

## **AUDIT OF ENVIRONMENTAL COSTS AND LIABILITIES IN THE GREEN ECONOMY**

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### **Introduction**

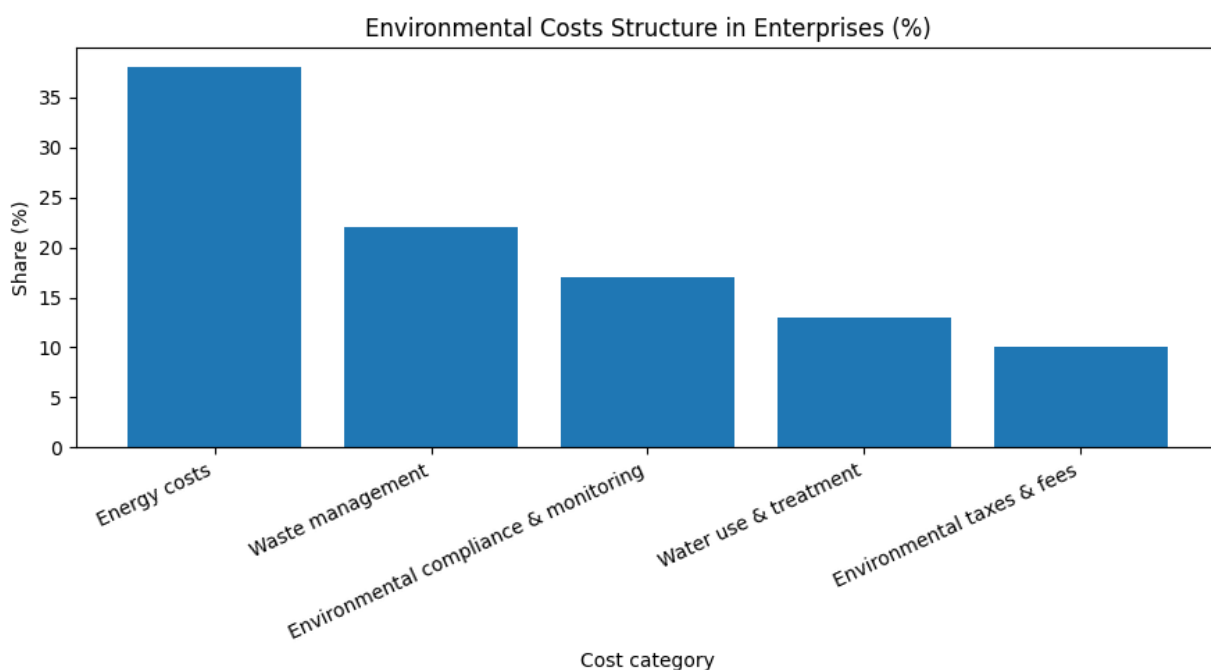
In the green economy, environmental costs and liabilities increasingly determine enterprise profitability, solvency, and market access. Their materiality is evident in global estimates: “the cost of the health damage caused by air pollution amounts to \$8.1 trillion a year, equivalent to 6.1% of global GDP” [1]. Corporate disclosures also confirm that environmental factors translate into large financial exposure: “The potential financial impact of water risk is \$531,058,809,825” based on 2023 reporting data [2]. In parallel, climate policy instruments are strengthening price signals; for example, “the average price in 2024 was EUR 64.74” for EU ETS auctions [3].

These facts imply a practical requirement for audit: environmental costs (energy, materials, waste, compliance) and environmental liabilities (remediation obligations, fines, contingent exposures, decommissioning) must be identified, measured, and evidenced with the same rigor as traditional financial items. This thesis outlines how auditing environmental costs and liabilities strengthens enterprise economic security and reporting reliability under green-economy conditions.

### **Main part**

In practice, auditing environmental costs and liabilities focuses on four core areas: completeness of environmental cost capture, correctness of measurement

and allocation, recognition and valuation of provisions and contingencies, and data governance and evidence quality.



**Figure 1. Environmental Costs Structure in Enterprises (%)**

First, auditors test completeness of environmental costs because these costs are often “hidden” across multiple accounts and departments. Typical items include energy and water consumption, waste handling and recycling, environmental monitoring, permits, certification, environmental taxes/fees, and compliance consulting. The risk is systematic understatement of product cost and overstatement of margins. A practical audit approach is to build an “environmental cost map” by reconciling operational data (utility meters, waste manifests, supplier invoices, lab reports) with financial ledgers, then performing analytical procedures to identify unexplained variances (e.g., energy intensity per unit output). This is particularly important when external pressure on pollution control rises, as

illustrated by the macro-scale cost of air pollution damages estimated at \$8.1 trillion per year [1]. Such figures signal tightening regulation and enforcement, which increases the likelihood that previously unrecorded compliance costs will become unavoidable.

Second, auditors evaluate measurement and allocation. In a green economy, environmental costs must be allocated to products, processes, and export markets to support decision-making. Where firms sell into “green” procurement channels, misallocation can distort export pricing and contract profitability. Carbon-related price benchmarks are useful for sensitivity analysis: the EU ETS 2024 average auction price of EUR 64.74/tCO<sub>2e</sub> provides a real-world reference for evaluating management’s carbon-cost assumptions in budgets and investment appraisal [3]. Audit procedures here include reviewing calculation models, testing input data (activity data, emission factors), and verifying change control over assumptions.

Third, auditors focus on environmental liabilities-especially provisions and contingencies. Key items include remediation and clean-up obligations, landfill closure/decommissioning, restoration commitments, penalties, and litigation exposure. The practical challenge is that environmental liabilities are often triggered by regulations, contracts, or past contamination, and their measurement depends on uncertain estimates (timing, discount rates, remediation technology). Evidence of large disclosed water-risk exposure (\$531.1 billion) shows why environmental risk can be financially material and should be consistently reflected in risk registers, budgets, and (where criteria are met) accounting provisions or disclosures [2]. Audit work typically reconciles the environmental risk register to

financial statement disclosures, tests management's estimation methodology, and evaluates whether obligations meet recognition thresholds.

Fourth, auditors assess governance and internal control over sustainability-related data that flows into financial reporting. Environmental cost and liability auditing increasingly depends on non-financial data (meters, sensors, supplier declarations). Weak controls elevate the risk of misstatement and greenwashing claims. Practical controls to test include: ownership of environmental datasets, approvals for emission factors, reconciliation routines between production volumes and environmental metrics, and audit trails for changes in estimation models. IFAC guidance emphasizes the need for integrated internal control to build trust in sustainability reporting and assurance readiness [4].

### Conclusion

Auditing environmental costs and liabilities is a critical tool for economic security in the green economy because it protects margin accuracy, strengthens liability recognition, and improves the credibility of sustainability-related financial information. Quantitative evidence-air-pollution damage costs of \$8.1 trillion annually, disclosed water-risk exposure of \$531.1 billion, and carbon price benchmarks such as EUR 64.74/tCO<sub>2</sub>e-shows that environmental factors are financially material and require robust audit procedures. Enterprises that institutionalize environmental cost mapping, model-based testing of allocations and assumptions, rigorous review of provisions/contingencies, and strong data governance will be better positioned to maintain profitability, compliance stability, and investor trust.

## REFERENCES

1. World Bank. *What you need to know about climate change and air pollution* (2022): air pollution health damage \$8.1 trillion, 6.1% of global GDP.
2. CDP. *Financial Sector Water Knowledge Hub / Water Security disclosure insights* (2023): potential financial impact of water risk \$531,058,809,825.
3. European Commission / EU ETS market reporting (via ICAP facts/summary): average EU ETS auction price EUR 64.74 in 2024.
4. IFAC. *Guidance on integrated internal control and trust in sustainability reporting* (2023–2024).