

# Standards Build Consensus

Reporting in a Truly Digital Age

Key developments from XBRL International.

John Turner  
CEO

# Quick Backgrounder

**What is this XBRL stuff anyway?**

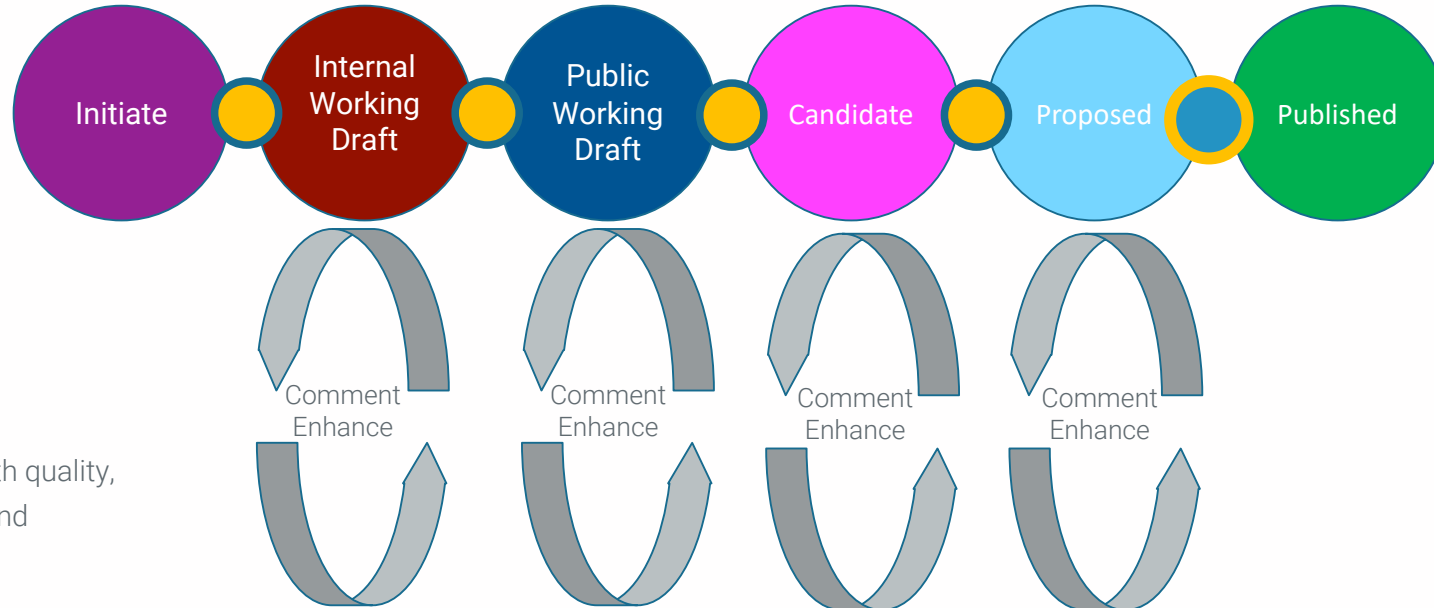
# First – What is “XBRL International”

And why does digital matter?



# Standards Making

- XBRL International develops specifications under an independently appointed group of experts, the “XBRL Standards Board”. Work done within Working Groups of relevant experts.
- Standards making is modelled on international best practices, drawing particularly on W3C and aspects of ISO.
- XBRL International currently has a very limited role in relation to taxonomies.



XBRL Standards Board  
Decision/Gate

XSB needs to be satisfied with quality, requirements, approach and consistency.

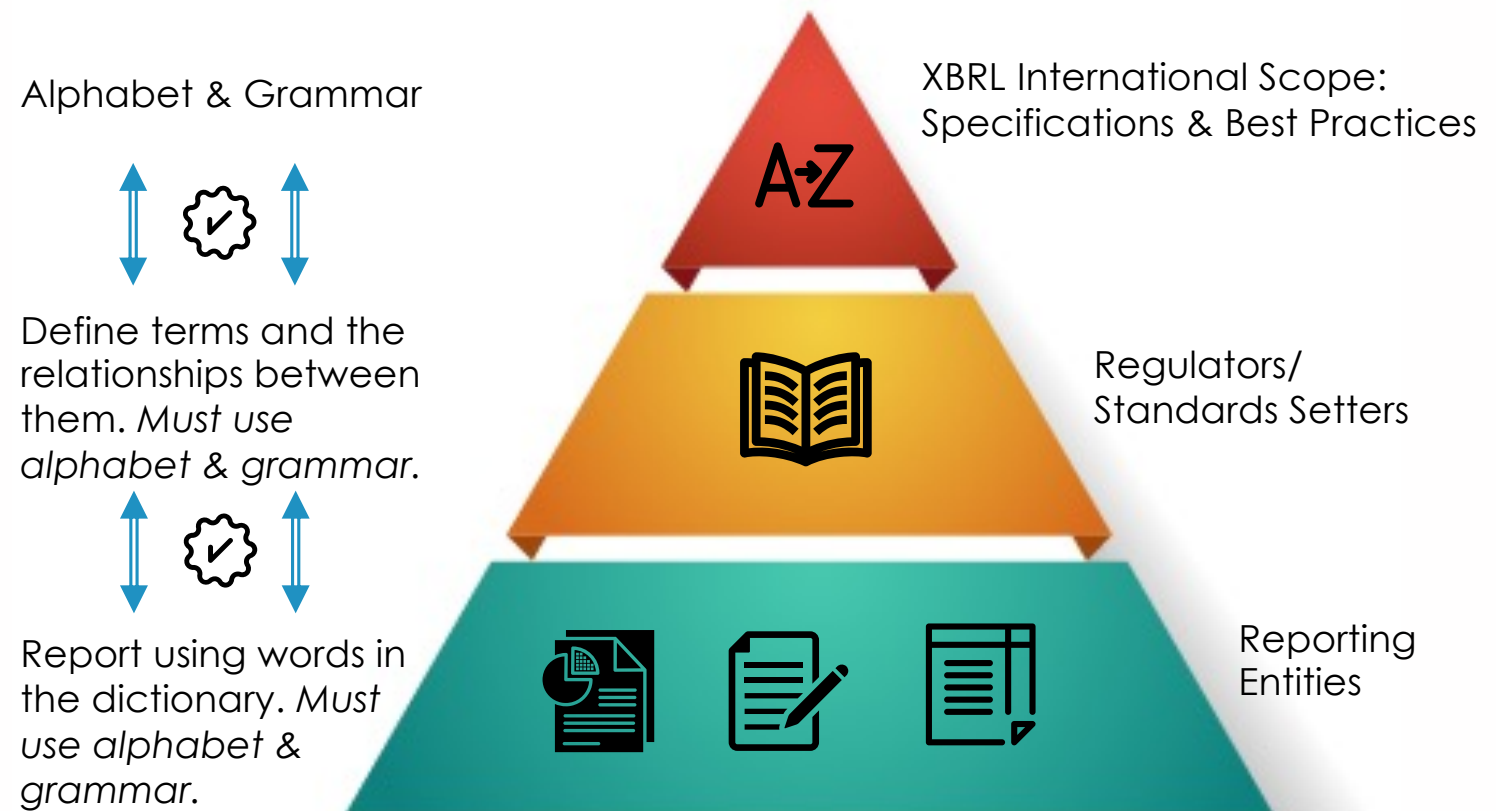


Board final approval, based on XSB and staff recommendation. Board needs to be satisfied that **relevant processes** have all been followed.

# An analogy...

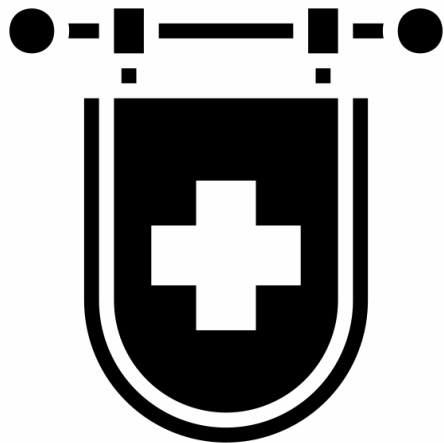
A flexible framework for digitisation of reports of any kind.

- Structured data powers analysis, discovery and insight.
- Corporate reports in particular are both complex and valuable.
- The XBRL standard provides a uniform way to prepare, file, publish and analyse this information.
- The framework can be used in a multitude of environments



# Switzerland!

We are content neutral and domain neutral

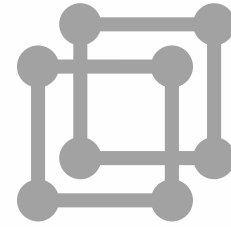


# Taxonomies capture...

## Amongst other things...

- Descriptions
- Relationships between concepts
- Authoritative References + Instructions
- Simple calculations

- $f(x)$  (Formulae)



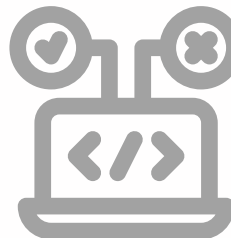
Special Relationships  
(Like Dimensions)



Units Registry



Multi-lingual descriptions



Strong data typing

(And more!)

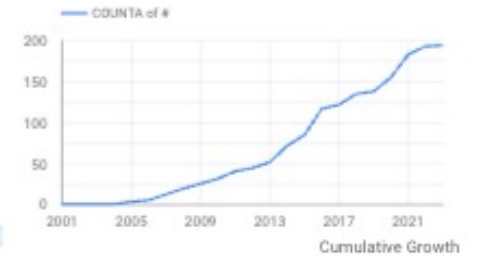
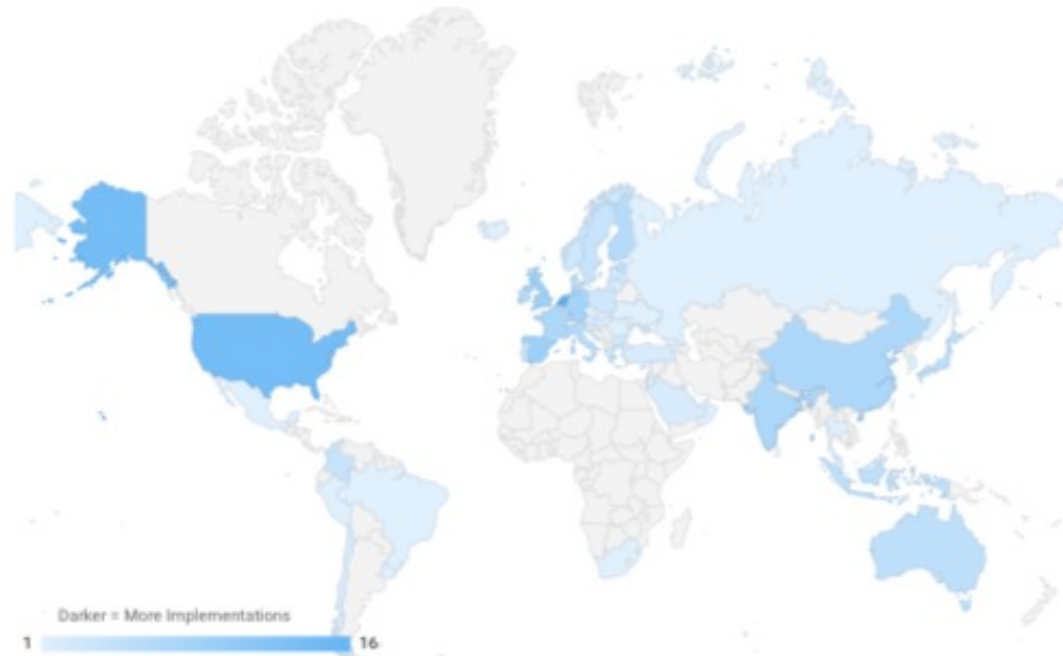
# The 2020s are a *global digital age*

- 210+ Mandates
- 130+ Regulators
- 60+ Countries
- 25M+ Companies



Category ▾

Number of Implementations  
**213**



Implementer ▾
U. S. Small Business Administration
Turkish Revenue Administration
Tokyo Stock Exchange
The Superintendency of the Securities Market
The Superintendence of Companies
The Royal Dutch Organization of Accountants
The Qatar Stock Exchange + Qatar Financial Markets Authority
The Mexican Stock Exchange and The National Banking and ...
The Insurance Commission
The Institute for the Supervision of Insurance

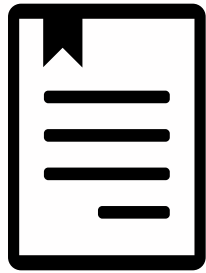
1 - 10 / 154 < >

Full details available at the [XBRL Project Directory](#).



# Reporting is ALWAYS an ecosystem

The standard provides a digital backbone for reporting ecosystems



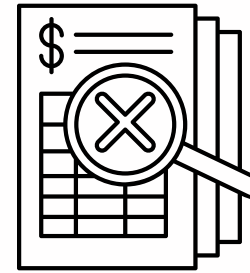
Standards  
Setters



Regulators



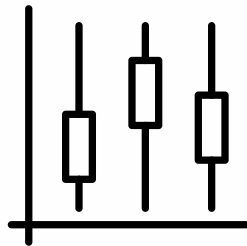
Banks/Companies



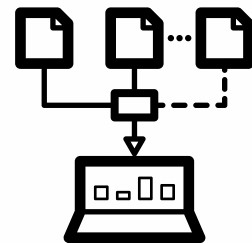
Auditors



(Certified)  
Software Vendors



Statisticians



Data Providers



Investors

# Core Evolution

**The Standard Itself**

# Evolution: Open Information Model or OIM

Strategic Effort to remove dependence on XML

OIM  
Meaning  
Required in  
Any Digital  
Report

$f(x)$



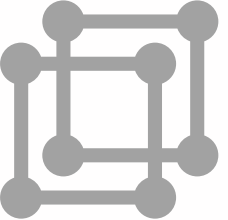
XBRL-XML



XBRL-JSON



XBRL-CSV



# (What is Inline XBRL?)

HTML + XBRL: Single Document. Machine Readable. Human Readable.

Inline XBRL documents contain marked up “tags” for relevant information.

They can look and feel like a “glossy” designed document, or equally, reflect a very simple layout.

The screenshot shows the 'Inline Viewer' interface for a sustainability report. It features a circular diagram with 'Purpose With you today, for a better tomorrow' at the center, surrounded by six pillars: Governance and leadership, Sustainable business, Measurement and reporting, Climate action, Engagements and communication, and Stronger communities. Below the diagram is a table of key initiatives. The main content area displays text from the report, including a section on carbon emissions and a 'Streamlined Energy and Carbon Reporting (SECR) data' table. A sidebar on the right shows 'Fact Properties' for the selected data point.

**Aviva plc Annual Report and Accounts 2021**  
1.18

**Our sustainability ambition continued**

**Streamlined Energy and Carbon Reporting (SECR) data**

	2021 <sup>1</sup>			2020 <sup>2</sup>		
	Offshore	UK	Total	Restated <sup>3</sup> Offshore	UK	Restated <sup>3</sup> Total
Emissions <sup>4</sup>						
Scope 1 (tCO <sub>2</sub> e)	1,760	8,870	10,630	3,352	8,386	11,738
Scope 2 (tCO <sub>2</sub> e)	5,640	—	5,640	8,610	8,269	16,879
Scope 3 (tCO <sub>2</sub> e)	2,944	1,072	4,016	3,078	1,910	4,988
<b>Total emissions (tCO<sub>2</sub>e)</b>	<b>10,344</b>	<b>9,942</b>	<b>20,286</b>	15,040	18,565	33,605
Carbon offsets <sup>5</sup> (tCO <sub>2</sub> e)	(10,344)	(9,942)	(20,286)	(15,040)	(18,565)	(33,605)
<b>Total net emissions</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>—</b>

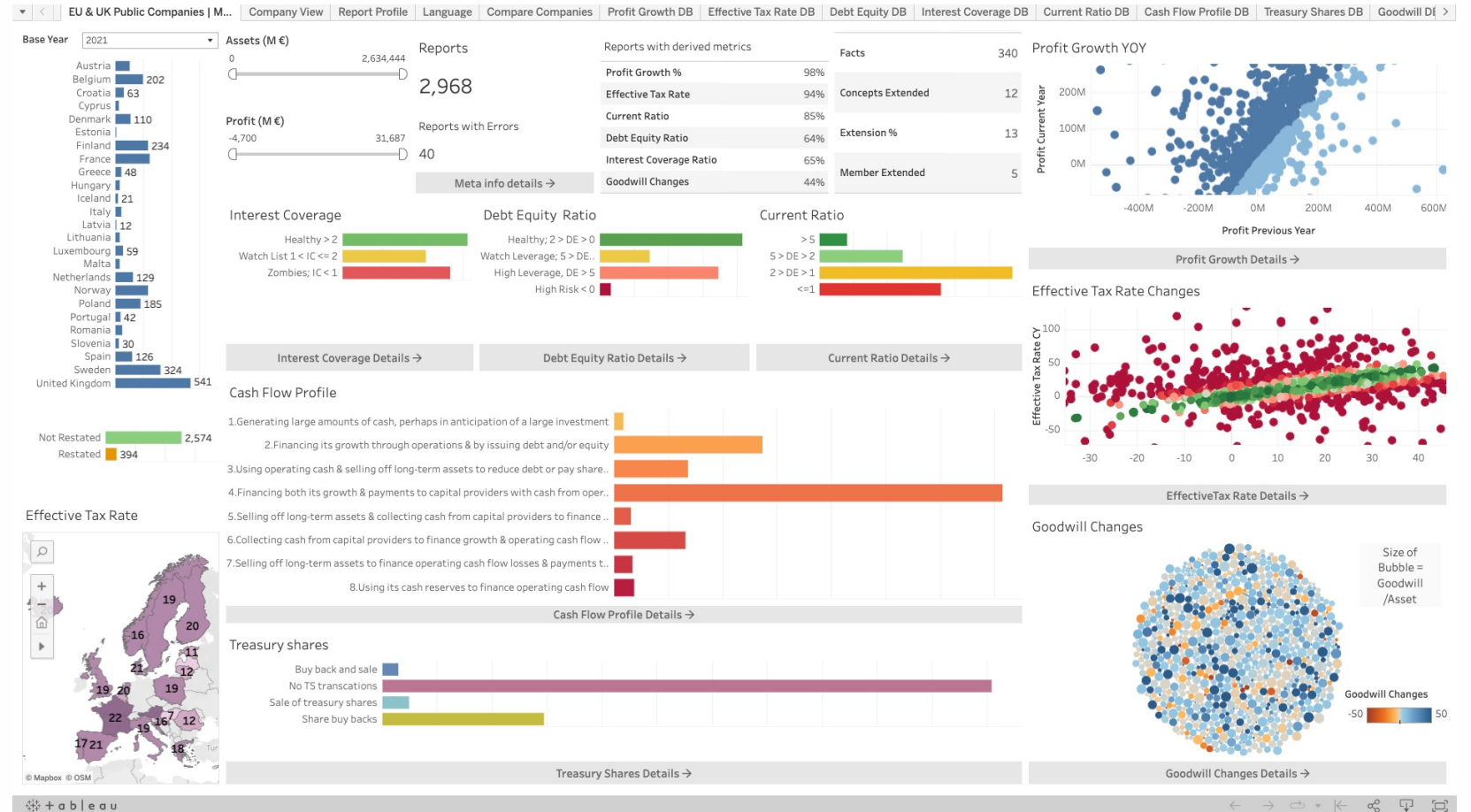
**Fact Properties**

- Concept: (direp) Emissions, direct, total
- Dimensions:
  - Reporting Region [Dimension]: UK and Offshore
- Date: 1 Jan 2021 to 31 Dec 2021
- Fact Value: 10,630 utrt
- Accuracy: 0 (ones)
- Change: 9.4% decrease on 1 Jan 2020 to 31 Dec 2020
- Entity: [LEI] YFOY5B0IB8SM0ZFG9G81
- Concept: direp:EmissionsDirectTotal
- Taxonomy: http://xbrl.frc.org.uk/reports/2022-01-01/direp

# Low hanging fruit – xBRL-JSON directly consumable

## Regulatory Dashboard

- Built from fxo – filings.xbrl.org
- Take the Inline XBRL
- Convert to xBRL-JSON
- Consume into Tableau
- (Or your choice of tool)

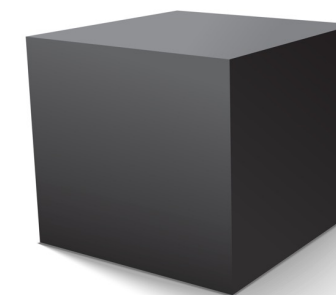


# Other developments...

## Digital Signatures in XBRL (including vLEIs). Report Packages.

Digital signatures provide verifiable proof that a document was signed by the claimed signatory.

Report packages contain XBRL reports and all supporting documents (including digital signatures and supporting files)



# Next big thing....

## Taxonomies

We also need to decouple taxonomies from their XML roots!

This work is starting.... As we shall see when we talk about formula!

Simplifying access to and use of taxonomy artefacts means...

~~EU TAXONOMY~~

“SMALL LIST WITH  
SOME INDENTS”

# FERC – Taxonomy-Driven Reporting

US regulated electricity supplier  
Extremely detailed financial,  
engineering and pricing data  
reporting obligations.

File in XBRL or Inline XBRL  
Data filed is then made  
available in familiar templates  
– they are populated via  
template | row | column  
mappings.

Line No.	Kind of Tax (See Instruction 5) (a)	Type of Tax (b)	State (c)	Tax Year (d)	BALANCE AT BEGINNING OF YEAR		Taxes Charged During Year (g)	Taxes Paid During Year (h)	Adjustments (i)	BALANCE AT END OF YEAR		DISTRIBUTION OF TAXES	
					Taxes Accrued (Account 236) (e)	Prepaid Taxes (Included in Account 165) (f)				Taxes Accrued (Account 236) (j)	Prepaid Taxes (Included in Account 165) (k)	Electric (Account 408.1, 409.1) (l)	Extraordinary Items (Account 409.3) (m)
1	Social Security Tax	Federal Tax	Federal	2022	216,342		1,230,966	1,770,733		(323,425)		1,686,742	
2	<b>Subtotal Federal Tax</b>				216,342		1,230,966	1,770,733		(323,425)		1,686,742	
3	Sales and Use	State Tax	KY	2022	143,795				(a) (143,795)				
4	<b>Subtotal State Tax</b>				143,795				(143,795)				
5	Property Tax	Local Tax	KY	2022	14,825,048				(b) (14,825,048)				
6	<b>Subtotal Local Tax</b>				14,825,048				(14,825,048)				
7	State Property Tax	Property Tax	KY	2022	2,604,132		19,855,185	11,744,464	(c) 14,825,048	25,539,901		15,509,813	



# FERC – Taxonomy Driven Reporting

Example mapping between templates/row/columns and concept names and dimensions.

Mapping generated from the taxonomy.

ELECTRIC PLANT LEASED TO OTHERS (Account 104)					
Row Number	Column Number	Label	Element	Period	Dimensions
1 - 46	a	Lessee Name	<i>LesseeName</i>	Current	ferc:ElectricPropertyLeasedToOthersAxis
1 - 46	b	Lease Description	<i>LeaseDescription</i>	Current	ferc:ElectricPropertyLeasedToOthersAxis
1 - 46	c	Commission Authorization	<i>CommissionAuthorization</i>	Current	ferc:ElectricPropertyLeasedToOthersAxis
1 - 46	d	Expiration Date of Lease	<i>ExpirationDateOfLease</i>	Current	ferc:ElectricPropertyLeasedToOthersAxis
1 - 46	e	Electric Plant Leased to Others	<i>ElectricPlantLeasedToOthers</i>	Current	ferc:ElectricPropertyLeasedToOthersAxis
1 - 46	new	Indication of Associated Company	<i>IndicationOfAssociatedCompany</i>	Current	ferc:ElectricPropertyLeasedToOthersAxis
47	e	Electric Plant Leased to Others	<i>ElectricPlantLeasedToOthers</i>	Current	

FERC FORM No. 1 (ED. 12-95)

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# FERC – Taxonomy Driven Reporting

Even descriptive guidance is generated from the taxonomy.

The FERC system is a massively complex data collection that involves extensive data validation.

Data validation is using next generation formula (not yet standardized)

## 227 - MATERIALS AND SUPPLIES

The Materials and Supplies Schedule is a fixed line schedule with a sequence table that allows filers to list additional items not included in the schedule. The schedule requires multiple values for each line item for two periods. This also applies to any additional items included in the sequence table.

Values in this schedule should be entered as positive amounts.

When the values are rendered the values that appear on the schedule are based on the value used for the report year and the report period.

The schedule reports the current period and includes opening instant values and closing instant values as well as duration items for the current period. These values will always be for annual periods as this schedule is not used for quarterly reports.

The schedule includes a validation rule that checks the subtotal of Plant Materials and Operating Supplies is calculated correctly.

The values in the schedule must be reported in US dollars.

The schedule uses typed dimensions to capture other materials and supplies not covered by the schedule.

Eight elements used on this schedule are shared with the Balance Sheet. These values if identified in the balance sheet will automatically appear in this schedule when rendered. If the values within the schedule are different then the reason for the difference should be identified with a footnote. The value from the balance sheet should be used on the schedule.

The Materials and Supplies schedule has a set of blank rows that allow the filer to describe other classes of materials and supplies. The user provided blank rows do not aggregate to a total. A total value cannot be supplied in XBRL as it will be dimensionally invalid. References are included in the taxonomy to indicate which dimension to use to disaggregate a total. These references are included on the abstract which is the parent to the individual rows on the sequence table. When rendered the rows added will appear below the heading. For each added row the filer will also have to provide a description of the item and the departments using the material as well as the current and prior period amounts. The dimension to use for each breakdown is listed below.

## List of Sequence Groups

Rows associated with the element MaterialsAndSuppliesOtherClassesAbstract can be defined by tagging the elements in the schedule 227 - Schedule - Materials and Supplies - Other Classes (<http://ferc.gov/form/2020-01-01/roles/Schedule/F1/ScheduleMaterialsAndSuppliesOtherClasses>) with the typed dimension ferc:MaterialsAndSuppliesOtherClassesAxis.

FuelStock

110 - Schedule - Comparative Balance Sheet - Assets And Other Debits

FuelStockExpensesUndistributed

110 - Schedule - Comparative Balance Sheet - Assets And Other Debits

Merchandise

110 - Schedule - Comparative Balance Sheet - Assets And Other Debits

NuclearMaterialsHeldForSale

# Generative AI and XBRL



# Prudential Data Must Be Analysed

If it's structured ... get out in front!

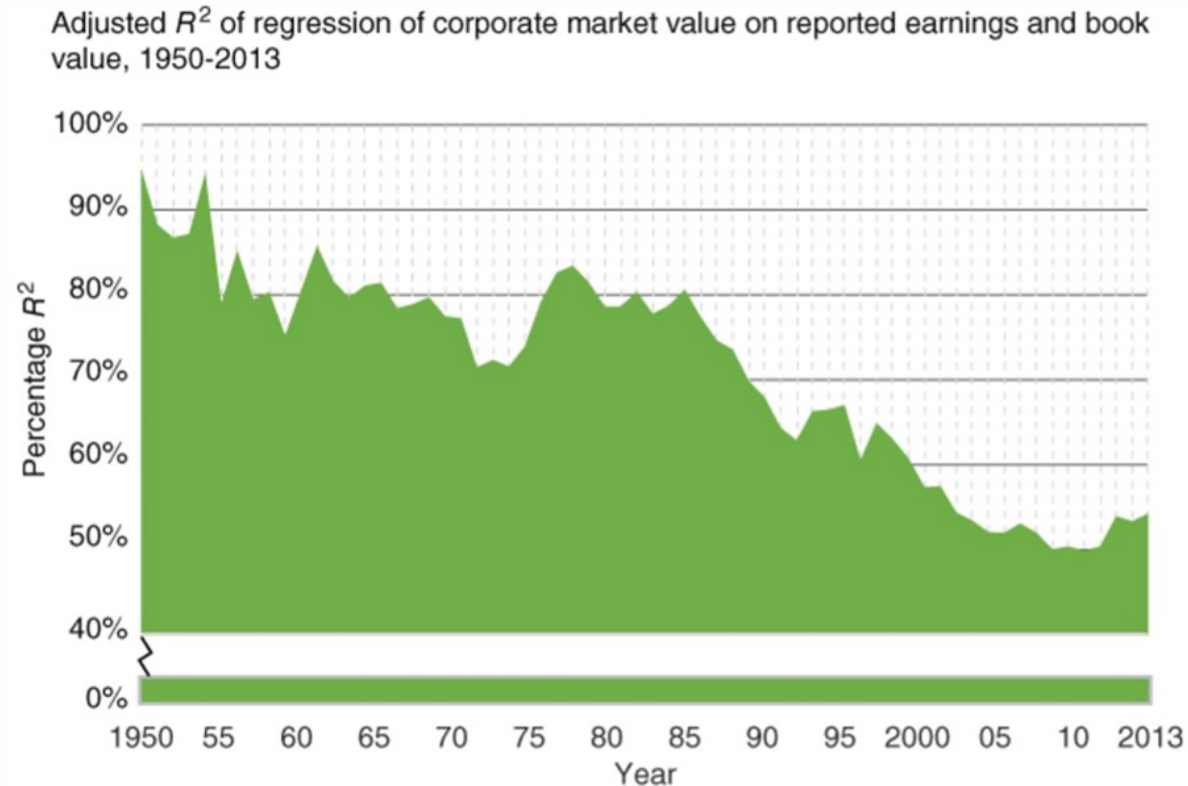
- SVB just the latest example... *regulators still not ahead of the shorts!*
- You have unique, exceptional, highly structured data sets.
- Suptech R&D we WANT to see is generative AI and regulatory data.



# Sustainability Disclosures

# Big Picture: Non-financial measures are important

Investors look to intangibles, business models, market position, more than traditional financials.



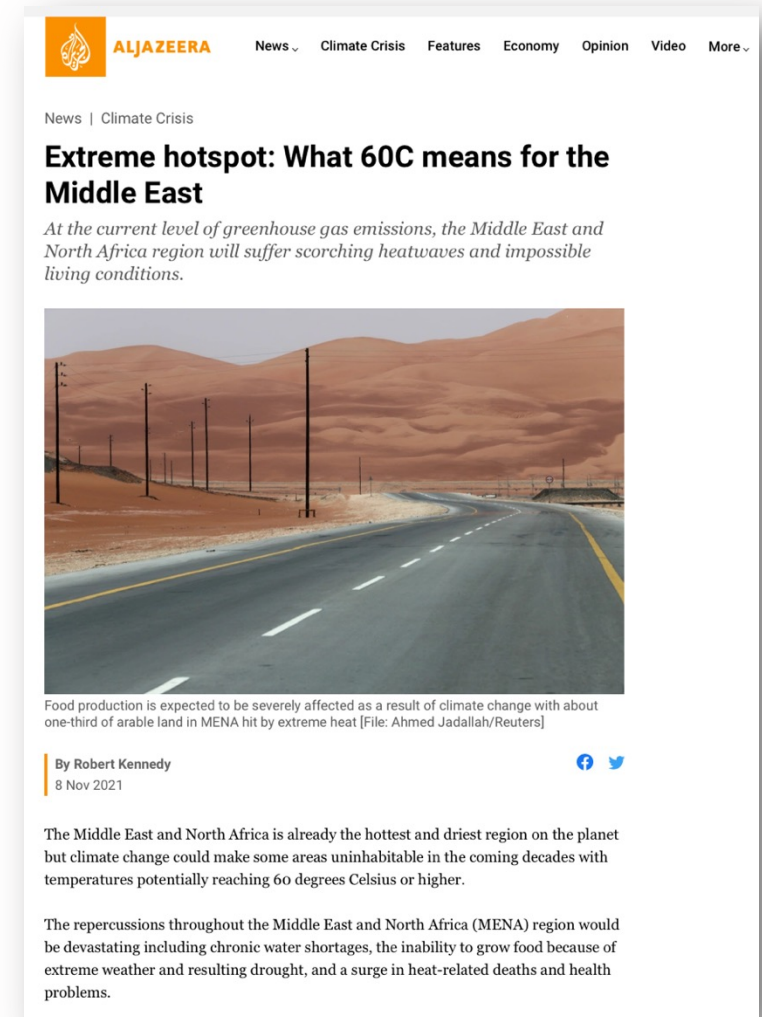
- Book value and reported earnings once governed valuations. Increasingly, this is only part of what investors look to.
- Questions about business model, intangible assets, relative market position and vulnerability to external shocks are what many investors focus on.

Source: [Baruch Lev, Feng Gu \*The End of Accounting and the Path Forward for Investors and Managers\* 2016](#)

# One Key External Shock: Climate Change

## Pandemic was a Dry Run...

- Citizens, governments and even (some) of the media are focussed on global climate change.
- Investors have a particular focus on the financial risks and opportunities that climate change presents to different parts of the economy.
- Many (if not yet most) *policy makers* are looking to almost every aspect of economic production, to identify levers that can be used to alter CO2 emissions.
- Disclosure is one of them.




The image shows a screenshot of a news article from Al Jazeera. The article is titled "Extreme hotspot: What 60C means for the Middle East" and is categorized under "Climate Crisis". The sub-headline reads: "At the current level of greenhouse gas emissions, the Middle East and North Africa region will suffer scorching heatwaves and impossible living conditions." Below the text is a photograph of a desert landscape with a road and power lines. The article is by Robert Kennedy, dated 8 Nov 2021. The main text states: "The Middle East and North Africa is already the hottest and driest region on the planet but climate change could make some areas uninhabitable in the coming decades with temperatures potentially reaching 60 degrees Celsius or higher." A second paragraph explains: "The repercussions throughout the Middle East and North Africa (MENA) region would be devastating including chronic water shortages, the inability to grow food because of extreme weather and resulting drought, and a surge in heat-related deaths and health problems."

ALJAZEERA News Climate Crisis Features Economy Opinion Video More

News | Climate Crisis

### Extreme hotspot: What 60C means for the Middle East

At the current level of greenhouse gas emissions, the Middle East and North Africa region will suffer scorching heatwaves and impossible living conditions.



Food production is expected to be severely affected as a result of climate change with about one-third of arable land in MENA hit by extreme heat [File: Ahmed Jadallah/Reuters]

By Robert Kennedy  
8 Nov 2021

The Middle East and North Africa is already the hottest and driest region on the planet but climate change could make some areas uninhabitable in the coming decades with temperatures potentially reaching 60 degrees Celsius or higher.

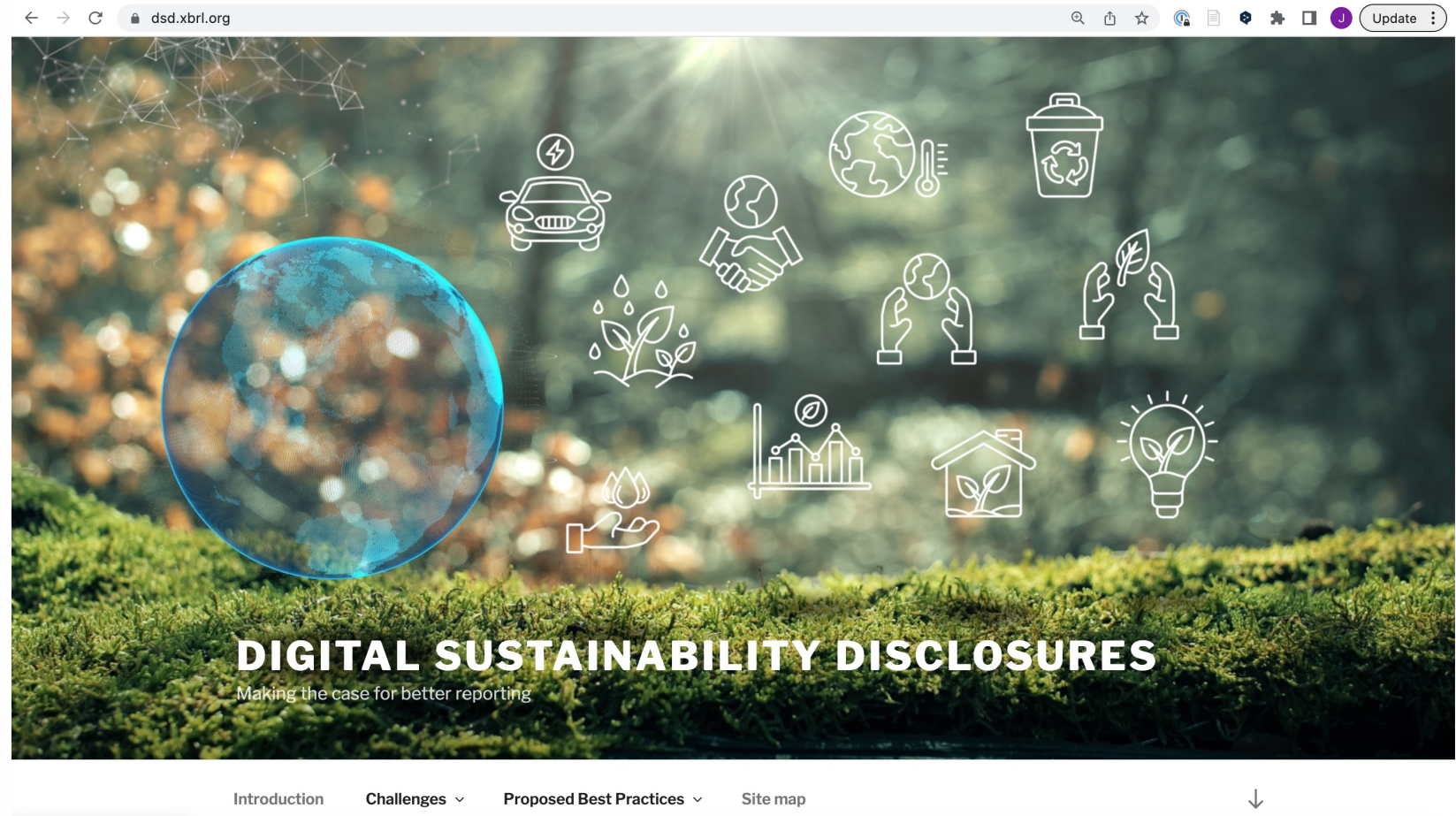
The repercussions throughout the Middle East and North Africa (MENA) region would be devastating including chronic water shortages, the inability to grow food because of extreme weather and resulting drought, and a surge in heat-related deaths and health problems.



# Collaboration

## Stakeholder Interest Group

- Sustainability Standards Setters
- Technical focus
- New requirements for ESG
- Proposed best practices
- Keep watching [dsd.xbrl.org](https://dsd.xbrl.org)



# Formula

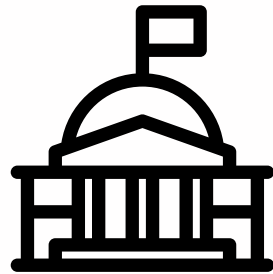
# Reporting is ALWAYS an ecosystem

The standard provides a digital backbone for reporting ecosystems



Regulators

$f(x)$



Supervisors

$f(x)$



Banks/Companies

$f(x)$



(Certified)  
Software Vendors

$f(x)$

# Reporting is ALWAYS an ecosystem

Change impacts the entire reporting ecosystem – which is why the XBRL community is so keen to ensure that however the Regulators process formula internally, that the taxonomy provides a single source of truth. Genuine ongoing, public interest desire to collaborate.



Regulators

X



Supervisors

27x

+ECB



Banks/Companies

5000x



(Certified)  
Software Vendors

60x

# Future of Formula - summary



## "XBRL Formula 2.0"

- Rapid formalisation of XF
- Completion of OIM Formula

## "XBRL Rules 3.0"

- New language
- Text-based
- Natively OIM compatible
- Built on XULE experience

# Formula evolution for European reporting

Problem	Solution
Validation time and hardware requirements	<b>XF</b> <ul style="list-style-type: none"><li>• Reduces taxonomy size (radically)</li></ul> <b>OIM Formula</b> <ul style="list-style-type: none"><li>• Reduces report model memory requirements</li><li>• Avoids CSV to XML conversion cost</li></ul>
Complexity of debugging validation rules	<b>XF</b> <ul style="list-style-type: none"><li>• Assertions are comprehensible to humans</li></ul>
Coverage of use cases by validation rules	<b>Formula 3.0 enhancements</b>
Complexity of implementing validation rules <ul style="list-style-type: none"><li>• Business experts think in terms of templates</li></ul>	<i>Template-centric assertions with XF?</i> <i>Range of taxonomy, external source potential</i>

# Template-centric assertions

- Load xBRL-CSV into an OIM model aligned with business templates
  - Template, row, column and sheet codes as dimensions
- Comprehensible assertions using an international standard
  - No need for custom DPM-XL and DPM-ML languages
  - Concise expression of rules across rows and columns
  - Simpler dimensional model (vs full semantic dimensions)
- Works with XBRL Formula as it stands today
- Benefits from future enhancements to XBRL Formula
- Reaffirms taxonomy as the Single Source of Truth for validation

```
"dp454790": {  
  "decimals": "$decimalsMonetary",  
  "dimensions": {  
    "concept": "eba_tmpl:mi",  
    "eba_tmpl:T": "F 36.01.a",  
    "eba_tmpl:R": "150",  
    "eba_tmpl:C": "70",  
  },  
  "eba:documentation": {  
    "CellCode": "{F 36.01.a, r0150, c0070}",  
    "logicalDataPointId": "41728"  
  }  
}
```

# DPM-XL transformed to abbreviated XF

with {tC\_90.00, r\*}: {c0070} \* {c0080} = {c0010}



```
1 namespace dpm = "http://www.eurofiling.info/xbml/ext/data-point-model";
2 cover all except t, s, r, c
3
4 assertion v10101_m {
5     unsatisfied-message (en) "with {tC 90.00, r*}: {c0070} * {c0080} = {c0010}"
6     with t[C_90.00]
7     test {c[0070]} * {c[0080]} = {c[0010]}
8 }
```

54 Characters (\*1,1)



# Get involved

- Open questions
  - How slow are things now?
  - How fast is fast enough?
  - Which tables & rules cause the most trouble?
- What we need
  - Realistic test data
  - Performance testing
  - Assistance with prototyping
  - Assistance with specification development

## Regulators



## Software vendors



Our **purpose** is to improve the accountability and transparency of business performance globally, by providing the open data exchange standard for business reporting.

Our standards are freely licensed. We operate in the public interest as a global not-for-profit.



**Join Us**  
[xbrl.org](https://xbrl.org)

Questions!



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