



PLATFORM ON
SUSTAINABLE FINANCE

**Monitoring Capital Flows
to Sustainable Investments:**

Intermediate report

- Annexes

April 2024

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Abbreviations

CSRD	Corporate Sustainability Reporting Directive
CSDDD	Corporate Sustainability Due Diligence Directive
EBA	European Banking Authority
ECB	European Central Bank
ESAP	European Single Access Point
ESG	Environmental, Social & Governance
ESMA	European Securities & Markets Authority
ESRS	European Sustainability Reporting Standard
EU GBS	European Green Bond Standard
EUA	European Union Allowances (emissions)
GHG	Greenhouse Gases
ICMA	The International Capital Market Association
IEA	International Energy Agency
IPO	Initial Public Offering
KPI	Key Performance Indicator
NFRD	Non-Financial Reporting Directive
NZAOA	Net Zero Asset Owner Alliance
NZBA	Net Zero Banking Alliance
PAI	Principal Adverse Impact
SBTi	Science-based Targets Initiative
SFDR	Sustainable Finance Disclosure Regulation
SLB	Sustainability Linked Bond
SLL	Sustainability Linked Loan

Annex 1. INVESTMENT GAP OVERVIEW

Introduction

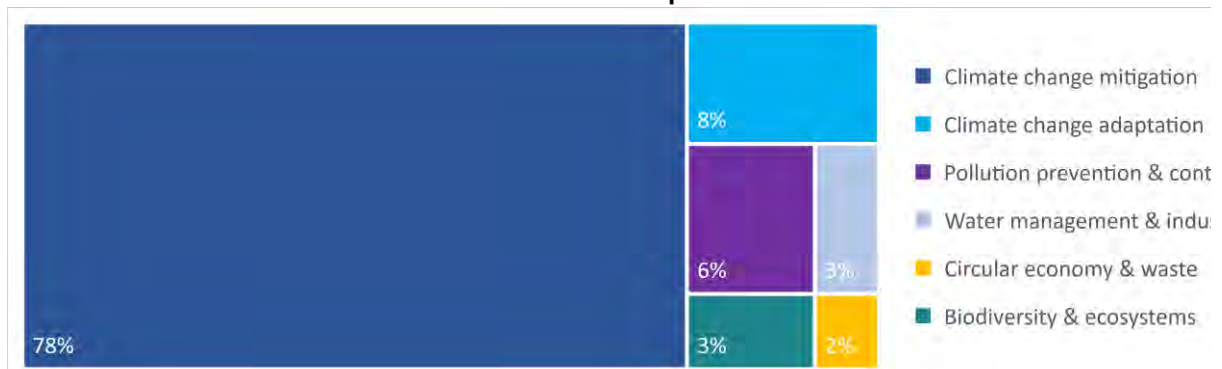
Current levels of sustainable investments remain largely misaligned with what is required to meet overall Green Deal objectives. This chapter provides an overview of investment gaps for these objectives and will serve as a reference for the monitoring of capital flows.

Investment needs to meet environmental objectives

Overall, the European Union will need to invest about EUR 620 billion more each year until 2030 than it did in 2011-2020 to pave the way for climate neutrality and a resilient economy by 2050 (Figure 1), with the bulk of funding to be mobilised by private entities. This amount should still be considered a lower estimate as vast uncertainties remain around the means to achieve the various objectives and their related costs. However, overall investment needs, albeit significant, should be compared with the cost of inaction, generally of much greater magnitude. The full costs and consequences of climate impacts and the biodiversity crisis at EU and global levels are largely unknown (European Commission, 2023a).

Figure 1. Breakdown of investment needs by environmental objective

Total additional investment needs ≈ EUR 620 billion per annum until 2030



Sources: Estimates from European Commission (2022, 2023a&b).

With more than three quarters of additional needs (about EUR 480 billion each year until 2030)¹ and market-ready alternatives to many unsustainable processes, the climate mitigation objective is expected to capture the bulk of sustainable investments in the near future. A variety of definitions and scope of action can be found in the literature on climate adaptation, biodiversity and circular economy, leading to wide ranges of investment needs. The estimated requirements presented here should thus be considered as lower bounds. For instance, circular business models offer vast economic opportunities – and require large investments – to extend product life and enhance waste management (McKinsey, 2022a&b; Summa Equity, 2023). The Directorate-General for Environment reviews underpinning circular economy estimates are designed under more restrictive definitions of opportunities offered by a circular economy, leading to more conservative investment requirements. There is a growing body of evidence on biodiversity finance at the global level (OECD, 2020a, 2021, 2023; Deutz *et al.*; 2020), including on the nascent interest for private financing (Flammer *et al.*, 2023). But EU-level analysis is much scarcer. The Commission’s estimate for sustainable water management (≈ EUR 27 billion p.a.) is broadly corroborated by other authoritative studies such as those of the OECD (2020b).

Climate and energy security investment needs

Investment needs to meet climate mitigation objectives

Clean energy transformations are central to the Green Deal and the Fit for 55 package. The corresponding investments rose beyond the EUR 360 billion mark in 2023, a EUR 154 billion increase since 2019 (IEA, 2023a).²³ EU investments in clean energy are expected to level off in the near term as pressure mounts on financing costs and supply chain constraints persist. In Europe, where more than 40% of electricity supply is decarbonized, the deployment of clean vehicles and recharging and refuelling infrastructures require the largest boost in investments (+37% or EUR 272 billion every year to 2030) (Figure 2). Demand side measures, including a

¹ Annual spending on energy and transport over 2011-2020 lied around EUR 760 billion (European Commission, 2021, 2023a). At least 30% of EU budget (EUR 578 billion) over the period 2021-27 is already directed to climate action (European Commission, 2023a). The details of investment needs beyond 2030 as estimated by the European Commission are not yet publicly available.

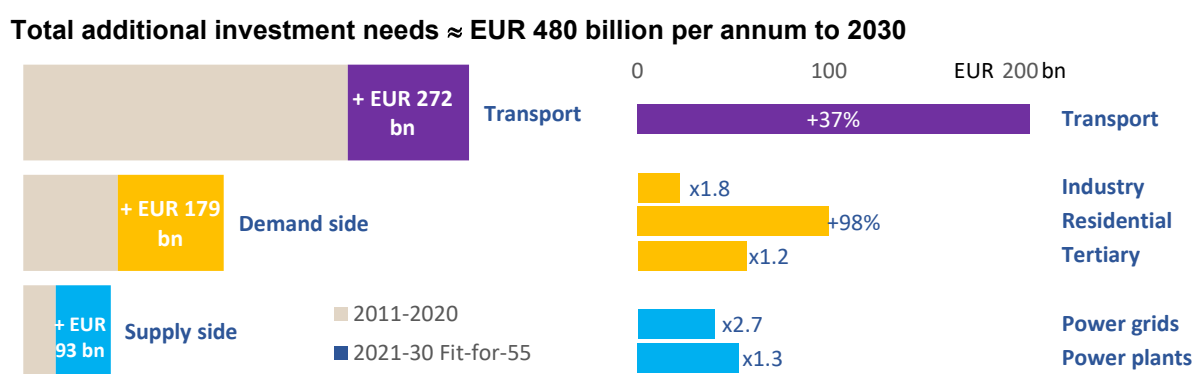
² China invested EUR 540 billion in 2022, growing at the same rate as the EU (+19% relative to 2021). US investments were just above EUR 250 billion (+13%), recently stimulated by the Inflation Reduction Act that was enacted in August 2022 (IEA, 2023a).

³ Further details on recent clean technology developments are reported in the *Market Trends* chapter.

more energy-efficient building stock (+98%), and the upgrade of power networks (a 2.7-fold increase) are also expected to require sizeable investments.

The ambition to disengage from Russian natural gas by 2027 prompted policymakers to adopt the REPowerEU action plan in May 2022, prioritizing various reforms and extending measures in place with the Green Deal. The action plan provides an unambiguous signal to investors to accelerate the green transition and phase out unabated fossil fuels more rapidly. Overall, REPowerEU aims to mobilise about EUR 300 billion of additional investments (EUR 33 billion per year on average), including EUR 72 billion in grants and EUR 225 billion in loans. REPowerEU provisions are factored into the estimates of additional investment needs in support of clean energy deployment (EUR 480 billion per year).

Figure 2. Average annual investment needs in the energy system (EUR billion)



Sources: Analysis based on European Commission (2023b). Note: Investment needs for the fit-for-55 package were originally derived from the MIX and MIX-H2 scenarios (European Commission, 2021) and were updated in 2023.

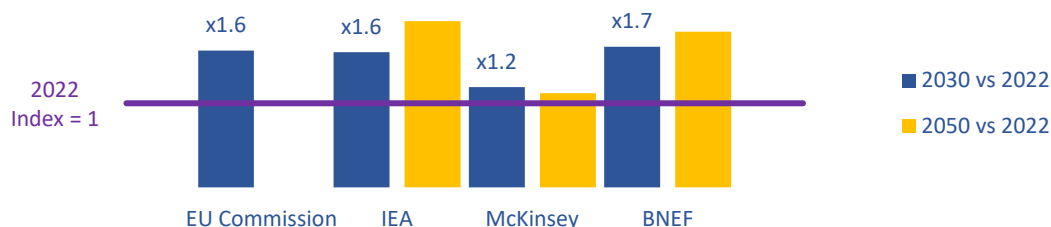
Investment profile

The timing of investments is of the essence for an effective roll-out of the green transition, taking account of the maturity of green technologies, actors' awareness, and absorption capacities. Clean energy investment needs are front-loaded because of the imperative to catalyse the transition across the board with green energy supplies. A comparison of various net zero assessments at EU level suggests that clean energy investments should be ramped up immediately by at least 60% above current levels before 2030 (Figure 3).⁴ This investment profile is characteristic of an accelerated transition, limiting the transition and physical risks in

⁴ Globally, climate finance should increase at least five-fold as quickly as possible to avoid the worst impacts of climate change (CPI, 2023). The status of global climate finance is provided in the *Market Trends* chapter. Emerging market and developing economies (other than China) will drive the global increase in clean energy investments, reaching a sevenfold rise relative to current levels during the second half of the 2040s (IEA, 2023b).

the long term but also alleviating systemic shocks with far-reaching consequences across the real economy and the financial sector (ECB, 2023).⁵ Investment needs are generally projected to level off in the longer term.

Figure 3. Indicative multiplication factors of annual EU investments by 2030, 2050 relative to 2022



Sources: EU Commission (2023b), IEA (2023c), McKinsey (2023), BNEF (2023a&b). Notes: The Commission's investment figures are not available for 2050. IEA figures are based on clean energy investments in advanced economies.

National investment needs

Various assessments of investment gaps are conducted independently at national level and tailored to the domestic characteristics of energy systems. The periodical update of *National Energy and Climate Plans* is intended to guide investors and boost the pipeline of sustainable projects at a more local level.⁶ However, some national plans, including 2023 updates, may lack up-to-date assessment of investment needs (ECA, 2021; European Commission, 2023c). Their revisions could be used in the future to assess progress in clean energy investments against national goals.

Private sector contribution

Public resources alone are too limited to fill the investment gap. Private financing is thus indispensable to complement public provisions. Studies informing the public-private investment ratio are scarce and based on partial data. The International Energy Agency estimates that private entities had funded more than 80% of clean energy spending in 2022 (IEA, 2023b),

⁵ The latest scenario update by the Network for Greening the Financial System (NGFS) suggest that global climate policies are not bold enough to reach carbon neutrality by 2050. A delayed transition to a green economy in the European Union and at the global level will likely cause more substantial economic losses and financial instability in the long term. (Aerts et al., 2023).

⁶ An overview of 2021 NCEPs submissions and a recent study in the case of France are reported in Annex 1.

broadly in line with Bruegel’s estimates (Darvas and Wolff, 2021) and slightly above CPI reporting (CPI, 2023).⁷ A 75%-80% range appears sensible for private sector contributions (European Commission, 2023b).

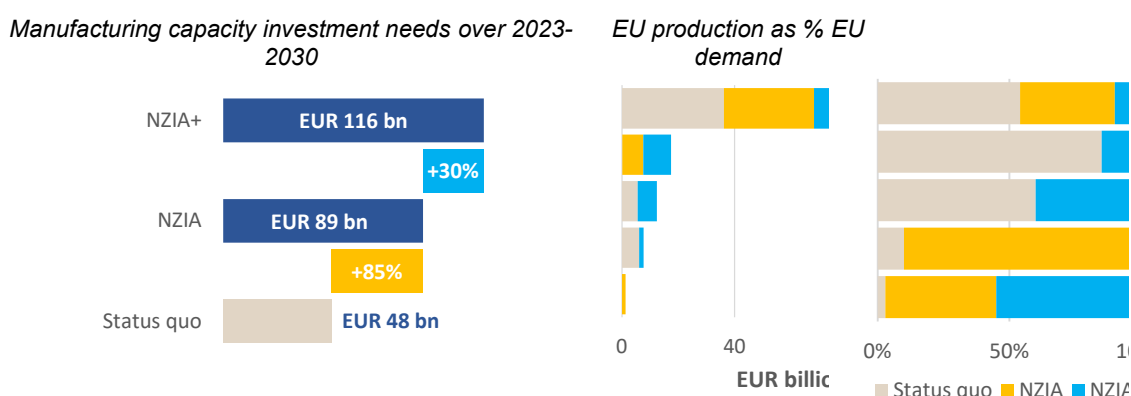
Additional investment needs to meet EU’s green strategic autonomy

Enhancing the green strategic autonomy is among the EU’s policy priorities (European Parliament, 2023). This can be achieved by reducing the EU’s import dependence on strategic net zero technologies and raw materials and in parallel by developing domestic green supply chains. The Commission has recently conducted an assessment of investment needs and funding options to strengthen the EU’s manufacturing capacities of net-zero technologies (EU Commission, 2023b). Three scenarios are used to characterise different levels of autonomy for the EU manufacturing sector: *A Status quo scenario*, maintaining current market shares up to 2030; a *NZIA policy scenario* boosting market shares to reach the NZIA indicative technology-specific objectives; a *NZIA+ policy scenario* with enough EU manufacturing capacity to meet the entire domestic demand for wind, solar PV, heat pumps, batteries, and electrolyzers.

A total of almost EUR 120 billion would be needed to build autonomous net-zero manufacturing capacity in Europe, with a majority of spending directed to battery manufacturing and privately funded (80% of the total in the *NZIA+ policy scenario*) (Figure 4). This requirement comes in addition to investment needs already identified to reach carbon neutrality but excludes the domestic upstream supply chain, e.g., production of critical raw materials.

Figure 4. Investment needs to meet the Net Zero Industry Act objectives

Total additional investment needs ≈ EUR 90-120 billion in total over 2023-2030



⁷ At the global level, private financial institutions could facilitate about 55%-60% of annual financing (IEA, 2023) between 2022 and 2050 (USD 3.5 trillion according to McKinsey, 2023b).

Sources: EU Commission (2023b).

Caveats

Despite some degree of alignment across studies, modelling choices describing priority-capital intensive sectors, the heterogeneity in the definition of sectors in scope, technology maturity, etc. make cross-model comparisons difficult. Bottom-up approaches, based on country-level needs (incl. from national plans) are hard to reconcile with more top-down approaches at EU level. Furthermore, only recent modelling updates factor in the mid- to long-term implications of external shocks such as the war in Ukraine and the reorganization of global supply chains.

Key knowledge gaps, or uncertain outcomes beyond anecdotal evidence, were identified both at EU and country-level in relation to investment needs for climate change adaptation and several environmental objectives (e.g., limited data on biodiversity at EU level), public-private ratios as well as R&D needs.

A word of caution

Investment gap assessments are based on projections which only partially represent the complexity of our economies. They are based on numerous assumptions and parameters likely to influence modelling outcomes and the range of scenarios under scrutiny. Bottom-up models with a richer representation of the energy sector that are traditionally developed to derive clean energy investment needs, often fall short of representing the financial sector and its connection to the real economy.

The rapidly evolving policy and regulatory environment, the swift technological developments underway are likely to alter current business models, as well as investment and funding trends observed historically (a characterisation of structural investment patterns is provided in the Market Trends chapter). A periodical revision of investment gap assessments will be needed to factor in these transformations.⁸ These projections and the characterisations of investment

⁸ The careful calibration of models, anchored in actual market trends and fully aligned with policies in place or announced, is paramount to ensure the validity and policy relevance of results. The original assessment of investment needs in line with the *Fit for 55* package conducted by the Commission and published in 2021, rested on an ETS price rising to EUR 30 per tonne of CO₂eq (baseline scenario) by 2030 and up to EUR 48 per tonne of CO₂eq by 2030 (MIX scenario) (European Commission, 2021). As noted in the report, the actual market price at the time of publication in June 2021 was already around EUR 50. Since then, it has solidly established itself above EUR 80 per tonne, thus at odds with one of the fundamental scenario assumptions and a key driver of technology shifts. Actual market developments (i.e., the progressive phase-out of free EU ETS allowances in the fourth phase over 2021-2030) are misrepresented, thereby putting the overall assessment in question.

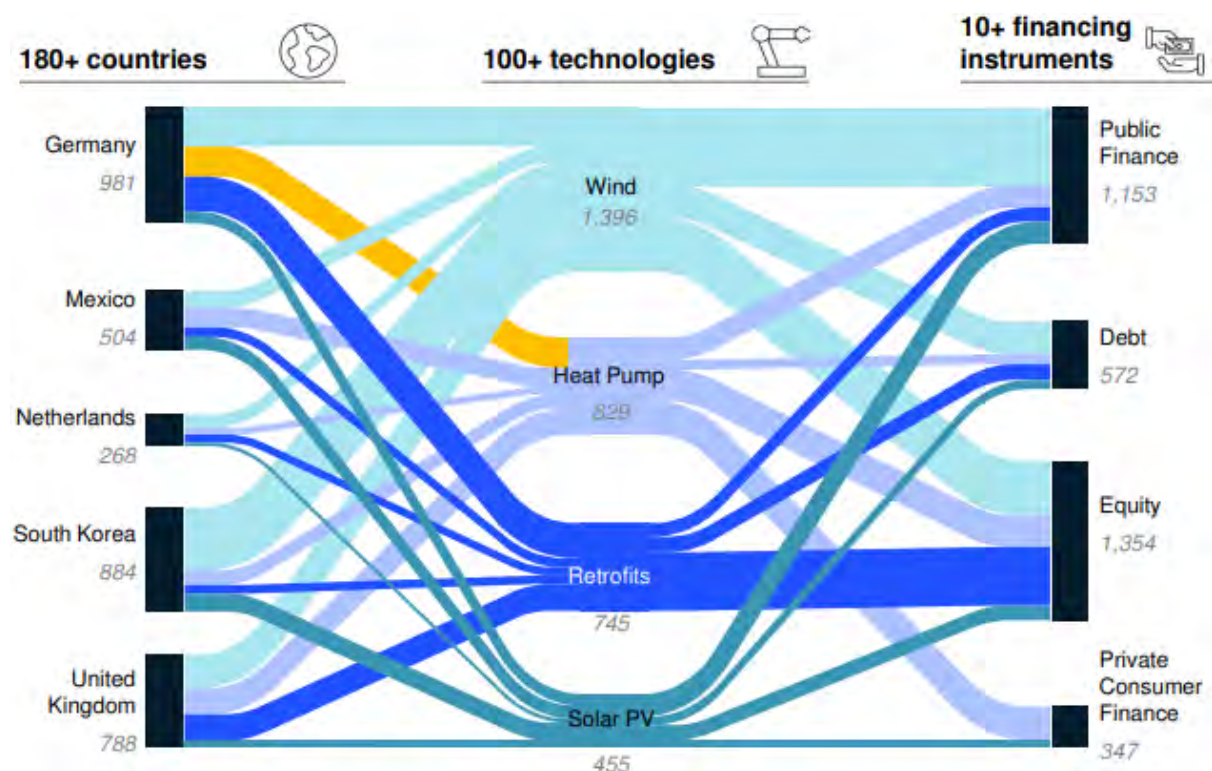
gaps should thus be apprehended very cautiously when confronted with market-based data on actual financial flows and real economy investments.

McKinsey’s Transition Finance model

The Transition Finance Model (TFM) tool aggregates various data sources and CAPEX scenarios to create an outlook on how capital supply may meet demand and which financing actors and instruments are to be mobilised. The TFM tool can be used to inform the effective allocation of capital across instruments and products.

The tool translates transition scenarios (e.g., net zero, current policies, 2 degrees) into 180+ countries, 100+ underlying key technologies, 10+ financing instruments and possible capital providers on the basis of real economy dynamics and macroeconomic factors (See illustration below).

Example of McKinsey’s TFM tool output: Breakdown of investments in net zero technologies for selected geographies and financing instruments (USD billion, 2023-50)



Source: Reproduced from McKinsey (2023), Transition Finance Model.

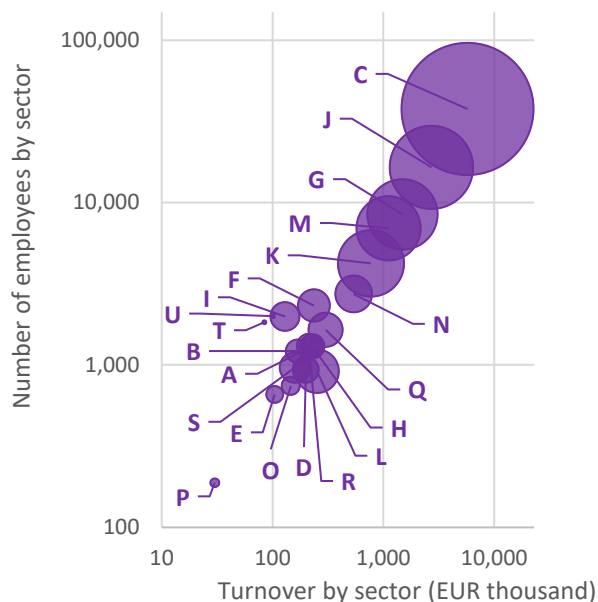
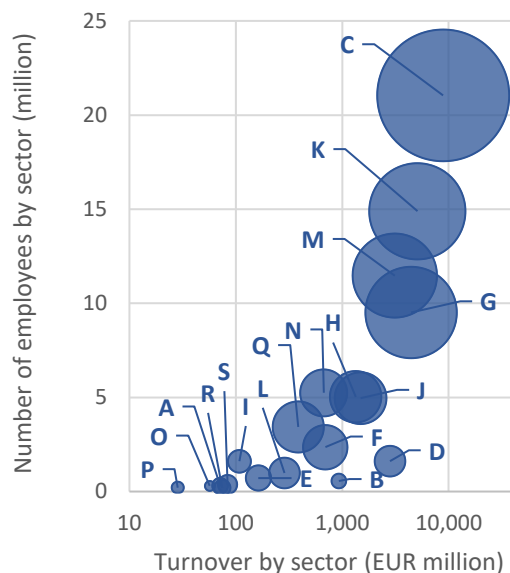
Annex 2. REAL ECONOMY

CSRD universe by sector (excerpt)

Large caps (34 000 entities)

Listed SMEs (2 000 entities)

Bubble size indicates the number of firms per sector



Turnover >= EUR 50 million
Total assets >= EUR 25 million
Nb employees >= 250

Turnover < EUR 50 million
Total assets < EUR 43 million
Nb employees < 250

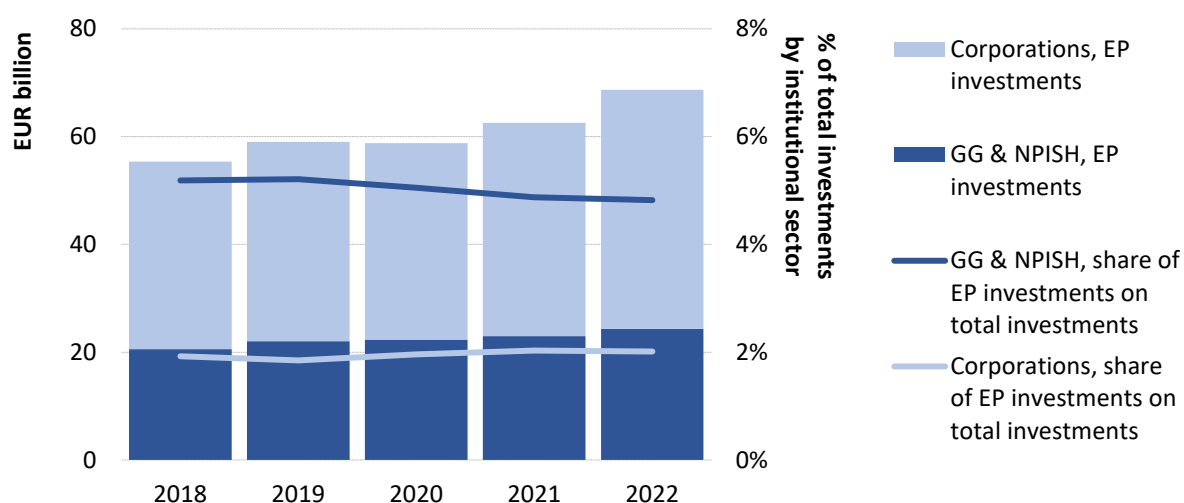
A	Agriculture, forestry and fishing
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam and air conditioning supply
E	Water supply; sewerage, waste management and remediation activities
F	Construction
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M	Professional, scientific and technical activities
N	Administrative and support service activities
O	Public administration and defence; compulsory social security
P	Education
Q	Human health and social work activities
R	Arts, entertainment and recreation
S	Other service activities
T	Activities of households as employers
U	Activities of extraterritorial organisations and bodies

Source: Analysis based on ORBIS database

Corporate investments in environmental protection

In 2022, the EU invested EUR 69 billion into assets essential to provide environmental protection services (e.g., wastewater treatment plants, vehicles to transport waste, acquisitions of land to create a natural reserve, or cleaner equipment for producing with fewer polluting emissions, but without renewable energy), with corporates accounting for 65% of the total (EUR 44 billion).

Investments for environmental protection, EU-27, 2018–2022



Source: Eurostat.

Note: Data for EU are estimated by Eurostat; total investments include, for each sector, gross fixed capital formation and acquisitions less disposals of non-financial non-produced assets; GG: general government; NPISH: non-profit institutions serving households; EP: environmental protection.

The numbers include both the specialist providers of environmental protection services (e.g., private companies dealing with waste collection and processing and with sewerage) and corporations other than specialist producers, which purchase technologies and equipment reducing the environmental pressures arising from their production process.

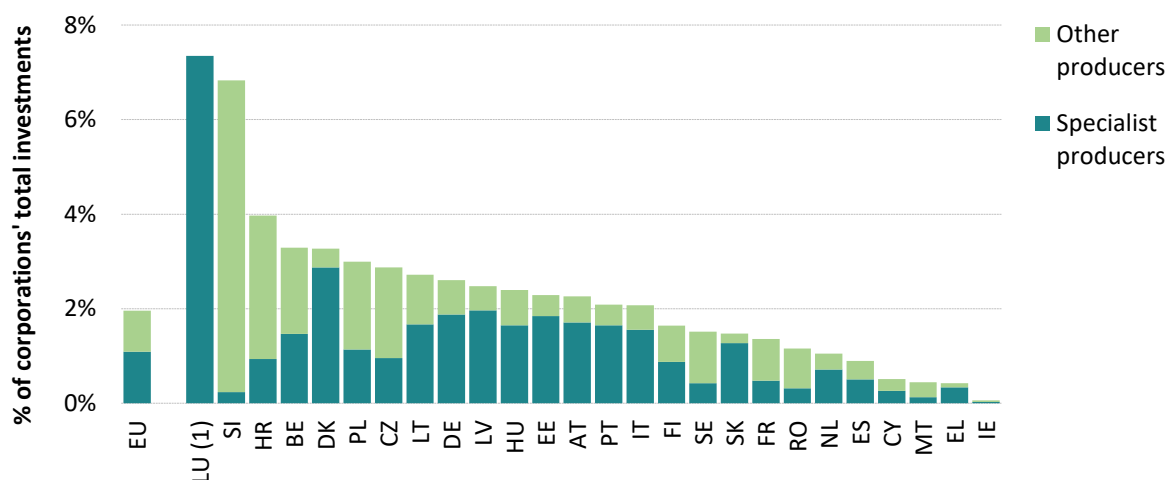
With 38% and 36% in 2022 respectively, the manufacturing sector and other business sector, both non-specialist producers, accounted for the majority of total environmental protection investments of corporations beyond specialist producers.

The share of environmental protection investments in total investments of corporations is relatively low, equivalent to 2.0% in 2022, and kept relatively stable over the period 2018-2020. Total investments (from all type of investors) increased slightly faster than investments in environmental protection.

With 44% and 25.7% of the total investments for environmental protection, wastewater and waste management services received the largest investment in 2022. Other recipients included: air protection (10.5%), protection against radiation (7.8%), soil and groundwater protection (6%), biodiversity and landscape protection (4.4%), and noise reduction (1.6%).

In 2020 (most recent year for the mandatory EPEA data reporting), the share of environmental protection investments in total investments ranged from 0.1% to 7.3% of total investments across countries.

Investments for environmental protection, EU-27, 2018–2022



Source: Eurostat.

Note: data for EU are estimated by Eurostat. Total investments include gross fixed capital formation and acquisitions less disposals of non-financial non-produced assets of corporations from annual sector account (National Accounts). Bulgaria is not included in this graph given that data from annual sector accounts for corporations are not available. (1) Other producers: environmental protection expenditure not available.

Given that a large amount of environmental protection investments are related to waste and wastewater management services, the variations observed may be due to the different organisation of provision of such services across countries, i.e. some countries rely strongly on the government sector (e.g., public utility entities) to provide such services, while others tend to resort, at least partially, to market-based instruments, and e.g. leave it to the market to set prices of such services.

Transition

Additional initiatives and sources on transition plans

- [UNFCCC Global Climate Action portal / Actor Tracking](#)
- [Climate Bonds Initiative \(CBI\) Guidance to assess transition plans](#) (September 2023)
- [Defining Transition Finance and Considerations for Decarbonization Contribution Methodologies, GFANZ, consultation paper](#) (September 2023)
- [WWF, University of Zurich, Oxford Sustainable Finance Group, Net Zero Transition Plans: Red Flag Indicators to Assess Inconsistencies and Greenwashing](#) (September 2023)
- [Transition Plan Taskforce \(TPT\) Disclosure Framework](#) (October 2023)
- [ACT methodology](#) (Launched in 2015)
- [SBTi Financial Institutions Net-Zero Standard, Science Based Targets Initiative, consultation draft](#) (June 2023)
- [SBTi Corporate Net-Zero Standard, Science Based Targets Initiative, Version 1.1](#) (April 2023)
- [Climate Action 100 + \(CA100+\) Net Zero Benchmark Disclosure Framework Methodology](#) (October 2022)
- Other methodologies developed by private corporations.

Transition plans and science-based targets

Following the June 2023 Commission recommendation, transition plans and science-based targets are key instruments for financial and non-financial entities to identify the way forward and the financing needed to reach their objectives. They are usually determined through scenario analysis and sectoral science-based pathways and can be used to engage with investors once entities have enough clarity on their transition finance needs. Therefore, in this methodology, the concept of transition will be centred around the existence of a transition plan at the entity level or science-based targets set for the entity when proportionate. Including science-based targets aims at adding all entities to the framework that have limited resources to build a full transition plan but are still committed to transition to a net-zero pathway and have set science-based targets to do so. This is likely to particularly be the case for small and medium enterprises (SMEs).

Transitions plans

Transition plans are defined in Article 2(3) of the EU Commission recommendation as follows: *“Transition plan means an aspect of the undertaking’s overall strategy that lays out the entity’s targets and actions for its transition towards a climate-neutral or sustainable economy, including actions, such as reducing its GHG emissions in line with the objective of limiting climate change to 1,5 °C.”*

This implies a strong connection between transition plans and corporate strategies. When using transitions plans, corporates shall establish targets and actions to reach the end objective of limiting climate change to 1,5°C. Other definitions of transition plans feature commonalities on for example: time-bound character; link with corporate strategies; specific focus on business-model (activities), operations and assets; 2050 net-zero target (some interim targets can be more stringent, incl. in the case of the EU).

Science-based targets

Science-based targets offer an alternative to identify transition finance needs (and flows). The Science-Based Target Initiative defines credible science-based targets (e.g. SBTi’s Net-Zero Standard) with a dual objective: i) Reducing scope 1, 2, and 3 emissions to zero or a residual level consistent with reaching global net-zero emissions or at a sector level in eligible 1.5°C-aligned pathways; and (ii) permanently neutralizing any residual emissions at the net-zero target year and any GHG emissions released into the atmosphere thereafter (SBTi, 2023).

While such net-zero standards are designed for corporates larger than 500 employees, SMEs can also submit science-based targets using SBTi’s streamlined route for SMEs. The SBTi Companies Taking Action Dashboard illustrates the relevance of science-based targets for SMEs. Half of the 1,200 EU-headquartered organizations with approved science-based targets as of September 2023 were large companies. SMEs accounted for 48% of the total and financial institutions for the remaining 2%.⁹

⁹ For the purposes of target validation by SBTi, a SME is defined as a non-subsidiary, independent company with fewer than 500 employees.

ESRS and transition of entities

Selection of transition-related ESRS indicators

Selected ESRS provisions	Number	Detail
ESRS 1 General requirements	ESRS 1 (5.1)	Undertaking must specify if the sustainability statement covers its value chain
	ESRS 2 GOV-1	The company must disclose the expertise and skill of its administrative, management and supervisory bodies on sustainability matters
ESRS 2 General disclosures	ESRS 2 GOV-2	The company must inform how the board and supervisory bodies are informed about sustainability matters and how frequently they are assessed / Entity must disclose who is responsible for sustainability matters
	ESRS 2 GOV-3	The entity must disclose information about the integration of sustainability reported performance in incentive schemes
	ESRS 2 GOV-5	The entity must disclose its internal control process
	ESRS 2 IRO-1	Explanation of whether and how a scenario analysis was used
	ESRS 2 SBM-1,2&2	The undertaking must disclose and describe the key elements of its strategy that affects/relates to sustainability matters to identify exposure to material impacts, risks and opportunities
	ESRS 2 MMR-M	The undertaking shall disclose the scope of its targets. This includes the undertaking's activities and/or upstream/downstream value chain where applicable, and geographical boundaries.
	ESRS 2 MDR-A 69	Current and future financial resources allocated to action plan (both CAPEX and OPEX) in monetary terms
	ESRS E1 Climate	ESRS E1-1
After identifying climate related risks, the undertaking will describe the resilience of its business model and of its strategy in relation to climate change		

ESRS E1-2	The undertaking shall describe its policies adopted to manage its material impacts, risks and opportunities related to climate change mitigation and adaptation.
ESRS E1-3	The undertaking shall disclose its climate change mitigation and adaptation actions and the resources allocated for their implementation
ESRS E1-4	The undertaking shall disclose the climate-related targets it has set
	The undertaking shall describe the expected decarbonisation levers and their overall quantitative contributions to achieve the GHG emission reduction targets (e.g., energy or material efficiency and consumption reduction, fuel switching, use of renewable energy, phase out or substitution of product and process)
ESRS E1-5	The undertaking shall provide information on its energy consumption mix. It will disclose its total energy consumption in MWh and its different sources production
ESRS E1-6	Scope 1, 2 and 3 emissions need to be disclosed in metric tonnes of CO ₂ eq
ESRS E1-7	The undertaking shall disclose the use of GHG storage or removal, and/or use of carbon credits for its projects or in its value chain
ESRS E1-8	The undertaking shall disclose whether it applies internal carbon pricing schemes, and if so, how they support its decision making and incentivise the implementation of climate-related policies and targets.
ESRS E1-9	Anticipated financial effects from material physical risks and effects from transition risks
	When disclosing climate-related opportunities, the undertaking must explain the nature of its costs savings, time horizons and the methodology used to identify opportunities
	The entity must disclose the anticipated financial effects from material physical risks, material transition risks and also the potential benefits of material climate-related opportunities.
ESRS E1-16	The undertaking shall disclose expected changes in revenue from low-carbon products
	Disclosure of significant operational expenditures (Opex) and (or) capital expenditures (CapEx) required for implementation of transition plan.

ESRS E4 Biodiversity	ESRS E4-1	The undertaking shall disclose how its biodiversity and ecosystem impacts, dependencies, risks and opportunities originate from and trigger adaptation of its strategy and business model.
ESRS G1 Business conduct	ESRS G1-5	The undertaking must disclose any activities/commitments in relation to political influence and lobbying, as well as their purpose
ESRS S1 Just Transi- tion for own workforce	ESRS S1- SBM3	The undertaking shall provide any material impacts on its own workforce that may arise from transition plans for reducing negative impacts on the environment and achieving greener and climate- neutral operations, including information on the impacts on own workforce caused by the undertaking's plans and actions to reduce carbon emissions in line with international agreements.
	ESRS S1 - 5	The undertaking shall disclose the time-bound and outcome-oriented targets it may have set related to reducing negative impacts on its own workforce; and/or advancing positive impacts on its own workforce; and/or managing material risks and opportunities related to its own workforce
ESRS S2 Just Transi- tion for sup- ply chain workers	ESRS S2- SBM3	The undertaking shall provide information in the case of material negative impacts, on consideration of impacts on workers in the value chain that may arise from the transition to greener and climate-neutral operations.
ESRS S3 Just Transi- tion for af- fected com- munities	ESRS S3- SBM3	The undertaking shall provide information in the case of material negative impacts, on consideration of impacts on affected communities that may arise from the transition to greener and climate-neutral operations.

Overview of key transition frameworks

Organization	Elements covered	Criteria / Thresholds	Focus	Level	Summary
IPSF	- target setting for firms - transition plan scope - assessment of transition plans	No	Corporates, FIs & Regions	Activity Entity Portfolio	The report proposes 9 'Transition Finance Principles'. While the 'target' part (principles 1-4) follows science and international frameworks, it allows for heterogeneity across world regions. In the 'delivery' part (principles 5-9), the need for comparability across locations as well as external verification of disclosed metrics and transition plans is highlighted.
UNHLEG	Target setting for firms Transition plan scope	No	Corporates, FIs, Cities & Regions	Entity	The report provides 5 high-level principles, supported by 10 underlying recommendations, that stars that should guide the setting and attaining of net zero targets.
OECD	Key indicators	No	Corporates	Entity	The study provides context, definitions, and key challenges on transition finance. It highlights the ten elements that transition plans must have to be deemed credible, derived from the assessment of several existing initiatives focused on transition, also included within this literary review.
CDP	Key indicators Assessment methodology	Yes. Methodology requires reporting on all indicators.	Corporates and FIs	Entity	The note lays out six fundamental principles for a credible transition plan and translates them into elements (direct & supporting indicators) that can be derived from companies' response to CDP's yearly Climate Change Questionnaire.
TPT	Key indicators	No	Corporates and FIs in the UK	Entity	The taskforce aims at setting a framework and guidance (specific for high impact sectors, corporates and FIs) to assist UK entities to disclose credible, useful, and consistent transition plans. It builds on the existing recommendations to disclose transition plans developed by the TCFD and the ISSB.
WWF, University of Zurich & Oxford Sustainable Finance Group	Key indicators	No	Corporates and FIs	Entity	This paper proposes a methodology based on existing key indicators for transition plan disclosure, ambition, credibility, and feasibility assessments. Besides the requirements per indica-

					tor, the study links a priority to each of them, based on its frequency of appearance in literary review, allowing for red flag identification.
CA100+	<ul style="list-style-type: none"> • Key indicators • Assessment methodology 	Yes. Methodology requires specific criteria per indicator.	Corporates	Entity	This benchmark presents a disclosure framework, composed by indicators, sub-indicators, and metrics which are expected to be disclosed by entities in transition, along with an assessment methodology used to evaluate adequacy of such corporate transition-related disclosures.
CBI	Key indicators	No	Corporates	Entity	This report sets a framework to assess corporate transition plans based on five hallmarks that provide the guidance needed to determine if the plan is comprehensive enough. Although it does not provide assessment methodology or thresholds, it identifies green and red flags per hallmark to watch out for during the assessment of a transition plan.
SBTi Corp	Target setting recommendations	Yes. Thresholds for target	Corporates	Entity	The standard provides guidance on how to set credible science-based net-zero targets for corporates, which are an essential part of transition plans.
GFANZ	Key financing strategies	No	FIs	<ul style="list-style-type: none"> • Entity • Portfolio 	This paper aims to build on GFANZ's four transition financing strategies identified in previous 2022 work (Net-zero Transition Plan - NZTP) with precise attributes proposition, to show connectivity to complementary existing transition finance practices and to further develop potential decarbonization methodologies.
SBTi FI	Target-setting recommendations	Yes. Thresholds for target	FIs	<ul style="list-style-type: none"> • Entity • Portfolio 	The standard provides guidance on how to set credible science-based net-zero targets for financial institutions, which are an essential part of transition plans.

IPSF, UNHLEG, OECD, and CDP frameworks: Commonalities assessment

	Fully covered
	Partially covered
	Not covered

Element	Sub element	IPSF	UNHLEG	CDP	OECD
Strategic ambition	Business model and key assumptions	I-5.1			
	Process for identifying climate related risks & opportunities	I-1.1	Reco 4	C-3.1	O-5
	Climate related risks identified, potential impact and response strategy	I-1.1	Reco 4 & 5	C-3.2	O-5
	Climate related opportunities identified, potential impact and response strategy	I-1.1	Reco 4	C-3.3	O-5
	Link between climate related risks & opportunities and overall company ambition	I-1.1	Reco4	C-4.1; C-4.2	O-5
	Use of climate scenario analysis	I-1.1	Reco 1,2 & 4	C-2	O-1; O-5
	Use of regional pathways (location specificity)	I-1.2			
	Use of sectoral pathways (industry specificity)	I-2.1; I-3.1			O-2
	Use of technology roadmaps	I-2.3			O-2
	Use of taxonomies (performance categories)	I-3.3			O-2
	Phase out of fossil fuels			Reco 5	
Governance	Oversight and reporting of climate related issues	I-6.1	Reco 4	C-1.1	O-9
	Skills and expertise on climate related issues	I-6.1	Reco 4	C-1.2	
	Responsibility and accountability on climate related issues		Reco 8	C-1.3	O-9
	Incentives and remuneration linked to climate KPIs		Reco 4	C-1.4	
	Culture on climate related issues				
Transition financial planning	Revenue			C-5.1	O-8
	CapEx	I-5.1	Reco 4	C-5.1	O-8
	OpEx	I-5.1		C-5.1	O-8
Climate-related metrics	Scope 1 emissions	I-2.4	Reco 2 & 4	C-7	O-3
	Scope 2 emissions	I-2.4	Reco 2 & 5	C-7	O-3
	Scope 3 emissions	I-2.4	Reco 2 & 6	C-7	O-3

	Emissions third-party verification	I-8.2		C-7	
	Carbon removals	I-2.5			
	Carbon credits				O-4
	Carbon offsets	I-2.5			O-4
	Interim GHG reduction targets	I-2.2	Reco 1,2 & 4	C-6.1	O-1
	Net-zero target	I-2.2	Reco 1 & 4	C-6.3	O-1
	Other climate-related targets	I-2.2		C-6.2	
	Target third-party verification		Reco 4 & 8	C-6.1; C-7	O-10
Engagement	Engagement with supply/value chain	I-7.1	Reco 4	C-9.2	O-7
	Engagement with industry	I-7.2; I-8.3	Reco 6		
	Engagement of firms with financial institutions	I-7.2; I-8.3			
	Engagement with government, public sector, unions, communities, and civil society	I-7.2	Reco 4,6 & 8	C-8	O-1; O-2
Transparency	Verification of disclosure by external auditor (claimed progress of KPI, full transition plan)	I-8.2; I-9.1			
	Progress on climate related metrics and KPIs	I-1.3; I-5.1; I-8.1		C-7	O-3
	Progress on climate related targets	I-3.2		C-6.1; C-6.3	O-3
	Progress on engagement initiatives				O-7
	Progress on financial planning for climate transition	I-6.3			O-3; O-8
Implementation	Coverage of transition plan (no material omissions, time horizon milestones)	I-5.2 I-5.3			
	Transition of business operations	I-6.2	Reco 5	C-9.1	
	Transition of products and services	I-6.2	Reco 5	C-5.2	
	Policies and conditions for the transition	I-6.2	Reco 4		
	Just Transition	I-4.2			O-7
	DNSH (simultaneity of objectives, co-benefits preferred)	I-4.1			O-6
	RBC due diligence (internal monitoring, correction mechanisms)	I-6.3			O-6

Annex 3. FINANCIAL MARKETS

Primary market instruments

Loans

Indicator	Details	Rationale for inclusion
Energy efficient real estate (stocks and flows) [ESG P3 disclosure template 2]	<i>Loans collateralised by commercial and residential immovable property in the highest energy efficiency level (kWh/sqm) brackets. [Expressed as a percentage of total loans collateralised by commercial and residential immovable property.]</i>	<i>Provides an overview of collateral of existing loans, providing an overview of the ‘starting point’. Changes over time can be included as the delta in stock between t and t-1 and delta in the numerator only.</i>
Green asset ratio (GAR) (stocks and flows) [ESG P3 disclosure template 7/8]	<i>Loan part only of the GAR (%), broken down into the various counterparties (NFCs, FCs, HHs). Break-down of the total GAR into CCM, CCA, of which specialised, transitional/adaptation and enabling activities (as applicable) also possible.</i>	<i>Provides a proxy for sustainable lending. Focuses on financial assets funding sustainable activities as per the EU taxonomy (contributing substantially to CCM or CCA). Changes over time could be included as the delta in the ratio between t and t-1, and the change in the numerator only.</i>
Assets not included in the GAR but in the Banking Book Taxonomy Alignment Ratio (BTAR) (stocks and flows) [ESG P3 disclosure template 9]	<i>Assets making up the loan part of the BTAR, to EU NFCs only. [Expressed as a percentage of total assets.] Break-down into CCM, CCA, of which specialised, transitional/adaptation and enabling activities (as applicable) also possible.</i> <i>Note – Data collected by banks on a voluntary basis.</i>	<i>The GAR in its nominator only covers lending to NFCs s.t. to NFRD disclosure obligations. SMEs (not s.t. NFRD) make up a substantial portion of the EU corporate landscape and are of relevance for banks’ B/S¹⁴. Hence the assets not covered by the GAR would present an important complementary indicator, and at the same time inclusion would ensure setting the right incentives for banks. Changes over time can be included as the delta in stock and numerator between t and t-1.</i>

Loans funding climate change activities not covered in the GAR or BTAR (stocks and flows)	<i>Loan exposures that are not taxonomy aligned according to the GAR indicators but that still support counterparties in the transition and adaptation process for the objectives of climate change mitigation and climate change adaptation (loans issued under standards other than EU standards). Counterparty sector break-down, risk mitigated (transition vs physical). [Expressed as a percentage of total assets.]</i>	<i>Captures banks' activities that are directed at (climate-related) sustainable objectives but that are not captured by the GAR as not fully taxonomy aligned. Complements the estimation of banks' green loan books beyond EU taxonomy alignment. Changes over time can be included as the delta in stock and the numerator between t and t-1.</i>
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[ESG P3 disclosure template 10]

Bonds

Indicator	Details	Rationale for inclusion
Number of green bonds issued (flows)	<i>Number of bonds issued in the EU, on an annual basis. This indicator will be calculated by aggregating the amount of bonds issued within the EU on a one-year period. In addition, the Platform will look at the split of bonds issued based on the standard they comply with (ICMA, CBI, EU GBS).</i>	<i>Overview of activity in the European green bonds market.</i>
Funds raised by green bonds (flows)	<i>Amount of money raised from bonds at the moment of issuance, covering money raised from bonds issued in the EU on an annual basis. The indicator will be calculated by aggregating the amount of money raised in EU-issued bonds on a one-year period. In addition, the Platform will look at the split of amounts raised based on the bonds standards mentioned above (EU GBS, ICMA, CBI etc.)</i>	<i>Financial flows related to green bonds</i>

Type of green bond issuers (stocks and flows)	<ul style="list-style-type: none"> • Issuer size: SMEs, medium size company, large cap, very large cap • Corporates, sovereigns, or public administrations/entities • Issuer's macro-sector (real economy activities) for corporate bonds only 	Gives an overview of the type of GB issuers to better understand what sectors and what category of economic actors issue GB
Geographical split on green bonds (stocks and flows)	<ul style="list-style-type: none"> • Market of issuance within the EU (look at the issuer code) • Issuer's nationality 	Give an overview of the geographical repartition of bonds' issuers and places of issuance
Green bonds' purpose (stocks and flows)	<ul style="list-style-type: none"> • Use of proceeds (type of green projects funded) • Breakdown by activities (Nace codes as available) 	Important indicator to understand the type of projects and environmental goals green bonds answer to
Share of funds raised by general-purpose bonds dedicated to green projects (flows)	<p>The Platform would apply the green revenue proxy defined in the Real Economy section to determine the share of the funds raised by each general-purpose bond that goes into green projects.</p> <p>This indicator will be calculated by aggregating the amount of money raised in EU-issued bonds on a one-year period</p>	Green financial flows related to general-purpose bonds

Equity

Indicator (public equity)	Details	Rationale for inclusion
Share of new green funds raised by companies based on the greenness of their activities (flows)	<p>Here, the Platform would take into consideration IPO, private placements and diluted follow-on equity offerings). In the absence of labeling to determine "green company" the Platform would measure at the firm level the amount of equity raised with a green financing purpose over one year, based on the</p>	This indicator gives information on the proportion of new equity raised funding companies performing green activities

green revenue proxy described in the Real Economy section.

The geographical coverage would include companies listed in the EU

Indicator (private equity)	Details	Rationale for inclusion
Share of new green funds raised by companies based on the greenness of their activities (flows)	<p><i>Here the Platform would take into consideration amounts raised by private firms when there are capital increases. These include early-stage capital raises (VC, Business Angels etc.) and later stage capital raises.</i></p> <p><i>In the absence of labelling to determine “green company” the Platform would measure at the firm level the amount of equity raised with a green financing purpose over one year, based on the green revenue proxy defined in the Real Economy section.</i></p> <p><i>The geographical coverage would include non-listed EU companies</i></p>	<p><i>This indicator gives information on the proportion of new equity raised funding companies performing green activities</i></p>

Secondary market instruments

Equity

Indicator (public equity)	Details	Rationale for inclusion
Average PE ratio for firms with high Taxonomy alignment metrics (equity value indicator) (stocks)	<p><i>The Platform would look at the average Price Earnings (PE) ratio of the 25% of companies with the highest rate of aligned metrics to the Taxonomy vs. the 25% of companies with the lowest rate of alignment for key sectors such as energy, utilities, industrials and financials.</i></p>	<p><i>This indicator would reveal how companies with high Taxonomy alignment metrics are valued on the markets by investors, and how they evolve over time vs their peers with low Taxonomy alignment. PE ratio is a metric that is commonly used by investors to value companies and their sector. Therefore, the Platform</i></p>

		<i>considers that this is a relevant indicator to include in this framework.</i>
Average EV/EBITDA ratio for firms with high Taxonomy alignment metrics (enterprise value indicator) (stocks)	<i>The Platform would look at the average Enterprise Value (EV) /EBITDA ratio of the 25% of companies with the highest rate of aligned metrics to the Taxonomy vs. the 25% of companies with the lowest rate of alignment for key sectors such as energy, utilities, industrials and financials.</i>	<i>As with the PE ratio, the EV/EBITDA ratio is a valuation indicator commonly used by investors. The latter would also reveal how companies with a high degree of alignment with the Taxonomy are valued by investors on the markets, and how they evolve over time compared with their peers with a low degree of alignment with the Taxonomy. The Platform considers that it is relevant to complement the PE ratio with the EV/EBITDA ratio, as the latter takes into account both the debt and the equity structures of companies. This allows a better comparison among firms with different capital structures. It is also useful for valuing firms with negative earnings, which would make PE ratio meaningless.</i>

Investment funds

Indicator	Details	Rationale for inclusion
1. Share of SFDR Art.8 and Art.9 funds (stocks)	<i>Ratio of SFDR Art.8 and Art.9 fund assets (separately) over total assets under management of EU-domiciled investment funds, in %. Based on snapshot data (end of observation period).</i>	<i>The combined ratio is one indication of the share of 'ESG-oriented' funds. The focus on Article 9 funds provides more precise information on the share of sustainable investing in the EU. Rely on AuM rather than number of funds to compute value-based metrics.</i>

<p>2. Share of Taxonomy-aligned investments of SFDR Art.8 and Art.9 funds (stocks)</p>	<p><i>Portfolio-weighted average Taxonomy-alignment of Article 8 and Article 9 funds, in % of all investments.</i></p> <p><i>Objective to rely on annual disclosures. TBC based on data availability/quality: Turnover vs. CapEx vs. Opex.</i></p> <p><i>Special carve out for PAB/CTB funds given lower expected Taxonomy alignment.</i></p> <p><i>If available, possibility to rely on data provider estimates for Art.6 and non-EU funds</i></p>	<p><i>The SFDR templates (available from 2023) require Article 8 and 9 funds to disclose the minimum percentage of investments aligned with the EU Taxonomy (including and excluding sovereign bonds). This is the best indication on aggregate alignment of the EU fund industry with the Taxonomy.</i></p>
<p>3. Share of non-Taxonomy aligned sustainable investments of SFDR Art.8 and 9 funds (stocks)</p>	<p><i>Similar to indicator #2 but focus on non-Taxonomy aligned sustainable investments.</i></p> <p><i>Special carve out for PAB/CTB funds given automatic 100% qualification.</i></p>	<p><i>The SFDR templates (available from 2023) also require Article 8 and 9 funds to disclose the minimum percentage of sustainable investments NOT aligned with the EU Taxonomy, split between social and other environmental objectives. This will provide useful information for comparison purposes with Taxonomy aligned investments.</i></p>
<p>4. Net fund flows into SFDR Art.8 and Art.9 funds (flows)</p>	<p><i>Aggregate net flows into SFDR Art.8 and Art.9 funds, in % of assets under management.</i></p> <p><i>Based on monthly data cumulated over twelve months (divided by AuM used in the previous indicator).</i></p> <p><i>Possibility to split the indicator between funds experiencing net outflows vs. funds experiencing net inflows, asset class (equity, bond), management type (active vs. index-tracking), etc.</i></p>	<p><i>Signals investor appetite for ESG funds (broadly speaking) and more specifically for investments with an environmental and/or social objective.</i></p> <p><i>Further breakdowns could provide useful insight into investor appetite for transition instruments (e.g., flows into passively managed funds tracking EU climate benchmarks)</i></p>
<p>5. Net fund flows into Taxonomy-aligned investments (flows)</p>	<p><i>Aggregate net flows into Taxonomy aligned investments, calculated as:</i></p>	<p><i>For SFDR Art.8 and 9 funds: combination of indicators #2 and #4 to derive net flows into Taxonomy-aligned investments.</i></p>

	<i>SFDR Art.8/9 funds: net flows * Taxonomy alignment (incl. carve out for PAB/CTB). If Taxonomy KPI estimates not available for Art.6 and non-EU funds: net flows * weighted average Taxonomy alignment of portfolio holdings</i>	<i>For SFDR Art.6 and non-EU funds the absence of Taxonomy KPI estimates implies relying on portfolio holdings to derive similar figures.</i>
6. Net fund flows into non-Taxonomy aligned sustainable investments (flows)	<i>Similar to indicator #5 but focus on non-Taxonomy aligned sustainable investments (incl. carve out for PAB/CTB).</i>	<i>Combination of indicator #3 and #4 to derive the net flows going into non-Taxonomy-aligned sustainable investments.</i>

Summary of transition-related indicators

Instrument type	Indicator	Transition application
Bonds	Number of green bonds issued.	<i>Carve out for “of which by entities in transition”</i>
	Funds raised	
	Type of issuers	
	Geographical information	
	Bonds’ environmental criteria	
	General purpose bond characterisation	<i>Duplicating the general indicator but applied to entities in transition only. Note that this graph cannot be compared to the one comprising all firms, as there will be double-counting of entities in transition.</i>
Equity	Amount of equity raised	<i>Carve out for “of which by entities in transition”</i>
	PE ratio of companies in transition compared with other companies in the same sector	<i>Duplicating the general indicator but applied to entities in transition only. Note that this graph cannot be compared to the one comprising all firms, as there will be double-counting of entities in transition.</i>
Funds	Taxonomy alignment of Art. 8 & 9 funds.	<i>Carve-out for PAB/CTBs.</i>
	Non-taxonomy aligned sustainable investments of article 8 & 9 funds.	

Net flows into Taxonomy aligned investments.

Net flows into non-taxonomy aligned sustainable investments.

Metrics for the transition of financial institutions

Further detail on the ESG Pillar 3 templates indicators to assess the transition of banks

Indicators from Template 3

IEA Net Zero Sectoral Alignment metrics

Stocks and net flows

- The deviation (%) of financed emissions from IEA NZ scenarios per NACE sectors. Only available for high-impact sectors (real estate and financial sectors not included):
Power; Fossil fuel combustion; Automotive; Aviation; Maritime transport; Cement, clinker and lime production; Iron & steel, coke and metal ore production; Chemicals; "Potential additions relevant to the business model of the institution".
- Shows how portfolios' financed emissions align or not to net-zero scenarios.

IEA Net Zero Average Alignment metrics

Stocks and net flows

- Weighted average deviation (%) for the high-impact sectors reported.
- Provides a general sense of banks' transition progress, as an addition to the more granular indicators coming from the metric describe above.

Indicators from the combination of Templates 1 and 3

Climate targets

% coverage of financed emissions

+ Top 3 sectors not covered

- Matching T3 sectors with targets on financed emissions (T1 col. i).
Share of financed emissions covered by transition targets = $\text{Sum of these emissions} / \text{Total financed emissions (T1 I 53)}$.
Top 3 sectors not covered by T3. Top 3 emitters as shares of total financed emissions.
 - Provides a sense of how material targets are in terms of coverage, and in turn how likely is the overall portfolio to transition.
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