, tonnes	2024
	Technical materials for construction of new assets	
// E5-4, 31(a)	Steel	296,200
// E5-4, 31(a)	Copper	6,900
// E5-4, 31(a)	Aluminium	5,600
// E5-4, 31(a)	Plastics	9,700
// E5-4, 31(a)	Glass fibre	5,900
// E5-4, 31(a)	Rare earth elements	300
// E5-4, 31(a)	Concrete	6,800
// E5-4, 31(a)	Glass	26,600
	Technical materials, scrap steel used in steel production	
// E5-4, 31(c)	In absolute value	59,200 - 103,700
// E5-4, 31(c)	In percentage, %	20 - 35

The use of scrap steel is a norm in steel production, with its content varying across geographies and reflecting established industry practices. Approximately 80% of the steel we source used in the production of steel plates for foundations comes from Europe, where supplier data indicates that, on average, 35% of the material used in these plates derive from scrap.

Ørsted

What percentage of the company's input materials are recycled?

The percentage of the company's input materials that are recycled is approximately 35%.

AI extraction from unstructured documents

Remuneration metrics

S1 – table 7

	2024
Gender pay gap[1]	-1,6%
CEO remuneration ratio	29

[1] Negative gender pay gap reflects a pay gap in favor of males
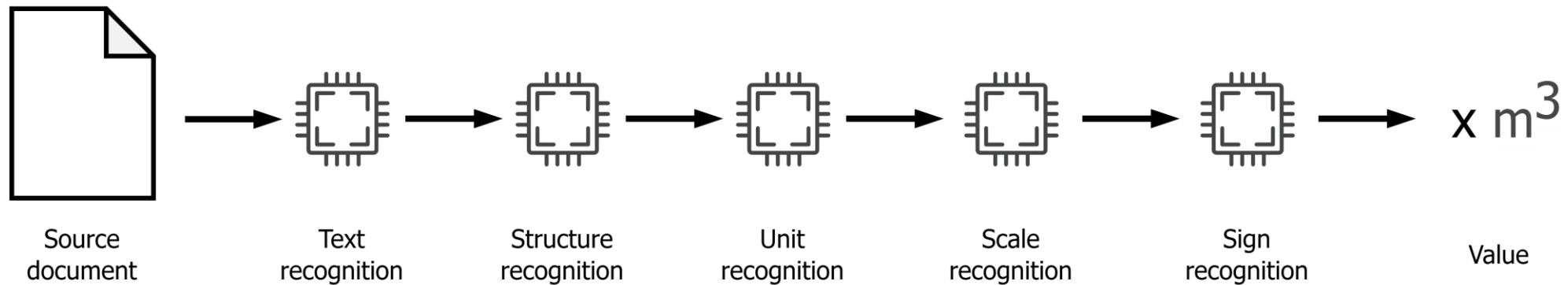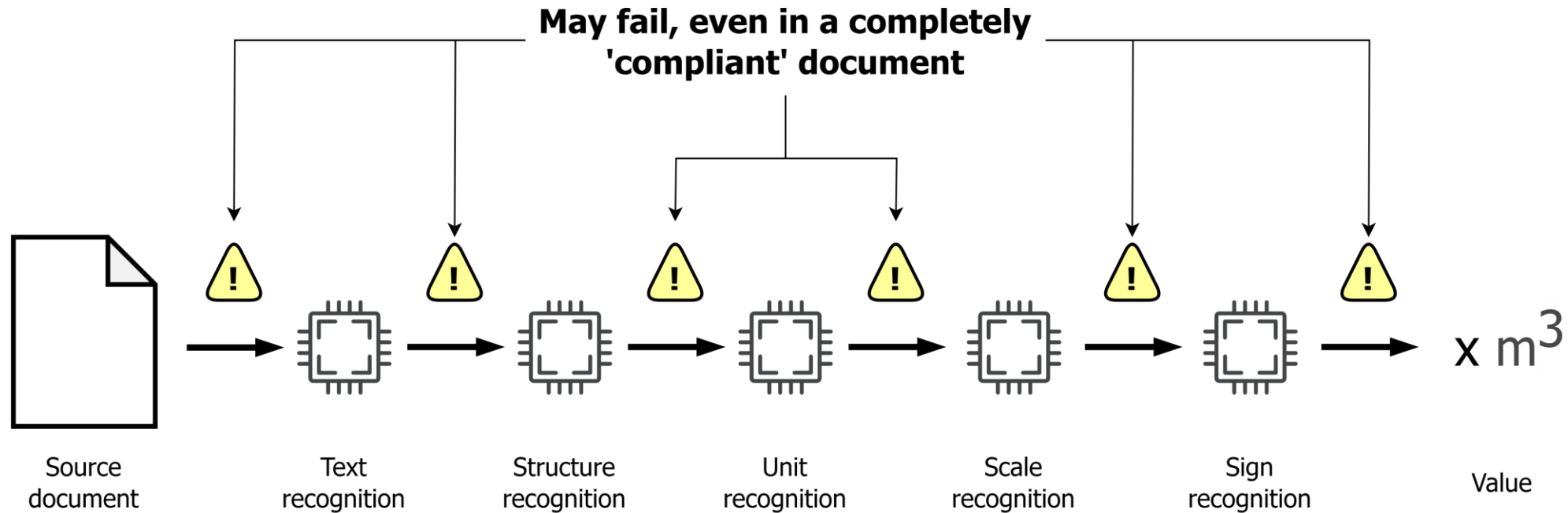
Bavarian Nordic

What was the unadjsted gender pay gap in 2024?

The unadjusted gender pay gap in 2024 was reported as **-1.6%**.

AI extraction from unstructured documents

Source document → Text recognition → Structure recognition → Unit recognition → Scale recognition → Sign recognition → x m^3 Value

AI extraction from unstructured documents

AI extraction from unstructured documents

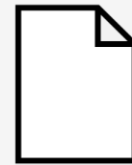What are [company]'s scope 1 emissions?

×1   ×1   Approx. 5 seconds

What companies have reduced their scope 1 emissions the most in 2024?

×10000   ×1   Approx. 14 hours

Database setup

×10000   ×1000   Approx. 580 days

Extraction from XBRL documents

Reliable, deterministic

Source document → XBRL processing → x m^3 Value

×10000 ? ×1 <1 second

Extraction from XBRL documents

Reliable, deterministic

✓

Source
document

XBRL
processing

Value

$x\ m^3$
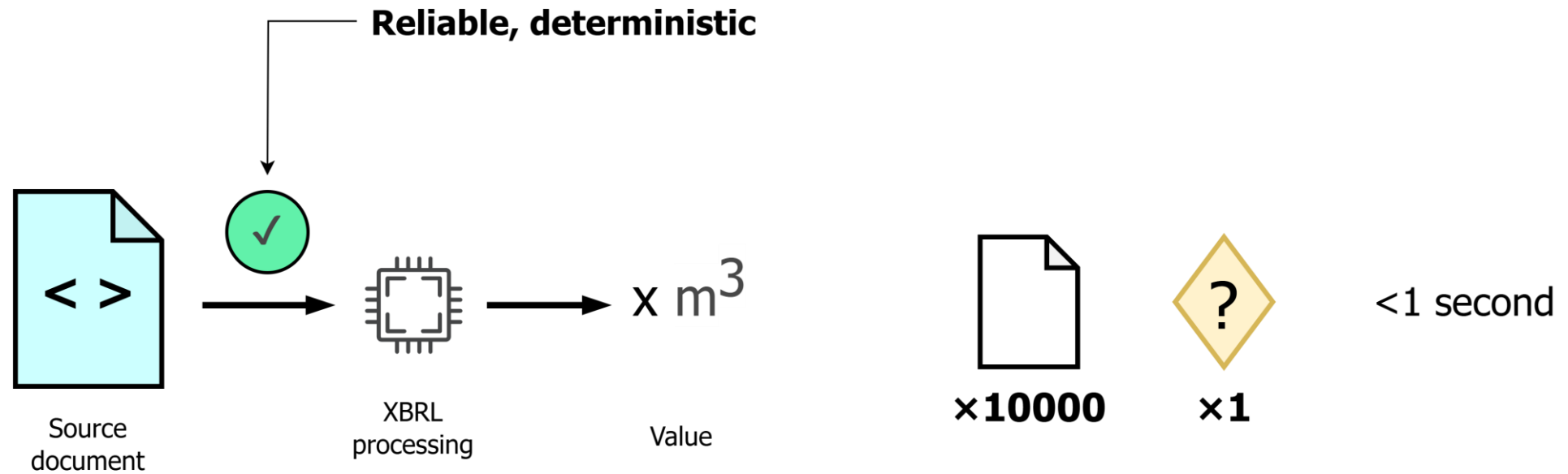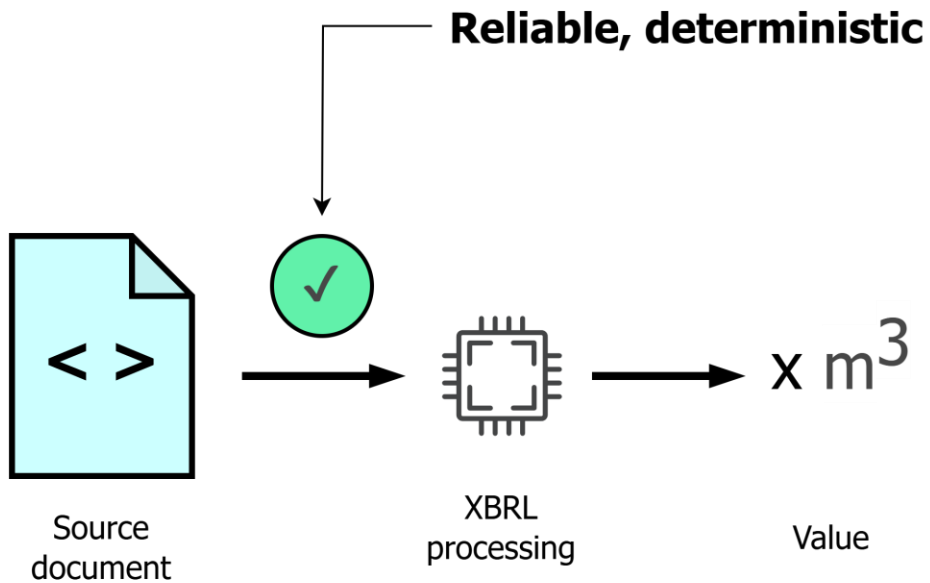
⚠ Queries are technical

⚠ Only tagged information accessible

⚠ Only tagged documents accessible

XBRL with AI idea n°1: AI reading Inline XBRL

Inline XBRL document → AI processing → Value ($x\ m^3$)

✓ Fewer misinterpretations than AI on PDF

✓ Natural language queries

✓ Not limited to tagged information

XBRL with AI idea n°1: AI reading Inline XBRL

AI determinants of success and failure: The case of financial statements

Marcelo Farr
Universidad Adolfo
Ibáñez

William C. Johnson
University of
Massachusetts

Ariel Markelevich*
Suffolk University

Alexis Montecinos
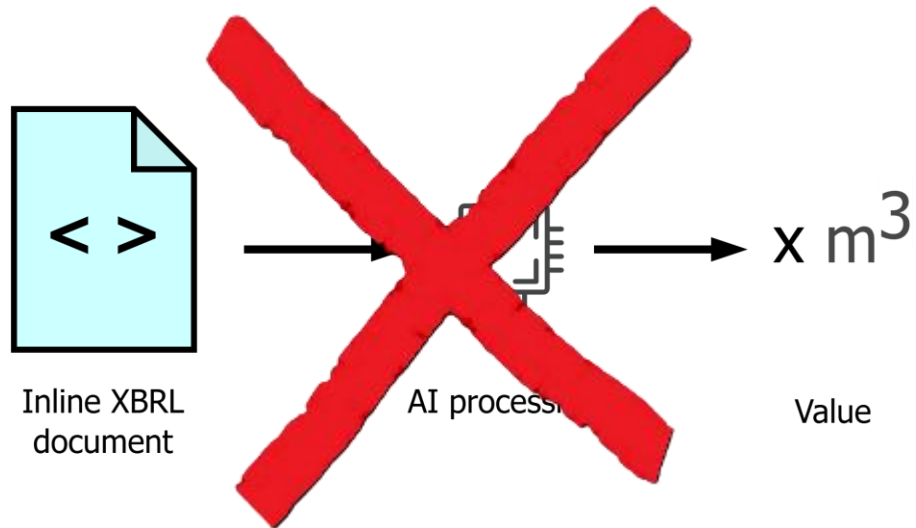Suffolk University

* Corresponding author amarkelevich@suffolk.edu

March 2025

Table 3. AI Error rates for accounting data

	No context N=46,830	AI with text N=82,417	AI with HTML N=77,474	AI with XBRL N=87,978
Overall average across all concepts	99.91%	18.38%	16.33%	9.20%

XBRL with AI idea n°1: AI reading Inline XBRL
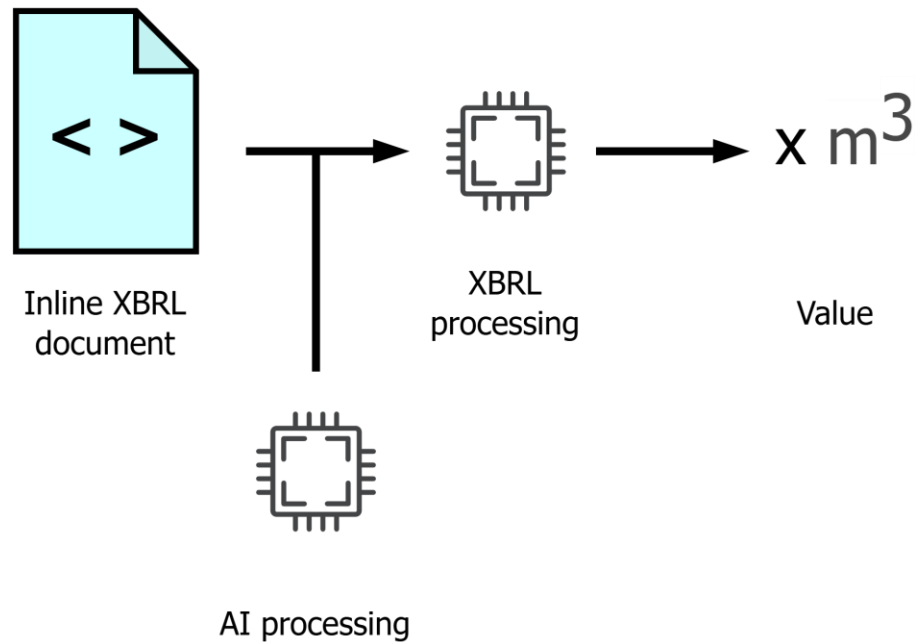

Inline XBRL document → AI process~~or~~ → x m^3 (Value)

⚠ Speed performance of raw AI

⚠ Relies on identifier names more than content

XBRL with AI idea n°2: AI-created XBRL queries

Inline XBRL document → XBRL processing → x m^3 (Value)

AI processing

✓ Better accuracy than AI on PDF

✓ Speed performance of XBRL

✓ Natural language queries

XBRL with AI idea n°2: AI-created XBRL queries
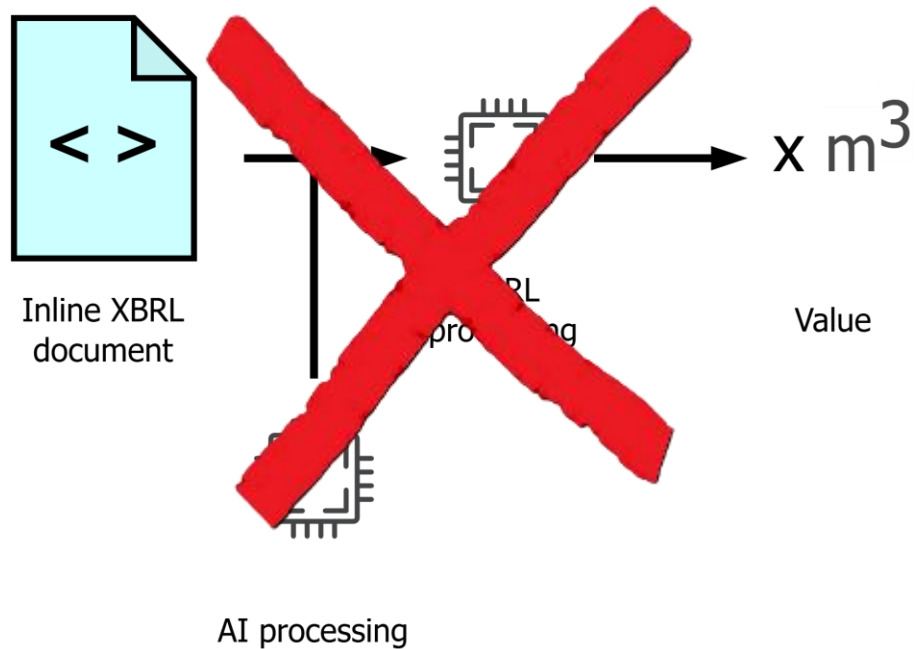
Inline XBRL document

AI processing

x m³

Value

⚠ Only tagged information accessible

⚠ Only tagged documents accessible

XBRL with AI idea n°3: the XBRL teacher

Is this a pyrophone?

XBRL with AI idea n°3: the XBRL teacher

Wendelin Weißheimer playing the pyrophone

Is this a pyrophone?
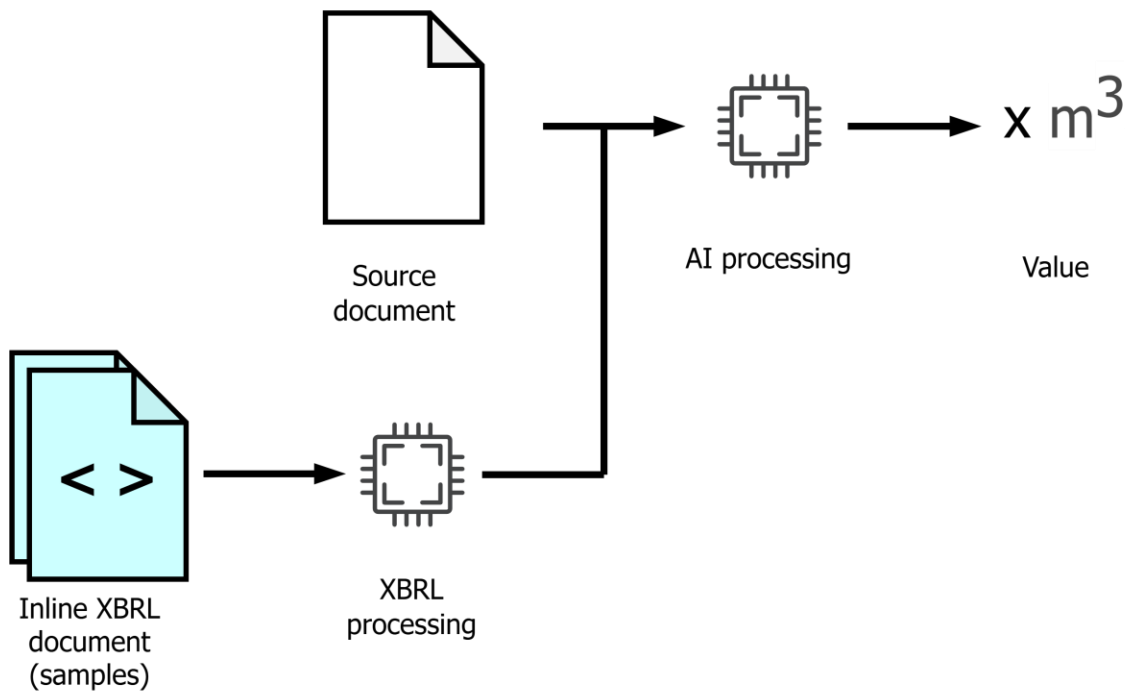
XBRL with AI idea n°3: the XBRL teacher

Source document

AI processing

Value

$x\ m^3$

Inline XBRL document (samples)

XBRL processing

✓ Better accuracy than AI on PDF

✓ Natural language queries

✓ Not limited to tagged information

✓ Not limited to tagged documents

XBRL with AI idea n°3: the XBRL teacher

Source
document

AI processing

$x\ m^3$

Value

⚠ Speed performance of raw AI

Inline XBRL
document
(samples)

< >

XBRL
processing

XBRL with AI idea n°4: the agent

Sample questions → AI agent →

AI XBRL query

XBRL taught AI

- ✓ Speed performance of XBRL
- ✓ Better accuracy than AI on PDF
- ✓ Natural language queries
- ✓ Not limited to tagged information
- ✓ Not limited to tagged documents
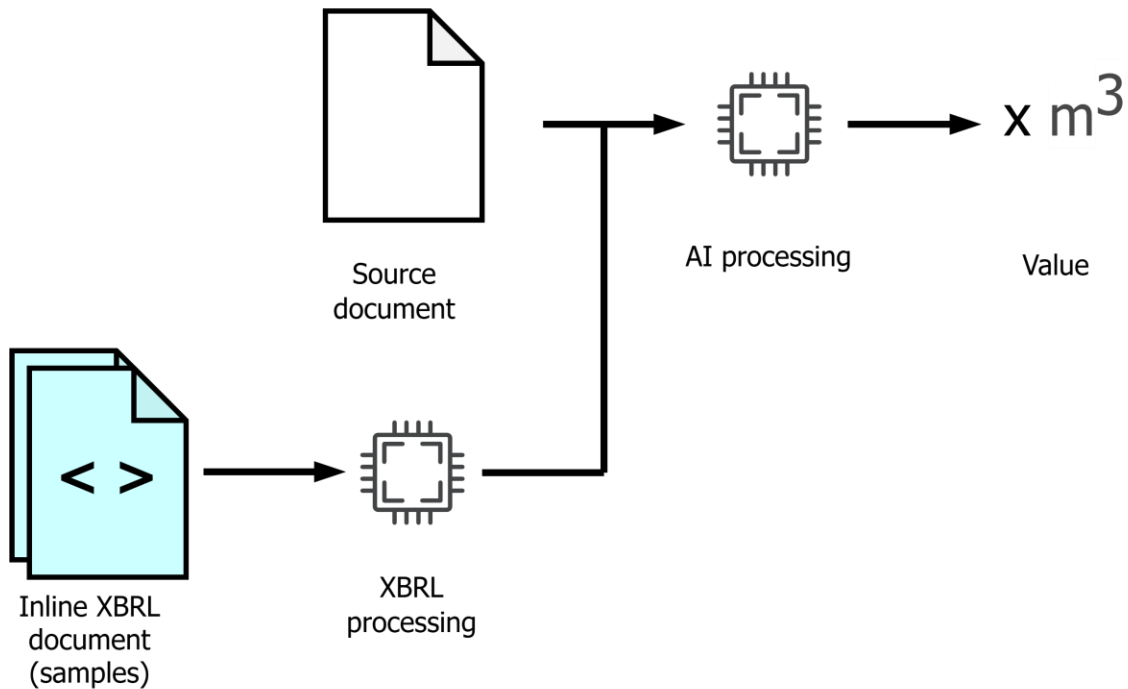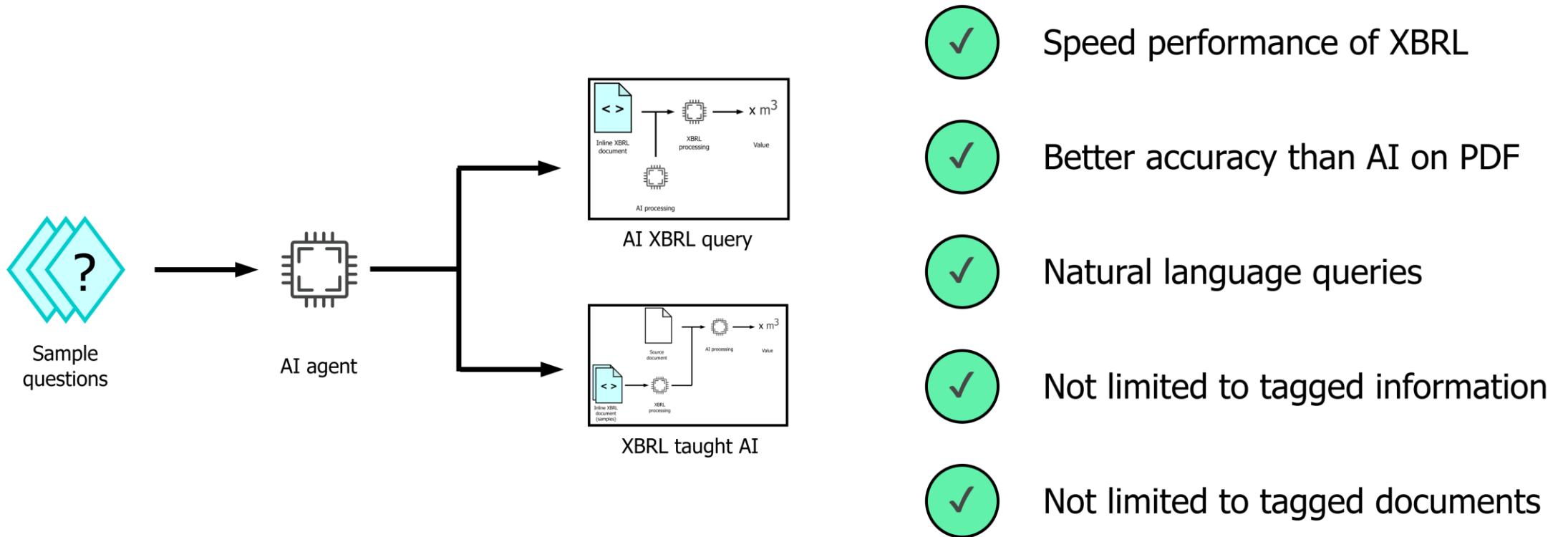
XBRL with AI idea n°4: the agent

Without any input regarding the definition of unadjusted gender pay gap in the ESRS:

Remuneration metrics
S1 – table 7

	2024
Gender pay gap¹	-1,6%
CEO remuneration ratio	29

¹ Negative gender pay gap reflects a pay gap in favor of males

Me

What was the gender pay gap of Bavarian Nordic in 2024?

Corpo-Gen-AI

The gender pay gap of Bavarian Nordic in 2024 was 1.6%.

The company reports its gender pay gap as "-1,6%" but states that this figure reflects a gender pay gap in favor of males. It also describes its accounting policy for the gender pay gap as the difference between female and male average pay levels, whereas other companies calculated the gender pay gap as the difference between male and female salaries.

AI performance on sustainability without and with XBRL

- On raw PDF, AI shows unsatisfactory performance for value retrieval
  - main issues are reliability and time performance
  - even worse on narrative ('Does the company disclose restoration actions related to pollution?')

- XBRL and AI can compensate each other's issues, <u>if done properly</u>
  - ❌ plugging AI into XBRL documents
  - ❌ using AI to handle the technical aspects of XBRL
  - ✅ using XBRL to feed AI with examples and counterexamples
  - ✅ using AI to decide between technical XBRL queries and further AI

AI performance on sustainability without and with XBRL

- Thank you!

- Happy to further discuss: Marc Houllier, mhoullier@corporatings.com

- Try AI on PDF yourself: https://sustainabilityreportingnavigator.com/#/csrdreports