WORKING PAPER

ESG Risks in the Spotlight of ICAAP and ILAAP

From Regulatory Obligation to Strategic Opportunity

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Abstract

The integration of Environmental, Social, and Governance (ESG) factors into the risk management of financial institutions remains highly relevant despite recent adjustments to regulatory frameworks like the Corporate Sustainability Reporting Directive (CSRD). ESG risks are not only a regulatory obligation but also a strategic lever to enhance the future viability and resilience of institutions. Supervisory authorities are increasingly emphasizing the systematic inclusion of ESG risks, particularly in the context of the Internal Capital Adequacy Assessment Process (ICAAP) and the Internal Liquidity Adequacy Assessment Process (ILAAP). This development offers institutions the opportunity to use ESG factors not only for risk mitigation but also for active management and competitive positioning. Institutions that embrace ESG as a strategic driver will lead the transformation toward sustainable finance. This paper analyses the necessity of integrating ESG risks into internal management and risk processes, outlines supervisory expectations, and presents a structured implementation approach—from governance to operational execution in the first line of defence—with particular attention to strategic value.

1. Introduction: The Persistent Relevance of ESG Risks for the Financial Sector

The European Green Deal and the associated action plan by the European Commission aim to achieve a climate-neutral economy by 2050. A key mechanism for reaching this goal is the targeted steering of financial flows. This intention is reflected in a comprehensive and

continually evolving regulatory framework that addresses all segments of the financial sector—banks, insurers, and asset managers.

Although the so-called "Omnibus Package 1" has led to a simplification of the CSRD, initially easing pressure on the industry, it should not be misinterpreted as a relaxation of regulatory requirements for ESG risk management. On the contrary, the focus is increasingly shifting toward the integration of ESG aspects into central management processes. ESG risks are becoming an important strategic management element—with direct influence on capital allocation, refinancing costs, and business model evaluation.

Supervisory expectations are not only being updated but also significantly clarified and tightened. In January 2025 (a hypothetical date used to illustrate the paper's timeliness), the European Banking Authority (EBA) reaffirmed the integral role of ESG risk management in the Supervisory Review and Evaluation Process (SREP), including the full range of supervisory and sanctioning instruments. These guidelines, effective from January 11, 2026, for most institutions and from January 11, 2027, for small and non-complex institutions, define comprehensive requirements for identifying, measuring, managing, and monitoring ESG risks. They emphasize that institutions must develop plans to ensure resilience to ESG risks over short-, medium-, and long-term horizons, in alignment with the EU's climate neutrality objective by 2050.

In parallel, drafts of guidelines for ESG scenario analyses have been subject to public consultation. On the national level too—such as through Austria's Financial Market Authority (FMA) guidance issued in 2025—supervisory intensity is increasing.

While large institutions directly supervised by the European Central Bank (ECB) have long been expected to implement the expectations outlined in the ECB's ESG guide, midsize and smaller institutions are now increasingly in focus. These play a key role in financing the real economy, real estate, infrastructure projects, and leasing markets.

Smaller institutions, while often facing different implementation dynamics and resource constraints, play a pivotal role in regional socio-economic transformation. Their proximity to local communities positions them as key enablers of sustainable finance. However, they are not shielded from supervisory expectations nor from reputational asymmetries—public scrutiny or ESG missteps can disproportionately impact their stakeholder trust, despite a smaller systemic footprint. Regardless of the valid application of the proportionality principle with respect to risk content, complexity, and institutional size, fundamental requirements—such as extending time horizons in scenario analyses under CRD/CRR—remain unchanged.

The focus has shifted from debating *whether* ESG matters to determining *how well* institutions can operationalize ESG to enhance both compliance and competitiveness. Active engagement with ESG risks presents an opportunity to combine regulatory compliance with economic value creation and to future-proof sustainable business models.

This paper analyses the key components of ESG-compliant risk management within ICAAP and ILAAP and illustrates implementation strategies through practical examples. Supervisory-preferred methodologies such as the exposure/risk method, the alignment method, and the scenario method are contextualized.

2. Integrating ESG in ICAAP/ILAAP

The traditional ICAAP and ILAAP, comprising six interdependent phases, must be consistently expanded to include ESG perspectives and aligned more closely with overall bank steering. ESG integration should not be understood as an additional layer, but as a cross-sectional perspective that can have a targeted impact in each phase:

1. **ESG-informed governance**: This involves the critical review and, if necessary, adjustment of the business model, overarching institutional strategy, and derived strategies for business areas and organizational units—especially the second (risk controlling, compliance) and third lines of defence (internal audit). Explicit inclusion of ESG expertise in decision-making bodies and clear assignment of responsibilities along the governance structure are key success factors.
2. **Comprehensive risk inventory**: At least annually—and on an ad hoc basis as needed—a systematic risk inventory must be conducted. This must explicitly address ESG risks, transparently disclose the institution's exposure, and incorporate both qualitative and quantitative early warning indicators.
3. **Quantitative assessment of ESG risks**: The financial impacts of ESG risks and their influence on the institution's liquidity position must be quantified to estimate their potential magnitude. Appropriate ESG stress tests and sensitivity analyses that exceed minimum regulatory requirements should be developed.
4. **Integration into risk-bearing capacity (RBC)**: Quantified ESG risks must be compared against available economic and regulatory capital within the RBC framework. This analysis will determine potential capital or liquidity needs, the need to adjust limits, risk concentration guidelines, and organizational measures. ESG-specific risk tolerances should be defined within the Risk Appetite Framework.
5. **Transparent reporting**: Results of the ESG risk analysis must be integrated into regular ICAAP/ILAAP reports and communicated appropriately to various management levels and supervisory bodies. Interfaces with external (sustainability) disclosures and supervisory reporting must be defined—especially in terms of data consistency with CSRD/ESRS requirements.
6. **Operational anchoring and adjustments**: Beyond reporting cycles, organizational, procedural, and methodological adjustments must be made in operational units (especially front and middle office), as active ESG risk management primarily occurs in or near the first line of defence. ESG capability building and provision of appropriate tools are essential.

Implementing ESG aspects in each of these phases presents a significant challenge and affects nearly all business and service areas within a financial institution. At the same time, it provides

an opportunity to firmly anchor ESG within the risk management value chain and thus align regulatory requirements with entrepreneurial value.

3. ESG Governance: The Strategic Foundation

A robust ESG governance framework forms the core of effective ESG risk management within ICAAP and ILAAP. An institution's business strategy—which defines the "where" (markets), "what" (products), and "with whom" (customers)—must be expanded to include ESG dimensions. This requires structured analysis of the political, social, and environmental context, as well as anticipating changes in markets, product preferences, and customer behaviour. Expectations of key stakeholders—owners, (potential) employees, the public, investors, media, and regional communities—must be systematically captured and integrated strategically.

To effectively manage ESG-related topics, establishing an ESG committee at the executive level or integrating ESG responsibilities into existing decision-making bodies is advisable. Close coordination with the supervisory board, ideally via a dedicated sustainability committee, ensures governance is embedded at oversight and monitoring levels as well.

Building on this overarching ESG-integrated strategy, institutions must adjust and update business line-specific product strategies, risk strategies, the Risk Appetite Framework (RAF), capital adequacy concepts, and liquidity strategies. In parallel, the organizational and procedural structure of risk management across all three lines of defence must be reviewed and, if necessary, adapted regarding ESG-related processes, methods, and IT support.

In addition to defining SMART objectives, institutions should develop a balanced set of Key Performance Indicators (KPIs) and Key Risk Indicators (KRIs). These should include both leading and lagging indicators to allow for real-time monitoring of progress and early detection of emerging risks. The goal is to enable strategic control, not just backward-looking documentation.

Examples of strategic ESG goals in practice:

- **Decarbonization pathways**: Define science-based targets for gradually reducing greenhouse gas emissions from internal operations and financed emissions in credit and investment portfolios. This includes specific reduction percentages for future years and allocating declining GHG budgets—potentially differentiated by sub-portfolios depending on controllability and data availability.
- **Exclusion criteria and divestment strategies**: Set clear exclusions for financing or other business relationships with companies in controversial sectors (e.g., banned weapons manufacturing) or those significantly violating international standards. This involves detailed analysis of counterparties' service portfolios and supply chains and may require phased withdrawal from existing investments.
- **Positive impact orientation**: Pursue specific UN Sustainable Development Goals (SDGs) through targeted investments and financing. This affects investment strategies in

lending and capital markets and necessitates adjustments in controlling (e.g., bonus systems based on internal return-on-equity targets) and impact measurement (e.g., CO_2 equivalents, SDG contributions) as part of credit monitoring.

An institution's level of ambition is largely shaped by its values, owner expectations, and the political-economic and social context—and should be reviewed regularly for relevance and effectiveness.

4. Risk Inventory: Identification and Transparency of the ESG Exposure

The risk inventory forms the foundation for all subsequent phases of the risk management process. A systematic identification and assessment of ESG risk exposure is essential—not only for mitigating risk but also as a basis for strategic management decisions. While external ESG scores offer a starting point, institutions must demonstrate look-through capabilities—evaluating underlying ESG drivers with sufficient granularity and methodological transparency. From a legal and compliance perspective, institutions should ensure that supply chain exposures are assessed in light of the forthcoming Corporate Sustainability Due Diligence Directive (CSDDD). Risk-based due diligence processes should be embedded, particularly for high-risk geographies and sectors.

- **Data basis and indicators**: Common starting points include ESG scores from external providers, analysis of underlying ESG risk factors (environmental, social, and governance dimensions), and use of NACE industry codes for sectoral allocation. The sustainability classification under the EU Taxonomy Regulation may also serve as an indicator of environmentally sustainable economic activities. Links to ESRS indicators and CSRD requirements should be established.
- **Extended analytical factors**: Purely score-based approaches are insufficient for in-depth impact analysis. Additional necessary information includes the geographic and topographic location of borrowers and collateral, jurisdiction, physical climate risks, transition risks, and borrower credit quality. This applies similarly to all movable and immovable collateral. Incorporating supply chain analysis can be supportive.
- **Portfolio clustering and sensitivity analysis**: Based on these criteria, ESG-relevant clustering of the overall portfolio is feasible. For each asset class and collateral type, it is necessary to analyse how deviations in specific ESG risk factors (e.g., rising CO_2 prices, extreme weather events, social disruptions) impact the specific exposure (transmission channels) and how these influence the institution's risk map for financial (credit, market, operational) and liquidity risks.
- **Heatmaps and vulnerability analysis**: Heatmaps can be generated based on the sensitivity of individual clusters to ESG risk factors. These visualize the institution's aggregated vulnerability and create a transparent foundation for further quantification and control measures. They also allow for early identification of potential "stranded assets" or sectors with high transformation or adaptation needs.

- **Expanded scope of exposure**: ESG risk inventory should not be limited to the portfolio alone. It must also consider the institution's own operations, supply chains, employee structure, IT service providers, and the potential societal impact of the organization or its management. These aspects should be included in assessments of operational, reputational, and business model risks.

In summary, the ESG risk inventory serves as a critical interface between strategy, risk identification, and disclosure. It lays the foundation for a consistent, reliable, and management-relevant ESG data architecture within the institution.

5. Quantification: Assessing the Financial Impact of ESG Risks

Building on the identified clusters and their sensitivities, the financial impact of ESG risks is quantified through scenario analyses. This quantification is central not only for determining capital requirements but also for providing key steering impulses for the business model and portfolio strategy.

- **Scenario selection and design**: It is essential to rely on scenarios from recognized scientific or supervisory sources (e.g., Potsdam Institute for Climate Impact Research (PIK), Network for Greening the Financial System (NGFS), national central banks) or to develop institution-specific scenarios based on well-justified assumptions. These should include both physical and transition risks, reflect the principle of double materiality, and incorporate stakeholder perspectives.
- **Time horizons and balance sheet dynamics**: A central challenge lies in modelling the long time horizons required by regulation (often at least 10 years, significantly longer for climate risks). This requires differentiated assumptions regarding balance sheet structure and earnings developments over the projection period. Experience and methods from the insurance industry—such as dynamic modelling, management actions, and forward-looking analyses—can provide valuable insights here.
- **Key quantification aspects**:
    - **Credit risk**: In addition to the probability of default (PD), the loss given default (LGD) must be analysed. Impairments of ESG-sensitive collateral must be explicitly included.
    - **Combined scenarios**: Developing and justifying combined scenarios that include transition risks (e.g., regulatory interventions, technological disruptions), acute physical risks (e.g., extreme weather events), and chronic physical risks (e.g., sea level rise) requires particular care if not modelled using integrated macroeconomic frameworks.
    - **Capital market investments and liquidity buffers**: ESG risk in capital markets can be assessed using a tiered sensitivity model based on NACE-code risk factor clusters and ESG attributes. Effects on liquidity reserves and refinancing capacity should also be evaluated.
    - **Internal master ESG scoring**: To ensure comparability and consistency in scenario analyses—especially when aggregating risks from various portfolios and

using different external ESG data sources—developing and implementing an internal master ESG scoring system is essential. This should operate similarly to internal credit ratings, be integrated into existing systems, and be validated regularly.

6. Double Materiality: Interdependencies Between Impact and Risk

The concept of double materiality—strengthened by the revision of the CSRD and the introduction of the ESRS as a mandatory principle—must also be taken into account during risk inventory and quantification. It expands classical risk assessments by analysing the impact of the institution's own activities on the environment and society (impact) and the feedback of these effects on the institution's financial risk profile. This interdependency must be systematically addressed and made manageable. Moreover, institutions must factor in not only transition and physical risks but also the risk of greenwashing, litigation, and stakeholder backlash. Failure to integrate double materiality may result in supervisory criticism, market sanctions, and legal exposure under CSRD, CSDDD, or SFDR frameworks.

- **Quantification of impact risks**: Financial consequences arising from insufficient due diligence in the value chain or from non-compliant internal business practices (e.g., environmental violations, human rights breaches) are often difficult to quantify directly. It is crucial to adopt the perspectives of both active and passive stakeholders (e.g., civil society, regulators, investors) to uncover potential reputational and legal risks.
- **Assessment approaches**: Historical damage cases, industry benchmarks, statutory penalties (e.g., fines), court rulings, or capital market data (e.g., stock price drops following ESG crises) can serve as proxies. Qualitative assessments are also appropriate, especially for risks that are strategically significant but difficult to quantify (e.g., loss of licenses in certain markets due to ESG non-compliance).
- **Baseline consideration**: In all scenario analyses, it should be assumed that already realized developments—climatic, technological, and sociopolitical—are reflected in existing valuations (e.g., of loans or collateral). ESG scenarios should therefore model only additional, incremental changes beyond the current state. This prevents double counting and increases the reliability of the models.

7. Risk-Bearing Capacity, Validation, and Management Implications

The quantified financial impacts of ESG risks—compared to a baseline scenario without additional ESG stress—indicate the expected incremental capital needs under each scenario. These results are then compared to the institution's projected risk-bearing capacity (RBC). Unexpected risks can be modelled and estimated using reasoned assumptions regarding volatility, market values, and scenario parameters. The aim is to identify early on which ESG scenarios may require strategic or regulatory countermeasures. Validation of ESG models should be fully integrated into the institution's overarching model risk management framework. This includes quantitative backtesting, qualitative review of assumptions, and cross-validation between Risk, Compliance, and ESG Strategy.

The analysis can yield the following insights:

- Potential future margin or earnings pressure across entire business segments, necessitating strategic realignment.
- Prospective breaches of internal or regulatory minimum capital ratios over time.
- Impending drying-up or significant cost increases in refinancing sources.

These findings feed into the established RBC evaluation processes, though scenario results must be interpreted with caution. ESG scenarios—especially those involving climate—carry considerable uncertainty, even amid broad scientific consensus on core trends. These uncertainties increase with longer projection horizons and are equally present in physical and transition risks, as well as in social and governance issues.

Accordingly, rigorous validation of the models and methodologies used is crucial, particularly in relation to:

- ESG scoring models, including their mapping to an internal master score.
- Assumptions about the transmission of ESG risk factors into conventional risk categories and their calibration.
- Predictive reliability of external models, especially for acute and chronic environmental and climate-related projections.
- Transparency and consistency in assumed probabilities for transition-related developments.

Given these uncertainties, a multi-tiered methodological approach is recommended: anchor ESG risk scenarios to recognized external narratives while also developing transparent internal "what-if" analyses. This enables institutions to monitor real-world developments (e.g., regulatory measures, market reactions, supply chain disruptions), validate or refute assumptions in real time, and activate pre-planned response measures. ESG risk-bearing capacity thus becomes a managed and forward-looking component of a resilient institutional strategy.

8. Reporting and Disclosure

ESG risk reporting must be fully aligned with the internal risk reporting cycle and embedded in the established ICAAP and ILAAP processes, while also meeting external disclosure obligations under Pillar 3 and the CSRD. Since the foundational scientific and regulatory frameworks—especially in the context of climate scenarios—evolve slowly, it may be appropriate and permissible to prepare dedicated ESG risk reports (particularly climate-focused) on an annual basis.

However, more frequent reporting may be warranted in the following cases:

- Significant shifts in portfolio structure or business model materially alter ESG risk exposure.
- New or revised ESG scenarios are published by recognized bodies (e.g., NGFS, PIK).
- Regulatory expectations or stakeholder demands require more regular updates.

Validation reports related to ESG risk models, processes, and data can either be attached to the ESG risk report or incorporated into the broader institutional validation report. A structured link to model governance and the internal control system (ICS) is highly recommended.

If the institution publishes a sustainability report—either voluntarily or due to legal obligations (e.g., under NFRD/CSRD)—the ESG risk disclosures used for ICAAP/ILAAP should be leveraged to ensure consistency. This necessitates harmonized data sources, clear ESG metric governance, and aligned reporting formats, creating a "single source of ESG truth."

If Risk Controlling also prepares regulatory metrics (e.g., Green Asset Ratio (GAR), Banking Book Taxonomy Alignment Ratio (BTAR)) or ESG-specific KRIs, these can serve as interfaces to external reporting and supervisory submissions. Wherever possible, supervisory metrics (e.g. Green Asset Ratio, Banking Book Taxonomy Alignment Ratio) should be derived directly from ICAAP/ILAAP assessments to enhance efficiency and traceability. Data provision must align with external reporting timelines and reference dates and should ideally be supported by automated systems.

9. Active ESG Risk Management in the First Line of Defence

Traditionally, the ICAAP/ILAAP cycle concludes with reporting and a feedback loop into strategy review. However, given the added complexity and novelty of ESG risk management, it is necessary to explicitly analyse and adjust management procedures in the first line of defence (1st LoD) and link them to ICAAP/ILAAP. Operationalizing ESG risk requires active ownership in the first line, particularly in lending and treasury functions.

9.1 Lending Business

- **ESG data collection and usage**: Increasingly, granular ESG information must be collected for borrowers and collaterals. This improves precision in individual risk assessments (beyond sectoral or regional proxies) and identifies opportunities to reduce ESG risk through customer consultation and support in transformation.
- **Integration into credit decision-making**: ESG risks and scoring results must be explicitly incorporated into credit decisions. Guidelines derived from the target portfolio (as defined in the ESG strategy), transformation contributions of financed activities (e.g., relative to the institution's decarbonization trajectory), and exclusion criteria should be considered.
- **Proactive credit monitoring**: ESG scenario analysis results should be systematically used in ongoing credit surveillance. Potential "stranded assets" or exposures with rapidly

increasing ESG risk must be identified early to prevent future impairments or reputational issues.

- **Workout management**: Dedicated strategies must be developed to manage and resolve ESG-critical exposures or stranded assets. Clear exit strategies should be defined for exposures incompatible with the ESG target portfolio per ICAAP/ILAAP.
- **Product development and distribution**: ESG data supports developing new advisory and support services to increase borrower resilience and improve the portfolio's ESG risk profile. This may result in new business opportunities and additional fee income. Public subsidy programs should be used to support ESG-improving transformation financing. Exit strategies based on ESG should only be a last resort.

9.2 Treasury

- **Transfer pricing adjustments**: Internal pricing mechanisms may need to be revised, as ESG factors influence cost components (e.g., risk, liquidity, capital) or introduce new elements (e.g., carbon costs).
- **Bonuses/maluses**: Incentive mechanisms (bonuses) or surcharges (maluses) can be introduced for specific sectors, asset types, or credit products based on the ESG strategy—e.g., through capital add-ons in risk models or internal return benchmarks.
- **Capital market portfolio management (proprietary investments)**:
  - Assign clear NACE codes to all assets.
  - Apply complete ESG scoring with mapping to an internal master score.
  - Actively procure necessary ESG data (e.g., issuer CO_2 footprints).
  - Ensure compliance with ESG limits, investment policies, and quotas (e.g., GAR).
- **Active stakeholder engagement**: Use investment mandates to influence issuers (e.g., engagement strategies, voting behaviour, ESG mandates for asset managers).
- **Mandate design**: Ensure that ESG investment policies translate clearly into mandate design for internal and external fund management and fund selection for customers.
- **Sustainable refinancing**: Use ESG-compliant funding instruments (e.g., green bonds, sustainability-linked bonds) to enhance reputation and attract ESG-focused investors.

9.3 Additional Affected Areas

Beyond the lending and treasury business, ESG integration affects numerous other departments:

- **Procurement**: Extend supplier due diligence to include ESG criteria.
- **Facility management**: Integrate ESG requirements into building investments and infrastructure planning (e.g., energy efficiency, materials).
- **Human Resources**: Anchor ESG objectives in employee target agreements; incorporate international human rights and labour standards into HR policies and procedures; promote diversity and inclusion and expand ESG training offerings.

10. Conclusion and Outlook

Integrating ESG risks into ICAAP and ILAAP is not a discretionary task but a strategic necessity and clear supervisory requirement. This marks a paradigm shift—from backward-looking risk assessment to forward-looking, impact-oriented management. It demands a fundamental rethinking of strategy and extensive adjustments to governance frameworks, risk processes, methodologies, and IT systems.

Institutions that actively engage with ESG risks, not only as regulatory requirements but as a means of strategic differentiation, will improve their resilience to environmental, social, and governance challenges. More importantly, they will position themselves as credible partners in the transformation of the real economy—benefiting from competitive advantages in capital market access, regulatory acceptance, and stakeholder confidence.

The path to fully integrated ESG risk management is complex. It requires continuous learning, agility, and interdisciplinary collaboration. Given the dynamic nature of the regulatory environment, evolving market practices, and heightened stakeholder expectations, ESG considerations are no longer optional—they are becoming the new standard of prudence in financial services.

In the future, the ability of a financial institution to assess, manage, and strategically harness ESG risks will increasingly determine its success in capital allocation, supervisory dialogue, and long-term value creation.