SUSTAINABILITY & THE ROLE OF THE ACTUARY

New challenges, opportunities and approaches:

Sustainability-Related Tasks for Actuaries

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EUROPEAN STANDARD OF ACTUARIAL PRACTICE 3

Existing ESAP3 implicitly covers ESG risks under article 3.1.1.
"*In considering whether the ORSA process follows an appropriately structured approach to uncertainty, the actuary should take into account whether it […] enables **new and emerging risks**, and approaches to risk, to be incorporated as they are identified*"

ESAP3 was approved in 2017 and is now subject to a mandatory review, including a view to **explicitly incorporate sustainability-related matters** (e.g. climate scenarios in ORSA)

New AAE taskforce launched in April 2022, led by Jules Krijgsman van Spangenberg (Netherlands, ASSC).

Upcoming ORSA Requirements - Climate Models

Definitely Read:

EIOPA Guidance for Climate Risk in ORSA:	https://www.eiopa.europa.eu/sites/default/files/publications/opinions/opinion-on-climate-change-risk-scenarios-in-orsa.pdf
IAA Climate Science: A Summary for Actuaries	https://www.actuaries.org/IAA/Documents/Publications/Papers/Climate_Science_Summary_Actuaries.pdf
Webinar, Recordings	https://www.actuaries.org/iaa/IAA/Publications/Papers/Climate_Issues/IAA/Publications/Climate_Issues.aspx https://www.youtube.com/InternationalActuarialAssociation
IAA Introduction to Climate-Related Scenarios	www.actuaries.org/IAA/Documents/Publications/Papers/CRTF_Introduction_Climate_Scenarios.pdf
IAA Application of Climate-Related Risk Scenarios to Asset Portfolios	https://www.actuaries.org/IAA/Documents/Publications/Papers/CRTF_Paper4_Asset_Portolios.pdf
EIOPA launches climate stress test for the European occupational pension sector	https://www.eiopa.europa.eu/media/news/eiopa-launches-climate-stress-test-european-occupational-pension-sector_en

Also Consider:

CEP Climate Financial Risks	https://www.cepweb.org/wp-content/uploads/2020/12/CEP-DN-Comparing-climate-risk-metrics-Final-2.pdf
NGFS Climate Scenarios for central banks and supervisors	https://www.ngfs.net/sites/default/files/media/2021/08/27/ngfs_climate_scenarios_phase2_june2021.pdf
ECB ST on for the banks	https://www.bankingsupervision.europa.eu/press/pr/date/2022/html/ssm.pr220127~bd20df4d3a.en.html#:~:text=The%20European%20Central%20Bank%20(ECB,ECB%20will%20publish%20aggregate%20results.
IAA Climate-Related Scenarios Applied to Insurers and Other Financial Institutions	https://www.actuaries.org/IAA/Documents/Publications/Papers/CRTF_Application_Climate_Scenarios.pdf
IAIS paper on transition risk	https://www.iaisweb.org/uploads/2022/01/210930-GIMAR-special-topic-edition-climate-change.pdf
Statement of Intent (SOI) for IAA Activities on Climate-Related Risks	https://www.actuaries.org/IAA/Documents/CMTE_EXEC/ClimateRisk_TF/Final_SOI_on_Climate_Risks_Approved_7May2020.pdf

Climate Models Reading – My Favourite Parts

Definitely Read:

EIOPA Guidance for Climate Risk in ORSA:	Annex 3/4: Mapping of Climate Risks to prudential Risks. Annex 5: Illustrative Example. 2 scenarios with at least one >2°C. Example Risks pp13-15.
IAA Climate Science: A Summary for Actuaries	Annex I: Data description and sources. Good Presentation Methods in general. Language of Certainty p6-7. Past Trend insufficient p17. Comparable pathways - 5 scenarios from IPCC AR6 p20-1. Regions & CIDs p34-47. Cummulative Carbon & Temperature p48-49.
IAA Introduction to Climate-Related Scenarios	Complexity presentation Sec 1.5. Approaches to Risk Analysis Sect 3. Annex I Scenarios (though 8.5°C missing.) Annex II References (could be more descriptive.)
IAA Application of Climate-Related Risk Scenarios to Asset Portfolios	Top-down Sec 3. Open Source Projects p14. Need for Implied Temperature Rise Sec 5.3. Sample Solvency Ratio Impacts Fig 8.
EIOPA launches climate stress test for the European occupational pension sector	No comments

Upcoming ORSA ~~Requirements~~ Guidance

1. Say something about climate.
2. At least 2 climate scenarios, at least one of which over 2° C.

Notes:

1. NOT de facto Standard
2. EIOPA interested in what companies will develop.
   - No more guidance to come.
3. Consistency between companies NOT a current issue.

4. Eventually, this may inform changes to standard formula.*

*See for example:
https://www.eiopa.europa.eu/sites/default/files/publications/methodological_paper-potential-inclusion-of-climate-change-in-the-natcat-standard-formula.pdf

For ORSA

Choose scenarios:

Recognise trade-off between **Physical vs. Transition Risks**.

Move paradigm from statistical (historic) modelling

to include climate science base scenarios.

Non-Life:

NatCat (and other physical) projection:

- **Incorporate Climate Scenario projections** of frequency & severity

Life/Pensions:

Regional Physical Risk overlays for mortality.

- **Physical risk overlay** to mortality
- **Unrest & Immigration** components

All Lines, methodologies:

Projection over time vs shocks to current portfolio.

Strategic assessment: viability of product lines.

Missing Elements from Climate Literature

The Society-Company Tension

- EIOPA: “resilience of the company’s business model and strategy…”

Treatment of long-vs-short timeframes

- Market Consistent vs Real World projections
  - e.g. Relationship between GDP projections and insurance reserves

Parameter changes

- Behaviour Tipping Points vs. Physical Tipping Points

ESG rating validation

- e.g. No exclusion strategies.
- e.g. Be suspicious of monetary based “carbon intensity” metrics

Missing Elements (2)

ESG Rating Validation

Consider: **Exclusion or Negative- Screening - Either Investments or liability underwriting**

- ESG investment ~$23 tr. (2016), Of which $15 tr. are negative/exclusionary screening*

Implication of exclusionary strategy:

- If all insurers/pension avoided carbon-intensive industries, then the remaining investors would be those with non ESG-like guiding principles, i.e. those with no incentive to change.
- Is “Exclusion” essentially Washing hands of climate issue?

  Note: Exclusion strategy often does not benefit society.

FIX: **Engagement** – As shareholder for investments
As insurance provider through underwriting.

* Certificate in ESG Investing – Official Training Manual, Ed. 1, CFA Society UK. (p 33)

Missing Elements (3)

ESG Rating Validation

Consider: **Economic/Monetary Exposures**

Common methodology*: Carbon Intensity = $\frac{Carbon\ Emissions}{Monetary\ Exposure}$

Typical Monetary Exposures*: Revenue, Income, Market Cap, Market Share, Tot Assets, GDP.

Are these Science Based Targets? See SBTi

Monetary-based methodologies are misleading.
Higher revenue or market share or GDP indicates lower intensity without lower emissions.

Bad Results: "As long as we grow enough, our carbon intensity improves."
"Company with the highest prices is lowest carbon emitter."

FIX: **Change Exposure**. Use Non-market, non-money exposures for comparison,
e.g. Kwh, Btu/J, km-ton, people-hrs, etc.

Sample - New ESG Portfolio Analysis

Adjustment for "Exclusions" & No Monetary Exposures

Sector	Exposure (Exp)	Benchmark: EU		Portfolio	
		Total Exp	CO_2 per Exp	Total Exp	CO_2 per Exp
Energy	kwh	t_B_1	C_B_1	t_P_1	C_P_1
Logistics	km-ton	t_B_2	C_B_2	t_P_2	C_P_2
Commute	km-people	t_B_3	C_B_3	t_P_3	C_P_3
Production	tons cement	t_B_4	C_B_4	t_P_4	C_P_4
Software	people-hrs of use	t_B_5	C_B_5	t_P_5	C_P_5
Heating	BTU or J	t_B_6	C_B_6	t_P_6	C_P_6
:	:				
Total CO_2		$\sum t\_B_i \cdot C\_B_i$		$\sum t\_P_i \cdot C\_P_i$	

- Like-for-like comparison of Portfolio to Benchmark (% improvement):

$$1 - \frac{\sum t\_P_i \cdot C\_P_i}{\sum t\_P_i \cdot C\_B_i}$$

How to Affect Climate Change?: Investments

Assets and investments are crucial.

How to invest for long-term sustainability?

– Signal willingness to invest
– Structure so client has quick payback: Is Cashflow positive from day 0?

Transform long-date assets to be Sustainable...

– e.g. maintenance assurance contracts.

Find Liabilities that match sustainable assets.

– e.g. Perpetual annuities. Perhaps specifically linked to policyholder needs.