

IBM Sustainability Software

# Sustainable Product Design: The Time Is Now

—  
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IBM Engineering - Senior Product Manager

# Own your impact

Practical pathways to transformational sustainability  
[Link to ibm.com](https://www.ibm.com)

This report represents the 25<sup>th</sup> edition of the IBM Global C-suite Series

Data collected Q4 2021



Our research draws on input from

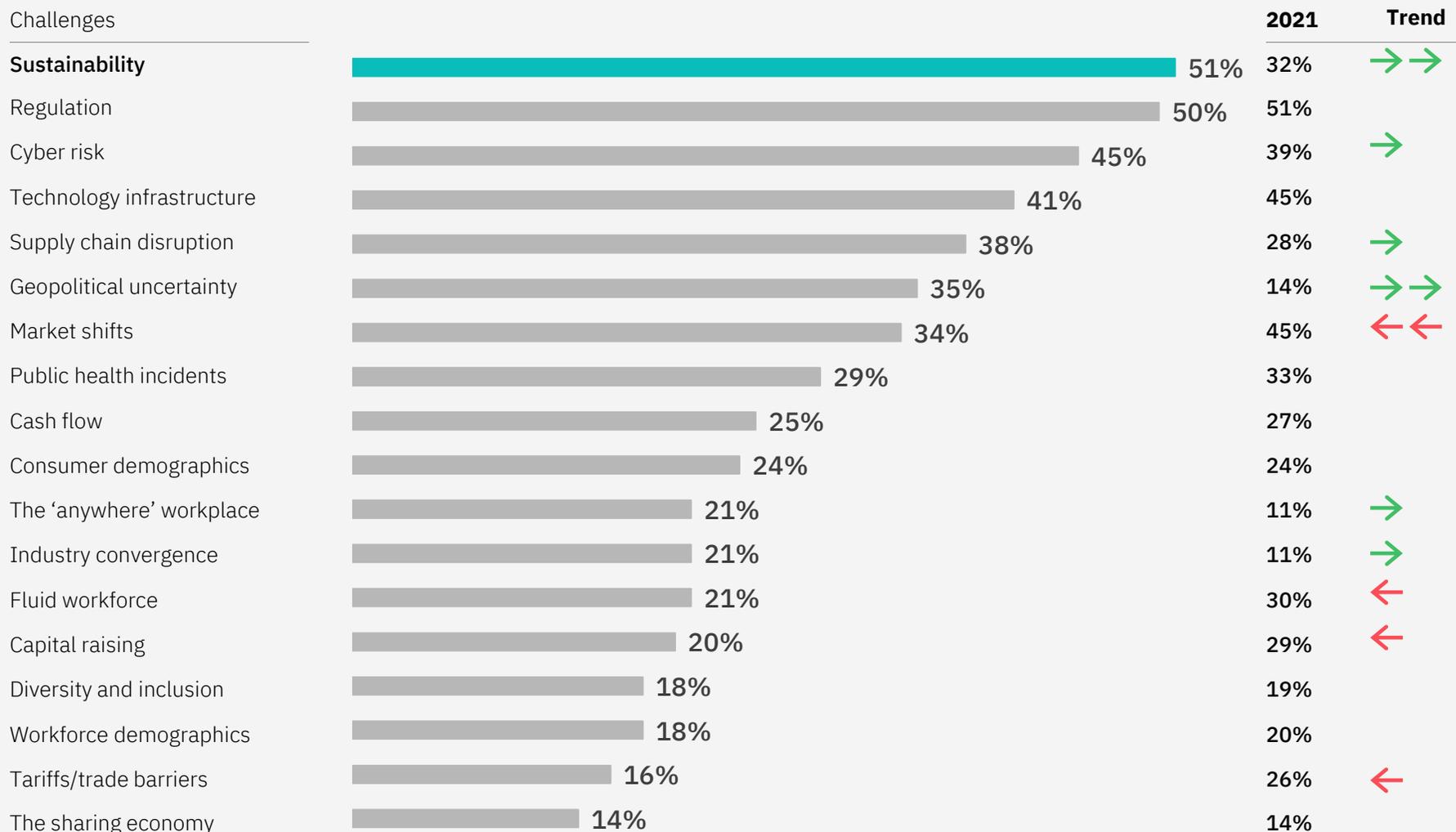
3,000  
Chief Executive Officers

28  
industries

40+  
countries

CEOs most frequently identify sustainability as their greatest challenge

### Expected greatest challenges for your organization over the next 2–3 years

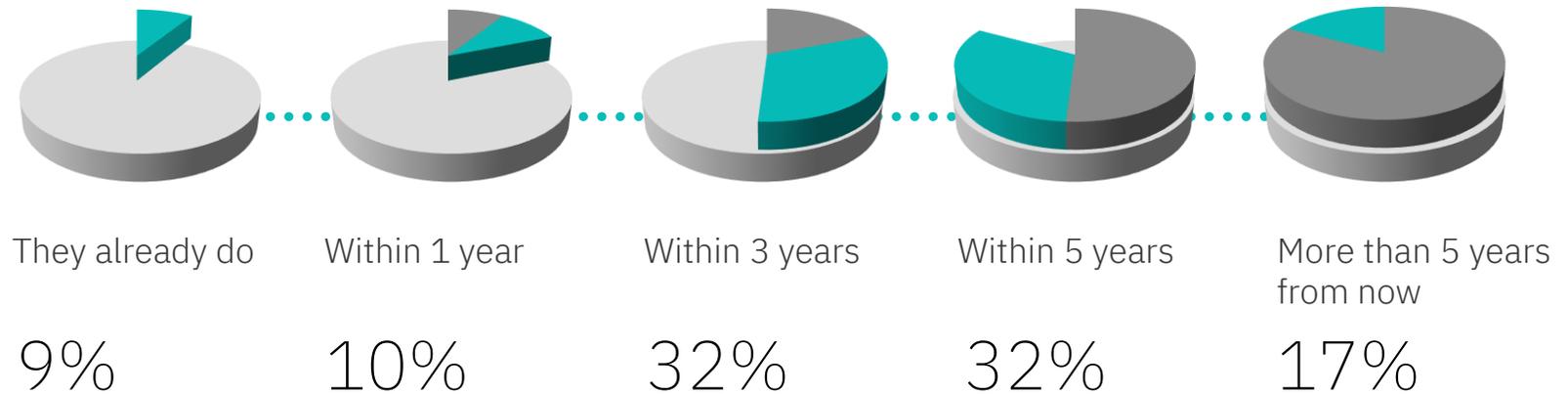


→ → Increase >10%    → Increase 5-10%    ← ← Decrease >10%    ← Decrease 5-10%

Q2. What do you expect will be the greatest challenges for your organization over the next 2–3 years?

Over **80%**  
of CEOs expect  
sustainability  
investments to  
produce improved  
business results in  
the next 5 years

### When will investments in sustainability produce improved business results



Q9. When do you expect your investments in sustainability to produce improved business results?

# Make sustainability matter

The World Economic Forum [reported](#) that the top five business risks are related to the environment. In addition:

- 62% of CXOs say sustainability is essential to remain competitive.
- 54% of consumers are willing to pay a premium for brands that are sustainable.
- 68% of employees prefer companies that have sustainable business practices.
- 59% of investors will choose companies that are [environmentally sustainable](#).



Innovative design  
is key to sustainability

80%

“Up to four-fifths of a product’s lifetime emissions are determined by decisions made at the design stage.”

McKinsey, 2022

“Product sustainability: Back to the drawing board”

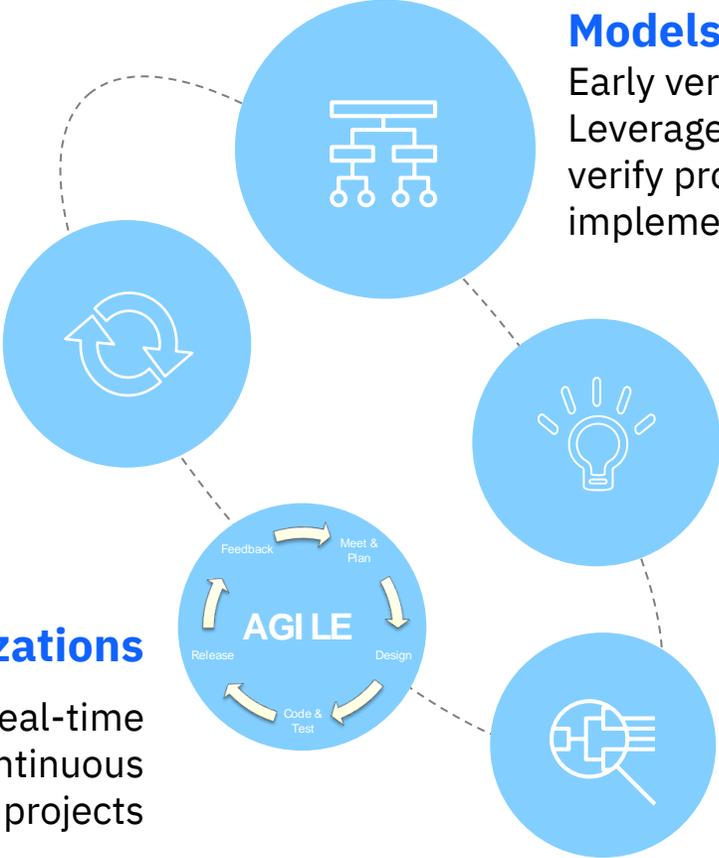
# These **five strategic themes** are underpinning the engineering transformation

## Strategic reuse

Support configurations of engineering data for strategic reuse across projects and products for efficient parallel development and variant management

## Scaled agile across organizations

Enable effective agile engineering with real-time feedback, team collaboration, and continuous delivery for multi-disciplinary projects



## Models for functional & domain engineering

Early verification with model-based design: Leverage design model to virtually optimize and verify product architecture before committing to implementation

## Digital threads for quality & efficiency

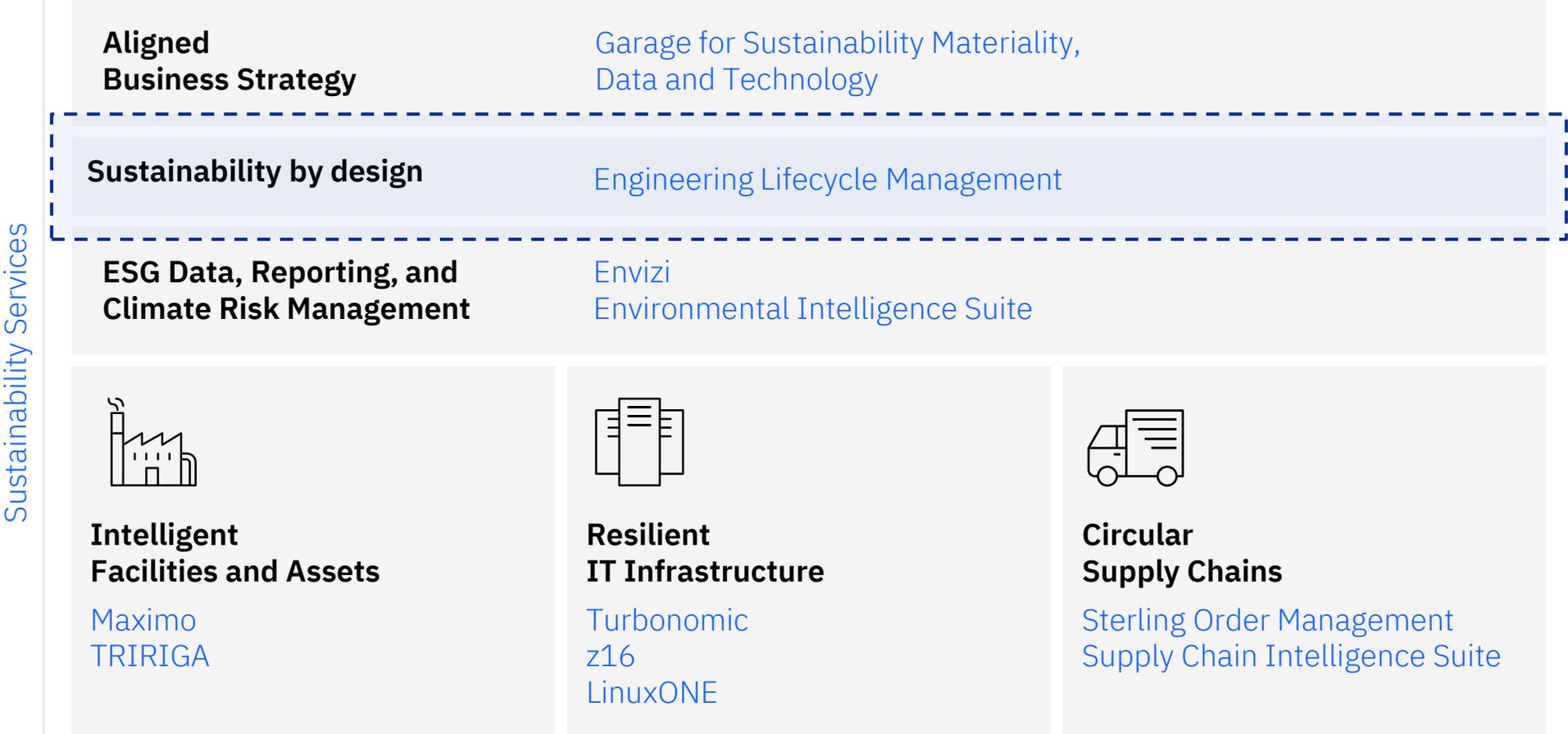
Enable cross-discipline digital threads to streamline impact of change analysis, standards compliance, and visibility

## Streamlined compliance

Create your work products with a system that foresees design control for every aspect and integrates compliance into the development process

# IBM Sustainability

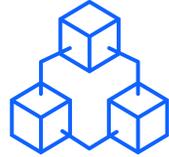
Turn sustainability ambition into action with **IBM** and an ecosystem of **partners**



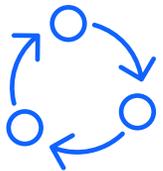
# IBM Engineering Lifecycle Management (ELM)



Foundational  
Requirements &  
System Design



Compliance &  
traceability



Seamless Product  
Development  
lifecycle



Model Based  
validation &  
optimization

## Product Design & Development

System & software engineering tools to transform engineering processes to create sustainable products, working across your supply chain.

Engineering Lifecycle Management enables various industry manufacturers and suppliers to define, implement, optimize, and validate products and systems that achieve breakthrough sustainability objectives.

# A Concrete Example: EU Taxonomy

*“The EU Taxonomy is a **green classification system** that translates the EU’s climate and environmental objectives into criteria for specific economic activities for investment purposes”*

*“It is a **transparency tool** that will introduce mandatory disclosure obligations on some companies and investors, **requiring them to disclose their share of Taxonomy-aligned activities.**”*

*“In addition, it can **guide market participants** in their investment decisions.”*

*“(…) it is expected that over time, the EU Taxonomy will be **an enabler of change** and encourage a **transition towards sustainability.**”*

Regulations are prepared to avoid “green washing”!

[More info on EU Taxonomy](#)



# EU Taxonomy Compass

Nice presentation but not easy to work in

## EU Taxonomy Compass

Q

### Construction of new buildings contribution to climate mitigation x

Sector ▾	Activity ▾	Climate mitigation	Climate adaptation
Construction and real estate activities	<a href="#">Construction of new buildings</a>	+	+
Construction and real estate activities	<a href="#">Renovation of existing buildings</a>	+ T	+
Construction and real estate activities	<a href="#">Installation, maintenance and repair of energy efficiency equipment</a>	+ E	+
Construction and real estate activities	<a href="#">Installation, maintenance and repair of charging stations for electric vehicles in buildings (and parking spaces attached to buildings)</a>	+ E	+

Description ▾

Substantial contribution criteria ▲

Constructions of new buildings for which:

- The Primary Energy Demand (PED)<sup>(281)</sup>, defining the energy performance of the building resulting from the construction, is at least 10 % lower than the threshold set for the nearly zero-energy building (NZEB) requirements in national measures implementing Directive 2010/31/EU of the European Parliament and of the Council<sup>(282)</sup>. The energy performance is certified using an as built Energy Performance Certificate (EPC).
- For buildings larger than 5000 m<sup>2</sup> <sup>(283)</sup>, upon completion, the building resulting from the construction undergoes testing for air-tightness and thermal integrity<sup>(284)</sup>, and any deviation in the levels of performance set at the design stage or defects in the building envelope are disclosed to investors and clients. As an alternative; where robust and traceable quality control processes are in place during the construction process this is acceptable as an alternative to thermal integrity testing.
- For buildings larger than 5000 m<sup>2</sup> <sup>(285)</sup>, the life-cycle Global Warming Potential (GWP)<sup>(286)</sup> of the building resulting from the construction has been calculated for each stage in the life cycle and is disclosed to investors and clients on demand.

Do no significant harm criteria ▲

Climate adaptation ▾

Water ▾

Circular economy ▾

Pollution prevention ▾

Biodiversity ▾

Minimum safeguards ▾

# EU Taxonomy imported into ELM

Structured document view with links and metadata

The screenshot displays the IBM Engineering Requirements Management (ELM) interface. The top navigation bar includes 'Olive Oil Requirements', 'Project Dashboard', 'Artifacts', 'Reviews', and 'Reports'. The main content area shows a structured document view for '5298 EU Taxonomy Regulation'. A left sidebar contains a 'Views' section with a search bar and a link to 'Climate mitigation Significant criteria'. The main table lists various taxonomy activities with their IDs, descriptions, and associated metadata.

ID	Contents	EU Taxonomy Activity	EU Taxonomy Criteria Type	EU Taxonomy Category	Comply
5298	-1 Construction and real estate activities				
5300	-1.1 Construction of new buildings				
5301	Development of building projects for residential and non-residential buildings by bringing together financial, technical and physical means to realise the building projects for later sale as well as the construction of complete residential or non-residential buildings, on own account for sale or on a fee or contract basis.  The economic activities in this category could be associated with several NACE codes, in particular F41.1 and F41.2, including also activities under F43, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.				
5302	-1.1.1 Climate mitigation				
5310	-1.1.1.1 Substantial contribution criteria				
5308	Constructions of new buildings for which:  1. The Primary Energy Demand (281: PED) , defining the energy performance of the building resulting from the construction, is at least 10 % lower than the threshold set for the nearly zero-energy building (NZEB) requirements in national measures implementing Directive 2010/31/EU of the European Parliament and of the Council(282) . The energy performance is certified using an as built Energy Performance Certificate (EPC).	Construction of new buildings	Substantial contribution criteria	Climate mitigation	
5317	2. For buildings larger than 5000 m2 (283) , upon completion, the building resulting from the construction undergoes testing for air-tightness and thermal integrity(284) , and any deviation in the levels of performance set at the design stage or defects in the building envelope are disclosed to investors and clients. As an alternative, where robust and traceable quality control processes are in place during the construction process this is acceptable as an alternative to thermal integrity testing.	Construction of new buildings	Substantial contribution criteria	Climate mitigation	
5318	3. For buildings larger than 5000 m2 (285) , the life-cycle Global Warming Potential (GWP)(286) of the building resulting from the construction has been calculated for each stage in the life cycle and is disclosed to investors and clients on demand.	Construction of new buildings	Substantial contribution criteria	Climate mitigation	
5311	-1.1.1.2 Do no significant harm criteria				
5309	The building is not dedicated to extraction, storage, transport or manufacture of fossil fuels.  The Primary Energy Demand (281: PED)(571) setting out the energy performance of the building resulting from the construction does not exceed the threshold set for the nearly zero-energy building (NZEB) requirements in national regulation implementing Directive 2010/31/EU. The energy performance is certified using an as built Energy Performance Certificate (EPC).	Construction of new buildings	Do no significant harm criteria	Climate mitigation	

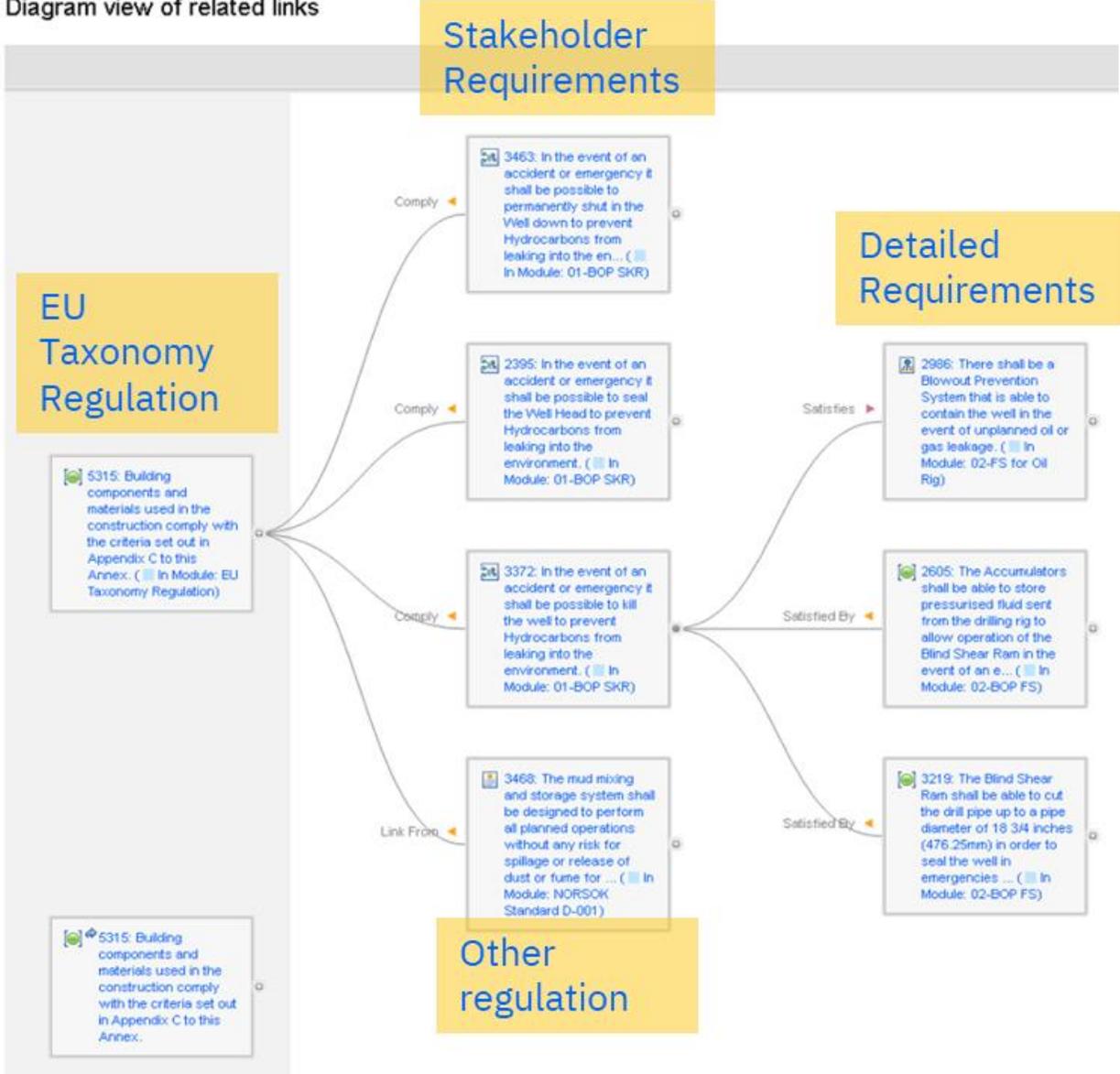
Showing 57 of 57 (100%)

# EU Taxonomy Regulations with ELM

Graphical view of linked data to do impact assessments and get an overview of compliance links

ELM is a powerful evidence system!

Diagram view of related links



# Honeywell MicroVCS Program using IBM ELM + pure::variants

Nominated for an Aviation Week 2022 Program Excellence Award

*Program Excellence Award submission  
by Christine Shea et al. Christine is Sr  
Systems Engineering Technical Manager  
in Environmental Control Systems,  
Honeywell*



Honeywell's Micro Vapor Cycle System is the ideal cooling solution for urban air mobility aircraft and military & civil helicopters where reduced size and weight are priorities.

- 35 percent lighter and 20 percent more efficient than conventional vapor cycle systems with comparable cooling capacity
- highly reliable and virtually maintenance free
- lower Global Warming Potential (GWP)

The MicroVCS program team

- reduced product development cycle time from 48-months to 24-months while simultaneously
- reducing R&D investment by 30 percent



*Micro VCS Condenser and  
Evaporator Fan Assembly*

Turn sustainability  
ambition into action



