



Updating Italy's Residential Taxonomy Thresholds with DeliverEEM

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1. Context

Why thresholds matter for banks and for GAR

Real-estate collateral is central to banks' risk management and capital markets execution. Mortgages to households typically account for a material—often the most substantial—share of the Green Asset Ratio (GAR), so a clear, reproducible way to identify “taxonomy-aligned” dwellings is essential for transparent disclosures, green funding frameworks, and supervisory dialogue. Within the EU Taxonomy's technical screening (notably the criteria commonly referred to as 7.1 and 7.7), two operational tests dominate residential assets in terms of Primary Energy Demand (PED) and Energy Performance Certificate (EPC):

- NZEB–10% for new buildings, i.e., a PED at least 10% lower than the national Nearly-Zero Energy Building requirement;
- Top 15% for acquisition & ownership, i.e. be within the top 15% of the national or regional building stock in terms of energy performance.

In practice, national NZEB benchmark and definition of the top 15% thresholds are required and at national level thresholds must be comparable across institutions, stable over time, and evidence-based, otherwise GAR figures—and the financing decisions they inform—can be noisy or non-comparable.

2. DeliverEEM

What we are updating—and the objectives guiding the work

In DeliverEEM, Ca' Foscari University and CRIF have updated the Italian thresholds used to identify taxonomy-aligned residential buildings, with the explicit aim of help the standardization of how banks compute GAR on collateral. The work program distills into five overarching objectives that guide all activities and ensure market value for the project stakeholders:

- De-risking energy-efficiency investments
- Enhancing the articulation of ESG factors in collateral valuation
- Optimizing financial operating models with a focus on ESG
- Coordinating a robust renovation supply chain
- Putting consumers at the heart of the climate transition

These objectives frame the relevance of the methodological refresh and the resulting deliverables: national thresholds, portfolio impact analyses, and publication roadmap.



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3. Methodology

A laboratory reconstruction of Italy's housing stock

Before detailing the steps, we set out the methodological backbone used to refresh Italian taxonomy thresholds. The design principles are representativeness, comparability and stability over time: starting from a large EPC (Energy Performance Certificate) universe, we apply rigorous data-quality controls on PED, then reconstruct the national housing stock in the lab by aligning the working sample to ISTAT marginals (heated floor area and construction epoch) via Iterative Proportional Fitting (IPF). Thresholds are computed as weighted quantiles on the IPF-balanced sample and cross-validated with Poisson and scaled resampling to verify robustness and reduce sensitivity to sample composition. The resulting climate-zone thresholds are therefore bank-grade—traceable, reproducible, and materially less volatile across vintages (2022→2025), a precondition for uniform GAR calculation.

Data and quality gates

From a multi-million EPC dataset, we applied stringent quality check (e.g., removal of inconsistent or out-of-range records such as “class G” flagged as NZEB) and focused on residential assets and the PED metric (non-renewable energy required by the building).

After a staged filtering from ~3.59 million observations, the working residential sample narrows to ~1.42 million, and—once aligned to population representation constraints—to ~682,762 records suitable for weighted inference.

Representativeness via Iterative Proportional Fitting

To avoid over-representation of newly built dwellings and to anchor thresholds to the national housing stock, we reweigh the sample to match ISTAT marginals (heated floor area classes × construction epochs) using Iterative Proportional Fitting (IPF). IPF yields calibration weights that align the weighted joint distribution of heated floor-area class and construction epoch with the corresponding population margins. Thresholds are then defined as weighted quantiles of PED (NREN), which target population-relevant cut-offs rather than sample-dependent estimates.

Quantile estimation and robustness

We compared alternative estimators based on the same calibration framework, namely IPF weighted quantiles, Poisson resampling, and scaled replication. The three IPF-based approaches produce closely aligned results, whereas raw, unweighted quantiles are markedly more sensitive to compositional biases in the EPC sample.

What changes between 2022 and 2025?

Two countervailing effects act on thresholds:

- an “EPC effect” (more EPCs on the registry and more new builds in 2022–2025) that tends to lower thresholds, and
- a “resampling effect” from the representativeness correction that tends to raise thresholds where newer buildings were over-represented.

The net result is balanced and less volatile thresholds by climate zone.

4. The updated thresholds



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Why portfolio impact is limited

The table below reproduces the climate-zone thresholds, it shows Top 15% and NZEB-10% for reference years 2022 and 2025:

Climate zone	Top 15% 2022	Top 15% 2025	NZEB-10% 2022	NZEB-10% 2025
A	65	55	45	40
B	65	55	45	40
C	70	60	50	40
D	75	65	55	45
E	100	100	70	70
F	105	105	70	70

The Top 15% thresholds tighten in C–D (reflecting the larger, more efficient sample in 2025 and the representativeness correction), while E–F remain broadly unchanged—a feature that matters for portfolio impacts given Italian banks' collateral distribution.

Most banks are likely to experience minimal GAR effects

We validated the updated thresholds both on representative sample portfolios and on live mortgage books in collaboration with several banks. The tests confirm that impacts are present but overall contained—alignment shares move, yet changes remain non-material in terms of both number of properties and outstanding. The main reasons are structural: bank collateral pools are, on average, newer and more energy-efficient than the national stock, and they are disproportionately concentrated in climate zone E, where thresholds are broadly stable across vintages—so adopting the new values improves comparability without introducing undue GAR volatility.

5. DeliverEEM in Practice



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Publication Roadmap, Expert Points, and Methods Cheat-Sheet

Bringing the work to market, our publication roadmap foresees the release of this residential report (Feb-2026), extension of the methodology to non-residential thresholds (H1-2026), and a final consolidated report with methodological annexes and implementation guidance (H2-2026), aligning industry adoption and supervisory dialogue on a common evidence base.

Executive takeaways for specialists

1. **Bank-grade thresholds.** Thresholds are computed on a population-aligned sample by applying Iterative Proportional Fitting (IPF) to match ISTAT marginals (heated area × construction epoch) and then estimating weighted PED (NREN) quantiles. Robustness checks via Poisson and scaled resampling deliver similar results.
2. **Operational climate-zone cut-offs.** Climate-zone thresholds (Top-15% and NZEB-10%) support uniform GAR computation and scalable collateral screening across heterogeneous portfolios.
3. **Contained portfolio impact.** Testing on representative sample books and in direct work with banks shows that effects exist but remain contained in both property counts and outstanding balances. The limited impact is explained by the composition of bank collateral pools: they are structurally newer, more energy-efficient than the national stock, and disproportionately located in climate zone E, where thresholds show minimal variation.

Methodological note

The analysis starts from a dataset comprising several million Italian EPC records subjected to strict quality check (removal of out-of-range or inconsistent records, restricting to residential units and PED-NREN). It then narrows to a high-quality working sample and then reconstructs the national stock in the lab via Iterative Proportional Fitting. Thresholds are obtained as weighted quantiles, with convergence across quantile estimators (weighted, Poisson, scaled). Between 2022 and 2025, the expansion of the EPC base and the higher share of new builds (“EPC effect”) tend to reduce thresholds. The adopted correction offsets bias from the over-representation of recent dwellings—yielding balanced, less volatile climate-zone thresholds suitable for disclosure, risk management, and green-funding workflows.



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