

Toward Net-Zero Real Estate: Policy Blueprint

Convergence of Climate Goals, Real Estate Portfolio Performance and Systemic Risk Reduction

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Advisor



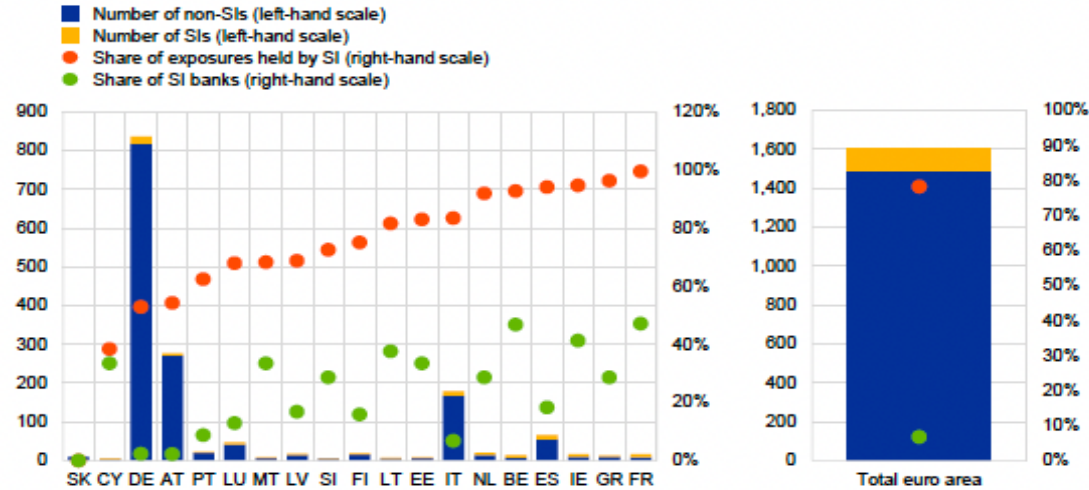
Sustainable Real Estate Finance and Capital Markets



European Bank Exposure to Climate Risk

Composition of the euro area banking system

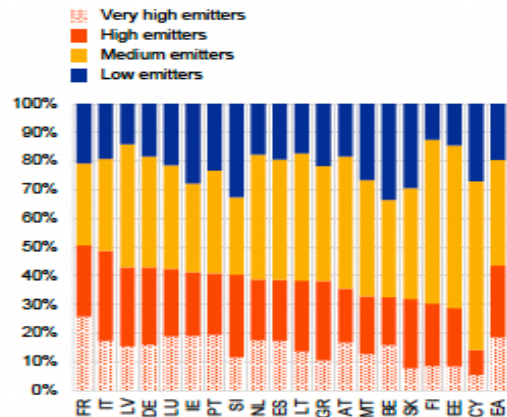
(left-hand scale: number of firms; right-hand scale: percentages)



Share of bank exposures exposed to climate risk per country

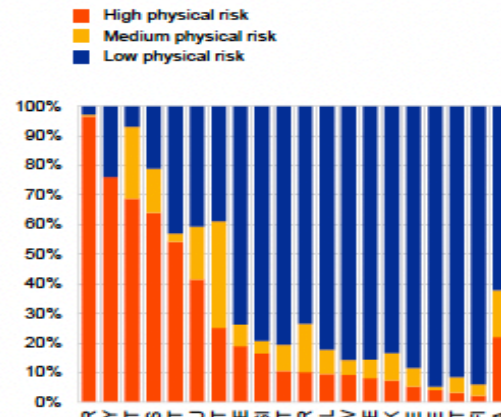
a) Share of bank loans exposed to transition risk

(percentages)



b) Share of bank loans exposed to physical risk

(percentages)



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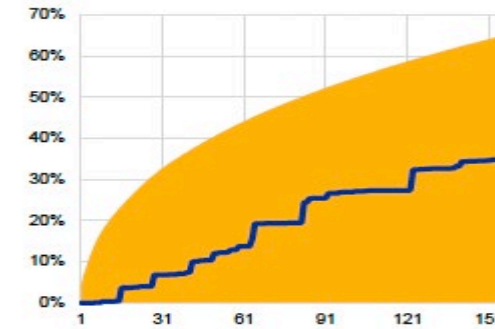


Share of exposures subject to high transition risk

a) Cumulative share of exposures and emissions of the top 10% of most polluting banks

(percentages)

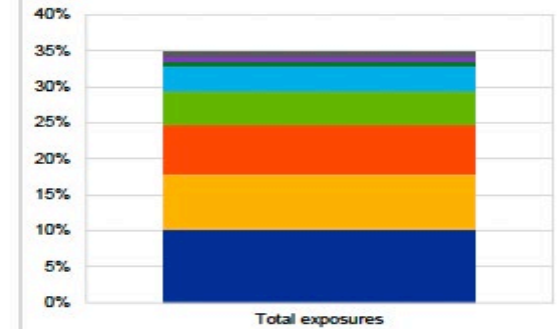
■ Cumulative share of exposures (left-hand scale)
■ Cumulative share of absolute Scope 1, 2 and 3 emissions in bank portfolios (right-hand scale)



b) Country composition of the top 10% of most polluting banks

(percentages)

■ IT ■ NL
■ DE ■ AT
■ FR ■ IE
■ ES ■ Other

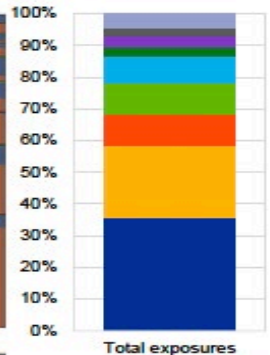
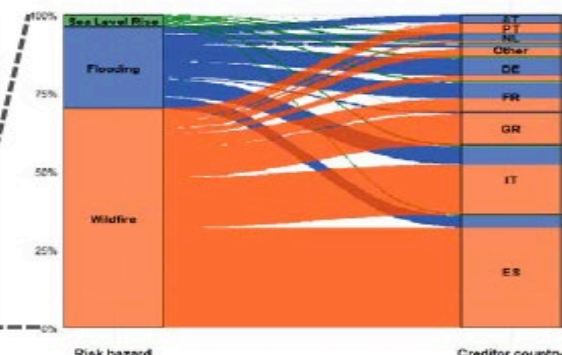
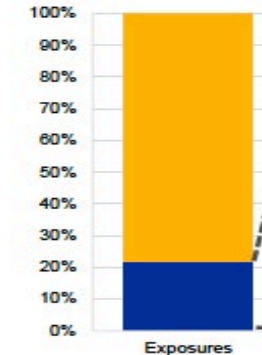


Share of exposures subject to high physical risk

Share of high physical risk exposures (left-hand side) and country composition of high physical risk exposures (right-hand side)

(percentages)

■ High physical
■ Medium and low physical

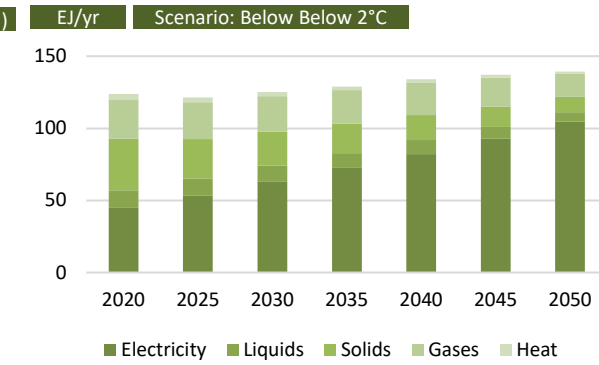
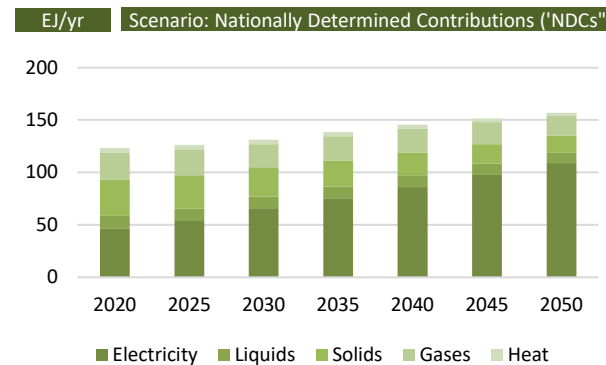
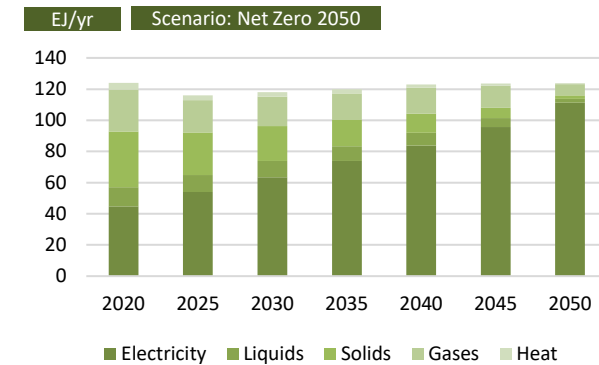
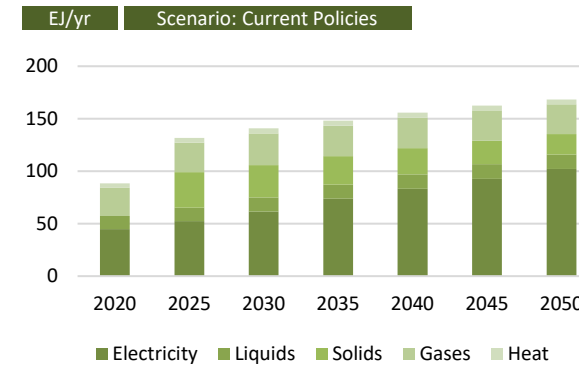
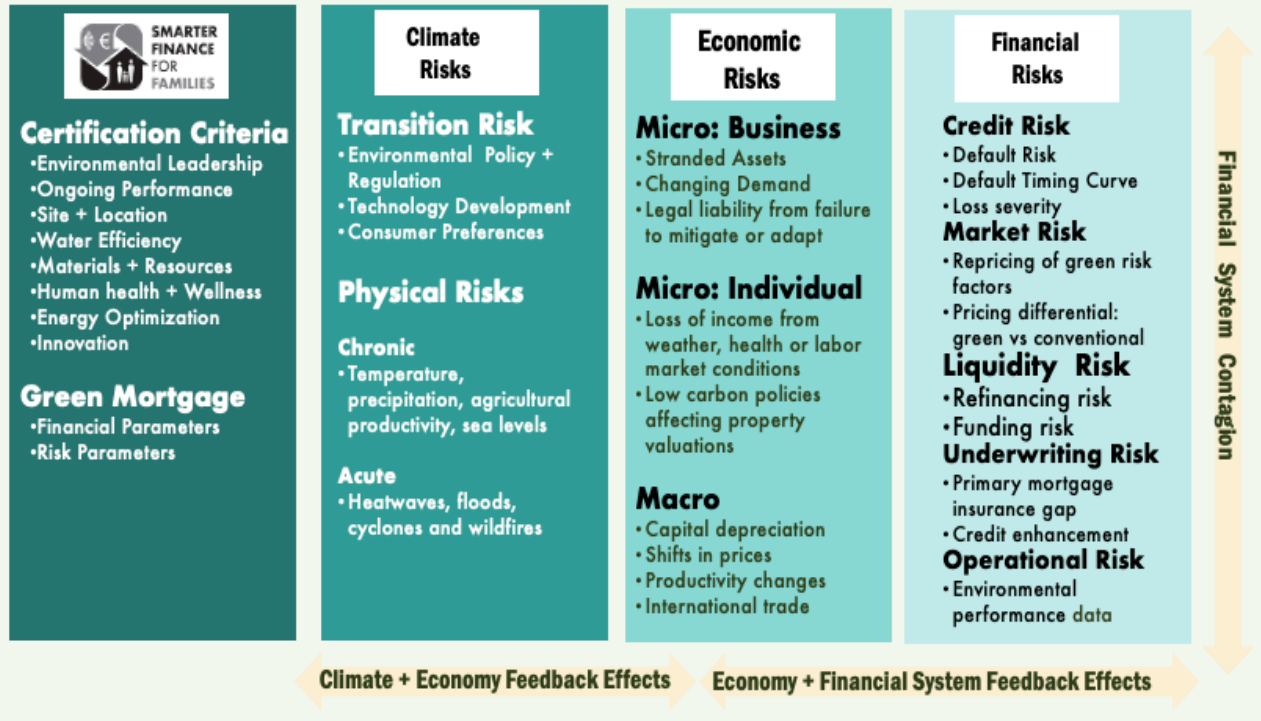


Climate Scenario Analysis

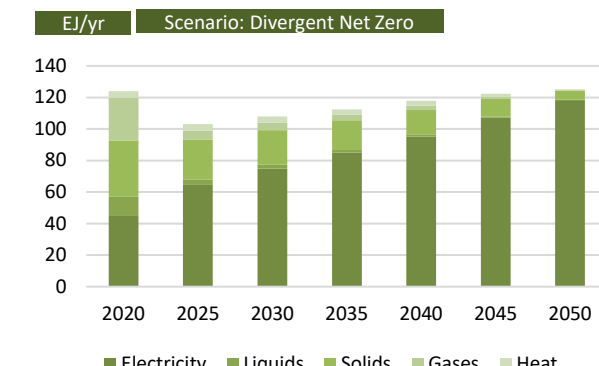
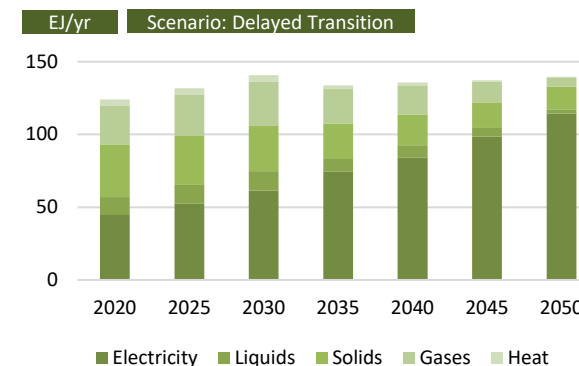
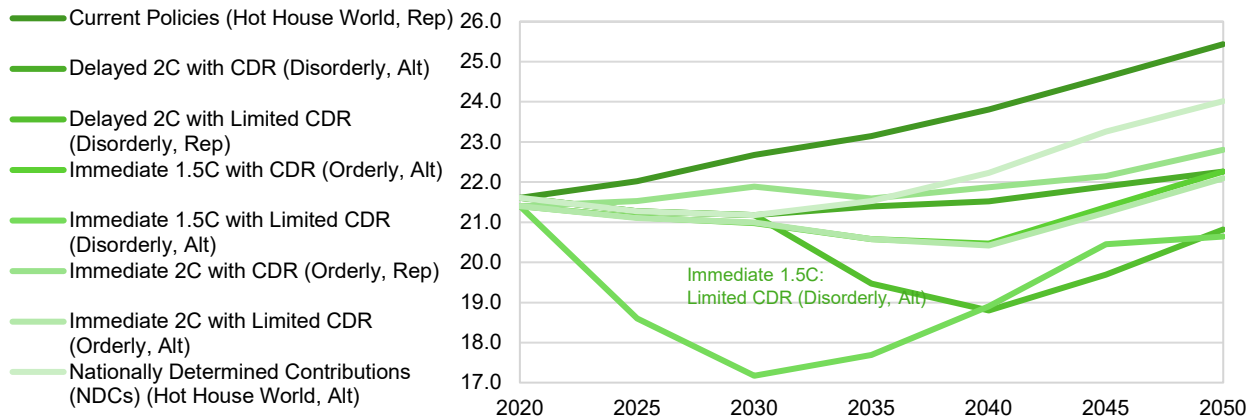
Property, Project and Portfolio Level



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NGFS: Projected Final Energy Use Buildings: 1 Variable 8 scenarios: EU28



EU Taxonomy-Aligned Climate Risk-Weighted Assets

Translating Environmental Performance into Cross-Risk Reduction and EU Taxonomy Alignment



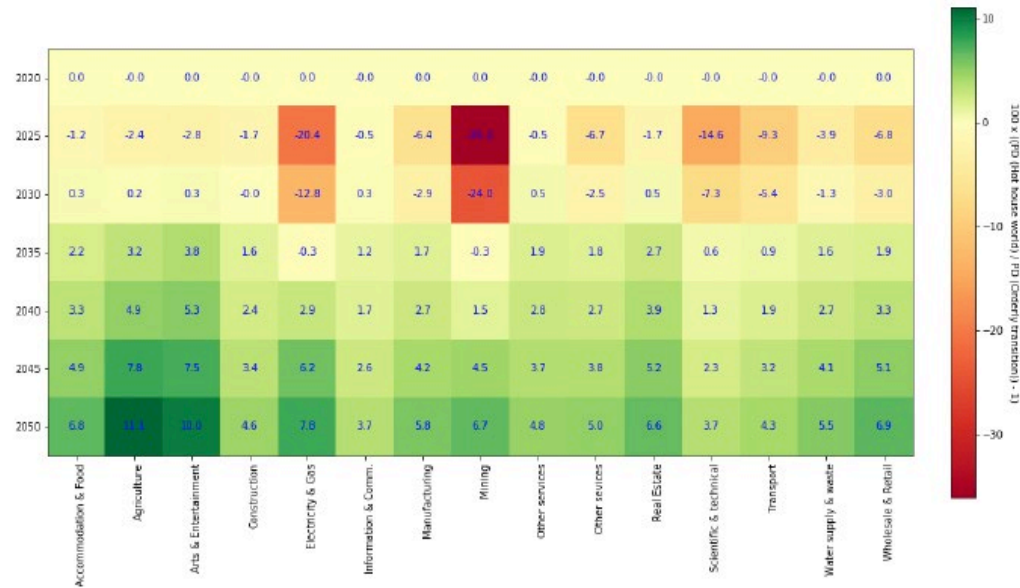
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Changes in sectoral default probabilities³¹

Changes relative to 2020 values, calculated for a hot house world scenario relative to an orderly transition scenario

(percentage difference between 2020 and 2050)



Source: ECB calculations based on NGFS scenarios (2020), Orbis, iBACH, Urgentem and Four Twenty Seven data (2018).

EU Taxonomy-Aligned Climate Adjusted RWA =

Baseline Risk Weighted Assets

X Primary Energy Demand Reductions (kWh/m2/year)/(% of energy use reduced/avoided)

X Carbon Reductions (kgCO2/m2/year)/(tonnes of CO2 reduced/avoided)

X Water Efficiency (annual water savings m3/year)

X Waste Management (% of total waste minimised, reused or recycled)

Environmental Performance Coefficient

Calibrating Financial Products and Transaction Structures

Certification-Based Methodology

Certification System	1st Tier Rating	2nd Tier Rating	Rating Type	Coefficient
SMARTER	Superior: (130-160 Points)	Excellent: (100-129)	Points	Risk-Based
Home Performance Index ('HPI')	Gold: (≥70)	Certified: (≥ 45%)	% Score	Risk-Based
BREEAM	Outstanding: (≥85)	Excellent: (≥85)	% Score	Risk-Based
LEED	Platinum: (80+ Points)	Gold (60-79 Points)	Points	Risk-Based
DGNB	Platinum: (≥80%)	Silver (≥65%)	Total Performance Index	Risk-Based
HQE	Exceptional (13-16 Stars)	Excellent (9-12)	Stars Obtained	Risk-Based

EU Taxonomy-Aligned Methodology

Technical Screening Criteria	Metric	Threshold	Coefficient
Primary Energy Demand Reduction	(kWh/m2/year)/ (% of energy use reduced/avoided)	Taxonomy-Aligned	Risk-Based
Carbon Reductions	(kgCO2/m2/year)/ (tonnes of CO2 reduced/avoided)	Taxonomy-Aligned	Risk-Based
Water Efficiency	(annual water savings m3/year)	Taxonomy-Aligned	Risk-Based
Waste Management	(% of total waste minimized, reused or recycled)	Taxonomy-Aligned	Risk-Based



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Eco-Financial Risk-Based Methodology

Risk Type	Mortgage Insurance	Interest Rate	LTV	Debt-to-Income
Climate Risk	x0.1	x0.95		
Transition Risk	x0.1	x0.95		
Physical Risk	x0.1	x0.95		
Credit Risk: Probability of Default	x0.1	x0.85	+1.10 up to 100%	+150bps
Credit Risk: Loss Given Default	x0.1	x0.85	+1.10 up to 100%	+2pps
Credit Risk: Correlation: 1st Order: Borrower Specific	x0.1	x0.85	+1.10 up to 100%	+150bps
Credit Risk: Correlation: 1st Order: Property Specific	x0.1	x0.85	+1.10 up to 100%	+150bps
Credit Risk: Correlation: 2nd Order: Securitized Product		x0.85		
Market Risk: Climate VaR ¹		x0.98		
Market Risk: Stressed VaR ²		x0.98		
Option-Adjusted Spread ³		x0.85		
Prepayment Risk ⁴		x0.8		
Interest Rate Risk:		x0.8		
Underwriting Risk	x0.1	x0.9		
Liquidity Risk		x0.98		
Operational Risk	Reduced by robust property-level certification data.			

Environmental-Factor Based Methodology

Pillars of Environmental Performance	Mortgage Insurance	Interest Rate	LTV	Debt-to-Income
Environmental Leadership	x0.50	x0.65		
Ongoing Performance	x0.80	x0.75	+1.05 up to 100%	+150bps
Site & Location	x0.60	x0.95		
Water Efficiency	x0.65	x0.98		+2pps
Materials and Resources	x0.90	x0.98	+1.15 up to 100%	
Human Health & Wellness	x0.35	x0.95		
Energy Optimisation	x0.10	x0.85	+1.15 up to 100%	
Innovation	x0.85	x0.98	+1.15 up to 100%	

Green Real Estate Finance

Product Sets

Maximizing Environmental Impact and Financial Performance

Primary Lending Products

Acquisition
Loan

Development
Loan

Construction
Loan

Mortgage

Renovation,
Refurbishment and
Renovation Loan

Capital Markets Products

(Bonds, Securitized Products, Derivatives and Indices)

CRE CDO

RMBS

Covered
Bond

REIT

CMBS
(Fusion)

NPL

Pfandbrief

REMIC

CMBS
(Conduit)

RPL

Sukuk

RE-REMIC

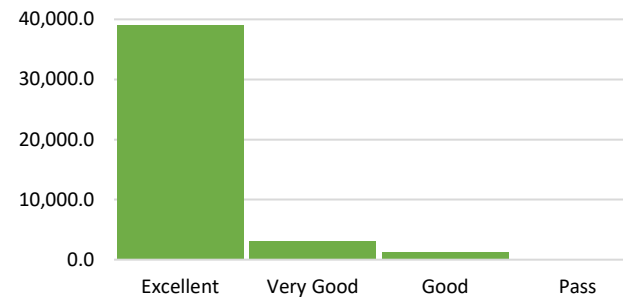
Acquisition Construction Development Ownership



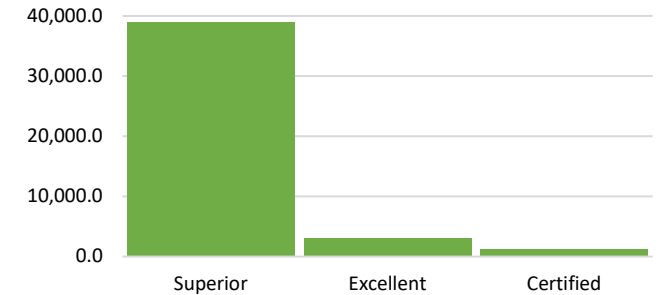
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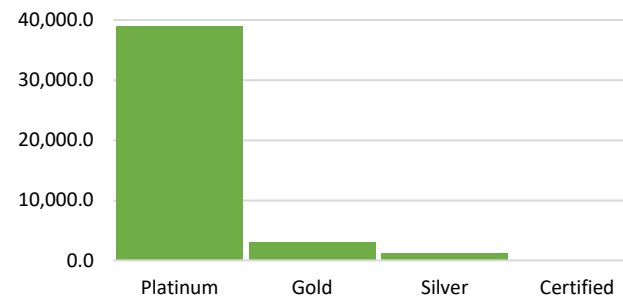
€mn Environmental Performance Breakdown: HQE



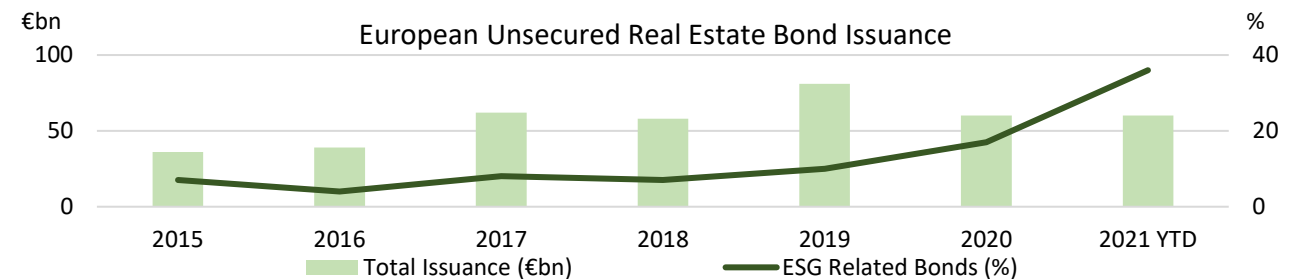
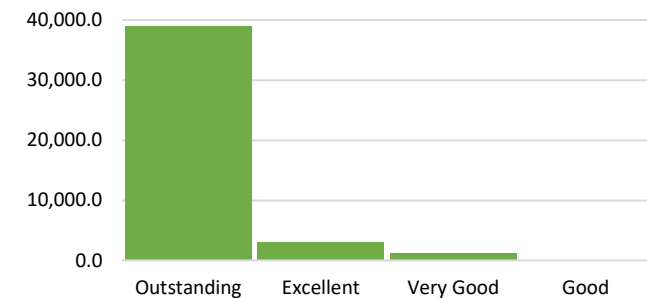
€mn Environmental Performance Breakdown: SMARTER



€mn Environmental Performance Breakdown: LEED



€mn Environmental Performance Breakdown: BREEAM



EU Green Bond Standards

Eligibility Criteria



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SMARTER Finance for Families Assessment criteria for Green Homes certified projects: New Construction and Major Refurbishment; Renovation and Retrofits	EU Taxonomy on Sustainable Activities									
	Mitigation Activities						Adaptation Activities			
	Construction of New Buildings		Building Renovation		Acquisition and Ownership of Buildings		Construction of New Buildings		Building Renovation	
	Technical Screening Criteria	Do No Significant Harm Assessment	Technical Screening Criteria	Do No Significant Harm Assessment	Technical Screening Criteria	Do No Significant Harm Assessment	Technical Screening Criteria	Do No Significant Harm Assessment	Technical Screening Criteria	Do No Significant Harm Assessment
Environmental Leadership	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ongoing Performance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Site & Location	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water Efficiency		✓		✓		✓		✓		✓
Materials and Resources	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Human Health & Wellness		✓		✓		✓		✓		✓
Energy Optimisation	✓		✓		✓		✓		✓	
Innovation					✓					

