GREEN TRANSITION IN IMPLEMENTATION PHASE

RECENT DEVELOPMENTS IN FRANCE AND JAPAN

AMBASSADE DE FRANCE AU JAPON
Liberté
Égalité
Fraternité

GX 推進機構 Acceleration Agency

BANQUE DE FRANCE
EUROSYSTÈME

Green Finance Network Japan

実践段階に入ったグリーン・トランジション：フランスと日本の最新状況

主　催　：　在日フランス大使館
後　援　：　GX 推進機構、グリーン・ファイナンス・ネットワーク・ジャパン (Green Finance Network Japan)
日　時　：　**2025 年 4 月 17 日(木)　14 時 30 分>18 時 00 分　(開場 14 時 00 分)**
会　場　：　在日フランス大使館 アトリウム　(〒106-8514 東京都港区南麻布 4-11-44)
参加費　：　無料
言　語　：　日英同時通訳つき

プログラム(敬称略)**：**

14:00>14:30　開場・受付開始

14:30>14:35　**《 開会挨拶 》ラファエル・ケレール** 在日フランス大使館 経済公使

14:35>14:45　**イブ・ペリエ** サステナブル金融研究所 (パリ・ユーロプラス)　理事長 (ビデオメッセージ)
14:45>14:55　**モルガン・デプレ** 欧州気候基金 国際金融・経済・自然プログラム エグゼクティブ・ディレクター (ビデオメッセージ)
14:55>15:15　**アモリー・ドルセー**　アムンディ・アセット・マネジメント　債券運用部門　ヘッド
15:15>15:35　**松本 千賀子**　三井住友トラストグループ 執行役常務/ CSuO、三井住友信託銀行/ 常務執行役員
15:35>15:55　**手塚 宏之**　JFE スチール株式会社　専門主監
15:55>16:05　**アドリーヌ・ラソー**（PhD）在日フランス大使館科学技術部 医療・環境・生命科学部門長

16:05>16:20　**コーヒーブレイク**

16:20>16:40　**ゴーティエ・ヴェルマンデル** エコール・ポリテクニーク 上級研究員／パリ・ドーフィン大学 准教授 (ビデオメッセージ)
16:40>17:00　**高田 英樹**　GX 推進機構 理事
17:00>17:20　**ステファン・ラトゥーシュ**　フランス中央銀行　アジア太平洋地域　首席代表（在シンガポール）
17:20>17:40　**ヤン・マラン** フランス銀行 金融安定局 次長/気候変動リスク等に係る金融当局ネットワーク（NGFS）事務局長（オンライン）

17:40>17:50　**《 閉会挨拶 》玉木 林太郎** 国際金融情報センター理事長

18:00>19:30　ネットワーキング・カクテル（在日フランス大使公邸にて）
《 ウエルカムスピーチ 》フィリップ・セトン　在日フランス大使
《 乾杯の挨拶 》松澤　裕　環境省地球環境審議官

MC | *アルチュール・ソニオ ペス　在日フランス大使館財務参事官 兼 経済部次長 / フランス銀行駐日代表*

※上記は諸事情により、事前連絡なく変更される場合がありますことをご了承ください

AMBASSADE DE FRANCE AU JAPON
Liberté Égalité Fraternité

GX 推進機構 Acceleration Agency

BANQUE DE FRANCE EUROSYSTÈME

Green Finance Network Japan

FRANCO-JAPANESE FORUM ON GREEN FINANCE

8th edition – 17 April 2025

Green transition in implementation phase: recent developments in France and Japan

Date: **Thursday 17 April 2025, 14:30>18:00** (doors open at 14:00)

Venue: **Atrium of the Embassy of France in Japan** (4-11-44, Minami-Azabu, Minato-ku, Tokyo 106-8514).

Languages: **Japanese and English** (with simultaneous interpretation)

— PROGRAM —

14:00>14:30 *Registrations*

14:30>14:35 **Opening address |** **Mr Raphaël KELLER,** Minister-counsellor for Economic Affairs, Head of the Regional Economic Department, Embassy of France in Japan

14:35>14:45 **Mr Yves PERRIER,** President, Institut de la Finance Durable (Paris Europlace) [*recording*]

14:45>14:55 **Mr Morgan DESPRES,** Executive Director International Finance, Economy & Nature Programmes, European Climate Foundation [*recording*]

14:55>15:15 **Mr Amaury d'ORSAY,** Head of Fixed Income Investment Platform, Amundi Asset Management

15:15>15:35 **Ms Chikako MATSUMOTO,** Managing Executive Officer, Chief Sustainability Officer, Sumitomo Mitsui Trust Group, Inc.

15:35>15:55 **Mr Hiroyuki TEZUKA,** Fellow, JFE Steel Corporation

15:55>16:05 **Ms Adeline LASSAUX,** Attachée for Science & Technology, Head of Health, Life sciences & Environment Department, Embassy of France in Japan

16:05>16:20 *Coffee break*

16:20>16:40 **Mr Gauthier VERMANDEL,** Senior Researcher, École Polytechnique, and Associate Professor, Université Paris-Dauphine-PSL [*recording*]

16:40>17:00 **Mr Hideki TAKADA,** Director, GX Acceleration Agency

17:00>17:20 **Mr Stéphane LATOUCHE,** Chief Representative for Asia-Pacific, Banque de France

17:20>17:40 **Mr Yann MARIN,** Deputy Head of Financial Stability Department, Banque de France, and Secretary General, Network for Greening the Financial System (NGFS) [*online*]

17:40>17:50 **Closing address |** **Mr Rintaro TAMAKI,** President, Japan Center for International Finance, Founder of the Green Finance Network Japan (GFNJ)

18:00>19:30 **Networking cocktail at the Résidence de France**
Welcome speech by **H.E. Philippe SETTON**, Ambassador of France to Japan
Kanpai by **H.E. Yutaka MATSUZAWA**, Vice-Minister for Global Environmental Affairs

MC | ***Arthur SOGNO PÈES****, Financial Counsellor, Deputy Head of the Regional Economic Department, Embassy of France in Japan, Representative in Japan, Banque de France*

— Please be informed that this program may change due to various reasons without preliminary notice —

Amundi
Investment Solutions

Trust must be earned

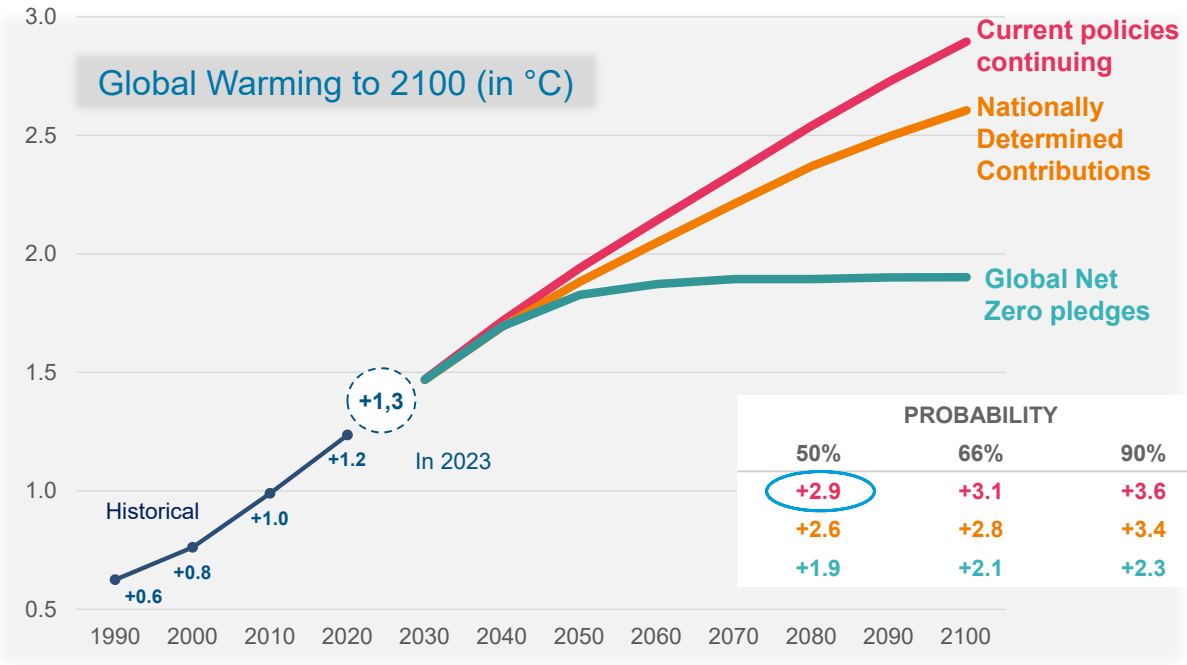
ALPHA FIXED INCOME

Amaury d'Orsay, CIO Fixed Income

Key Role of the Bond Holder in Sustainable Finance

APRIL 2025 Document for professional investors only

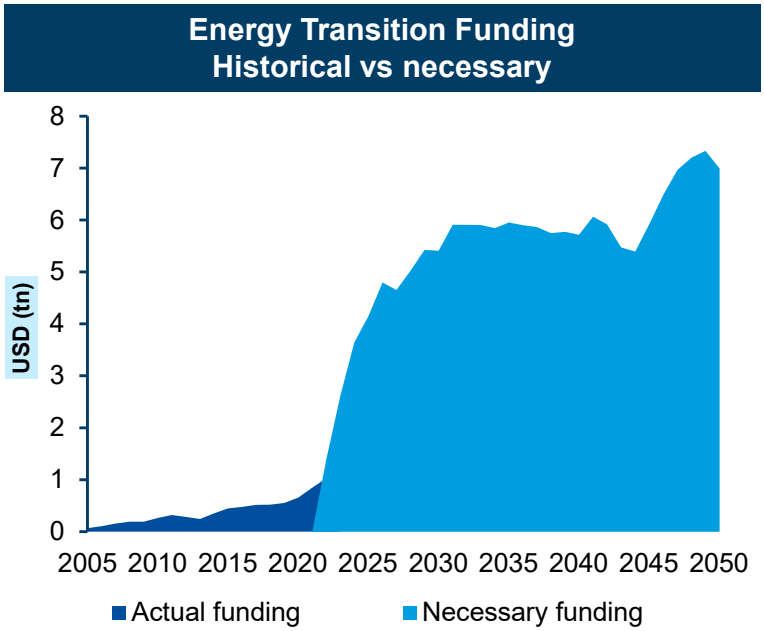
Projections show that under existing policies, the risk is now at 50% to reach +2.9°C by 2100



Source: Climate action Tracker Nov. 2024 update

Aiming for a 2°C world will require engaging with all sectors and actors

- **The trend remains positive**, with an **increasing number of corporates** agreeing decarbonization targets
- **38%** of the ICE BofA ML Large Cap index has **committed & validated targets with SBTi** as of December 31, 2024, up from **34%** December 31, 2022



Source: Amundi Institute on BloombergNEF. Note: Actual funding based on Energy Transition Investment Trend (ETIT) report. Necessary funding from BNEF Net Zero Scenario, excluding investments in grids and fossil fuels to align with ETIT scope. Values have been normalized to $2021. Data is as of 8 June 2023.

Industrial policy renewal at the center of the green tech race for energy sovereignty

Made in China 2025 and **14th Five-Year Plan** have surpassed **$100bn** in **clean energy** investments

80% and 70% respective share of **solar and EV** global manufacturing

China's NEV[1] penetration rate reach **48% of total vehicle sales**

36% of worldwide capital invested **towards low carbon technologies**

End of Biden administration allocated **$74bn of new funding** for climate initiatives, bringing **total IRA funding to $160bn**

Trump moved to **suspend climate financing** under IRA, however **full repeal is extremely unlikely**

~75% of total IRA spending flows into **Republican districts**

21% of worldwide capital invested **towards low carbon technologies**

The **EU Green deal** to mobilize up to **€1tn** in **sustainable investments** by 2028

"**Competitiveness compass**" launched to reduce regulatory burden and address energy cost

Share of RNE increased to **47% in Q3 2024** (vs. 43% Q3 2023)

19% of worldwide capital invested **towards low carbon technologies**

1. New Energy Vehicle, including all types of electric vehicles from battery-powered fully electric to plug-in hybrid cars
Source: IEA; EUC website; White house website; Jefferies; S&P Global Commodity Insights; Bloomberg ; CNBC ; The Guardian

Trump administration wants to boost fossil fuel (FF) production, while renewable energy is currently cheaper

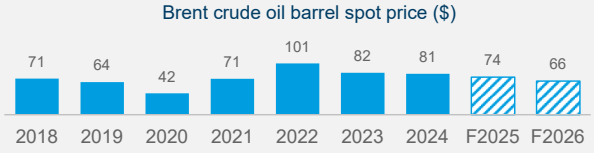
While US presidency favours FF production, what upside is expected?

Trump administration **aims to accelerate FF production**

- **Protectionist policies**
- **Easing restrictions**

However, **limited upsides are identified**

- **Shale oil and gas best locations** already been tapped
- **Oversupply anticipated** by both the IEA and the EIA
- **Increased US tariffs will negatively** impact exports



Renewables are expected to continue their development in the US

US administration's goal is to achieve "**lowest cost of energy of any industrial country**"

- **Some renewables already cheaper than FF**
- **Existing momentum**
- **AI energy demand** (x2 to x3 by 2030)

	Wind Onshore	Solar PV Utility	Gas combined cycle
US cost of energy 2024 ($/MWh)[1]	56 – 95[2]	52 – 76[2]	76

Higher tariffs (potentially combined with IRA's suspension) **will however have a negative impact**, as Chinese manufacturers are key suppliers for solar panels

[1] Lazard LCOA June 2024, RNE figures averaged by region, excluding highest and lower outlier
[2] Including firming costs, expenses incurred to ensure reliable energy supply from renewable sources, compensating for variability in generation Source: IEA; US Energy Information Administration (EIA); Lazard 2024 US LCOE analysis

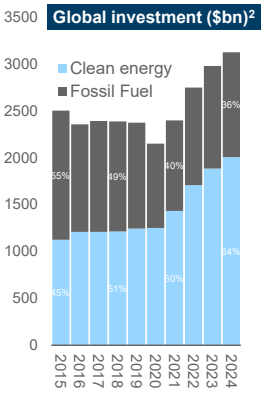
Amundi Investment Solutions

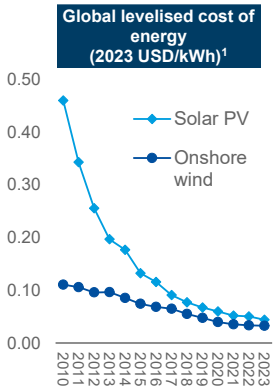
Clean energy pursues its acceleration

Renewable energy (RNE)

Clean energy has reached a **critical inflection point**, with **lower costs and increased adoption rates**

- Clean energy spending surpasses FF at a 2:1 ratio
- ~91% of new electricity capacities globally from RNE
- Solar PV accounts for ¾ of add. RNE capacity

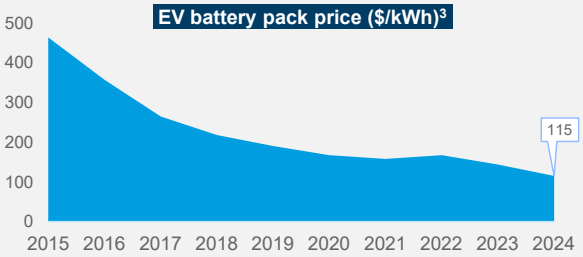




Electric vehicles (EVs) and batteries

BATTERIES

- Strong signal on batteries development
- EV battery pack price **reduced by 20%** in 2024



ELECTRIC VEHICLES (EVs)

- **Battery** pack accounts for **30-40%** of final EV price
- Price reduction could bring price parity between ICE and electric vehicles as soon as 2026

[1] IRENA [2] IEA [3] IEA & BloombergNEF
Source: IEA, World Energy Outlook 2024; HSBC 2025 Outlook; EMBER report on renewable market; IRENA; BloombergNEF

Amundi Investment Solutions

Amundi Responsible Investment 2025 convictions

Transition is underway

- **Transition is a secular trend**: Climate change is impacting real-economy. Risks & opportunity assessment is at stake.
- **Nimbleness in portfolio construction**: Resilience of portfolios is needed with high stake on timing and leveraging opportunities from high stakes development programs.
- **Diversification** is key to tackle risks and seize opportunities

Heightened Sustainability risk factors

- **Disorderly transitions**: Volatility in policy-making and geopolitical fragmentation
- **Delayed actions**: Increasing physical risks and the challenge of lagging demand for green energy solutions, leading to unexpected adaptations in investment strategies
- **Diligent responses**: Inevitable policy adaptations driven by heightened risks

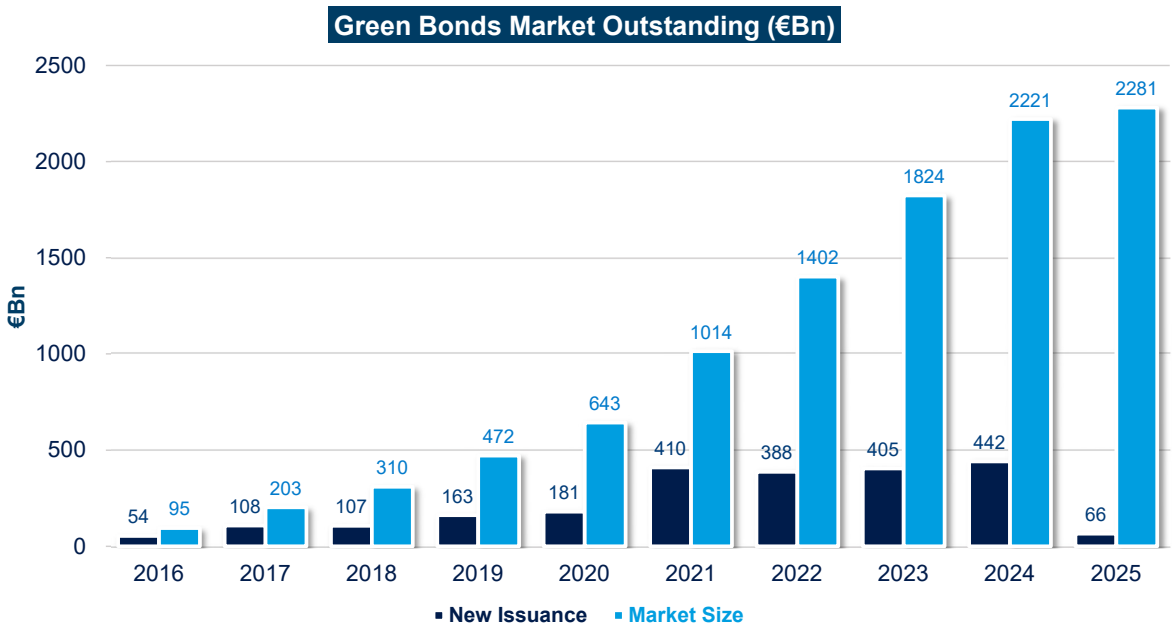
A needed focus on real world impact

- **Sustainability factors assessment focus on real-world impact**: Physical risk, transition risk, biodiversity impact, …
- **Solutions shaped by real-world impact**: Growing demand for innovative approaches (impact finance, nature-based solutions, blended finance)

Amundi Investment Solutions

The green bond market is key for the transition

Green Bonds has developed rapidly since 2007 to become a mainstream product

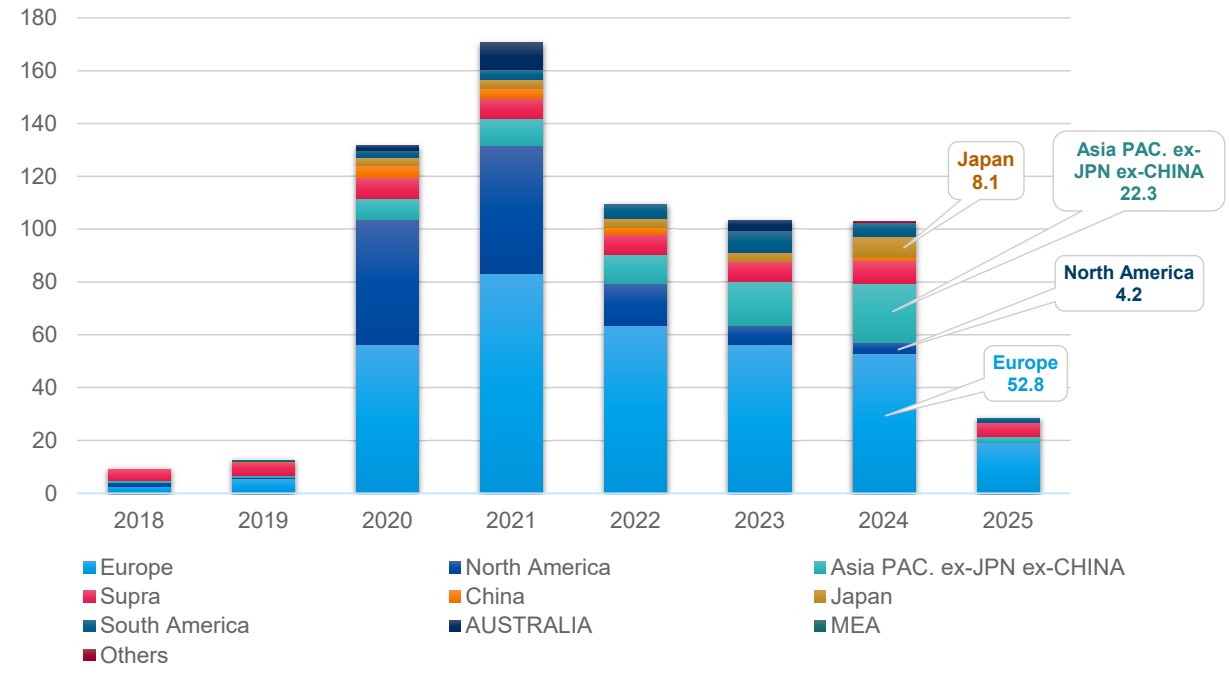


Source: Bloomberg, Amundi as of 28/02/2025. For illustrative purposes only. Please refer to the Amundi Responsible Investment Policy and the Amundi Sustainable Finance Disclosure Statement available at https://about.amundi.com/legal-documentation.

Amundi Investment Solutions

The green bond market, now matured and diversified

The Green bonds are the **key fixed income instrument** to finance the low-carbon transition



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ESG & Defense

Defense & weapons in Amundi

- **Our methodology**
  - **No exclusion of the defense sector**
  - **The complete sector definition is broader:** "Defense & Aerospace"
  - **Sector neutral** approach
  - Methodology on a **standardized rating**
- A **precise exclusion policy**[1] which **covers controversial weapons**
  - Through **international conventions** (Ottawa or Montreal) on cluster munitions, etc.
  - And with additional **sector exclusions** → Go further than the norms ie. nuclear + depleted uranium (RI Policy updated on a threshold of 5% of revenue)

Defense & Economy

- **Nominal GDP** (ie. including inflation) in Europe will grow in the years to come, baring a major unexpected shock.
- The **share of GDP allocated to defense** will grow (2.5% seems an absolute minimum).
- **Today around 40% of total European defense spending** (ie. $200bn) is allocated to equipment development / procurement / maintenance; as budgets rise the share allocated to equipment tends to rise.

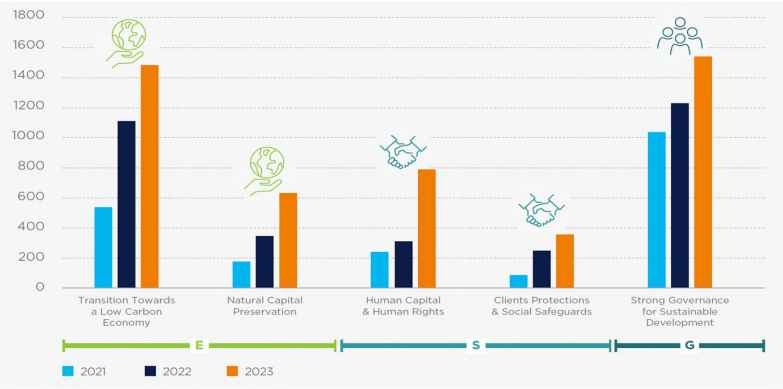
[1] https://about.amundi.com/files/nuxeo/dl/c44a7bb2-813b-4346-96e0-e3d695241d9b
Sources: Amundi, JP Morgan, Bank of America

Engagement

Amundi Group, a year in review

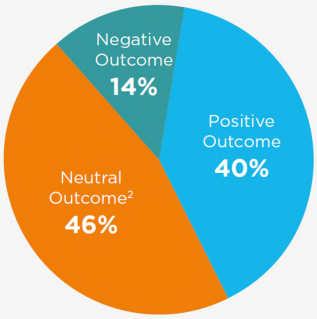
Amundi 2023 Engagement Statistics

- Climate, Biodiversity, Social Cohesion & Governance remain our focus
- **2531 unique issuers engaged** in 2023 (2,115 in 2022, 1,364 in 2021, 878 in 2020)



We increased our engagement across all macro themes in 2023, with the greatest gains being on the transition to a low carbon economy.

Outcomes of Engagements Closed in 2023



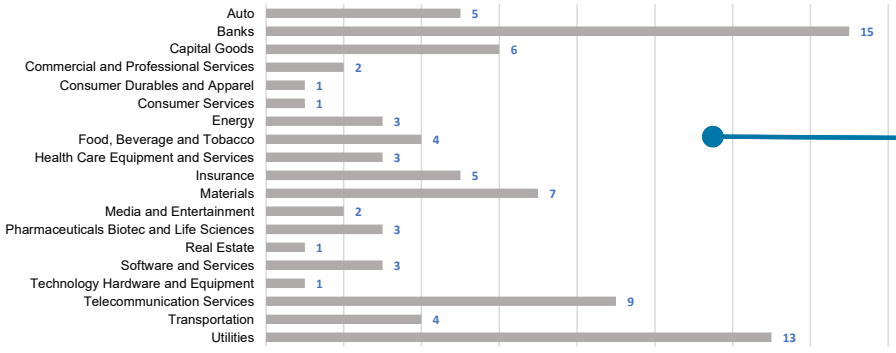
Over 40% of engagements closed in 2023 had a positive outcome, whereas only a small portion closed with a negative outcome[2]

Source: Amundi engagement report (https://about.amundi.com/article/our-engagement-report-2023)
[2] Neutral Outcome means engagements that were closed and did not specifically have a positive or negative outcome. This can be due to many factors such as when the context at the company changes making the engagement KPI no longer relevant.

Engagement

Example of an active fixed income mandate over H2.2024

Sector breakdown of engaged companies



88 issuers in the portfolio were engaged in the second half of 2024

Engagement Themes	Auto	Banks	Capital Goods	Commercial and Professional Services	Consumer Durables and Apparel	Consumer Services	Energy	Food, Beverage and Tobacco	Health Care Equipment and Services	Insurance	Materials	Media and Entertainment	Pharmaceuticals Biotec and Life Sciences	Real Estate	Software and Services	Technology Hardware and Equipment	Telecommunication Services	Transportation	Utilities	Total
Natural Capital Preservation	8		4		2	1	9	8	1	7	6	1				1	2		10	**60**
Product, Client, Societal Responsibility			1					3	1			1			1		6		1	**14**
Social Cohesion	3	10	1	2									1		1		14		12	**44**
Strong Governance for Sustainable Development		1	3						3	5	3		4	1	1		4	1	2	**28**
Transition Towards a Low Carbon Economy		27	2	1			1				2						4	3	6	**46**
TOTAL	**11**	**38**	**11**	**3**	**2**	**1**	**10**	**11**	**5**	**12**	**11**	**2**	**5**	**1**	**3**	**1**	**30**	**4**	**31**	**192**

What about the market standards?

Global or Local, both must be aligned !

EXAMPLE : THE EU GREEN BOND STANDARDS

Taxonomy-alignment

The funds raised shall be allocated to projects that are aligned with the EU taxonomy. For sectors not yet covered, there will be a flexibility pocket of 15%

Transition plan

The issuer commit to a green transition plan and disclose how the investments made through the green bond fit into this transition plan.

External review

Allocation and impact reporting must be checked by an accredited external reviewer, registered with and supervised by the ESMA (European Securities Markets Authority)

Transparency

Mandatory Framework and detailed Reporting requirements (as opposed to voluntary annual reporting under ICMA).

EU Green Bond Standard vs ICMA Green Bond Principles

The main differences

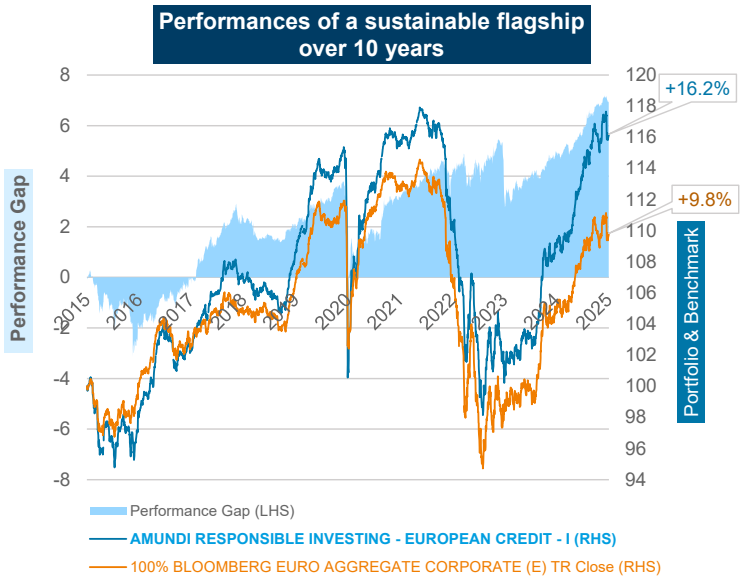
	EU GREEN BOND STANDARD	ICMA GREEN BOND PRINCIPLES
ELIGIBILITY CRITERIA	**Strict Alignment** with EU Taxonomy	**Broad definition** of eligible projects
TRANSPARENCY	**Requires** annual reporting	**Encourages** reporting
IMPACT	**Must demonstrate** measurable positive impact	**Aims for** positive environmental impact
COMPLIANCE	Part of **regulatory framework**	**Voluntary framework**, no enforcement
FLEXIBILITY	**Prescriptive**, aligned with EU taxonomy	**Flexible Framework**, voluntary guidelines

! **Standards** are important to **strengthen the market** via a **reliable framework and guidelines** and give **confidence** to investors

! But **global and local standards** must be **perfectly aligned** to avoid any conflict or misunderstanding

ESG & Performance

Sustainable investments does not alter performance on the long run !



ESG Scores and Ratings (28/02/2025)		
	Fund[1]	Index[1]
E score	1.22	0.76
S score	0.48	0.36
G score	0.50	0.19
ESG score	0.96	0.56

Total Carbon Footprint (tons/M.EUR)		
Fund[1]	<	Index[1]
56,51		90,84

Total Carbon Intensity[2] (tons/M.EUR)		
Fund[1]	<	Index[1]
66,32		135,85

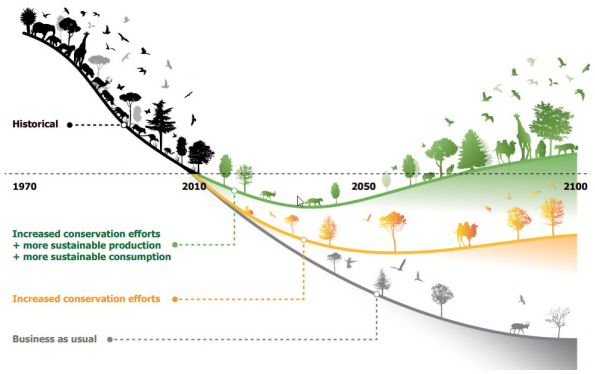
Source: Amundi, as of 20/03/2025, gross performances in EUR. Reference Index: 100% BLOOMBERG EURO AGGREGATE CORPORATE (E) TR Close. Past performance does not predict future results. Investment return and the principal value of an investment in the Funds or other investment product may go up or down and may result in the loss of the amount originally invested. Please note that the fund will not necessarily be registered or authorized in all jurisdictions or be available to all investors. All trademarks and logos used for illustrative purposes in this document are the property of their respective owners. Please refer to the Amundi Responsible Investment Policy and the Amundi ESG Regulatory Statement. For more product-specific information, please refer to the Prospectus.

1 Fund: ARI European Credit / Index: BLOOMBERG EURO AGGREGATE CORPORATE (E) TR Close

2 Source: Trucost as of 28/02/2025

Biodiversity is globally deteriorating

Biodiversity is disappearing at a rate 100 to 1000 times higher than normal



CAUSES OF BIODIVERSITY LOSS ARE ALL MAN-MADE

Changes in Land & Sea use

20 000 to 30 000 ha of natural, agricultural and forest areas are **consumed every year in France**

Unsustainable resource exploitation

90% of the world's **fish stocks** are exploited to their **maximum capacity**, or even overexploited

Climate Change

99% of **corals could disappear** by the end of the century with a warming of **+2°C**

Pollution

70 à 80 % **fewer insect populations** in a few decades in Europe's mixed agro-industrial landscapes

Invasive Species

Invasive species play a role in **60%** of **species extinctions**

Source: Adam Islaam IIASA Nature DOI: 10.1038/s41586-020-2705-y

1 Dasgupta, P. (2021), The Economics of Biodiversity: The Dasgupta Review 2 IRP (2021). Building Biodiversity: The Natural Resource Management Approach 3 World Wide Fund for Nature [WWF] 2020

Key Drivers of Biodiversity loss

Direct drivers

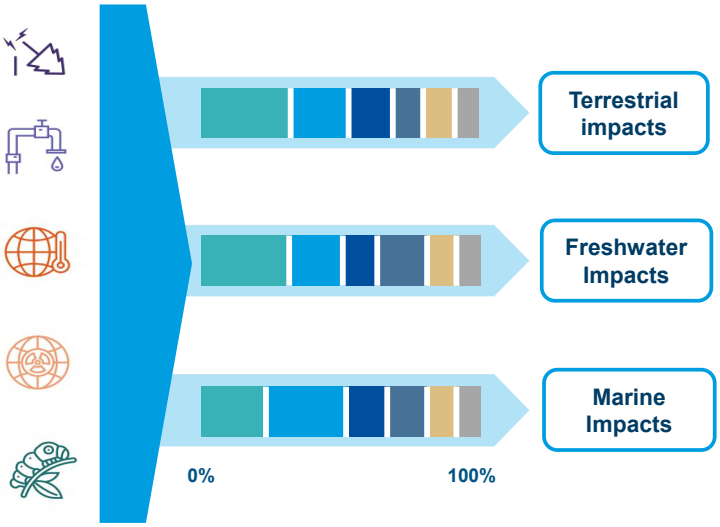
Changes in Land & Sea use
Clear cutting forests for farmland (palm oil, soy, cattle), intensive farming practices

Unsustainable resource exploitation
overfishing: fishing at a rate higher than replenishment rate

Climate change
Global warming is affecting species and ecosystems around the world

Pollution
Pesticides, fertilizers, Marine plastic

Invasive species
Animals, plants, fungi and microorganisms that have entered and established themselves in the environment outside their natural habitat



Indirect drivers

Demographic and sociocultural	Economic and technological
Institutions and governance	Conflicts and epidemics

Amundi's Biodiversity Investment Framework

Create a biodiversity strategy that help achieving international goals and targets on biodiversity:

- ✓ **Conservation** of biodiversity requires to **lower pressures on nature**
- ✓ **Sustainable use** of its components is intertwined with **economic efficiency**

1. AVOID	2. REDUCE	3. FAVOR
Avoid investing in companies with high negative impact on biodiversity	Reduce negative impact on biodiversity through inter- and intra-sector portfolio steering	Protect biodiversity and natural ecosystems by investing in biodiversity-positive activities and projects

Engagement with corporates with a dual materiality approach
to influence the activities or behavior of companies in which we invest, with the aim of improving their practices in terms of preserving natural capital

Case study “Favor”[1]

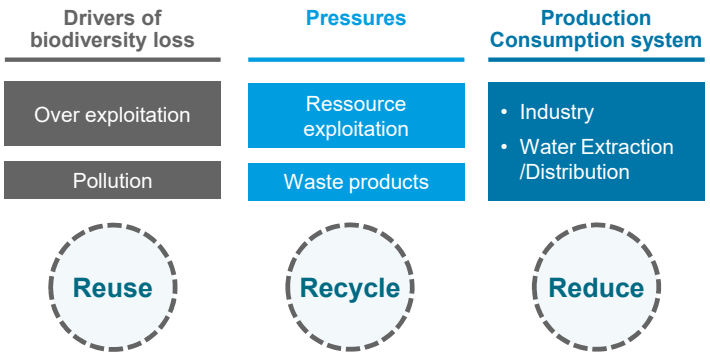
A water technology company in the US

A major player in the field of water technologies, from collection and distribution, from reuse to return to its natural environment.

Innovative solutions throughout the water cycle

- Water quality analysis and treatment
- Leak detection in water networks
- Smart meters
- Manufactures water and wastewater pumps and filtration equipment, key role in optimizing water supply and quality.

A solution provider for biodiversity



Impact on water conservation and biodiversity

These solutions play a crucial role in climate adaptation and resilience by optimizing water supply and quality.

The company has a leading offer in the field of water reuse, a key solution to water scarcity and pollution problems. Pollution reduction and the use of the company's solutions in environmental remediation have a significant positive impact on biodiversity.

Project:
The aging infrastructure was causing the town of Walla Walla **to lose 30% of its drinking water every year.**

Impact
An intelligent network has enabled Walla Walla **to reduce water losses by 50%, saving over 650 million liters a year.**

[1] Based on on MSCI Environmental Impact revenues: **Climate Change revenues > 80%** (Alternative Energy, Energy Efficiency, Green Buildings **or Natural Capital revenues > 20%** (Sustainable Agriculture, Sustainable Water, Pollution Prevention)

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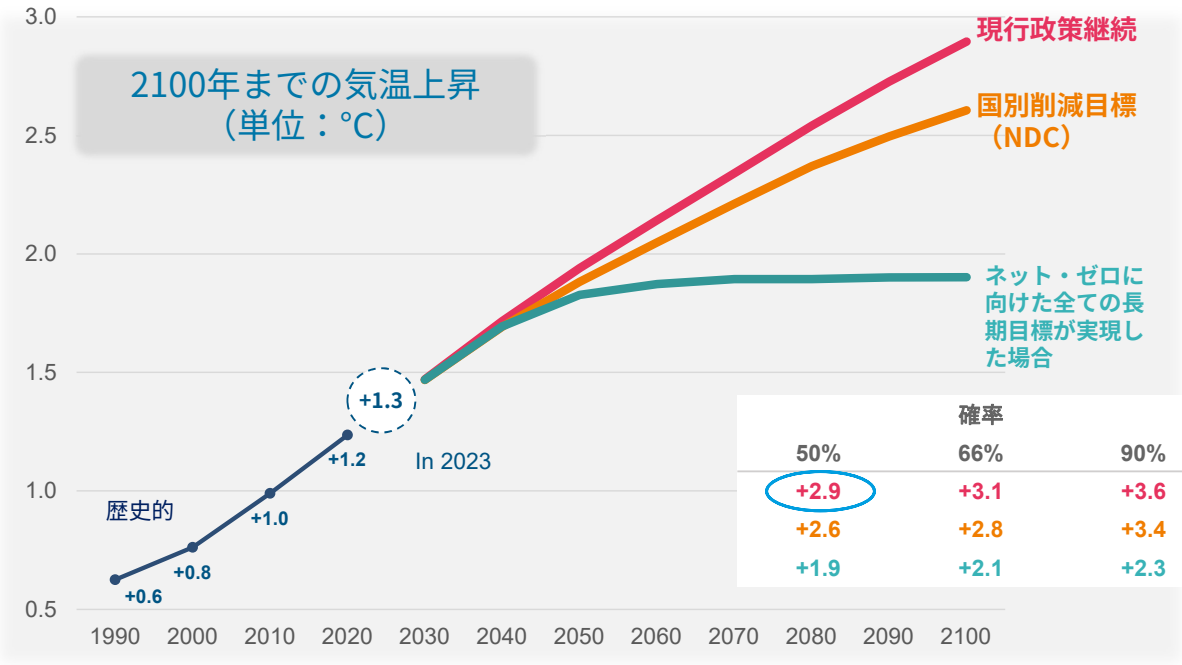
Investment Solutions
Trust must be earned

サステナブル・ファイナンスにおける債券投資家の重要な役割

アモリー・ドルセー
アムンディ・アセット・マネジメント　グローバル債券CIO

2025年4月　　機関投資家向け資料

現行政策のままでは50%の確率で2100年までに+2.9℃



出典：クライメート・アクション・トラッカー 2024年11月最新版

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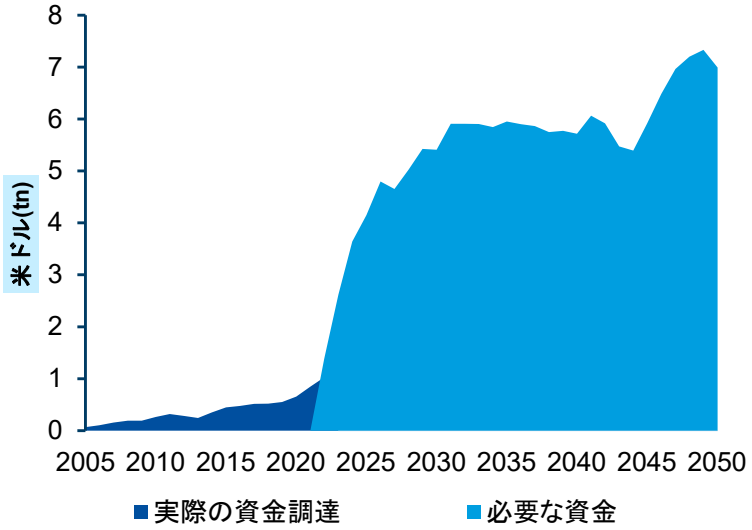
2°Cの世界に向けあらゆるセクターと関係者が関与する必要

- 脱炭素化目標に合意する**企業の数は増加しており**、**ポジティブな傾向が継続**
- ICE BofA ML Large Capインデックスを構成する発行体の**38%がSBTi認証済ないしは目標設定コミットメント提出済**（2024年12月31日現在）

エネルギー・トランジション・ファイナンス
これまでの実績と今後の必要額



出典：アムンディ・インスティテュート on BloombergNEF.注：実際の資金はエネルギー転換投資動向（ETIT）報告書に基づく。BNEFのネット・ゼロ・シナリオに基づく必要資金。ETITのスコープに合わせるため、送電網と化石燃料への投資を除く。数値は2021ドルに正規化されている。データは2023年6月8日現在。

エネルギー主権をめぐるグリーンテック競争の中心にある産業政策の刷新

中国製造2025と**第14次5カ年計画のクリーンエネルギー**投資額が**1000億ドルを**突破

太陽電池とEVの世界製造シェアはそれぞれ**80%と70%**

中国のNEV普及率[1] **自動車販売台数全体の48**%に到達

バイデン政権末期、気候変動対策に**新たに740億ドルの資金が**割り当てられ、**IRAの資金総額は1600億ドルに到達**

トランプ大統領はIRAの下で**気候変動融資の停止に**動いたが、**完全撤廃の可能性は極めて低い**

IRAによる支出全体のおよそ**75%が共和党の選挙区に**流入

EUグリーン・ディールは、2028年までに**持続可能な投資に**最大**1兆ユーロを投入**

規制負担の軽減とエネルギーコストへの対応を目的とした「**競争力の羅針盤」の**発表

2024年第3四半期の再エネシェアは**47%に**上昇（2023年第3四半期は43%）

世界の資本の**36**%が**低炭素技術への**投資

世界の資本の**21**%が**低炭素技術への**投資

世界の資本の**19**%が**低炭素技術に**投資

1.バッテリー駆動の完全電気自動車からプラグイン・ハイブリッド車まで、あらゆるタイプの電気自動車を含む新エネルギー車
出典：IEA; EUCウェブサイト; ホワイトハウスウェブサイト; ジェフリーズ; S&P グローバル・コモディティ・インサイト; ブルームバーグ; CNBC; ガーディアン紙

再生可能エネルギーのコスト低下と化石燃料増産を望むトランプ政権

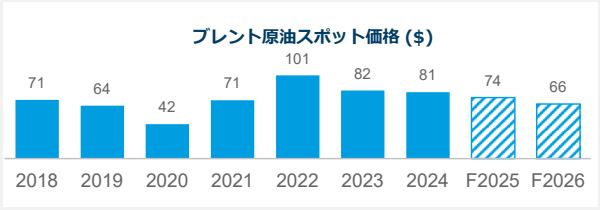
化石燃料増産にアップサイドはあるか

トランプ政権が目指す**化石燃料増産**

- **保護主義政策**
- **規制緩和**

一方で、**確認されるアップサイドは限定的**

- **シェールオイル・ガスの好適地は**すでに開発済み
- IEAとEIAが予想する**供給過剰**
- **米国の関税引き上げによる**輸出への悪影響



米国で見込まれる再生可能エネルギーの拡大

米政権が掲げる目標＝「**工業国の中で最も低いエネルギーコスト**」の達成

- **火力発電コストを下回る一部の再生可能エネルギー**
- **IRAをきっかけとしたモメンタム**
- **AIによるエネルギー需要増**: 2030年までに2～3倍に増加

	風力(オンショア)	太陽光	ガスコンバインドサイクル
発電コスト：米2024年（ドル／MWh）[1]	56 – 95 [2]	52 – 76 [2]	76

ただし、 中国メーカーがソーラーパネルの主要サプライヤーであることから、 **関税引上げ**（IRA停止と組み合わされる可能性もある）は、**マイナスの影響を与える恐れ**

1.Lazard LCOA 2024 年 6 月、再エネ の数値は地域別平均、最高・最低異常値を除く 2.再エネによる安定したエネルギー供給を確保し、発電量の変動を補うために発生する固定費を含む
出典：IEA; 米国エネルギー情報局（EIA）、Lazard 2024 US LCOE Analysis

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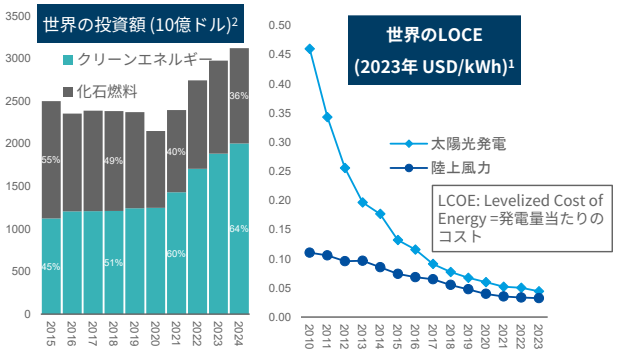
加速するクリーンエネルギー

再生可能エネルギー

クリーンエネルギーは、**コスト低下と導入率上昇で重要な変曲点に到達**

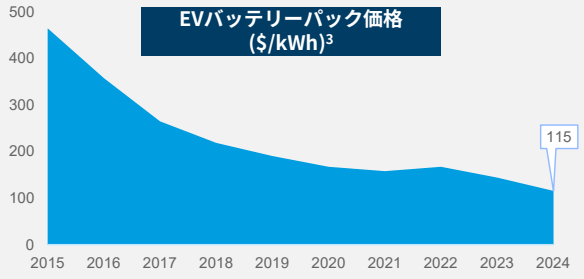
- クリーンエネルギーへの支出が化石燃料に対し2：1の割合で上回る
- 世界の新規発電容量の約91%が再生可能エネルギー
- 太陽光発電は追加分の3/4を占める



電気自動車（EV）とバッテリー

バッテリー

- バッテリー開発に強いシグナル
- 2024年にEVバッテリーパック価格は20%低下



電気自動車（EV）

- 最終価格の30～40%を占めるバッテリーパック
- 価格引き下げにより、早ければ2026年にもガソリン車と電気自動車の価格のパリティ実現の可能性

1. IRENA 2. IEA 3. IEA & BloombergNEF Source: IEA, World Energy Outlook 2024; HSBC 2025 Outlook; EMBER report on renewable market; IRENA; BloombergNEF

Amundi Investment Solutions

アムンディの2025年における責任投資の見通し

進行するトランジション

- **長期トレンドであるトランジッション**：気候変動が引き起こす実体経済への影響を認識、重要なリスクと機会の評価
- **ポートフォリオ構築における機動性**：大規模な財政プログラムを背景とする投資機会のタイミングを見極めつつ活用するために必要なポートフォリオの頑健性
- **分散投資**：機会を逃さずリスクに対処

サステナビリティ関連リスク増大

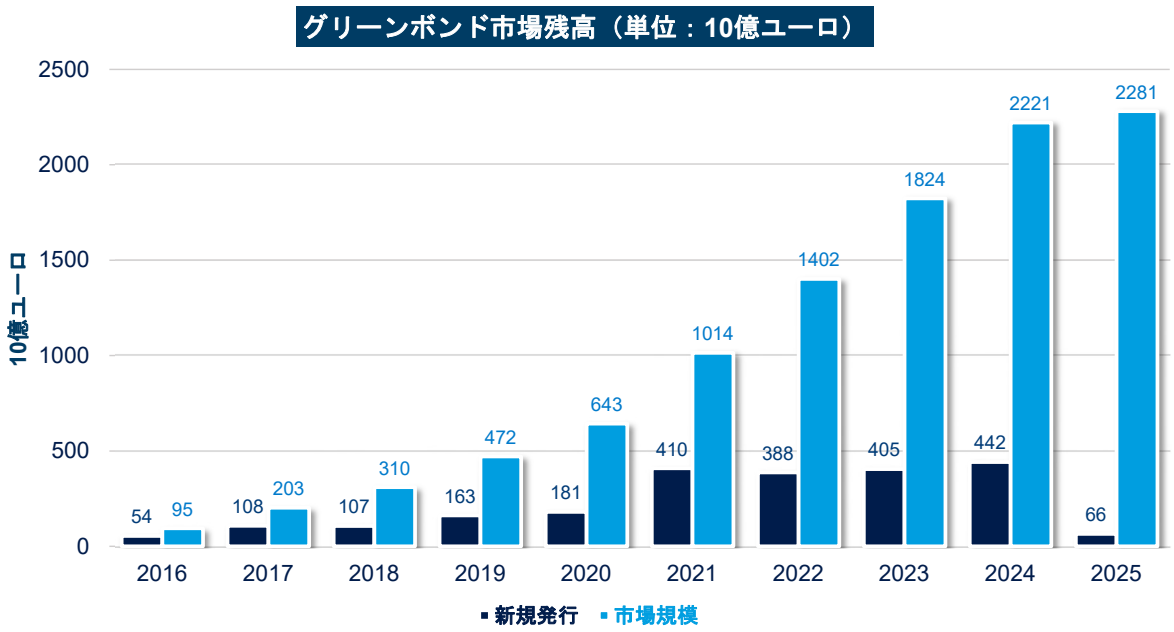
- **無秩序な移行**：政策決定のブレと政治的分断
- **行動の遅れ**：物理的リスク増大、グリーンエネルギー・ソリューション需要の低迷による予期せぬ形の投資戦略での適応
- **慎重なる対応：リスクが高まるなかで避けられない投資方針の変更**

実体経済への影響を注視

- **現実世界に焦点をあてるサステナビリティ要因評価の必要性**：物理的リスク、移行リスク、生物多様性への影響等
- **インパクト創出のための投資ソリューション**：革新的なアプローチ（インパクト・ファイナンス、自然ベースのソリューション、ブレンデッド・ファイナンス）への需要の高まり

グリーンボンド市場はトランジションの鍵

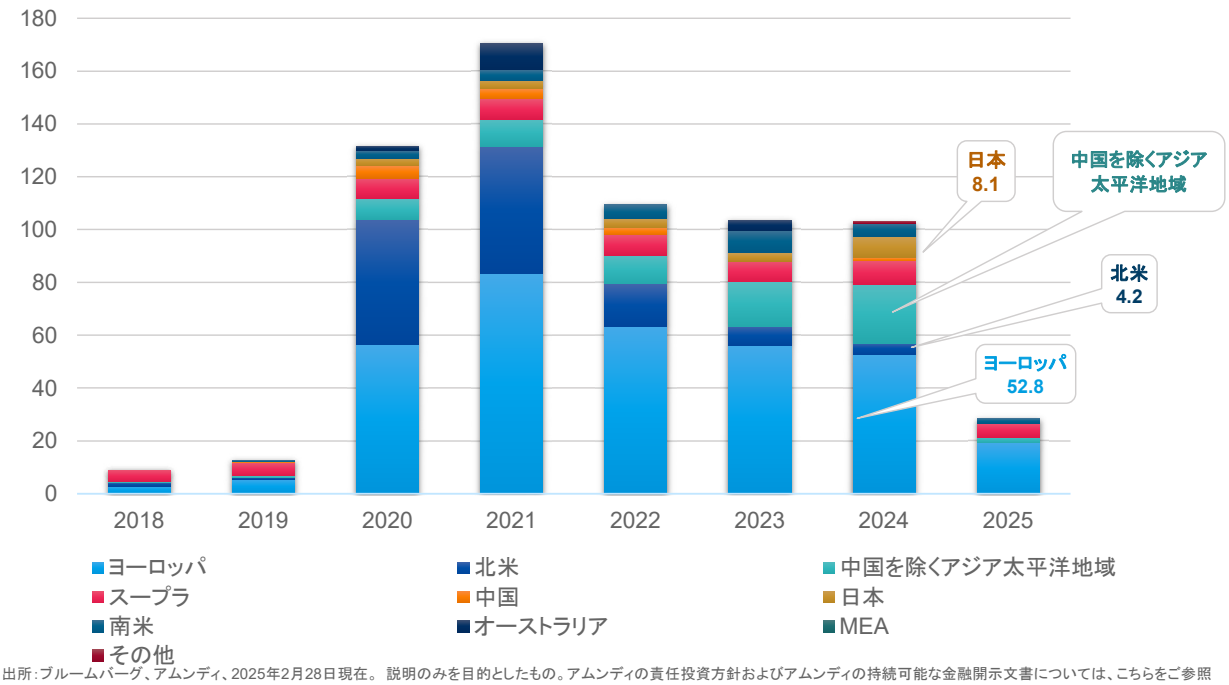
グリーンボンドは2007年以降急速に発展し、メインストリームのプロダクトに



出所：ブルームバーグ、アムンディブルームバーグ、アムンディ（2025年2月28日現在）。例示のみを目的とする。アムンディ責任投資方針およびアムンディ・サステナブル・ファイナンス・ディスクロージャー・ステートメント（https://about.amundi.com/legal-documentation）を参照のこと。

成熟化・多様化したグリーンボンド市場

グリーンボンドは低炭素社会へのトランジションに必要な資金を調達するための**重要な債券**



出所：ブルームバーグ、アムンディ、2025年2月28日現在。 説明のみを目的としたもの。アムンディの責任投資方針およびアムンディの持続可能な金融開示文書については、こちらをご参照のこと。https://about.amundi.com/legal-documentation

ESG評価と防衛ビジネス

防衛・兵器に関して

- **アムンディにおける取り扱い**
  - **防衛に関わる業種を除外せず**
  - **より広範なセクター全体としての定義＝**「航空宇宙・防衛」
  - **ESG評価はセクター内の相対比較**
  - **正規化されたレーティング**
- **問題視される兵器にフォーカスした除外方針** [1]
  - クラスター爆弾などに関する**国際条約**（オタワまたはモントリオール）で禁止される兵器に関わる発行体
  - あわせて国際条約を超え、核兵器や劣化ウラン弾などに関わる発行体を**除外**対象に（「責任投資方針」では総収入の5%を基準として更新）

防衛と経済

- 欧州の**名目GDP**は、予期せぬ大きなショックがない限り、今後数年間の成長が期待される
- **防衛支出がGDPに占める割合は**拡大する見込み（2.5%が絶対的な最低ラインと思われる）
- **現在、欧州の国防費全体**（＝2,000億ドル）**の約40%**が装備品の開発／調達／メンテナンスに割り当てられている。予算が増えるにつれて、装備品が占める割合が増える傾向

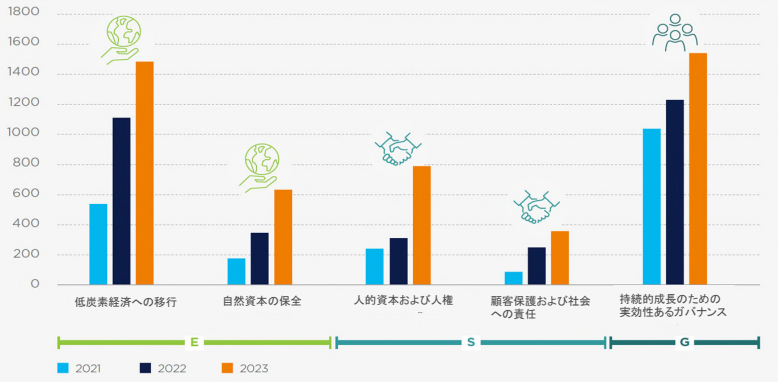
[1] https://about.amundi.com/files/nuxeo/dl/c44a7bb2-813b-4346-96e0-e3d695241d9b
出典：アムンディ、JPモルガン、バンク・オブ・アメリカ

エンゲージメント

アムンディ・グループの活動

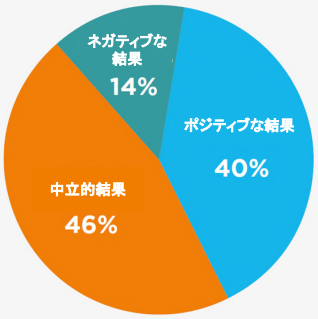
アムンディ2023エンゲージメント実績

- 気候変動、生物多様性、社会的結束とガバナンスに引き続き注力
- 2023年には**2531の個別発行体とのエンゲージメント**（2022年：2115、2021年：1364、2020年：878）



2023年においては、5つすべての主要テーマにおいてエンゲージメント増加、なかでも低炭素経済へのトランジションで最も大きな成果

2023年に終えたエンゲージメントの成果



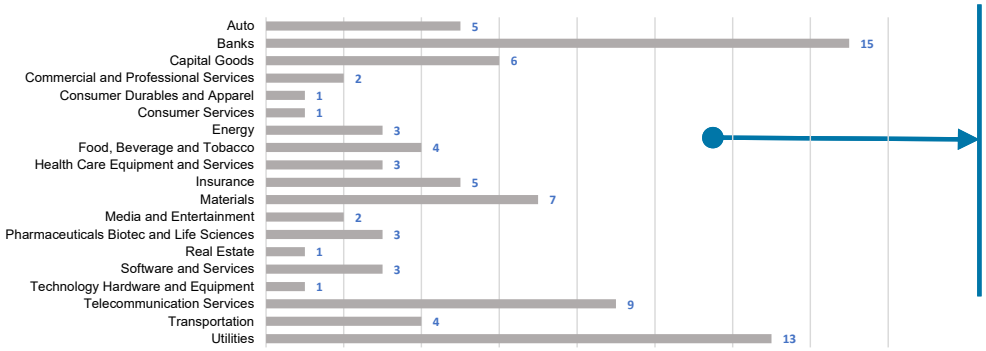
2023年に終了したエンゲージメントの40%以上がポジティブな結果であったのに対し、ネガティブな結果の割合は限られる[2]

出典：アムンディのエンゲージメント・レポート (https://about.amundi.com/article/our-engagement-report-2023)
[2]中立的な結果とは、特にプラスにもマイナスにもならず、終了したエンゲージメントを意味する。これは、例えば、会社の状況が変化し、エンゲージメントKPIが適切でなくなった場合などが相当する。

エンゲージメント

2024年後半におけるアクティブ債券マンデートにおける取組み例

エンゲージメント対象企業の内訳

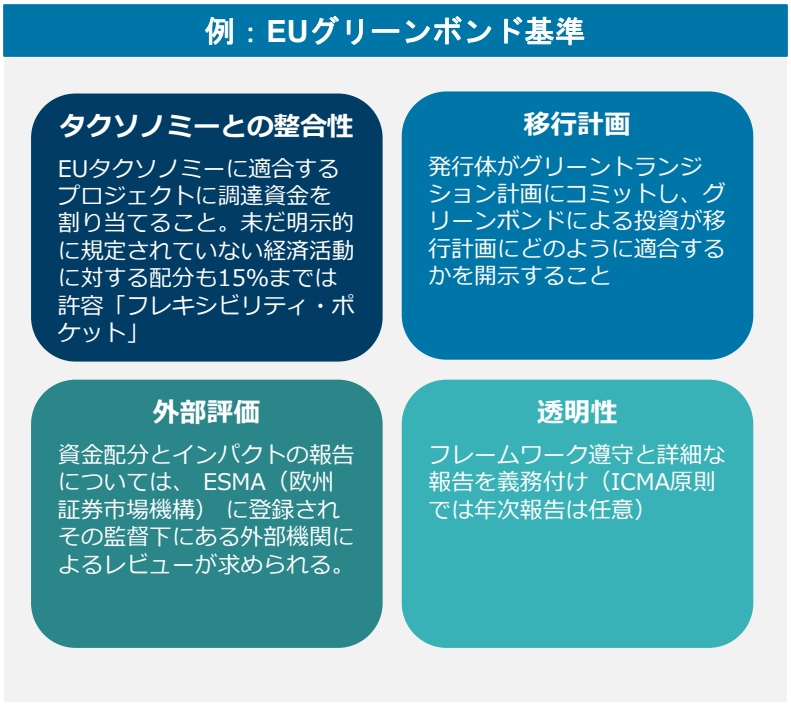


2024年下半期ポートフォリオに含まれる88の発行体との間でエンゲージメント実施

エンゲージメントテーマ	自動車	銀行	資本財	商業および専門サービス	耐久消費財・アパレル	消費者サービス	エネルギー	食品、飲料、タバコ	医療機器およびサービス	保険	素材	メディア・エンターテインメント	製薬、バイオ・ライフサイエンス	不動産	ソフトウェア・サービス	テクノロジー・ハードウェアおよび機器	通信サービス	運輸	ユーティリティ	合計
自然資本の保全	8		4		2	1	9	8	1	7	6	1				1	2		10	60
顧客保護および社会への責任			1					3	1			1			1		6		1	14
人的資本および人権	3	10	1	2									1		1		14		12	44
持続可能な成長のための実効性あるガバナンス		1	3						3	5	3		4	1	1		4	1	2	28
低炭素経済への移行		27	2	1			1				2						4	3	6	46
合計	11	38	11	3	2	1	10	11	5	12	11	2	5	1	3	1	30	4	31	192

マーケット・スタンダードの形成

グローバルであれローカルであれ、いずれにおいても整備が必要！



EUグリーンボンド基準とICMAグリーンボンド原則の比較

主な違い

	EUグリーンボンド基準	ICMAグリーンボンド原則
適合基準	EUタクソノミーとの**厳格な整合性**	対象プロジェクトの**広範な定義**
透明性	年次報告を**義務付け**	報告を**奨励**
インパクト	測定可能なプラスのインパクトの表示必要	目標としての環境へのプラスの影響
コンプライアンス	**規制の枠組みの**一部	**自主的な枠組み**、強制力なし
柔軟性	EUタクソノミーに沿った規範	**柔軟な枠組み**、自主的なガイドライン

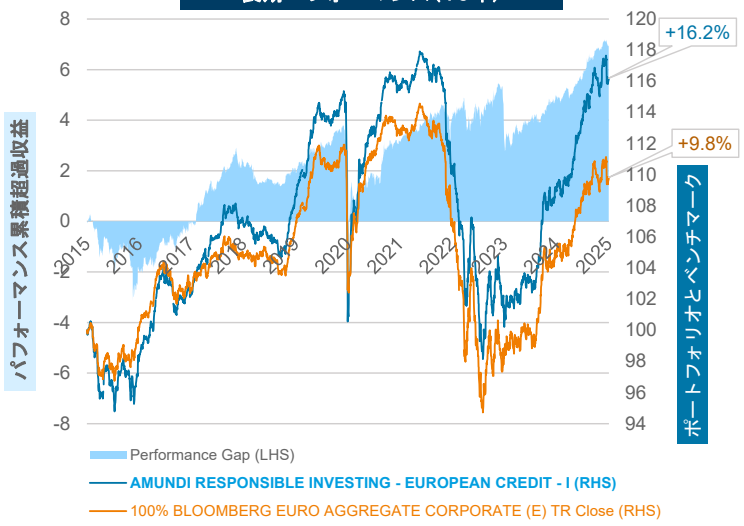
! **信頼できる枠組みやガイドラインを通じて規範を設けることは、市場を強化し**投資家に**信頼**を与えるために重要

! しかし、対立や誤解を避けるために**グローバルとローカルの間で規範は完全に整合して**いなければならない

ESGとパフォーマンス

サステナブル投資は長期的にはパフォーマンスに影響を及ぼさない！

サステナブル投資のフラッグシップ戦略
長期パフォーマンス（10年）



ESGスコア (2025年2月末時点)		
	戦略[1]	インデックス[1]
Eスコア	1.22	0.76
Sスコア	0.48	0.36
Gスコア	0.50	0.19
ESGスコア	0.96	0.56

総カーボンフットプリント（CO2トン／投資金額 EUR mil）		
戦略[1]	<	インデックス[1]
56.51		90.84

総炭素強度[2]（トン／売上 EUR mil）		
戦略[1]	<	インデックス[1]
66.32		135.85

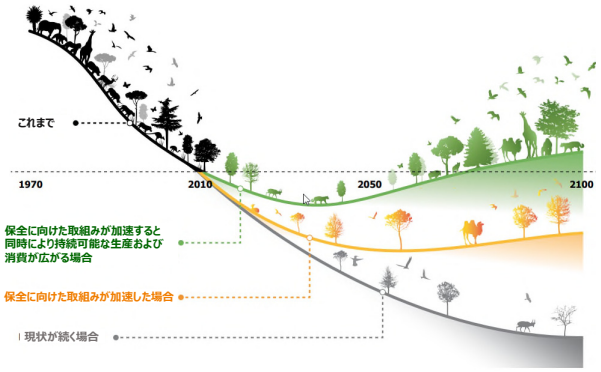
出所：アムンディ、2025 年 3 月 20 日現在、グロス・パフォーマンス（ユーロ）。参考指数：100% BLOOMBERG EURO AGGREGATE CORPORATE (E) TR クローズ。過去のパフォーマンスは将来の結果を予測するものではない。ファンドまたはその他の投資商品への投資の投資収益および元本価値は上下する可能性があり、当初投資した金額を損失する可能性がある。ファンドが必ずしもすべての法域で登録または認可されるとは限らず、またすべての投資家が利用できるとは限らないことに留意されたい。本文書で説明のために使用されている商標およびロゴは、各所有者の財産である。アムンディ責任投資方針およびアムンディESG規制声明を参照のこと。商品固有の情報については目論見書を参照のこと。

1 ファンドARI ヨーロッパ・クレジット / インデックスブルームバーグ・ユーロ・アグリゲート・コーポレート（E）TRクローズ

2 出典2025年2月28日現在

世界で失われる生物多様性

生物多様性は通常の100倍から1000倍の割合で消滅



生物多様性消滅の原因は
すべて人為的なものである

土地と海の利用の変化

フランスでは毎年、
20,000～30,000 ha
の農地・森林資源が消費される

持続不可能な資源開発

世界の漁業資源のうち、
90%
が乱獲されている

気候変動

99%
のサンゴが今世紀末までに消滅する可能性がある

汚染

ヨーロッパの農業と工業が隣接する地域では、数十年で
70 ~ 80 %
昆虫の個体数が減少

外来種

種の絶滅の
60%
が外来種によるもの

出典：アダム・イスラームIIASAネイチャー誌 DOI: 10.1038/s41586-020-2705-y、1 Dasgupta, P. (2021), The Economics of Biodiversity：ダスグプタ・レビュー 2 IRP (2021).生物多様性の構築：自然資源管理アプローチ 3 世界自然保護基金（WWF）2020

生物多様性損失の主な原因

直接的要因

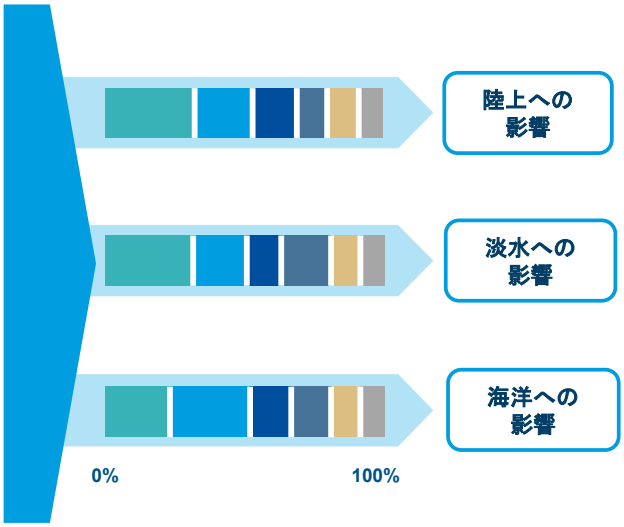
土地と海の利用の変化
パーム油、大豆、牧畜など用地確保のための森林伐採
集約的農法

持続不可能な資源開発
乱獲：再生率を上回る漁獲割合

気候変動
地球温暖化は世界中の種や生態系に影響

汚染
農薬、肥料、海洋プラスチック

外来種
本来の生息地以外の環境に侵入し定着した動物、植物、菌類、微生物等



間接的要因

人口動態と生活様式 | 経済活動・技術
法制度・ガバナンス | 紛争・伝染病

アムンディにおける生物多様性投資フレームワーク

生物多様性に関する国際的な目標やターゲット達成を支援する生物多様性戦略を策定

- ✓ 生物多様性の保全には、**自然への影響を下げる**ことが必要
- ✓ 自然を構成する資源を**持続可能な形で利用することは、経済効率と密接に関係**

1.回避
生物多様性への悪影響が大きい企業への投資は回避

2.削減
セクター間およびセクター内の投資比率を調整することで、生物多様性への悪影響を削減

3.支援
生物多様性に配慮した活動やプロジェクトへの投資を通じて、生物多様性と自然生態系を保護

ダブル・マテリアリティ・アプローチによる企業とのエンゲージメント
自然資本の保全という観点からの行動変容のために投資先企業に影響を与えることを目指す

「支援[1]」の事例

米国における水資源管理会社

取水から送配水、再利用、自然環境への還元に至る**水に関連する技術分野の主要企業**

水循環の全体で革新的ソリューション を提供

- 水質分析と処理
- 水道網における漏水検知
- スマートメーター
- 水の供給と水質の最適化で重要な役割を果たす上下水道用ポンプ・ろ過装置を製造

生物多様性に関するソリューション・プロバイダー

生物多様性損失の要因	環境影響	生産 消費システム
過剰搾取	資源開発	• 産業 • 取水／配水
汚染	廃棄物	
再利用	リサイクル	削減

水資源の保全と生物多様性におけるインパクト

一連のソリューションは、水の供給と水質を最適化し**気候変動への適応と耐性を高めるうえで重要な役割を担う。**

同社は、水不足と汚染問題の重要な解決策である水の再利用の分野で業界をリードする製品を提供。汚染削減と環境修復における同社のソリューションの利用は生物多様性に大きなプラスの影響を与える。

プロジェクトの例：
ワシントン州Walla Walla市では、インフラ老朽化による**毎年の送配水ロスが飲料水の30%**

インパクト
インテリジェントなネットワークにより同市の**水のロスを50%削減し、年間6億5,000万リットル以上を節約**

[1] MSCI Environmental Impact revenuesに基づき識別: 気候変動への対応に関わる事業からの売上が80%以上の場合 (代替エネルギー、エネルギー利用効率化、グリーンビルディング等)、あるいは、自然資本保全に関わる事業からの売上が20%以上の場合 (サステナブル農法・水資源管理、汚染防止)

Amundi investment Solutions

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アムンディ・ジャパン株式会社
金融商品取引業者登録番号：関東財務局長（金商）第350号
加入協会：
一般社団法人投資信託協会
一般社団法人日本投資顧問業協会
日本証券業協会
一般社団法人第二種金融商品取引業協会

4383733

Trust for a flourishing future
SUMITOMO MITSUI TRUST GROUP

FRANCO-JAPANESE FORUM on GREEN FINANCE

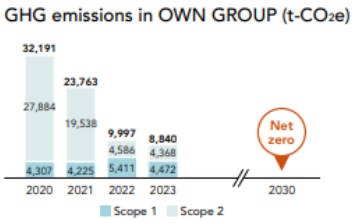
Financing the Transition in Japan, Balancing Aspirations and the Real Economy

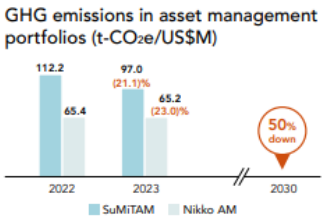
April 17, 2025
Chikako Matsumoto
Managing Executive Officer, Chief Sustainability Officer
Sumitomo Mitsui Trust Group

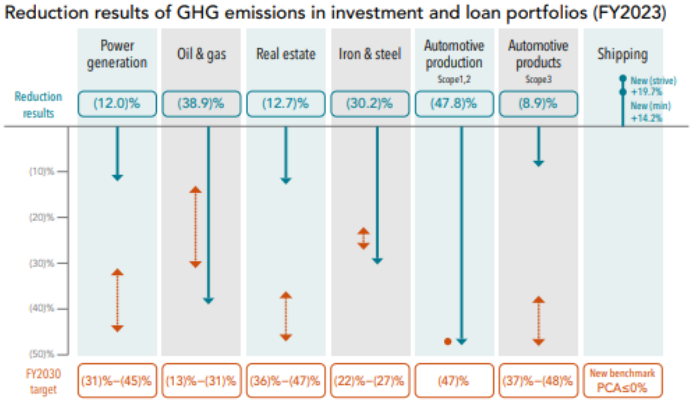
三井住友トラストグループ株式会社

Status of engagement on climate change

- Reduction of GHG emissions varies by category (progress in the Group, asset management portfolio, investment and loan portfolio including oil and gas sector, etc.)
- Power generation sector, real estate sector, Scope 3 of automotive sector, and shipping sector need further reduction





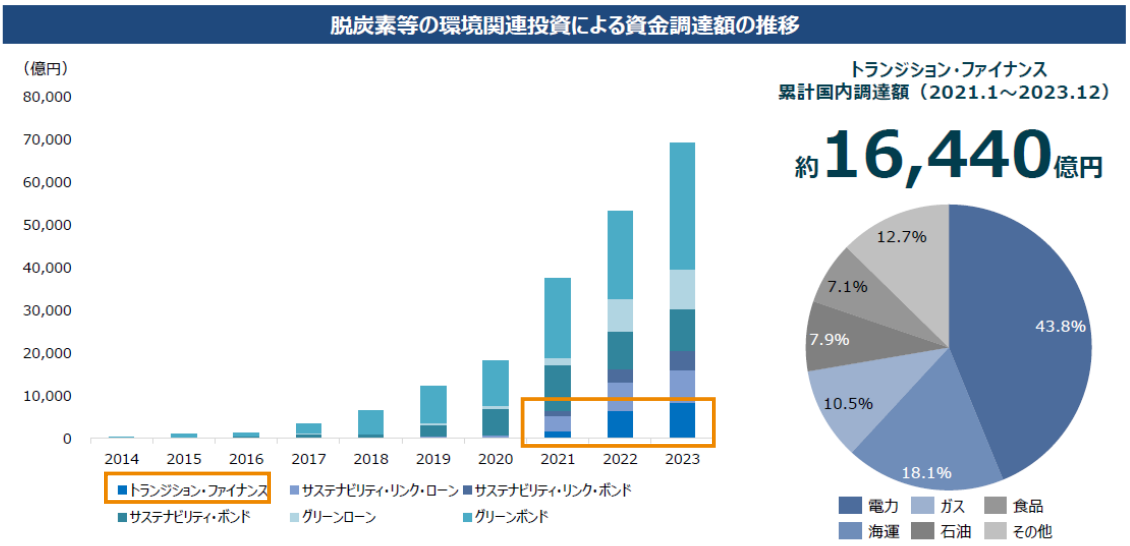


			FY2030 target		Results (FY2023)
OWN GROUP GHGEs	Scope 1		Net zero		4,472t-CO2e
	Scope 2				4,368t-CO2e
Portfolio GHGEs	Asset management	Sumitomo Mitsui Trust Asset Management	Cut emission intensity in half compared to 2019 for 50% of all assets under management*1	Net zero by 2050	(21.1)% (compared to June 2021) (as of March 2024)
		Nikko Asset Management	Cut emission intensity in half compared to 2019 for 43% of all assets under management*2		(23.0)% (compared to the end of December 2019) (as of December 2023)
	Investments and loans	Power generation sector (emission intensity)	138 – 173g-CO2e/kWh		219g-CO2e/kWh
		Oil & gas sector (emission reduction rate)	(13)% – (31)% (compared to March 2021)		(38.9)%
		Real estate sector (emission intensity)	34 – 41kg-CO2e/m2		58kg-CO2e/m2
		Shipping sector (Portfolio Climate Alignment)	0% or less		New (strive) +19.7% New (min) +14.2%
		Iron & steel sector (emission reduction rate)	(22)% – (27)% (compared to March 2020)		(30.2)%
		Automotive sector [Production] Scope 1, 2 emission reduction rate	(47)% (compared to March 2020)		(47.8)%
		Automotive sector [Product use] Scope 3 emission intensity	106 – 128g-CO2e/vkm		184g-CO2e/vkm
Sustainable finance			Cumulative amount from FY2021: JPY 15 trillion		Approx. JPY 3.8 trillion
Loan balance for coal-fired power plants			Zero (FY2040)		Approx. JPY 144.0 billion
Exposure of carbon-related assets			–		JPY 17.0 trillion

See below for details
https://www.smtg.jp/english/-/media/tg/english/sustainability/report/2024/climate_all.pdf

Transition Finance in Japan

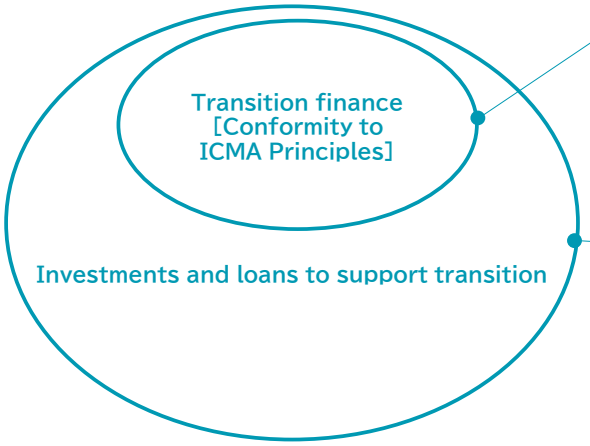
- The cumulative amount of transition finance in Japan has increased to approximately 1.6 trillion yen since 2021.
- By industry, electricity accounted for the largest share at 43.8%, followed by shipping, gas, and oil.
- While global financial institutions require alignment with the 1.5 degree pathway, Japan 's transition roadmap (below 2 degrees) is not 1.5 degrees aligned and is subject to some criticism.



Source: Reprinted from 9th Document of the Financial Services Agency's Investigative Commission for Development of Transition Finance Environment

Definition of Transition Finance

- The concept of transition finance includes investment and financing to support the transition to net zero in a broad sense and transition finance in a narrow sense to obtain third-party certification in accordance with international principles such as ICMA.



[Narrow] Transition finance

➢ Third-party certification in accordance with international principles such as ICMA

[Broad Definition] Investment and financing for transition support

➢ Assist the transition to net zero

e.g. Impact equity investments
-Climate tech
Positive impact finance
-Projects that have an impact on companies' decarbonization targets

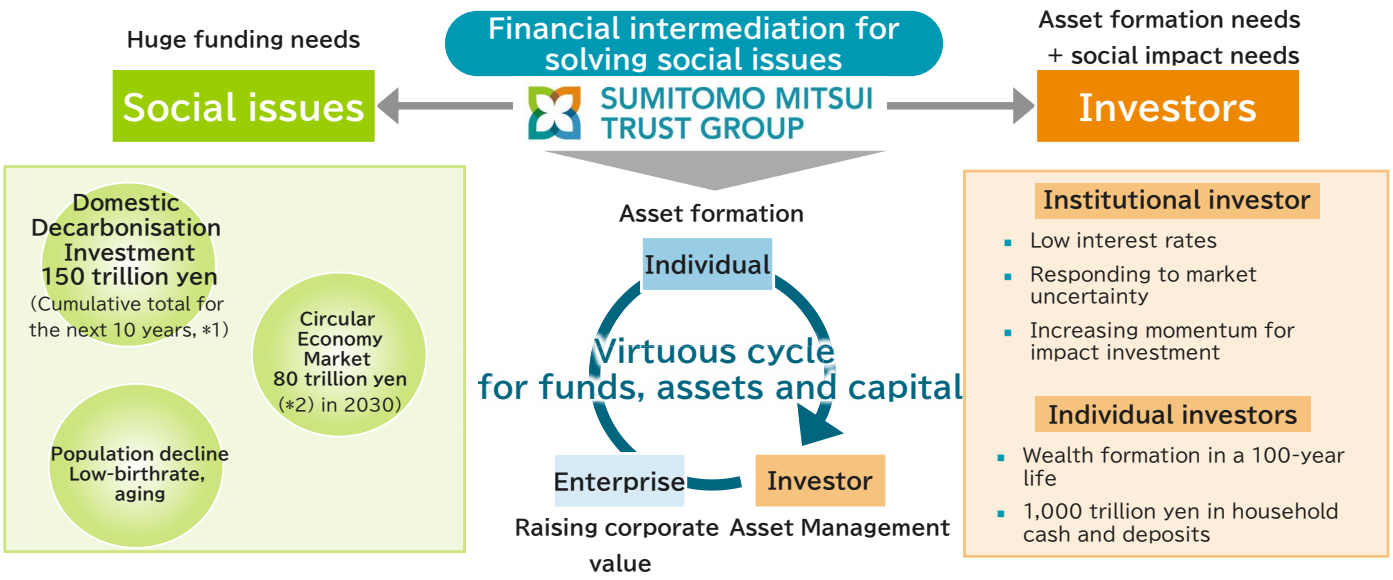
Public Funds for Decarbonizing Industries in Japan and US

Public Funds for Decarbonization v GDP

	US / IRA	Japan / GX
(a) Government funds	$369 billion	$130 billion
(b) GDP	$28.8 trillion	$4.1 trillion
(a) / (b)	1.3%	3.2%

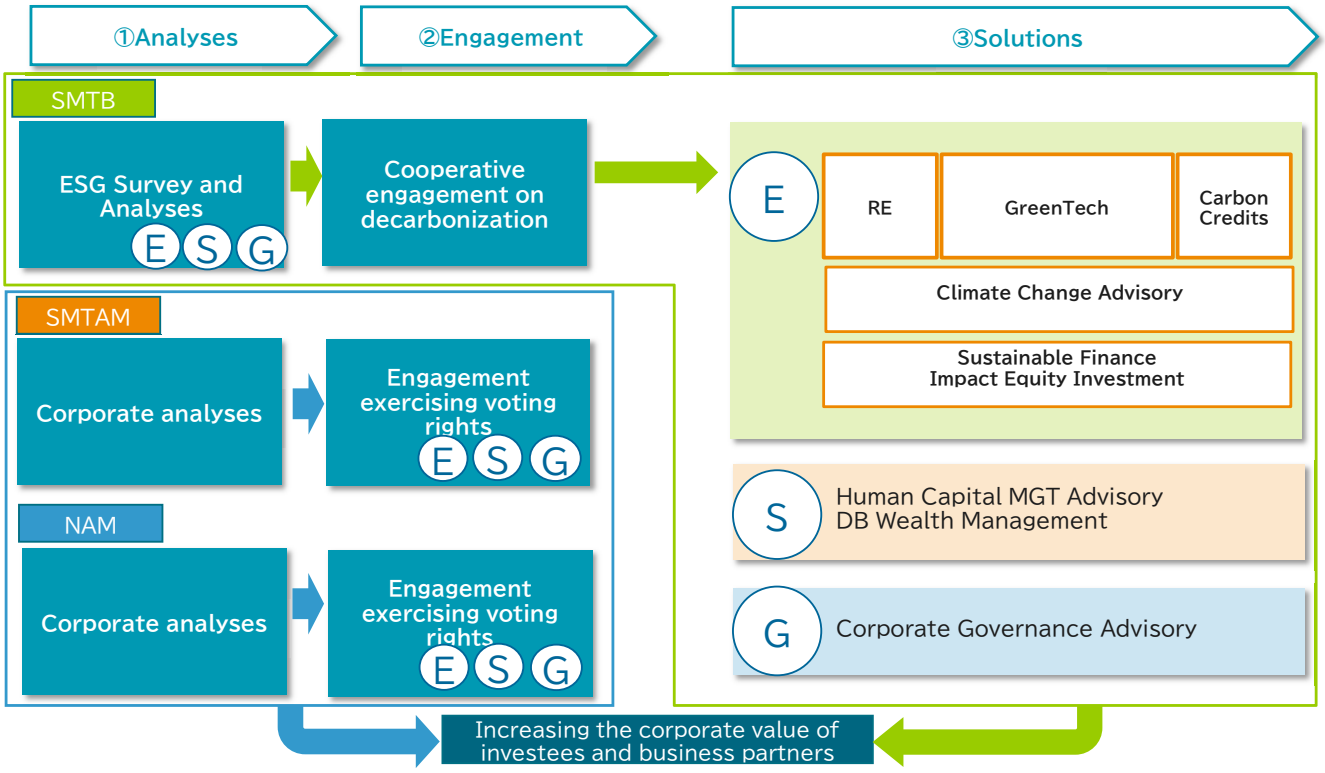
SuMi Trust Group as Financial Intermediation for Solving Social Issues

Fulfilling New Financial Intermediary Functions



(Source)*1: Ministry of Economy, Trade and Industry*2: Ministry of Economy, Trade and Industry*3: Bloomberg Intelligence

SuMi Trust Group Engagement with the Corporate Japan



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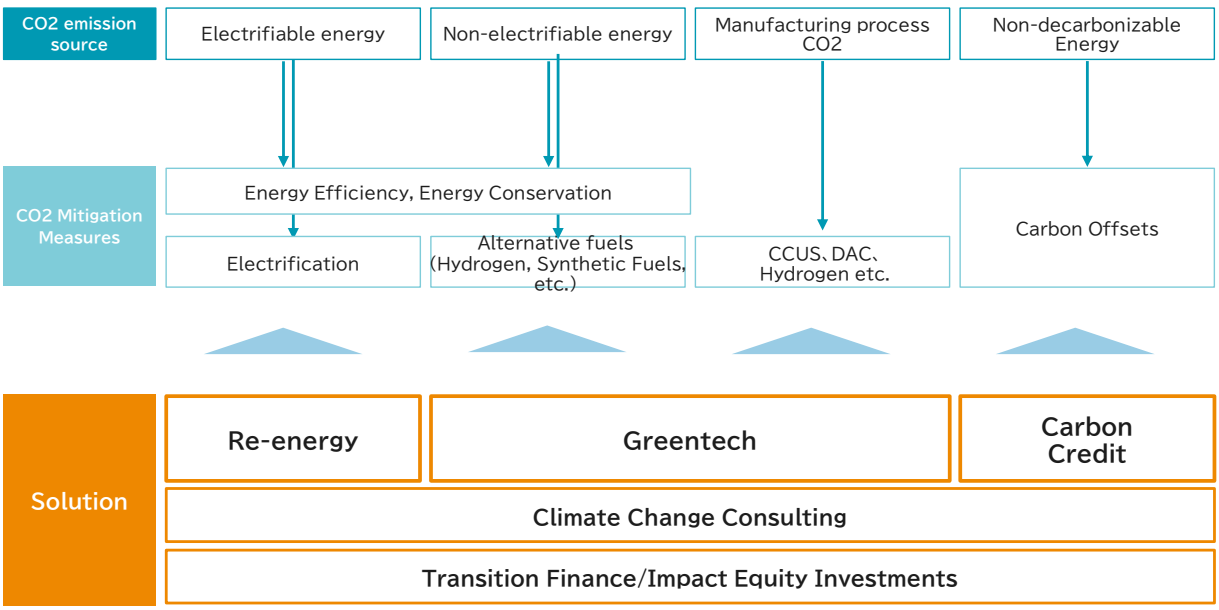
Climate Change Solutions of SuMi Trust Bank



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Asset Management Business

Initiatives for institutional investors

● Gatekeeping business

■ Provide private debt product handled by Apollo's main subsidiary

APOLLO GLOBAL MANAGEMENT

AUM
As of Sep. 24

Non-profit institutions | Pensions

¥**30**bn*2

● In-house function

■ Comprehensive domestic infrastructure fund (fund no. 1) acquired **110%** of the projected amount of investor funds

JAPAN EXTENSIVE INFRASTRUCTURE

Financial institutions

+ ¥**33**bn
(total ¥500bn by FY30)

■ Establish a renewable energy fund available in small lots

OSAKA GAS Daigas Group

Pensions

¥**8**bn

Inorganic growth

① osmosis INVESTMENT MANAGEMENT — UK, invested in 2024

Aims
- Expansion of ESG-related products sales in Asia including Japan and the Middle East

Cumulative sales amount*4

Pension	Insurance	Pension
Over ¥400bn	Over ¥50bn	Over ¥10bn

② TIKEHAU CAPITAL — Strategic partnership with Tikehau Capital (France), including investment in June, 2024

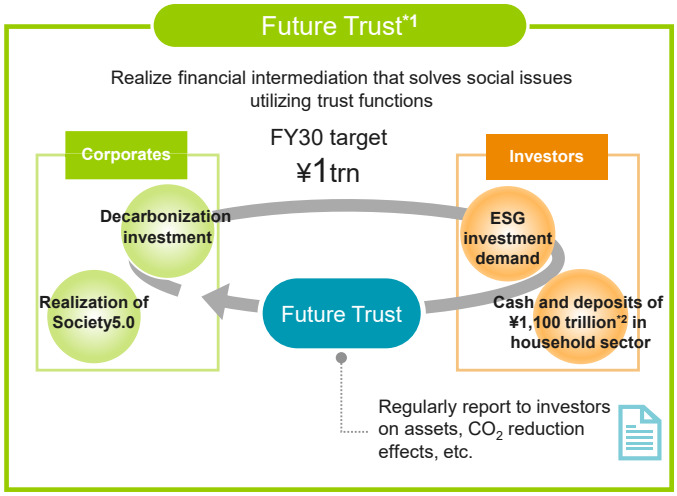
Aims
- Sales of private debt, etc. in Asia, including Japan
- Joint development of PA products

*1: Assets include private equities, corporate debt, real estate, infrastructure and natural resource investments, etc. (Excluding investment from our proprietary account)
*2: Include sales in joint money trusts

Asset Management Business ~ Private Assets ~

Release of the New Trust Funds "Future Trust"

Raise awareness of PA investments, starting with low-risk products.
Work towards diversifying products, including performance-linked dividend type products

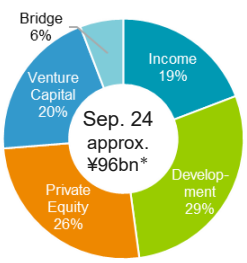


*1: A joint money trust with principal compensation which was launched in October 2024
*2: Bank of Japan, Flow of Funds Statistics
*3: AUM subject to the split and integration

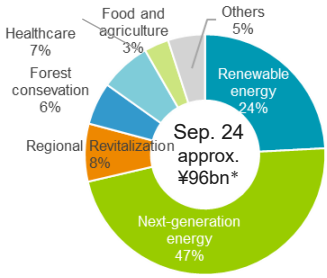
Impact Equity Investment Program

Impact Equity Investments

Project type



Investment sector



Target Return (IRR)

Income:	5-7%
Development:	7-15%
Private Equity:	12-17%
Venture Capital:	15-25%

Aiming for ROC of 10% or more
(Average during the investment period)

*: Total commitment amount (including dry powder)

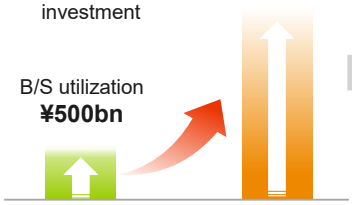
Expansion into the asset management business

FY30 aspiration

(Example) Impact equity investment

Investor funds **¥2trn**

B/S utilization **¥500bn**



Creating a virtuous circulation of funds

Examples: Investment in WOTA

Startup company from the University of Tokyo

Immediately after the Noto Peninsula Earthquake, WOTA began providing support for bathing, hand-washing, etc. using a small-scale decentralized water circulation system. It has achieved coverage of 89% of long-term water outage evacuation centers and 68 hospitals, nursing care facilities, etc.

11
11

Nature Positive Initiatives

Investment in sustainable forestry funds

- By acquiring knowledge about the forestry business through investment in forestry funds, we will provide added value to customers and investors in ESG investment and carbon credit related businesses
- We will provide information to investors about the benefits of impact investment (strengthening cooperation with local communities while protecting biodiversity, etc.)

Fund	Commitment Year	Fund Size	Major target area	Carbon Credit Creation
Hancock	2021	$1Bn or more	United States	None
New Forests	2022	$130M	Southeast Asia	Yes
Fund A from South America	2023	-	South America	Yes
Sumitomo Forestry	2023	$415M	North America	Yes
Manulife	2024	$480M	Global (North America, Australia, and New Zealand)	Yes

Real estate development project "The Forestis"

- Supporting the resolution of social issues such as aging society and sustainable urban life through investment in Forestia, a real estate development project aimed at harmonious coexistence of nature, life and human beings undertaken by MQDC

(Project Overview)

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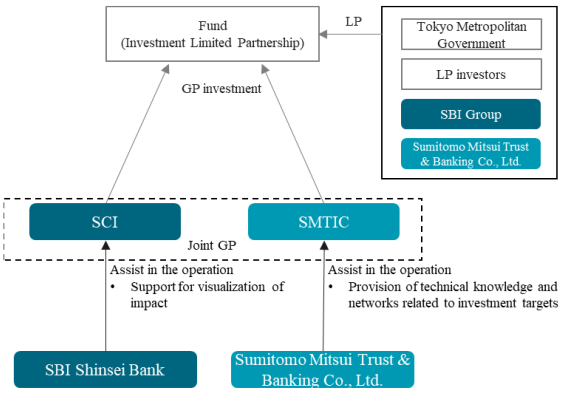
Nature Positive Initiatives

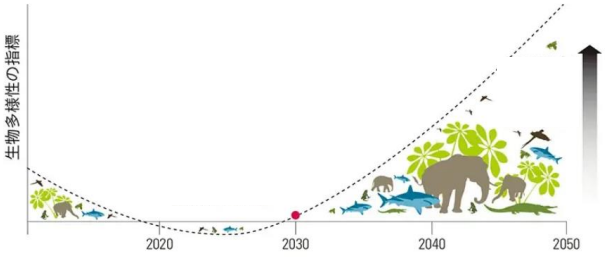
Circular Economy/Nature Positive Fund



Item	Description
Fund name	CE/NP Promotion Fund Investment Limited Partnership
Investment target	(Stage) Seed-Rater (Industry type) CE, NP and CT (mainly CE and NP) Territory: Business operators mainly engaged in business in Japan
Type of investment	LP investment
General partner (GP)	• SCI • SMTIC
Term of Fund	12 years (1 year × 3 extensions allowed)
Amount available for inclusion	Five years
Fund size	¥10 billion (target)

Nature Positive

- Activities to stop and reverse (recover) biodiversity loss



- Business opportunities exist as enterprises shift to NP management
- Understanding the issues facing each company and reflecting international trends (reduction of reputation risk) are important for expanding the business of SU companies.

Market size	Japan	Global
	47 trillion yen (2030)	$10.1 trillion (2030)

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Greentech Solutions and Investment

- We are committed to investing in domestic and global Greentech-affiliated funds, companies, and projects that will drive innovative decarbonization technologies (Greentech), and to acquiring cutting-edge trends and knowledge in these fields, with a view to business matching that contributes to the realization of carbon neutral strategies for our business partners.
- We can introduce 140 green tech venture companies

Greentech Solution Needs

Major technical areas

- Renewable power supply
- Storage battery
- Green hydrogen
- Green ammonia
- SAF
- CCS/CCUS
- DAC

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SMTB

Investment, collaboration, and off-balance needs

Our main investment targets (Greentech-related funds)

Fund name	Fund Characteristics	Covered area: Region	Covered area: Technology
• Copenhagen Infrastructure Partners (CIP)	• Fund to drive PtX and other decarbonisation-related projects in OECD countries	OECD countries	PtX (Hydrogen, ammonia, methanol processing technology, etc. derived from renewable energy)
• Breakthrough Energy Catalyst (Catalyst)	• Founded by Bill Gates • Collaboration of Public and Private Enterprises	U.S., Europe, etc.	Decarbonization of Hard to Abate Sectors (Green Hydrogen, Battery, SAF, DAC)
• Energy Capital Partners (ECP)	• Abundant track record in decarbonization and transition fields	U.S./ Japan	Decarbonization, Renewable energy in general

Other.

Provide solutions related to Greentech

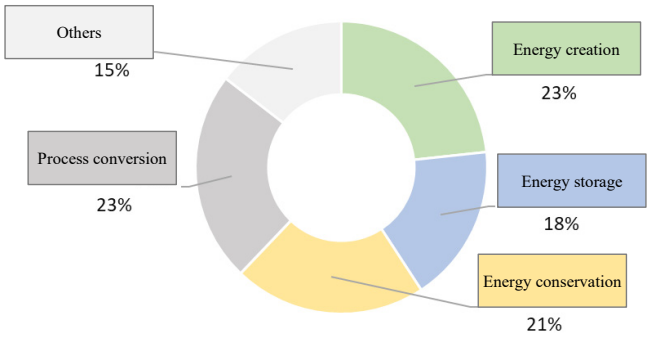
14

Technical coverage through SMTB fund investments

- We have more than 150 companies with decarbonisation technologies that we can reach through investment funds.
- Wide range of technical fields and can provide solutions that meet various needs.

Technical coverage of portfolio companies

- Covering a wide range of decarbonization technologies

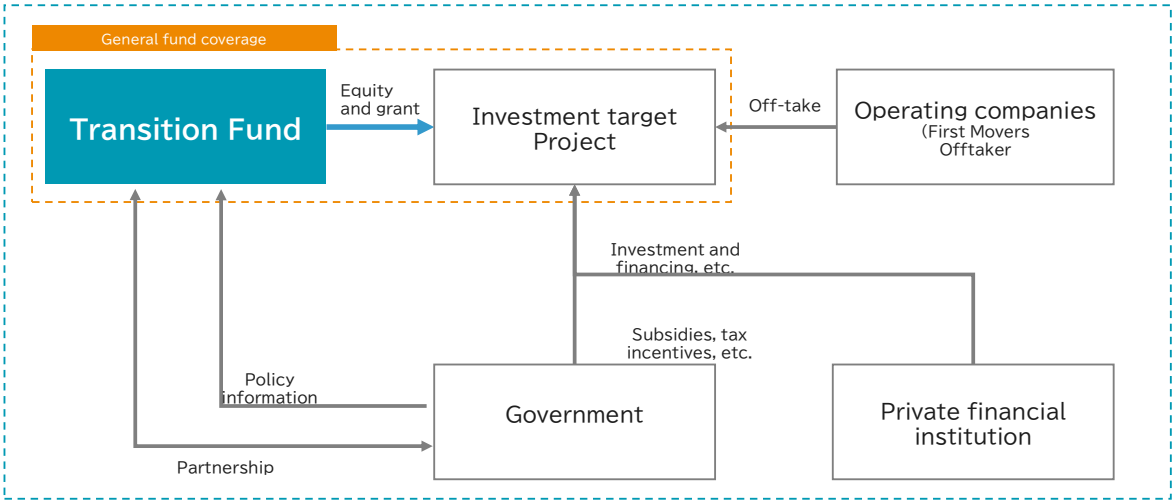


Portfolio companies' business areas (example)

Energy creation	• Renewable energy (solar, wind, hydro, geothermal, etc.) • Hydrogen • Nuclear fusion • Others
Energy storage	• Long Duration Energy Storage • Batteries (lithium, pneumatic iron, aluminum, etc.) • Water pumping (underground) • Others
Energy conservation	• Optimization of supply and demand through the use of smart meters • Optimization of air conditioning equipments using smart air conditioning sensors • Power transmission cables using high-temperature superconductors • Others
Process conversion	• Green steel • Low-carbon cement • Bioplastics • Others
Others	• Low Carbon Building Materials • Direct Air Capture/ CCS, CCUS • Low Carbon Foods/Agriculture • Others

*This slide is available only on the screen.

Creating an Ecosystem to Commercialize GreenTech



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Definitions of terms in this document

Sumitomo Mitsui Trust Group (Consolidated): “Consolidated “ or “SuMi TRUST Group”

Sumitomo Mitsui Trust Bank (Non-consolidated): “Non-consolidated “ or “SuMi TRUST Bank”

Net income (on consolidated basis) : “Net income attributable to owners of the parent”

NPL (Non performing loans): “Problem assets based on the Financial Reconstruction Act”

Financial indices per share

Indices regarding financial information per share such as “Net asset per 1 share,” “Dividends per 1 share,” are presented assuming that the consolidation of shares (one (1) share for every ten (10) shares) enacted on October 1, 2016, and the stock split of shares (two (2) for each share of common stock) enacted on January 1, 2024 took place, for consistency purposes.

第８回日仏グリーンファイナンスフォーラム

カーボンニュートラルに向けた JFEスチールの取り組みと課題

2025年 4月 17日

JFE スチール 株式会社

専門主監
手塚 宏之

https://www.jfe-steel.co.jp/

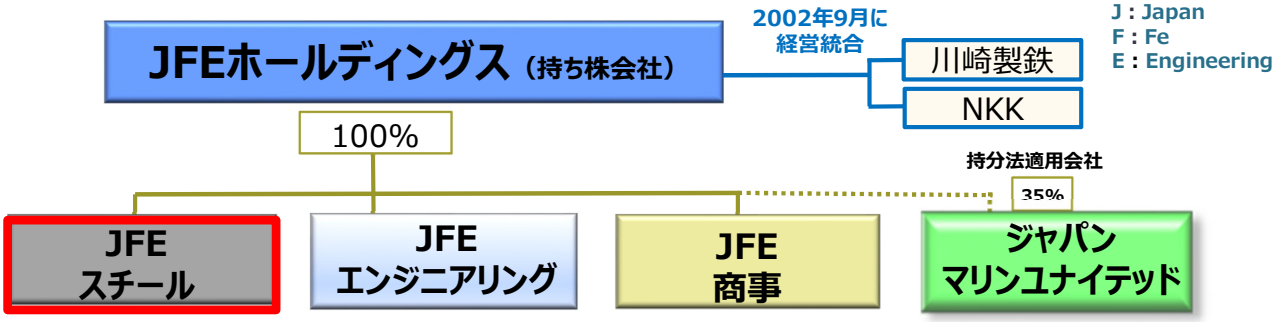
本日の内容

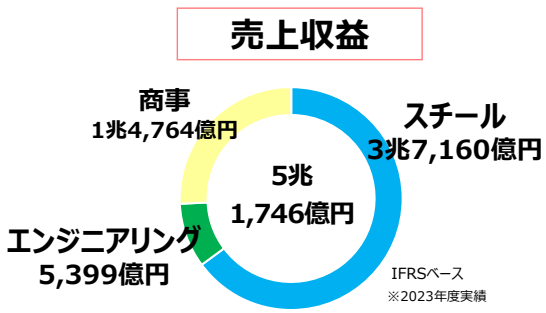
Environmental Vision 2050

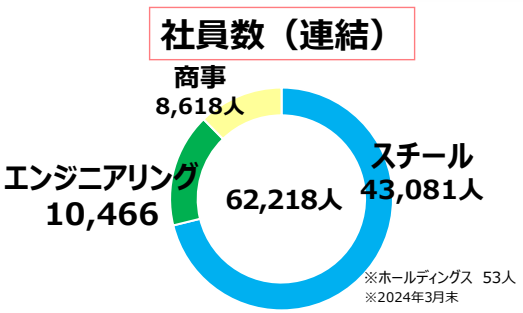
1. JFEの概要とカーボンニュートラルの背景
2. カーボンニュートラルへの取り組みと行動計画
3. カーボンニュートラル計画（トランジション期）
4. カーボンニュートラル計画（イノベーション期）
5. 鉄鋼製品によるCO_2削減・社会との連携

01 JFEの概要と カーボンニュートラルの背景

JFEグループの概要







JFEスチール：鉄鋼事業概要（拠点）

Environmental Vision 2050

CO_2 排出量: 4,830万トン/年 ※2023年度実績

西日本製鉄所

- 粗鋼生産量18.3百万トン／年
- **世界最大級の生産量を誇る製鉄所**
- 主要製品：薄板、厚板、電磁鋼板、線棒、形鋼

福山城天守北側鉄板張りの復元に使用する鉄板を寄贈

Source: JFEスチール

仙台製造所

- 電炉により建材＆線棒を製造
- 生産量　59万トン／年

東日本製鉄所

- 粗鋼生産量4.7百万トン／年
- **大都市隣接＆高級鋼製造を得意とした製鉄所**
- 主要製品：薄板、ステンレス、厚板、鉄粉、鋼管

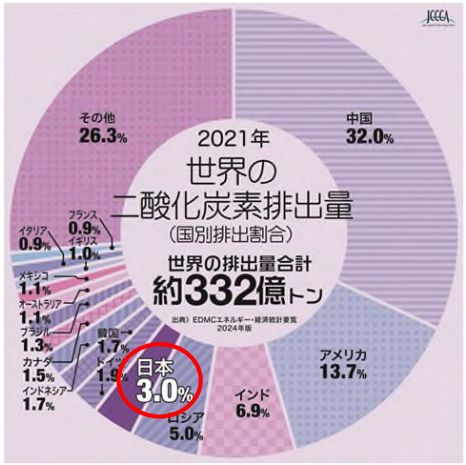
知多製造所

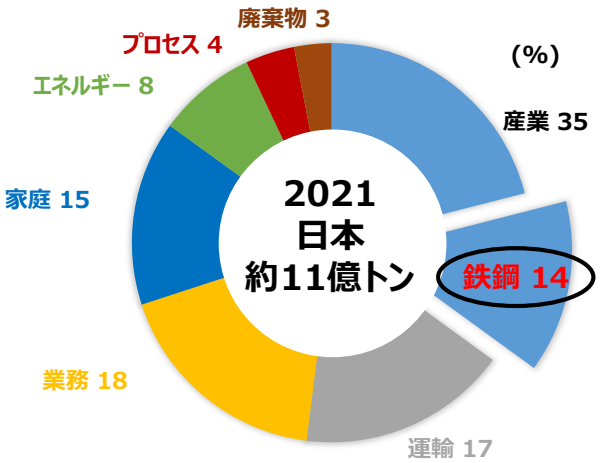
- 最先端の鋼管パイプ製造工場
- 世界最大のパイプ製品をラインナップ

世界/日本のCO_2排出量

Environmental Vision 2050

- 日本のCO_2排出量の世界シェアは、世界5位の3.0%（中米印で50%）
- 日本のCO_2排出量のうち、産業部門は35%、その中で鉄鋼は14%を占める





Source：JCCCAの図表素材を加工して作成　https://www.jccca.org
Source：国立研究開発法人国立環境研究所「日本の温室効果ガス排出量データ」よりグラフ作成　https://www.nies.go.jp/gio/archive/ghgdata/index.html

02 カーボンニュートラルへの取り組みと行動計画

第7次中期経営計画（2021年5月7日）

JFEグループ環境経営ビジョン2050
～カーボンニュートラルの実現に向けて～

SDGs

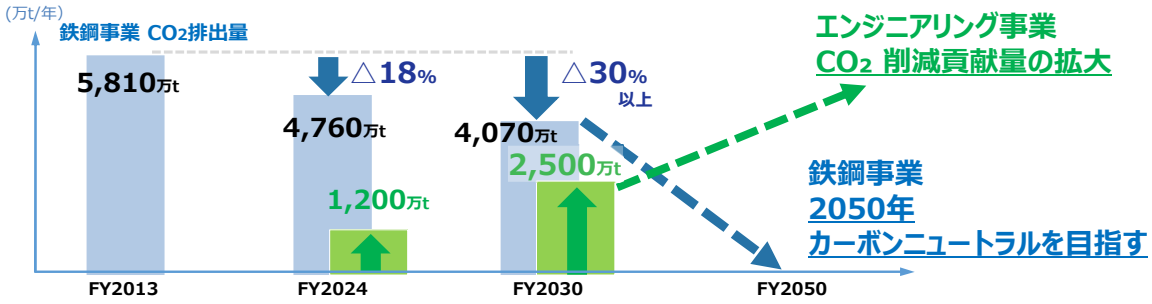
- **気候変動問題は事業継続の観点から極めて重要な経営課題**
- 異常気象の顕在化など、**地球規模での気候変動問題への対応が急務**

2020年を気候変動対応推進の節目の年と位置づけ、CO_2削減活動を推進
中期経営計画の最重要課題に掲げ、2050年カーボンニュートラルの実現を目指す

- 企業理念「**JFEグループは、常に世界最高の技術をもって社会に貢献します。**」のもと、気候変動問題の解決に向け、新技術の研究開発を加速し、**超革新的技術に挑戦**
- **事業リスクへの対応**だけでなく、**持続可能な社会の実現に貢献する事業機会**の拡大を推進し、社会全体のCO_2削減に貢献することで企業価値の向上を図る
- **TCFDの理念**を**経営戦略の策定**に反映し、**体系的に推進**

Source: JFEグループ環境経営ビジョン2050説明会 https://www.jfe-holdings.co.jp/common/pdf/investor/climate/2020-environmental-management-vision210525-01.pdf

2050年カーボンニュートラル実現に向けて



鉄鋼事業: **CO_2 排出量を2024年度末18%、2030年度30%以上削減（2013年度比）**
鉄鋼プロセスの脱炭素化等によって、カーボンニュートラルを目指す

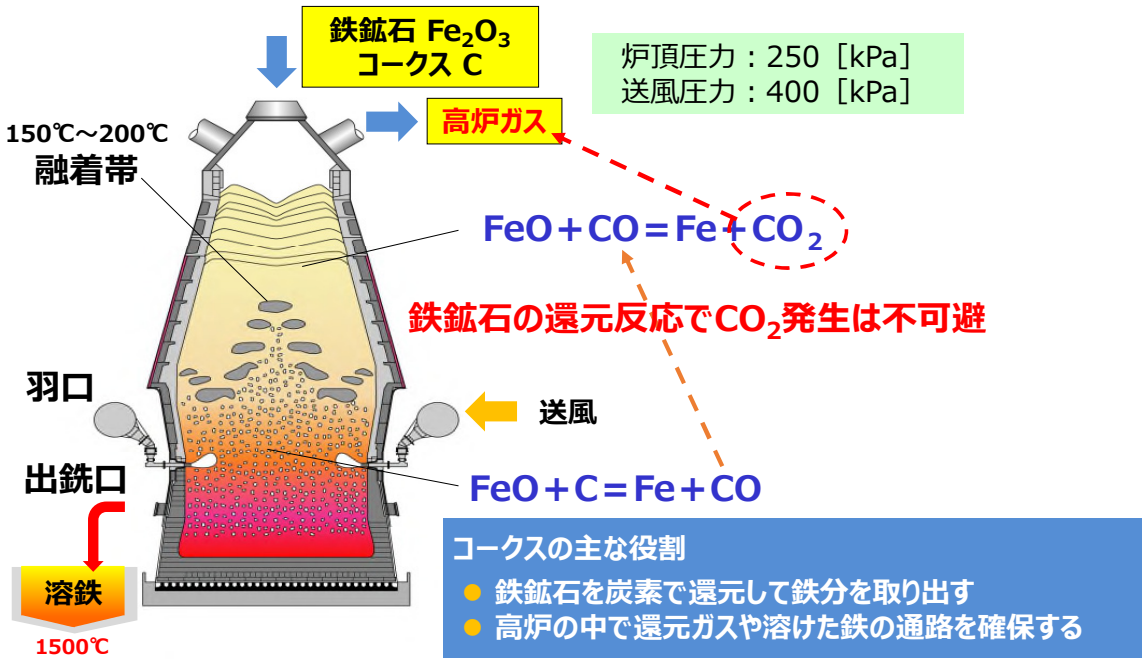
GX投資：1,600 億円/4か年 （2021-2024年度）

エンジニアリング事業: 再エネ発電、カーボンリサイクル技術の拡大・開発などの事業を通じた
CO_2削減貢献量拡大により、社会全体のカーボンニュートラル実現に貢献

GX投資：1,300 億円/4か年 （2021-2024年度）

Source: JFEホールディングス インベスターズミーティング資料（2023年3月期）を加工して作成

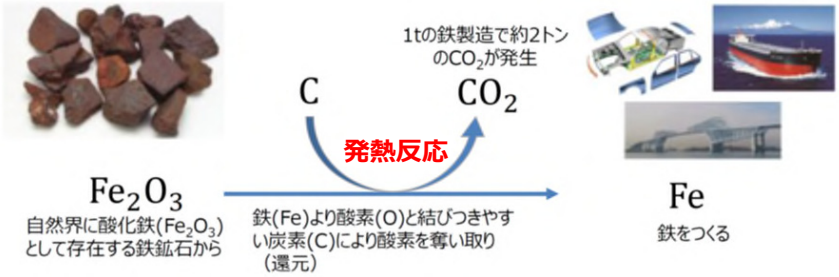
鉄の製造プロセス：鉄鉱石の還元（高炉の内部）



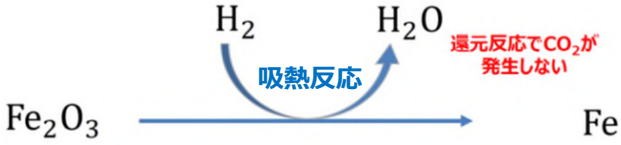
鉄鋼石の還元にCO_2排出は不可避

Environmental Vision 2050

■ **炭素**を用いた還元



■ **水素**を用いた還元

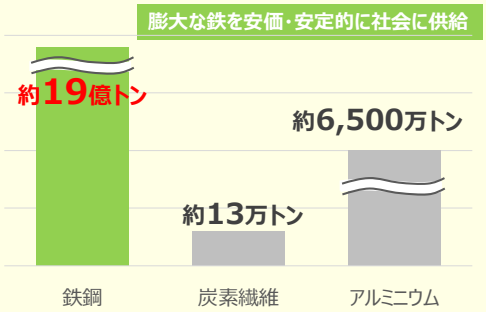


Source:「トランジションファイナンス」に関する鉄鋼分野における技術ロードマップ（経済産業省、21年10月）（https://www.meti.go.jp/policy/energy_environment/global_warming/transition/transition_finance_technology_roadmap_iron_and_steel_jpn.pdf）を加工して作成

鉄の価値　～鉄の使命と超革新技術への挑戦～

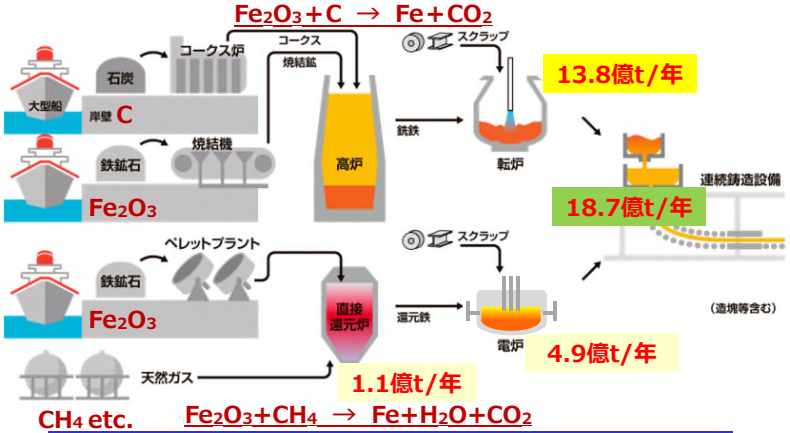
Environmental Vision 2050

■ **素材の世界需要（2020年）**



社会の持続的発展に不可欠な鉄
低環境負荷だが、莫大な需要
→ CO_2排出大

■ **鉄の製造プロセスと課題**　Source：生産量はWSA(世界鉄鋼協会)2020年統計データより



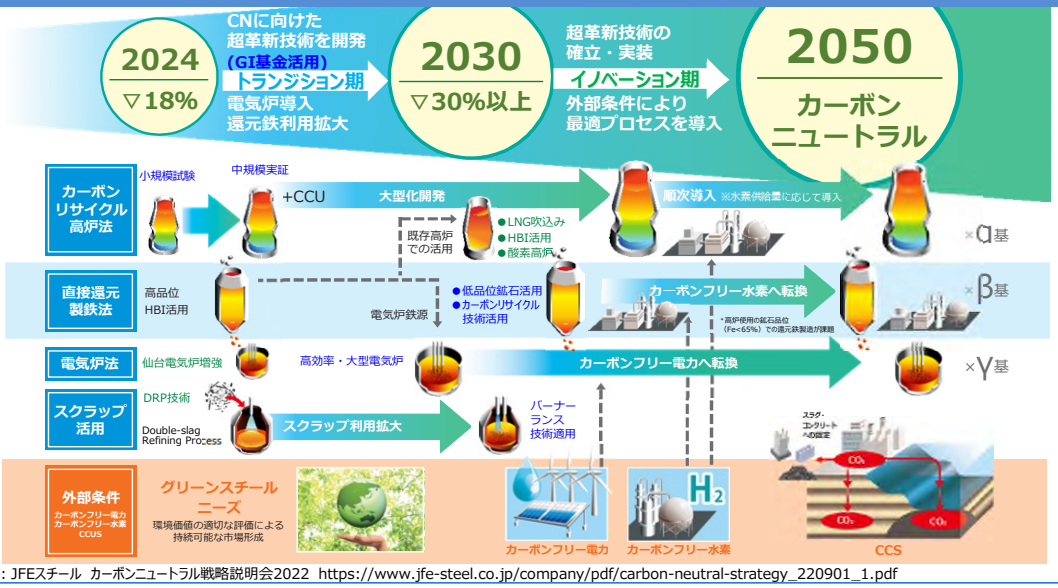
高炉：高品質、大量・安定供給に貢献
2050年カーボンニュートラルに向けて
高炉法の低炭素化がポイント → R&Dに挑戦

Source：JFEグループ サステナビリティ報告書2024　を加工して作成

JFEスチール　プロセス転換概要

Environmental Vision 2050

- GI基金事業等を活用した複線的な技術開発を推進し、実証された技術を順次導入
- 最適なプロセス構成で製鉄所に展開、カーボンニュートラル実現を目指す



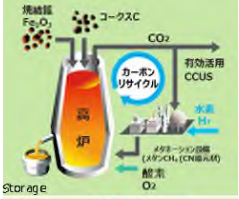
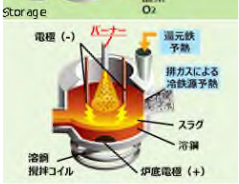
Source: JFEスチール　カーボンニュートラル戦略説明会2022　https://www.jfe-steel.co.jp/company/pdf/carbon-neutral-strategy_220901_1.pdf

超革新技術の開発：GI（グリーンイノベーション）基金事業※

※NEDO 製鉄プロセスにおける水素活用プロジェクト（GREINS）

Environmental Vision 2050

- 当社のカーボンニュートラル実現には、複線的な製鉄プロセスの超革新技術開発が必要

従来プロセス	主な課題	超革新技術(GI基金事業など)
高炉法 13.8 億t/年 主原料：鉄鉱石・石炭(コークス) 特長 • 生産性が高い • 既存設備を使用可能 • 低品位鉱石を使用可能 • 高級鋼生産可能 CO_2排出量　2.0t/t-steel	• コークスをカーボンニュートラル還元材(水素、メタン等)に置換する必要あり • CCUS※の活用が不可欠 • 水素コストが高い ※CCUS：Carbon dioxide Capture, Utilization and Storage	 **カーボンリサイクル高炉** 発生するCO_2をメタンに変換、還元剤として繰り返し利用するプロセスを開発 当社独自技術 CO_2削減目標 50%
電気炉法 4.9 億t/年 主原料：鉄スクラップ・還元鉄 特長 • CO_2排出量が少ない 0.5t/t-steel	• 生産性が低い • 高級鋼の製造困難 • スクラップのみでは鉄源不足 • カーボンニュートラル電源必要 • 電力コストが高い(国内)	 **高効率・大型電炉** スクラップや還元鉄の高効率溶解、不純物低減などによる高品質鋼材製造法を開発
直接還元法 1.1 億t/年 電気炉原料となる 主原料：鉄鉱石・天然ガス 特長 • CO_2排出量が少ない • 100%水素還元でカーボンニュートラル実現可能 1.0-1.5t/t-steel	• 高品位鉱石のみ使用可能 • 水素還元時、炉内温度低下 • 対策が必要(現時点で未確立) • 水素コストが高い • 設備投資金額が高い	 **直接還元製鉄法** 天然ガスの代わりに水素で低品位鉄鉱石から酸素を取り除き、還元鉄を製造する直接還元製鉄法を開発 CO_2削減目標 50%

Source: JFEスチール　カーボンニュートラル戦略説明会2022、2023より作成　https://www.jfe-steel.co.jp/company/pdf/carbon-neutral-strategy_220901_1.pdf

カーボンニュートラルに向けた行動計画

Environmental Vision 2050

- **2030年までを “トランジション期” と考え低炭素鉄鋼プロセスへの転換を推進**
- **2030年から2050年までを“イノベーション期” と定義し、超革新技術の確立・実装により、カーボンニュートラルの達成を目指す**

トランジション期

- 設備投資により低炭素技術の適用を拡大し、2030年CO_2削減目標▽30%以上の達成に向けたCO_2削減計画を確実に実行
- イノベーション期への移行準備として複線的な超革新技術の研究開発の加速
- 環境価値の適切な評価によるコスト回収可能なグリーン鋼材の市場創出

→ **初期需要形成**

✓ 政策面での需要喚起が必要

イノベーション期

- 超革新技術の早期確立・実装
- 地域社会やコンビナート各社と一体となった、カーボンニュートラル社会の構築
- 環境価値の適切な評価によるコスト回収可能なグリーン鋼材の市場拡大

→ 好循環を生む**持続的需要形成**

✓ 国内鉄鋼業の競争力維持に必要なカーボンフリー水素・電力の安価・安定・大量供給が前提

グリーン鋼材市場創出には環境価値に対する供給側・需要側双方の行動変容が必要

Source: JFEスチール カーボンニュートラル戦略説明会2022 https://www.jfe-steel.co.jp/company/pdf/carbon-neutral-strategy_220901_1.pdf

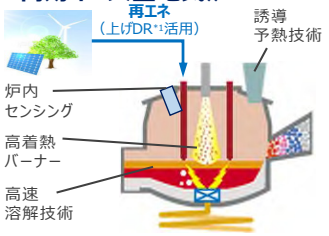
Environmental Vision 2050

03 カーボンニュートラル計画（トランジション期）2030年CO_2削減△30%に向けた取り組み

倉敷 高効率・大型電気炉／UAE直接還元鉄プロジェクト

- 倉敷電気炉には、当社の独自開発技術に加え、GI基金事業で開発を進めている**高品質化・高効率溶解技術などの革新プロセス技術を適用**
- これらの技術導入と**低炭素還元鉄の活用**により、既存大型電気炉では実現困難であった高炉法に匹敵するグリーンな高品質・高機能鋼材の大量供給体制を世界で初めて実現する

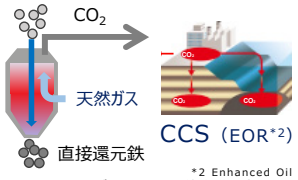
■高効率・大型電気炉



稼働予定	2027年度
年間生産量	約 200万トン/年
還元鉄使用量	最大 50%
CO_2削減効果	約 260万トン/年

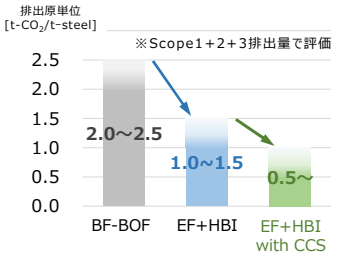
*1 上げDR：上げデマンドレスポンス（再生可能エネルギーの過剰出力分を需要を引き上げ有効活用）

■UAE直接還元鉄プロジェクト



稼働予定	2025年度下期以降
年間生産量	250万トン/年
還元方法	天然ガス（＋CCS） → 将来 水素活用

*2 Enhanced Oil Recovery：原油増進回収



（BF:高炉、BOF:転炉、EF:電気炉、HBI:還元鉄）

超革新電気炉＋低炭素還元鉄

高炉法に匹敵する
グリーンな高品質鋼材を製造

Source: JFEスチール カーボンニュートラル戦略説明会2023 https://www.jfe-steel.co.jp/company/pdf/carbon-neutral-strategy_231108_1.pdf

UAE直接還元鉄プロジェクト：還元鉄確保に向けた事業化

- **2023年7月17日 本プロジェクト*の港湾開発および操業、土地のリース・サービス、関連のインフラ整備について、Abu Dhabi Ports Group（以下「ADPG」）が本格的に参画することで合意**
- **ADPGとの協業により、プロジェクトエリアの確保、原材料購入・製品出荷における安定的な物流体制の構築など、低炭素還元鉄のサプライチェーンの確立を目指す**

*2022年9月1日 伊藤忠商事株式会社、EMSTEELと共に、**鉄鋼業界のグリーン化に向けた低炭素還元鉄のサプライチェーン構築**に関して、コアメンバーとして参画し、プロジェクト候補地をアブダビとする詳細な事業化調査を共同で推進することで合意

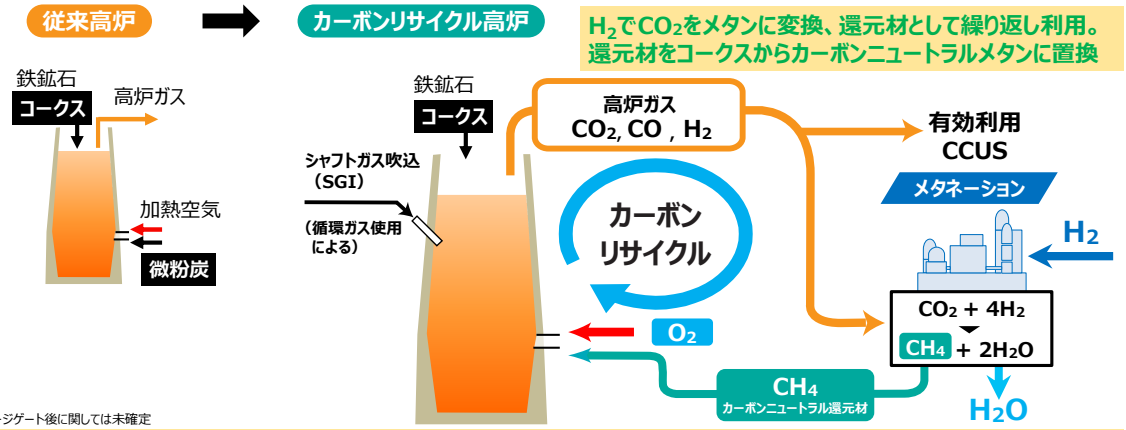
2023年7月17日
アラブ首長国連邦アブダビで開催された日本・UAEビジネスフォーラムの場にて
岸田文雄内閣総理大臣立ち合いのもと行われた覚書交換式の模様

Source: JFEスチール カーボンニュートラル戦略説明会2023 https://www.jfe-steel.co.jp/company/pdf/carbon-neutral-strategy_231108_1.pdf

04 カーボンニュートラル行動計画（イノベーション期）
2050年にむけた超革新技術開発

CR高炉によるCO_2削減技術開発※

- 東日本製鉄所千葉地区において小規模カーボンリサイクル試験高炉建設(150m³規模)
- 2025年4月~2026年度に試験操業を行いプロセス原理確認
- 現行の高炉法と比較してCO_2排出量を50%以上削減する技術を実証



※ステージゲート後に関しては未確定

実装に向けた方針※：2030年までに純酸素都市ガス使用条件下において中規模高炉実証試験
(倉敷地区、700m³規模)を実施、早期の実機実証試験・実装を検討

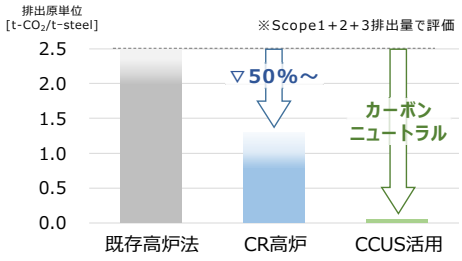
Source: JFEスチール カーボンニュートラル戦略説明会2022 https://www.jfe-steel.co.jp/company/pdf/carbon-neutral-strategy_220901_1.pdf

※NEDO 製鉄プロセスにおける水素活用プロジェクト（GREINS）

CCUSの必要性と取り組み：複線的な取り組み

- カーボンリサイクル高炉はCO_2削減50%以上を目標としており、カーボンニュートラル達成にはCCUSの活用が必要
- マレーシアCCSと連携した日本起点のCCSバリューチェーン構築の共同検討を開始
- 本プロジェクトの他、国内外含め、企業間連携拡大に向け検討を加速

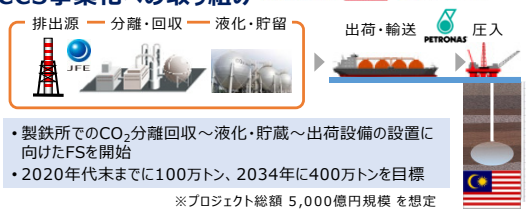
■国内鉄鋼業におけるCCUSの必要性



超革新技術の実装やカーボンニュートラルエネルギーへの転換を推し進めるも、製造プロセスからのCO_2排出を完全にゼロとすることは困難

最大20百万トン程度のCCUSが必要となる可能性

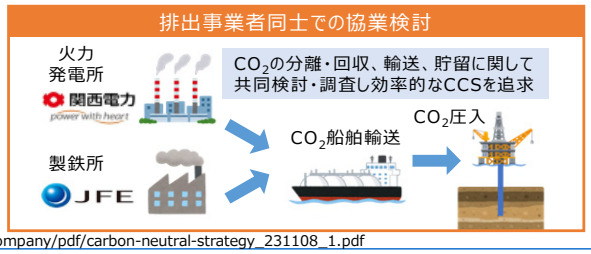
■CCS事業化への取り組み



- 製鉄所でのCO_2分離回収～液化・貯蔵～出荷設備の設置に向けたFSを開始
- 2020年代末までに100万トン、2034年に400万トンを目標

※プロジェクト総額 5,000億円規模 を想定

■企業間連携拡大の取り組み



Source: JFEスチール カーボンニュートラル戦略説明会2023 https://www.jfe-steel.co.jp/company/pdf/carbon-neutral-strategy_231108_1.pdf

05 鉄鋼製品によるCO_2削減 カーボンニュートラル実現に向けた社会との連携

グリーン鋼材：「JGreeX®」によるCO2削減への貢献

Environmental Vision 2050

- 製造プロセスにおけるCO2排出量を従来の製品より大幅に削減した**グリーン鋼材「JGreeX®」について2023年度上期から供給開始**
- 「JGreeX®」は**鉄鋼マスバランス方式を適用**し、鋼材の排出原単位や排出削減量を ISO規格に基づき計算、第三者認証を得て追加性と透明性を確保

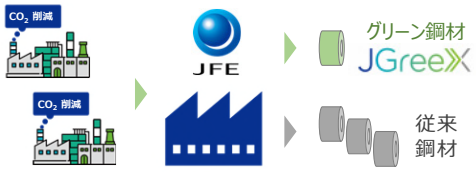
■グリーン鋼材「JGreeX®」の概要

JGreeX

ジェイグリークス（JFE ＋ Green ＋ GX）

供給開始時期	2023年度上期
供給可能数量	20万トン程度（23年度）
対象製品	当社が製造するすべての鉄鋼製品
認証機関	日本海事協会

■鉄鋼マスバランス方式の概要



CO_2排出量削減効果を
JFEスチール全体でプール

STEP.1
本方法を適用する任意の鋼材の排出原単位を算定
STEP.2
排出削減プロジェクトを特定し、その排出削減量を確定
STEP.3
確定した削減量を財源に削減証書を発行し、証書を付与し鋼材を供給

※ 国内高炉メーカーの他、ArcelorMittal、Thyssenkrupp、POSCOも、「マスバランス方式に基づくグリーンスチール」を製品ブランド化し、一部で販売を開始

Source: JFEスチール カーボンニュートラル戦略説明会2023 https://www.jfe-steel.co.jp/company/pdf/carbon-neutral-strategy_231108_1.pdf

グリーン鋼材：需要喚起に向けた課題

Environmental Vision 2050

- EUでは、マスバランス法を用いてCO2排出をオフセットしたグリーン鋼材をブランディングし販売
- 当社は2030年度のCO2削減目標▽30%達成時、同様の手法を採用することで、**最大500万t/年のグリーン鋼材を供給**することが可能
- カーボンニュートラル社会の構築に向けて社会構造変化をもたらし、新たな産業競争力を生み出すイノベーションを巻き起こすためには、**供給/需要サイド両面での行動変容を促す政策**が必要

供給サイド

- 低炭素/超革新技術の導入には、**莫大な設備投資**が必要：2030年まで1兆円規模の低炭素技術投資が必要
- 研究開発において最大限のコストアップ抑制を図っていくが、**環境価値創出には一定のコストアップ**が不可避
- これらに対する**適切なプレミアム**を獲得する予見可能性があることが必須

需要サイド

- グリーン鋼材は、**消費者が直接的なメリット**（品質・性能・利便性向上等）**を享受する製品とはならない**
- エシカル消費の拡大などの兆候はあるが国内では**環境価値に対する意識は低位**
- 環境価値を認知し、削減効果が大きい製品の**購入を促すインセンティブ**が必要

2030年までのトランジション期における低炭素技術投資を確実に実行し、**イノベーション期の超革新技術投資に繋げる原資を得る**ためにも、トランジション期において**グリーン鋼材市場の早期創出**が必須。
そのためには、鋼材需要家の行動変容と一般消費者の意識改革を後押しする**政策的支援**が必要。

Source: JFEスチール カーボンニュートラル戦略説明会2022 https://www.jfe-steel.co.jp/company/pdf/carbon-neutral-strategy_220901_1.pdf

脱炭素に向けた公募増資、CB発行による資金調達について

- 2022年6月、トランジションボンド（社債）の発行により、総額300億円の調達を完了
  →国内製造業で初めて経産省のクライメート・トランジション・ファイナンスモデル事業のモデル事例に選定
- 2023年9月、GX戦略の推進を機動的かつ確実に実行し、持続的な利益成長を続けるため、公募増資・CB発行(新株式発行、自己株式処分、転換社債発行)により総額2,045億円を調達
- 2030年に向けた鉄鋼製造プロセス脱炭素化に必要な1兆円規模の投資を支える財務基盤の強化を図る

種類	調達額	資金使途	金額	狙い
【新株式発行】 2,500万株 【自己株式処分】 3,000万株	1,145億円	(倉敷地区) 無方向性電磁鋼板の製造設備増強 ※Ⅰ期:2024年度上期、Ⅱ期:2026年度	約950億円	足もとの電磁鋼板の需要増を捕捉し、収益力を強化
		(インド) 方向性電磁鋼板の製造販売合弁会社設立の出資金	約150億円	
【転換社債発行】 2028年満期 転換価額3,041円* UP率　39.98%	900億円	(千葉地区) ステンレス用電気炉の導入	約150億円	今後のGX戦略の速やかな遂行を支える強固な財務基盤を確立
		鉄鋼製造プロセスの脱炭素化に伴う設備投資、事業投資、研究開発費等	約750億円	

*9月11日条件決定時点。2023年度中間配当反映調整後は2,973.7円。

Source: JFEホールディングス　2024年3月期インベスターズ・ミーティング　https://www.jfe-holdings.co.jp/investor/zaimu/g-data/jfe/2023/2023-setumei231106-02.pdf

ご紹介；弊社取り組みの詳細

★JFE GROUP REPORT 2024（統合報告書）

https://www.jfe-holdings.co.jp/investor/library/group-report/index.html

★JFEグループサステナビリティ報告書2024

https://www.jfe-holdings.co.jp/sustainability/data/index.html

★JFEスチール
カーボンニュートラル戦略説明会2023

https://www.jfe-steel.co.jp/company/pdf/carbon-neutral-strategy_231108_1.pdf

★DX REPORT 2023

https://www.jfe-holdings.co.jp/investor/library/dxreport/index.html

ねがう未来に、鉄で応える。

サス鉄ナブル!

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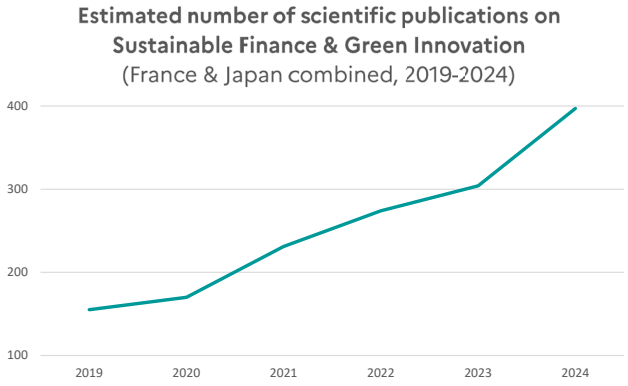
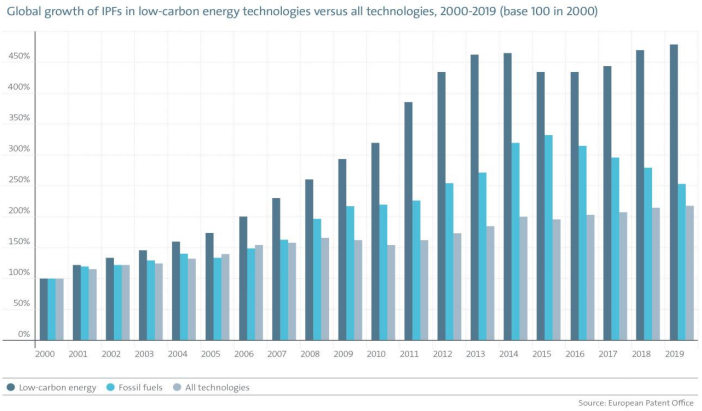
Green Finance & Research
Investing in Science-Driven Sustainability

Adeline LASSAUX
Attaché for Science and Technology
Head of the Health, Life sciences & Environment Department

Sustainability-related research keeps growing



...and so does innovation



- Europe leads in low-carbon energy patents (28% of global filings from 2010-19), with strengths in **renewables, rail, and aviation**.
- Japan ranks as the top individual country (25% of global filings), leading in **EVs, batteries, and hydrogen**.

However, innovation growth is slowing down

Between 2017 and 2019, patent growth in low-carbon energy technologies has slowed to **+3.3% per year. This is** just **a quarter of the pace seen a decade ago** (+12.5% per year for 2000-13).

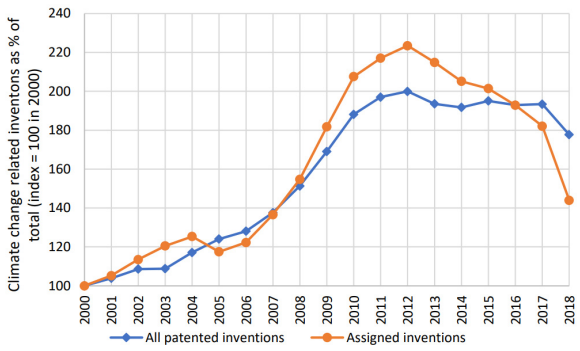
- Renewable energy patents have declined since 2012, as some technologies (e.g., solar PV) have matured, but new waves of innovation have not followed.
- Investments have shifted toward "enabling" technologies (batteries, hydrogen, smart grids), but these alone aren't enough to accelerate the energy transition.

Why is this a problem ?

- **Patents are early signals of future breakthroughs:** a slowdown today means fewer innovations reaching the market in the coming years.
- **According to the** International Energy Agency, **50% of the emissions reductions needed by 2050** depend on technologies that are **not yet commercially available.**

There is a gap between innovation and commercialization

While climate-related innovation (patented inventions) continues to grow, their market adoption has been lagging since 2016.



Share of climate change-related innovation over time, measured by a traditional patent metric and by patent assignments (OECD, 2022)

Possible macro explanations (Probst et al., 2021):

- Falling fossil fuel prices reduced incentives for alternative technologies.
- Low carbon pricing weakened financial drivers for green innovation.
- Some technologies have already reached maturity.

Even when new green innovations emerge, investors wait for policy clarity or proven market demand. This may cause viable green technologies to struggle to scale.

Regulations and policies are adapting…

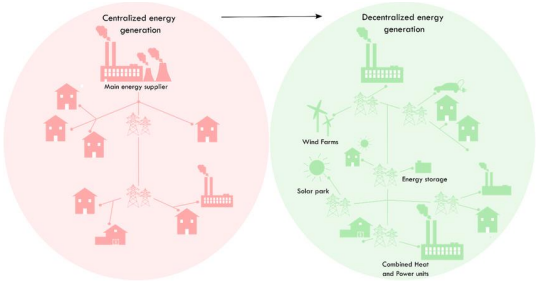
Just recently…

- France was the first EU country to transpose the **EU's Corporate Sustainability Reporting Directive (CSRD)** into its national law.
- Japan's **Financial Instruments and Exchange Act (FIEA)** has evolved to require enhanced sustainability and ESG disclosures.

… but technology is growing faster

- Technology and regulation are often in a mutual stranglehold.
- If policies and regulations lag behind technological developments, they hinder the innovation needed for sustainability, and vice versa.

This comes with risks : regulatory failure, greenwashing etc.

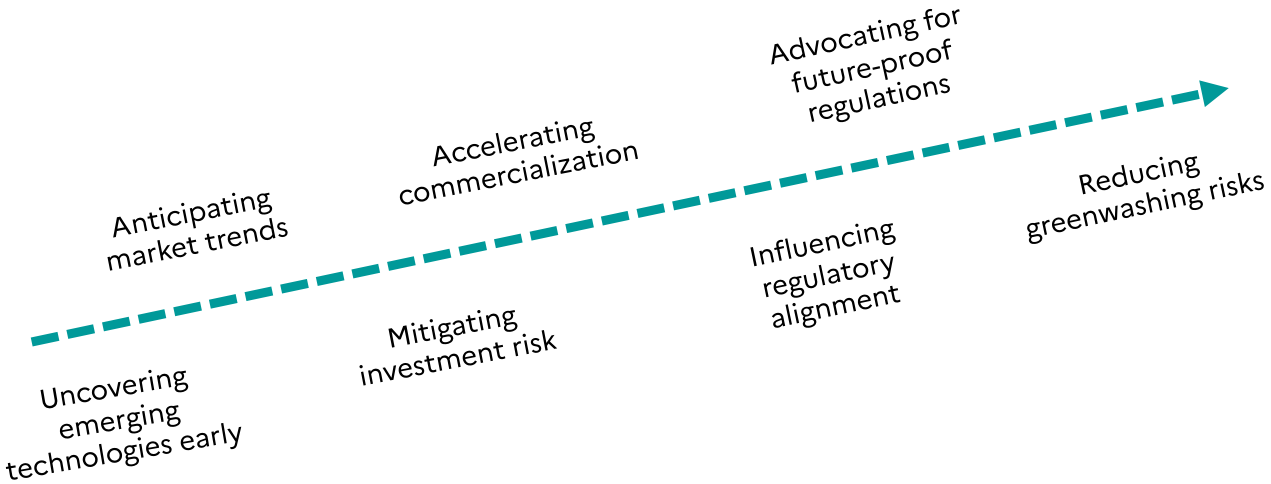


Example : many energy regulations were designed for centralized fossil-based systems and do not fit the needs of decentralized, low-carbon energy models.

Image : Schillinger, J., et al. (2022)

So much friction – which science can help reduce !

Smart investors use science as an early signal and a guiding reference, beyond market demand and regulations.



A case study : the importance of reliable environmental metrics

Nature underpins the economy

- Natural resources (such as pollinators, forests, and clean water) are essential for economic activity.
- When ecosystems degrade (e.g., fewer pollinators → lower crop yields), it leads to economic losses, higher costs for businesses, and disruptions in global trade.

Policymakers and financial institutions need science-based metrics to quantify nature-related risks and benefits (such as pollination, erosion and flood control, air and water purification etc.)

→ The **SEEA framework (System of Environmental-Economic Accounting)** is a UN-supported standard that integrates environmental data with economic accounts.

→ The **INCA project (Integrated System for Natural Capital Accounting)** applies the SEEA framework in Europe to **measure nature's contributions to the economy**, helping financial systems better align with environmental realities.

Conclusion

For a science-driven strategy

➢ Partner with scientific research institutions (universities and public research organizations).

➢ Support policies that align finance with science-based targets.

➢ Invest in solutions with proven, research-backed sustainability impact.

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Thank you !

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The New Keynesian Climate Model

Jean-Guillaume Sahuc[1] Frank Smets[2] Gauthier Vermandel[3]

[1]Banque de France, Université Paris-Nanterre
[2]BIS, Ghent University, CEPR
[3]Ecole polytechnique, Paris-Dauphine, Banque de France, i-MIP

– Green Finance Forum –

Introduction

- Monetary policy is a key player in financial markets;
- Any monetary policy decision yields significant financial changes ($\nearrow$ in r entails $\searrow$ in stock prices, $\nearrow$ in domestic currency, $\nearrow$ in borrowing costs, etc.)
- Monetary policy decides on a regular basis its monetary decisions (asset purchase, stance of refinancing rates) through press conferences
- Decisions are scrutinized by financial markets, and yields immediate response (e.g. "whatever it takes")
- If climate affects monetary policy $\rightarrow$ it will strongly affect financial markets

Introduction

- Climate change will shake the macroeconomic landscape in the next decades and the central bank will have to face 2 phenomena [Schnabel 2022]:
  - On the one hand, a warming planet causes damages that will make resources scarcer & prices higher → climateflation.
  - On the other hand, the fight against climate change through increasing carbon taxes will increase production costs → greenflation.
- How should the central bank conduct monetary policy in this new landscape?
- Answering this question requires a new class of IAM with New Keynesian ingredients to capture inflation dynamics.
- Current models used by IPCC neglect the nominal implications of climate policy/change.

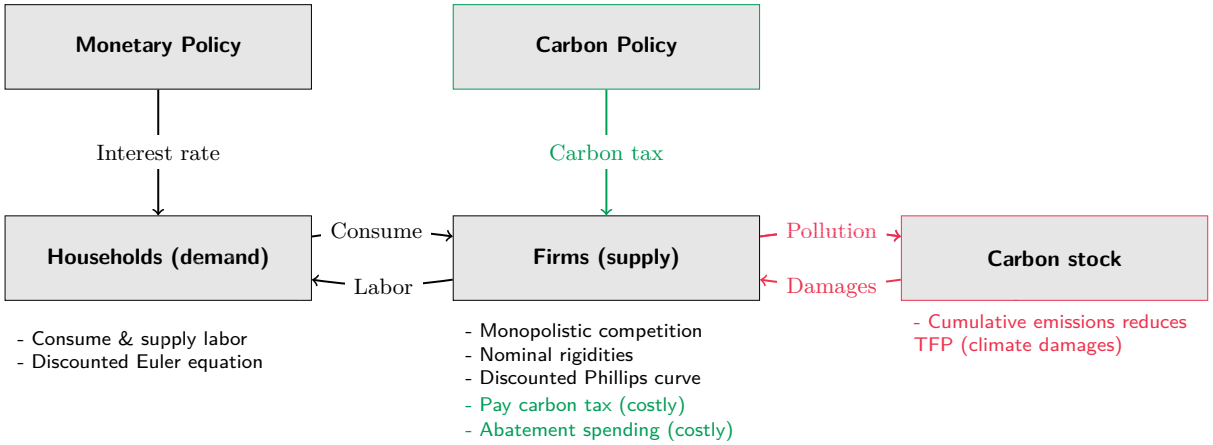
This paper

- The canonical New Keynesian model (e.g. Woodford, 2003) not designed for climate analysis.
- This paper develops The New Keynesian Climate (NKC) model by:
  - extending with a **carbon accumulation** constraint and a **mitigation policy** from the Integrated Assessment Model (IAM) [Barrage and Nordhaus 2023];
  - estimating NKC for the world economy with techniques that take into account nonlinearities resulting from climate change;
  - providing projections up to horizon 2100 under mitigation versus *laissez-faire* policy by changing an exogenous carbon tax rate.
- We offer a tractable framework that capture first order effects of climate change and mitigation policy on inflation.

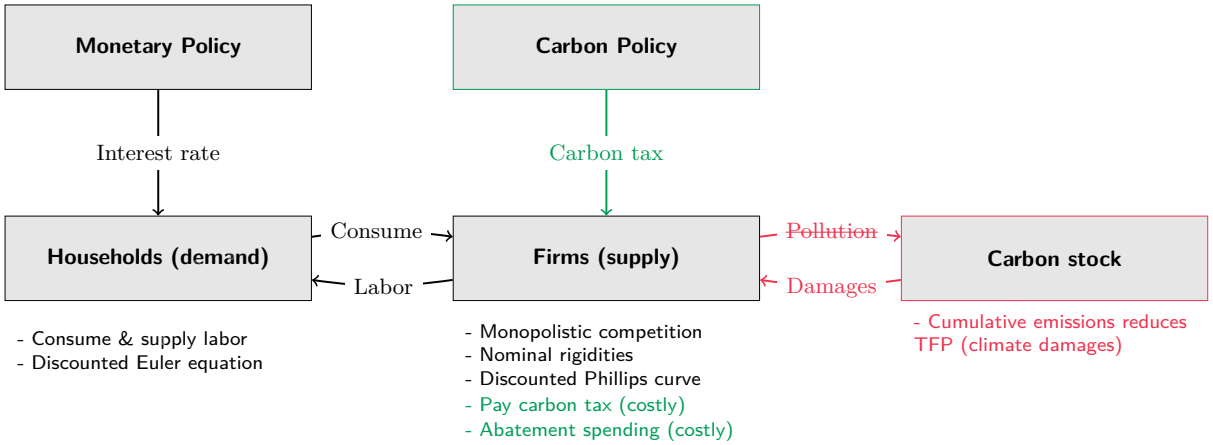
Outline

Plan

Main ingredients



Main ingredients



Plan

Estimation

- Estimation on world data from 1985Q1 to 2023Q3 (sources: World Bank, OECD and OurWorldInData).
- There are four observable variables:

$$\begin{bmatrix} \text{Real output growth rate} \\ \text{Inflation rate} \\ \text{Short-term interest rate} \\ \text{CO}_2 \text{ emissions growth rate} \end{bmatrix} = 100 \times \begin{bmatrix} \Delta \log (y_t) \\ \pi_t - 1 \\ r_t - 1 \\ \Delta \log (e_t) \end{bmatrix}$$

- Solution & filtering methods from Fair and Taylor (1983): fully nonlinear, MIT shocks and no aggregate uncertainty.

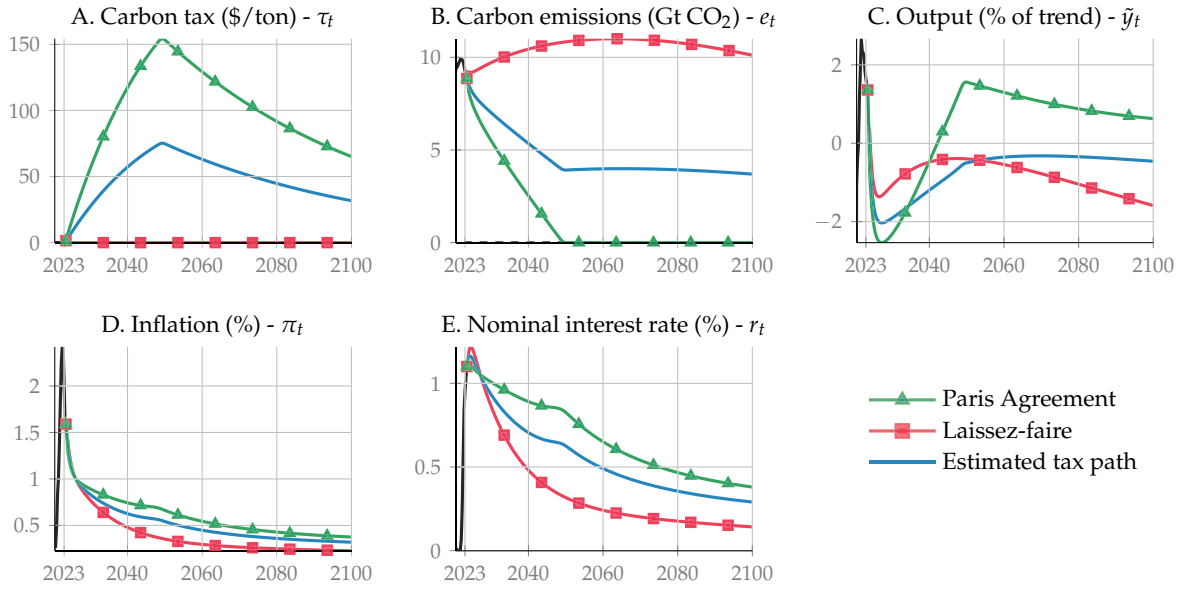
Plan

The Anatomy of Green/Climateflation

- What is the future macroeconomic landscape by the end of the century?
- We consider three alternative scenarios based on the realization of the carbon tax $\varphi\tilde{\tau}_t^*$:
  - Paris-Agreement with $\varphi = 1$
  - Estimated carbon path with $\varphi = 0.53$
  - Laissez-faire with $\varphi = 0$

Three Transitions

Figure 1: Model-implied projections based on alternative control rates of emissions



Dissecting the PC curve

- Stabilization objective of a central bank: important to understand how climate affects inflation.
- One can split the marginal cost into three term:

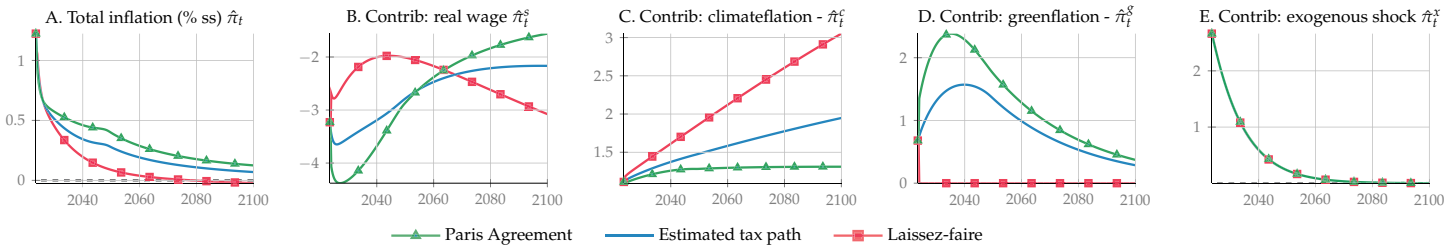
$$mc_t = \underbrace{\tilde{w}_t}_{\text{real wage}} \Big/ \underbrace{\Phi\left(m_t\right)}_{\text{climateflation}} + \underbrace{\theta_{1,t}\mu_t^{\theta_2} + \tau_{e,t}\sigma_t\left(1-\mu_t\right)\varepsilon_{e,t}}_{\text{greenflation}}, \tag{1}$$

which allows to break down inflation into 4 different forces:

$$\hat{\pi}_t \simeq \underbrace{\hat{\pi}_t^s}_{\text{wage term}} + \underbrace{\hat{\pi}_t^c}_{\text{climateflation}} + \underbrace{\hat{\pi}_t^g}_{\text{greenflation}} + \underbrace{\hat{\pi}_t^x}_{\text{exogenous shocks}} \tag{2}$$

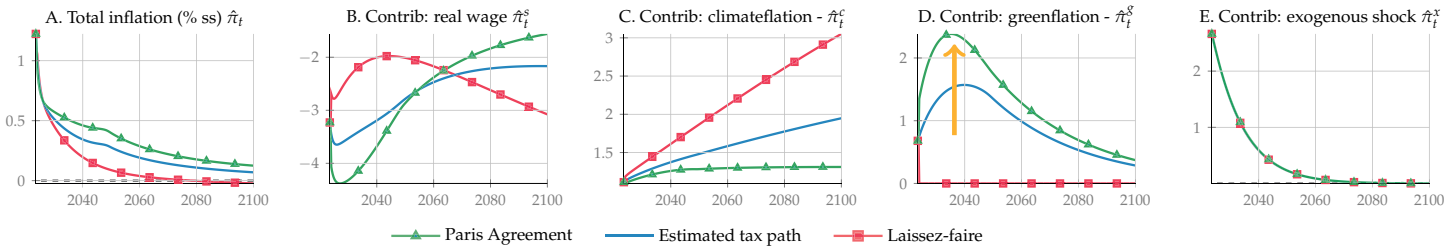
with $\hat{\pi}_t = \pi_t - \pi_t^\star$

Dissecting the PC curve



- Under Paris Agreement:
  - The immediate increase in carbon tax fuels inflation
  - General equilibrium effect: increasing abatement expenditures reduces both consumption and in turn the wealth effect on the labor supply
  - Net zero stabilizes damages, and hence climateflation

Dissecting the PC curve



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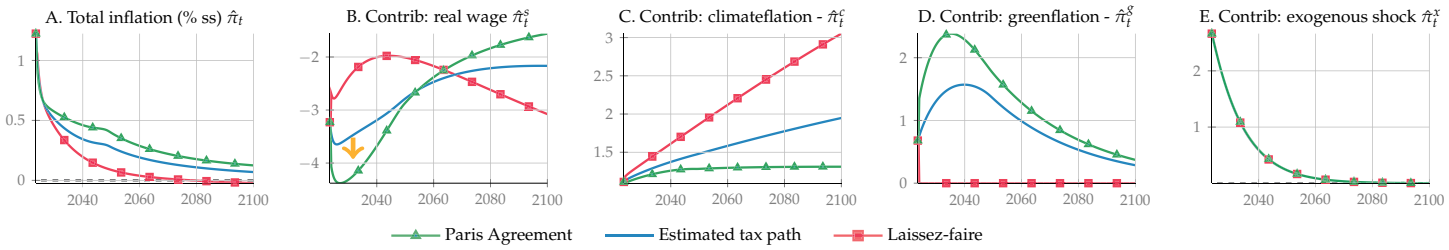

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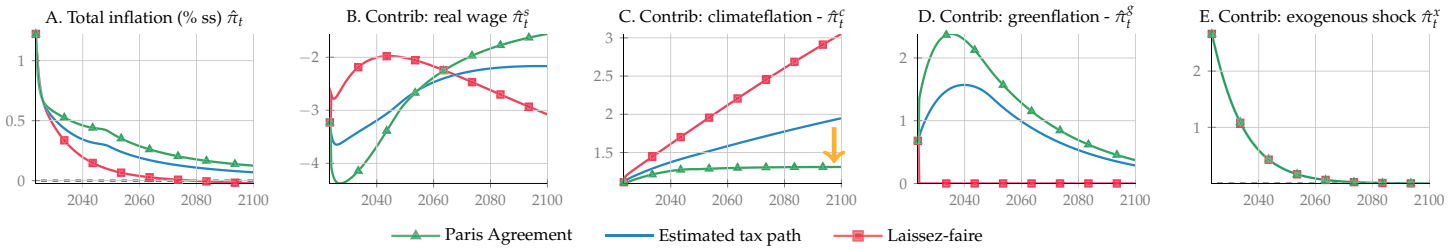

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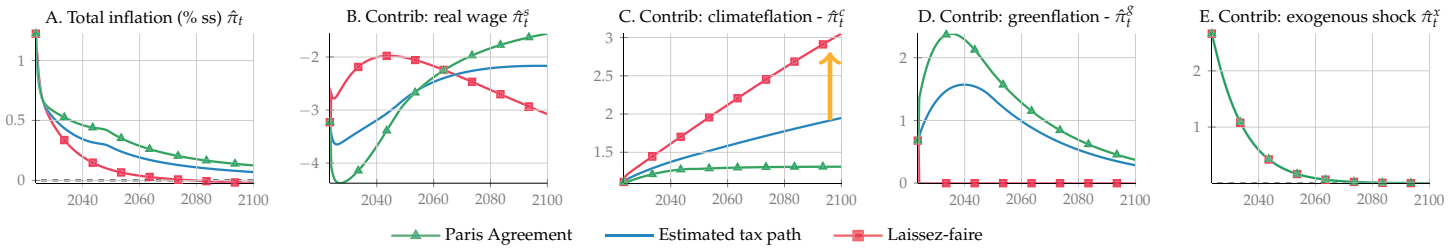
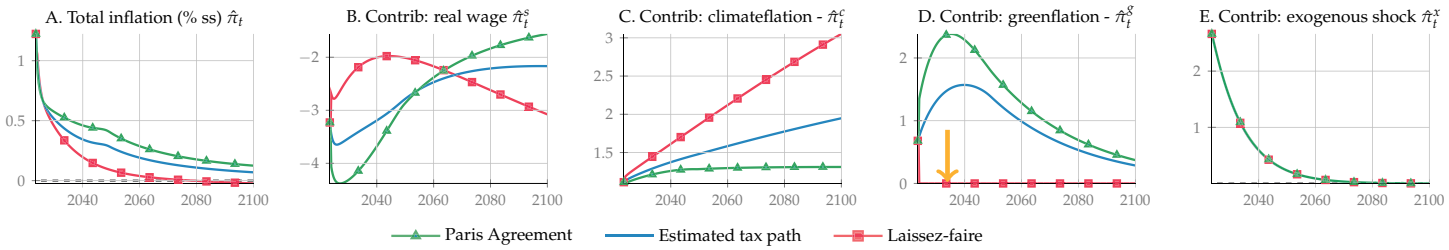
  - Net zero stabilizes damages, and hence and climateflation

Dissecting the PC curve



- Under Laissez-faire:
  - The rising damage makes resources scarcer: ever growing inflation as long as planet warms
  - Disengagement from carbon policy makes carbon price to be zero
  - General equilibrium effect: real wages fall as climate decreases productivity

Dissecting the PC curve



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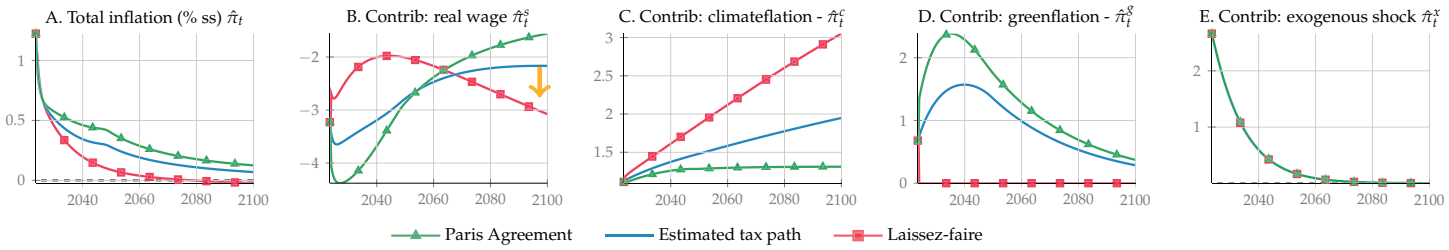

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  - Disengagement from carbon policy makes carbon price to be zero
  - General equilibrium effect: real wages fall as climate decreases productivity

What drives greenflation?

Positive greenflation robust to alternative assumptions:

- Does capital in production increase inflation?
  - **Yes!** By dampening the cooling effects from real wage cuts.
- Do social transferts matter for greenflation?
  - **Yes!** Progressive redistribution softens the consumption decline, mitigating the recession.
- Do sticky wages increase inflation?
  - **Yes!** By reducing the decreases in real wages.
- Does implementing the optimal transition increase inflation?
  - **Yes** (in the short term)! SCC increases faster initially, boosting greenflation.

Plan

Conclusion

- With conservative assumptions, climateflation and greenflation are quantitatively important
- The manner about they translate into effective inflation depends on real wages

Additional results in the paper:

- Policy rule bias: structural change of r^* matters: could inefficiently increase inflation by 1.5 percent
- Short pain from green transition (greenflation), for long term gains of avoiding climateflation

Thank you for your attention

Barrage, L. and Nordhaus, W. D. (2023). Policies, projections, and the social cost of carbon: Results from the dice-2023 model. Technical report, National Bureau of Economic Research.

Fair, R. and Taylor, J. (1983). Solution and maximum likelihood estimation of dynamic nonlinear rational expectations models. Econometrica, 51:1169–1185.

Schnabel, I. (2022). A new age of energy inflation: climateflation, fossilflation and greenflation. In Remarks at a panel on "Monetary Policy and Climate Change" at The ECB and its Watchers XXII Conference, Frankfurt am Main, volume 17.

Woodford, M. (2003). Interest and prices.

The New Keynesian Climate model 17 / 17

Promoting Investment in GX (Green Transformation)

Initiatives of the Japanese Government

17 April 2025

Director

GX Acceleration Agency, Japan

Hideki TAKADA

takada-hideki@gxa.go.jp (https://www.gxa.go.jp)

This presentation is personal views of the presenter and does not reflect official views of the Japanese government or the GX Acceleration Agency.

About the speaker

Hideki TAKADA

2024.7-	**Director, GX Acceleration Agency**
2022-2024	**Director for Strategy Development, Financial Services Agency**
2015-2018	**Senior Policy Analyst, Green Finance and Investment, OECD**
2003-2006	**HM Treasury (the UK finance ministry)**
1995-	**Ministry of Finance**

Japan's Policy for GX (Green Transformation)

- "GX" aims to achieve both:
  - Decarbonisation by 2050 and
  - Industrial competitiveness and economic growth
- Realise JPY150tn (≒USD1tn) of public and private investment over the next 10 years
- Upfront government investment of JPY20tn raised by issuance of the world's first sovereign transition bond: "Japan Climate Transition Bond" starting from Feb 2024

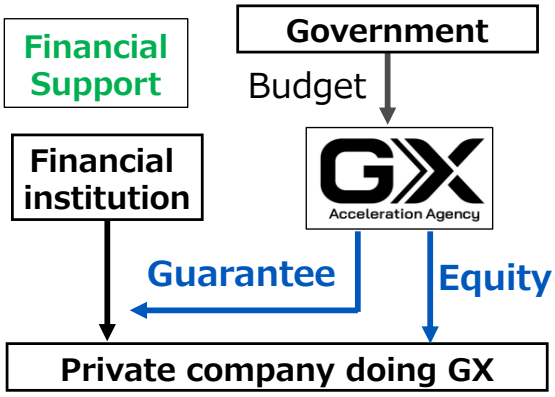
⇒1st issuance received 2 SPOs + CBI Certification

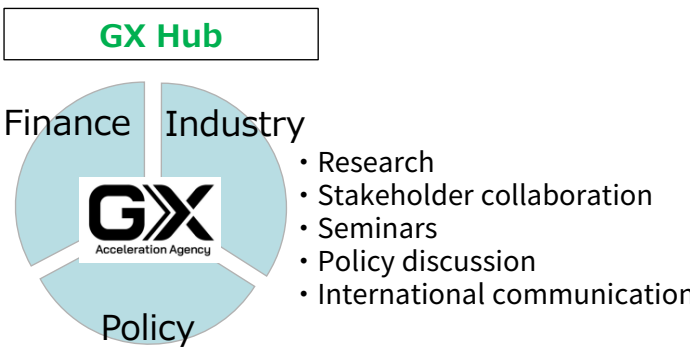
- Mobilise sustainable and transition finance in innovative ways

GX (Green Transformation) Acceleration Agency

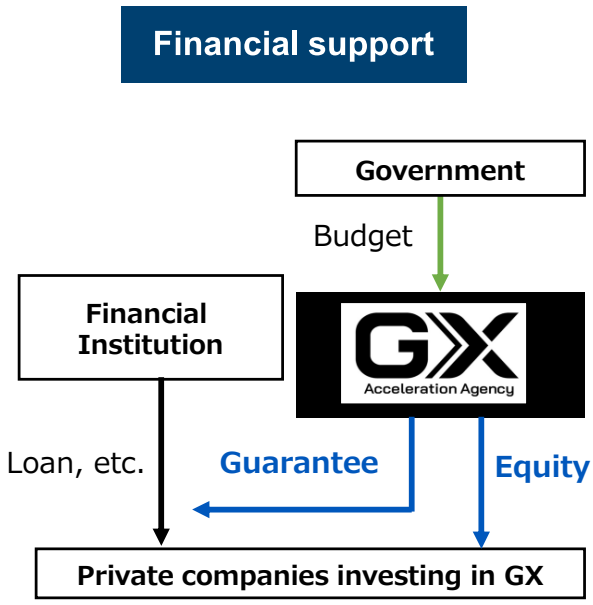
- **GX Acceleration Agency** has been launched by the Japanese Government from July 2024
- The Agency aims to realize **GX investment of JPY150 trillion** in the next 10 years in order to achieve **carbon neutrality by 2050** and, at the same time, enhance **industrial competitiveness** and **economic growth**. For this purpose, **the Agency will:**
  - Accelerate private sector investments through provision of **financial supports** such as credit guarantees and equity investments
  - Administer the **Emission Trading System and carbon pricing** introduced from FY2026
  - Act as the "**GX Hub**" to promote research, stakeholder collaboration, policy discussions and international communications on GX and sustainability

⇒ "**GX Future Academy**" initiative





Financial support by the GXA



- The Govt provides the GXA with JPY150bn (≒USD1bn) of the **guarantee fund**.
- The GXA, leveraging the guarantee fund, can provide up to JPY1.5tn (≒USD10bn) of **credit guarantees** to private sector projects
- In addition, the Govt provides the GXA with JPY40bn (≒USD0.27bn) as the budget for **equity investments** into private sector companies

※Figures are based on the FY2025 budget

4

Acting as the “GX Hub”

Active communication of GX policies

- Since the inauguration of the GX Acceleration Agency, its members are actively communicating Japan’s GX policies and the role of the GXA in various events including in regions and overseas.

Kitakyushu GX Day

Global GX/Finance Conference Sapporo

OECD Forum on Green Finance and Investment

5

Acting as the “GX Hub”

Collaborating with global stakeholders

- GXA established the “Global Advisory Council” to build networks with globally renowned experts and enhance international communications.

Members of the Global Advisory Council

Amit Bouri
Chief Executive Officer and Co-Founder
GIIN

Nicholas Pfaff
Deputy CEO, Head of Sustainable Finance
ICMA

Robert Youngman
Team Leader, Green Finance and Investment
OECD

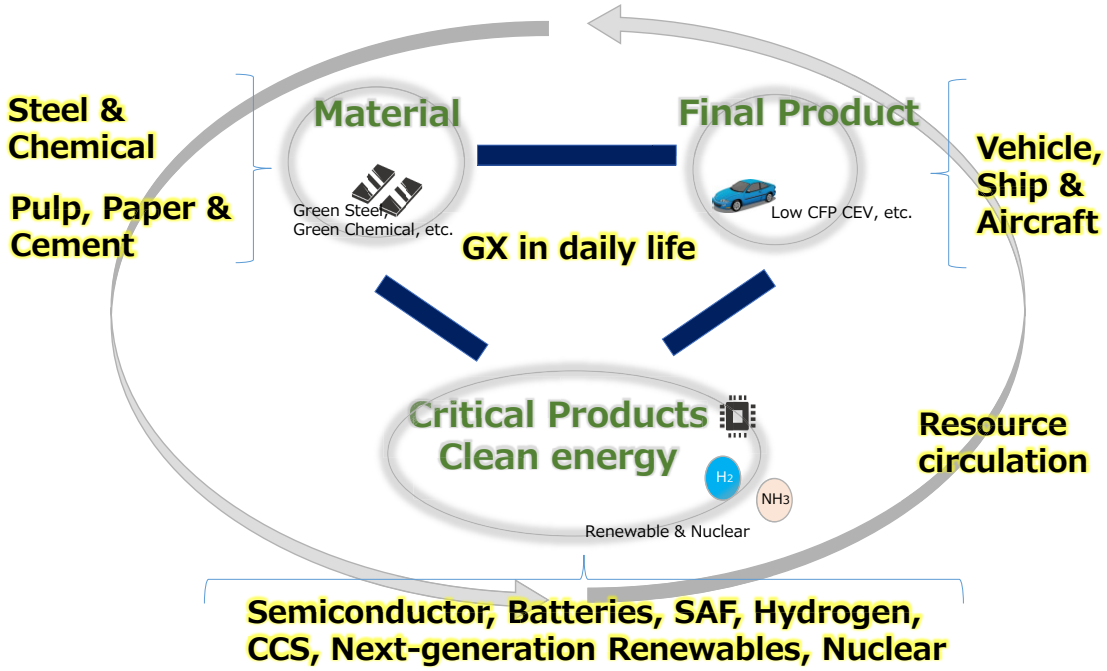
Sean Kidney
CEO
Climate Bonds Initiative

Sherry Madera
CEO
CDP

6

Sector-specific Investment Strategy

➢ The Sector-specific Investment Strategy (Dec 2023, revised Dec 2024) defines 16 priority areas for investment



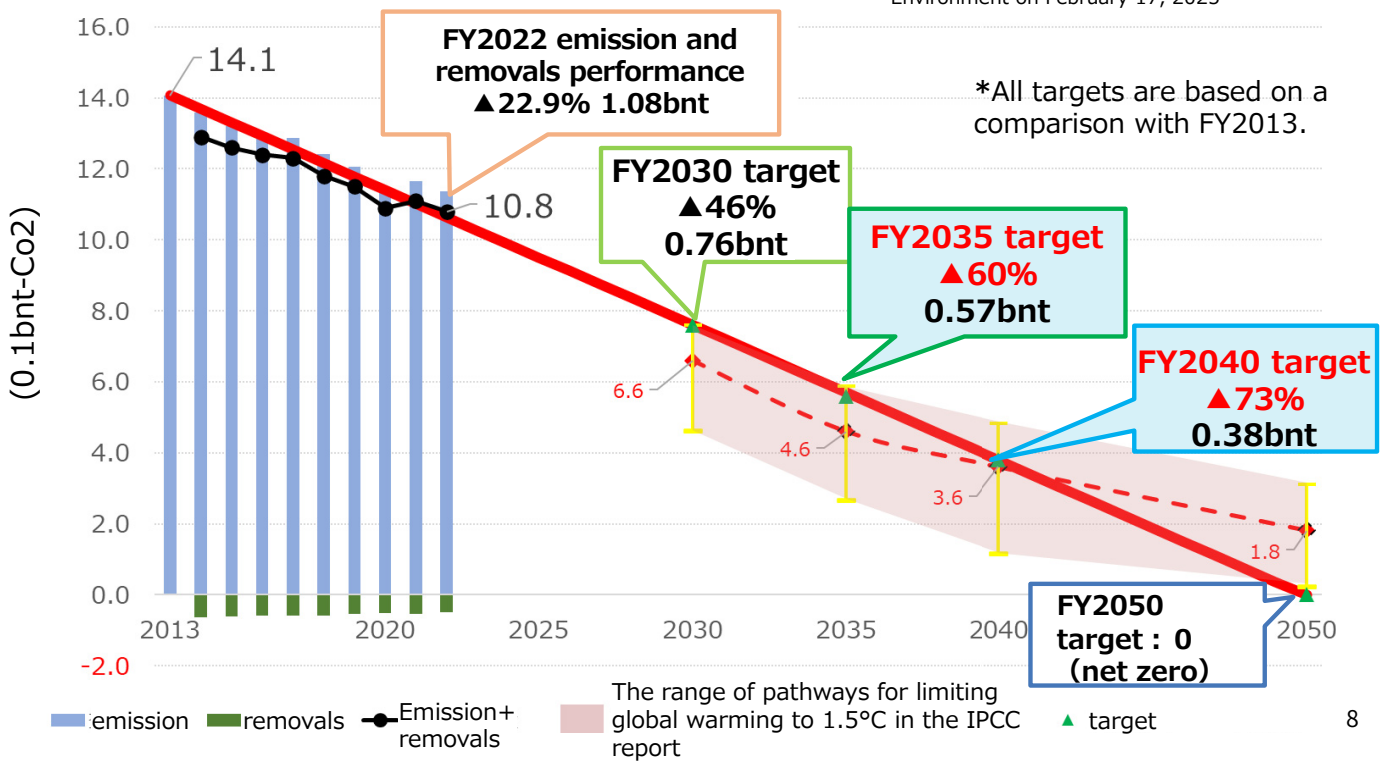
7

New policies launched

➢ The Plan for Global Warming Countermeasures

Revision of Japan's NDC

*Source: Press release issued by the Ministry of the Environment on February 17, 2025



8

New policies launched

➢ The 7th Strategic Energy Plan

Current and projected energy mix (electricity source)

	FY2023	2030 (Outlook, 6th SEP)	2040 (Outlook, 7th SEP)*
Renewable	**22.9%**	**36-38%**	**40-50%**
Solar	9.8%	14-16%	22-29%
Wind	1.1%	5%	4-8%
Water	7.6%	11%	8-10%
Geothermal	0.3%	1%	1-2%
Biomass	4.1%	5%	5-6%
Nuclear	**8.5%**	**20-22%**	**20%**
Fire	**68.6%**	**41%**	**30-40%**

*approximate figures

*Source: Presentation author, based on publications by the Agency for Natural Resources and Energy

9

New policies launched

➢ GX 2040 Vision

◆The **GX 2040 Vision** aims to provide long-term policy directions considering uncertain factors such as geopolitical tension, economic security and rising demand for electricity

◆The government will implement policies in line with the **GX 2040 Vision** to achieve energy security, economic growth and decarbonisation simultaneously

◆Key contents of the **GX 2040 Vision** includes:
- ✓GX industrial structure (including creation of GX markets)
- ✓GX industrial location
- ✓Importance of realistic transition and contribution to global decarbonisation

10

"Pro-Growth" Carbon Pricing Mechanisms

- Staged introduction of carbon pricing mechanisms
  - ➢FY2026: a statutory Emission Trading System
  - ➢FY2028: carbon levy on fossil fuel importers
  - ➢FY2033: allowance auctioning for power generation companies
- The ETS will cover corporates directly emitting 100,000 tons or more of CO2 per year
- An emission trading market will be administered by the GX Acceleration Agency
- The carbon price will be managed within a certain range which is expected to gradually increase
- Money raised by the carbon levy and allowance auctioning will be used for repaying the Climate Transition Bond

11

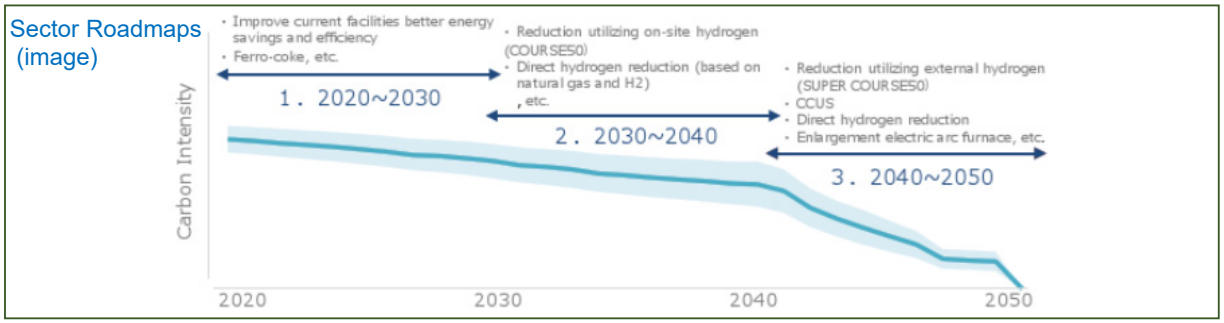
Transition finance: basic concept

- "Green finance" applies to low-carbon projects / technologies.
- However, industries that are currently high-emitting must also be decarbnised in order to achieve a decarbonised society.
- It is essential to provide finance for such industries to support their "transition" and achieve decarbonisation of an entire economy / society.
- The Japanese Government published guidelines on transition finance in May 2021 which require an **entity-wide transition strategy**. **Sector roadmaps** are prepared for hard-to-abate sectors such as steel, chemical etc..

⇒ **sector- and entity-based approach (vis-à-vis project approach)**

⇒ **transition finance is a dynamic (forward-looking) concept (vis-à-vis static concept)**

Sector Roadmaps (image)



12

Promoting sustainable investment by asset owners

▶ Speech by PM Kishida at "PRI in Person" (3 Oct 2023)

Addressing social challenges through investment would… provide long-term financial opportunities to both investors and the beneficiaries who entrust their funds to the investors. This approach of responsible investment… would precisely embody elements of what is generally called "fiduciary duty."

▶ Grand Design and Action Plan for a New Form of Capitalism 2024 (21 June 2024, Cabinet Decision)

The consideration of non-financial factors, including impact…when making investments, from the viewpoint of improving medium- to long-term investment returns, does not constitute "consideration of irrelevant matters"…

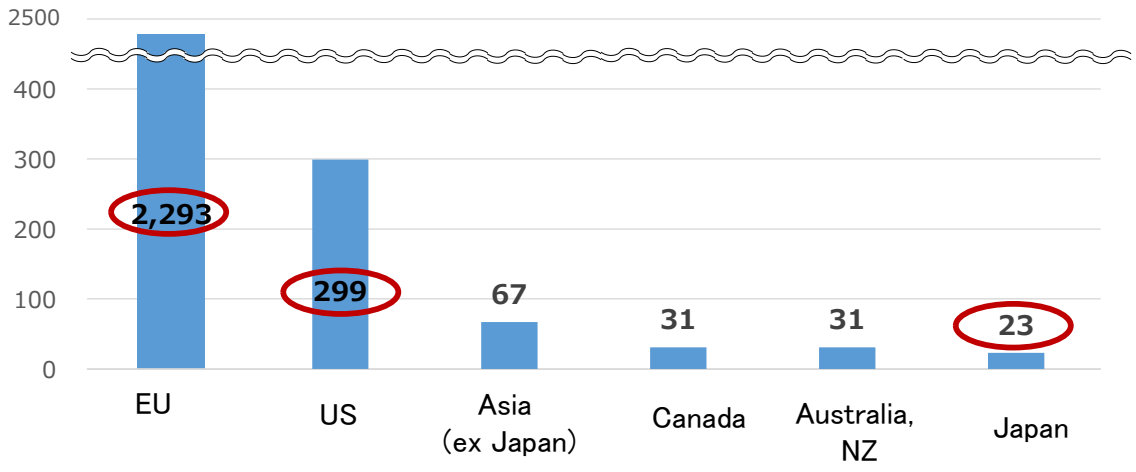
▶ Asset Owner Principles (28 Aug 2024, Cabinet Secretariat)

Asset owners should give consideration to the sustainable growth of investee companies by conducting stewardship activities by themselves or through the investment trustee, in order to achieve the investment targets for beneficiaries.

13

Sustainability Investment Funds

Outstanding amounts of sustainable funds
(As of Sept. 2023 Unit : USD billion)



(Source) Morningstar "Global Sustainable Fund Flows: Q3 2023 in Review"

Green Finance Network Japan

http://greenfinance.main.jp/en

- Bringing together Japanese green finance players in both public and private sectors
- Sharing information on green finance activities; organising events and workshops
- Providing a platform for connecting Japanese and international stakeholders

Founders : Takejiro Sueyoshi (Special Adviser, UNEP FI)
Rintaro Tamaki (President, Japan Center for International Finance)
Secretary General : Hideki Takada (Former Senior Policy Analyst, Green Finance and Investment, OECD / Ministry of Finance)

- Started from September 2018
- Over 600 members from 200+ organisations
- Attracting interest of many international stakeholders and media
- Members are coming from diverse bodies including:
  - Government (MOF, FSA, MOE, METI etc.)
  - Financial institutions (private FIs, public FIs, BOJ)
  - Investors, corporates
  - Academics, think-tanks
  - International organisations
  - NGOs, business associations
  - Media

Collaborating with global stakeholders

- **29 May 2019: London-Tokyo Seminar on Green Finance**
  (with British Embassy in Tokyo and Tokyo Metropolitan Government)
- **3 June 2019: Tokyo Dialogue on Sustainable Finance**
  (with Japan Climate Initiative and UNEP FI)
- **20 June 2019: Seminar on Green Bonds and Green Finance Developments**
  (with Climate Bonds Initiative and Citi)
- **10 October 2019: Japan-France Green Finance forum**
  (with French Embassy in Tokyo)
- **10 February 2021: London-Tokyo Seminar on Green Finance**
  (with British Embassy in Tokyo and Tokyo Metropolitan Government)
- **September 2021:** GFNJ received **The Japan Times Sustainable Japan Award**
- **29 October 2021: Webinar on Green Finance**
  (with Hong Kong Economic and Trade Office (Tokyo))
- **2 June 2022: Webinar on Green Finance**
  (with Green Finance Forum-Korea)
- **19 October 2022: Japan-France Green Finance forum**
  (with French Embassy in Tokyo)
- **25 October 2022: London-Tokyo Seminar on Green Finance**
  (with British Embassy in Tokyo and Tokyo Metropolitan Government)
- **21 July 2023: FDSF Global Conference 2023**
  (with Future Design Initiative by Science and Finance)
- **7 March 2024: Japan-France Green Finance forum**
  (with French Embassy in Tokyo)
- **25 November 2024: FDSF Japan Tour in Kitakyushu**
  (with Future Design Initiative by Science and Finance)

GX Acceleration Agency Contact

【Contacts】

- Address: 16th floor, 1-13-2, Yuraku-cho, Chiyoda-ku, TOKYO
- **Mail: gx_acceleration_agency@gxa.go.jp**
- HP: https://www.gxa.go.jp

17 AVRIL 2025

FACTORING THE CLIMATE AND NATURE INTO THE ACTIVITIES OF THE BANQUE DE FRANCE

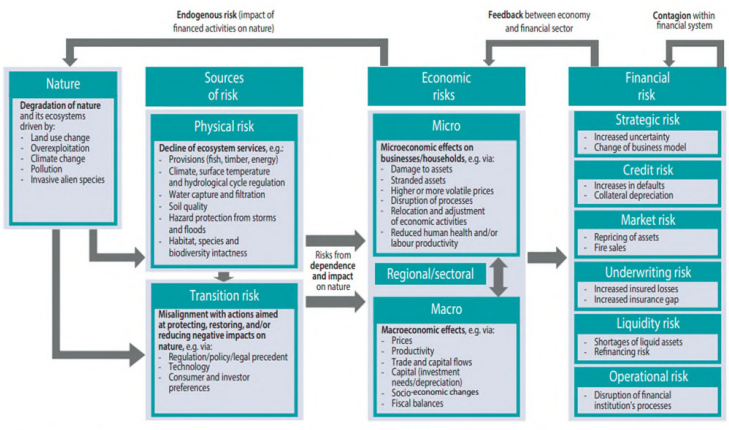
FRANCO-JAPANESE FORUM ON GREEN FINANCE

STÉPHANE LATOUCHE
CHIEF REPRESENTATIVE FOR APAC

BANQUE DE FRANCE
EUROSYSTÈME

WHY SHOULD CENTRAL BANKS CARE ABOUT CLIMATE CHANGE?

- Climate change is not just an environmental issue
- Climate change puts monetary and financial stability at risk
- Climate-related risks - both physical and transition risks - threaten financial stability, growth, and prosperity➔ risks at heart of Central Bank mandate



Sources: Adapted from Svartzman, R. et al. (2021) A "Silent Spring" for the Financial System ? Exploring Biodiversity- Related Financial Risks in France.

Most expensive climate disasters of 2024

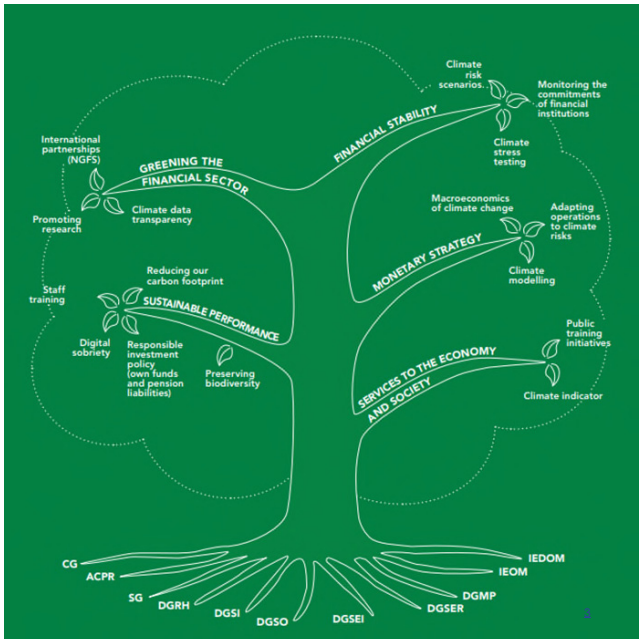
Based on insurance payouts

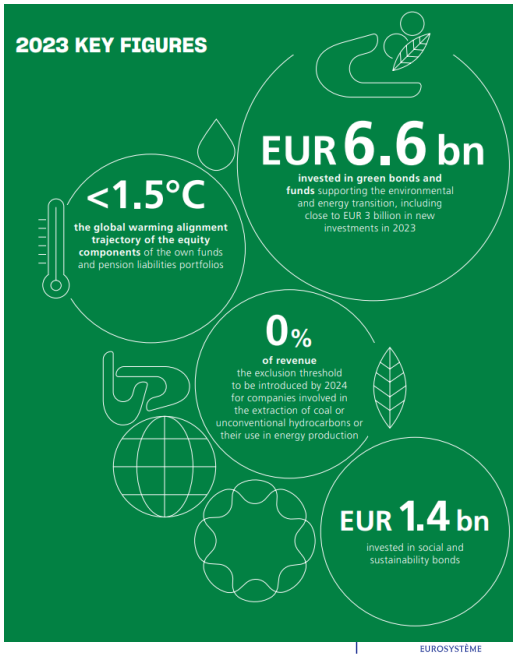
Date	Event	Location	Type	Fatalities	Economic cost
January-December	US storms	US	Storms	88	$60+ bn
9-13 October	Hurricane Milton	US	Tropical cyclone	25	$60 bn
25-28 September	Hurricane Helene	US, Mexico, Cuba	Tropical cyclone	232	$55 bn
9 June-14 July	China floods	China	Floods	315	$15.6 bn
1-9 September	Typhoon Yagi	Southwest Asia	Tropical cyclone	829+	$12.6 bn
1-11 July	Hurricane Beryl	US, Mexico, Caribbean islands	Tropical cyclone	70	$6.7 bn
12-16 September	Storm Boris	Central Europe	Floods	26	$5.2 bn
28 April-3 May	Rio Grande do Sul floods	Brazil	Floods	183	$5 bn
1-7 June	Bavaria floods	Germany	Floods	6	$4.45 bn
29 October	Valencia floods	Spain	Floods	226	$4.22 bn

Table: Martina Igini/Earth.Org • Source: Christian Aid • Get the data • Created with Datawrapper

BANQUE DE FRANCE
EUROSYSTÈME

FACTORING THE CLIMATE AND NATURE INTO THE ACTIVITIES OF THE BANQUE DE FRANCE AND THE ACPR

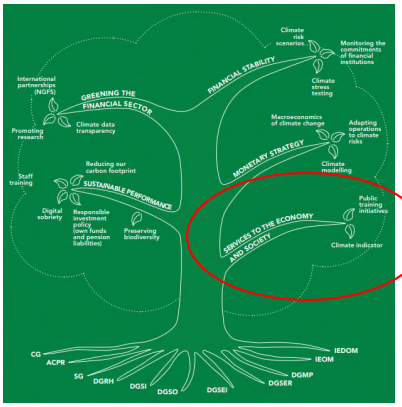




EUROSYSTÈME

PART 1: FACTORING THE CLIMATE AND NATURE INTO THE ACTIVITIES OF THE BANQUE DE FRANCE AND THE ACPR

Services to the economy and society

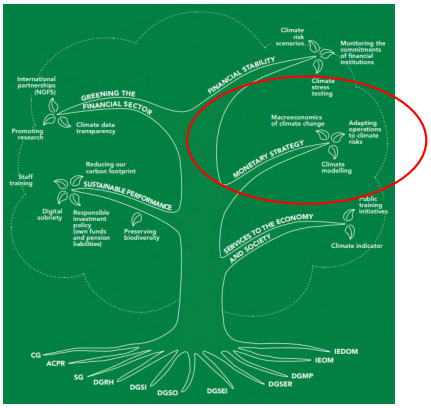


- **GOVERNANCE**
  - Climate strategy defined by the Executive Committee on Climate Change (ECCC)
  - Operational implementation by the Climate Change Centre (CCC) and ECCC networks
- **STRATEGY**
  - Development of a climate indicator for enterprises: Banque de France is allowed to collect sustainability data from companies, and will use CSRD data for companies subject to the Directive.
  - Financial education on climate
- **METRICS AND TARGETS**
  - E.g: 2023: tests extended to a sample of 550 companies in 10 sectors; Target for 2024: Indicator used for approximately 2,000 companies covering three sectors (power generation, property, transport)
  - E.g: Number of climate risk presentations to student groups: 33 in 2023

BANQUE DE FRANCE
EUROSYSTÈME

PART 1: FACTORING THE CLIMATE AND NATURE INTO THE ACTIVITIES OF THE BANQUE DE FRANCE AND THE ACPR

Monetary Strategy



- **GOVERNANCE**
  - Monetary policy-related work is conducted within the framework of the Eurosystem

- **STRATEGY**

  - **Action plan adopted in June 2021,** two pillars :

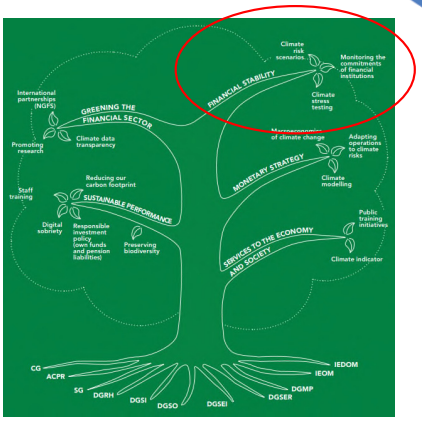
  - **Economic modeling.** Banque de France produces analysis to assess the macroeconomic consequences of climate change and the transition, and has modelled five-year transition scenarios to estimate the potential impact of the transition on inflation and growth.

  - **Inclusion of climate-related risks into Eurosystem monetary policy operations**
    - Climate-related disclosure requirements for eligibility as collateral and asset purchase
    - Collateral framework
    - Corporate Sector Purchase Program (CSPP), “tilting approach” by introducing a climate score by issuer, translated into the operational framework, since October 2022

BANQUE DE FRANCE
EUROSYSTÈME

PART 1: FACTORING THE CLIMATE AND NATURE INTO THE ACTIVITIES OF THE BANQUE DE FRANCE AND THE ACPR

Financial stability



- **GOVERNANCE**
  - The ACPR’s financial stability-related activities are conducted at European level within the Single Supervisory Mechanism (SSM) as regards microprudential supervision of the banking sector and, in France, via its contribution to work by the Haut Conseil de Stabilité Financière (HCSF – High Council for Financial Stability).

- **STRATEGY**
  - **As supervisor, ensure the stability of the financial centre**
    - E.g: pilot climate exercise launched in 2020, bringing together 9 banking groups and 15 insurers, followed by the 2023 climate stress tests focused exclusively on 22 insurers. Contribution to pan-European climate stress-tests.

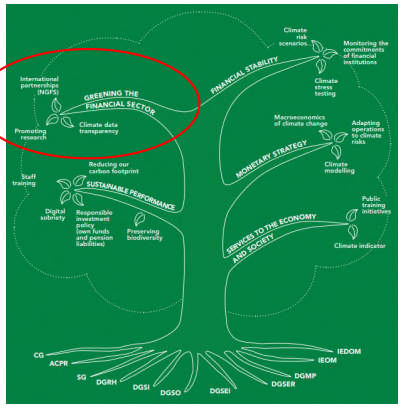
  - **As supervisor, ensure that climate & environmental risks are correctly incorporated**
    - E.g: ACPR’s report on implementation of article 29 of France’s Energy and Climate Act; 2023 thematic review to analyse how C&E risks are incorporated into the strategy, governance and risk management of around sixty institutions under direct supervision

- **METRICS AND TARGETS**
  - E.g: Exposure of French financial institutions to sectors with the greatest exposure to climate transition risks, end-2022: Less than 1% of total assets for the banking sector 2.2% for the insurance sector

BANQUE DE FRANCE
EUROSYSTÈME

PART 1: FACTORING THE CLIMATE AND NATURE INTO THE ACTIVITIES OF THE BANQUE DE FRANCE AND THE ACPR

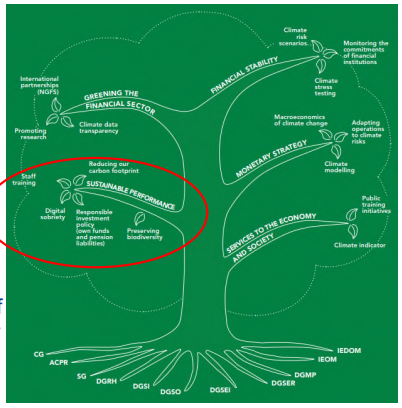
Greening the financial sector



- **GOVERNANCE**
  - Climate strategy defined by the Executive Committee on Climate Change (ECCC)
  - Operational implementation by the Climate Change Centre (CCC) and ECCC networks
- **STRATEGY**
  - **Climate and nature embedded in our corporate strategy**
    - E.g. Promote international cooperation between central banks and supervisors, notably through the NGFS secretariat; Build a climate dimension into macroeconomic models and scenario analyses; Better assess the financial impact of nature risk
  - **NGFS, BDF holds permanent secretariat**
    - E.g: NGFS Taskforce on Nature, published a report outlining recommendations for developing nature-related economic and financial risk assessment scenarios
  - **Research**
    - E.g: Over 50 research projects conducted internally on climate-related topics and, more recently, on macroeconomic and financial nature-related risks.
  - **Work at European and international level to build an extra-financial reporting framework**
- **METRICS AND TARGETS**
  - 21% of annual research publications in 2023 focus on climate and the environment

PART 1: FACTORING THE CLIMATE AND NATURE INTO THE ACTIVITIES OF THE BANQUE DE FRANCE AND THE ACPR

Sustainable performance (1/2)



- **GOVERNANCE**
  - Climate strategy defined by the Executive Committee on Climate Change (ECCC)
  - Operational implementation by the Climate Change Centre (CCC) and ECCC networks

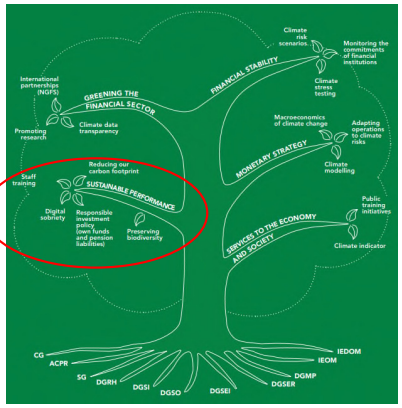
  + Dedicated CSR & responsible investment governance arrangements
- **STRATEGY**
  - **Climate and nature embedded in our corporate strategy, e.g.:**
    - **Reducing our carbon footprint:** actively commit the Banque de France to a pathway to carbon neutrality by 2030, by setting intermediate goals (procurement policy, travel policy, real estate footprint …)
    - **Preserving biodiversity**: structure our approach, by preparing a detailed inventory of our biodiversity-related challenges and carrying out an assessment of our biodiversity footprint as an organization
    - **Digital sobriety:** raise awareness, measure and optimize the environmental footprint of our information system, support the eco-design of applications and the information system, contribute to creating a responsible digital ecosystem
    - **Staff training** on climate, biodiversity and the Bank's environmental footprint
    - **Responsible investment policy** (see Section 2)
- **METRICS AND TARGETS**
  - 80.8% of BdF staff trained on the impact of climate risks on financial stability by 2023
  - 2023, 1st certification of climate metrics by external auditors ; 1st UNPRI reporting
  - Assessment of the BdF's corporate biodiversity footprint

Sustainable performance (2/2)

- **METRICS AND TARGETS**
  - **Carbon footprint**

	2019	2023	Variation 2023/2019	Target
Total greenhouse gas (GHG) emissions within operational scope (energy, fugitive emissions, commuting, business travel, waste)[a]	42,271[b]	31,454	-25.6%	Reduction of GHG emissions by -15% in 2024 relative to 2019
Scope 1 (direct emissions of GHG)[a]	14,311[b]	10,025	-29.9%	
Scope 2 (indirect emissions linked to energy)[a]	6,541	5,007	-23.4%	
Scope 3 (other indirect emissions of GHG – excluding financial investments)[a]	21,419[b]	16,422	-23.3%	

a) GHG emissions, in tonnes of carbon equivalent (tCO_2-eq), calculated using the regulatory BEGES methodology.
b) 2019 emissions incorporating changes in activity data, consistent with 2023 data.



BANQUE DE FRANCE EUROSYSTÈME

OVERVIEW OF THE BANQUE DE FRANCE'S RESPONSIBLE INVESTMENT STRATEGY

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BANQUE DE FRANCE: LEADING BY EXAMPLE
A RESPONSIBLE INVESTOR

TARGET	MILESTONES
PILLAR 1 → Align investments with France's climate commitments	
Objective No. 1	
Align the equity component with a 1.5°C trajectory. Horizon set at end-2023 for the own funds portfolio and European equities in the pension liabilities portfolio, and end-2025 for all equity in the pension liabilities portfolio	• <1.5°C alignment for the equity component of the own funds portfolio and European equities in the pension liabilities portfolio at end-2023 • <1.5°C alignment for the entire equity component of the pension liabilities portfolio at end-2023, two years ahead of target
Objective No. 2	
Exclude issuers whose involvement in fossil fuels is higher than the thresholds set by the Paris-Aligned Benchmark	• Since 2021, issuers deriving over 2% of revenue from thermal coal or 10% from unconventional hydrocarbons have been excluded • At end-2024, the coal and unconventional hydrocarbon threshold will be lowered to 0%, thresholds will be applied for oil (>10% of revenue) and gas (>50% of revenue) and firms developing new extraction projects will be excluded
Objective No. 3	
Contribute to financing the energy and ecological transition (EET) and to preserving biodiversity by investing in thematic funds and green bonds	At 31 December 2023 • EUR 6 billion invested in green bonds • EUR 614 million invested in EET thematic funds • Investment in a fund devoted to preserving marine biodiversity

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Source: Banque de France

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PILLAR 2 → Include environmental, social and governance (ESG) criteria in asset management	
Objective No. 4	
Exclude 30% of the corporate investment universe based on ESG criteria, in compliance with the requirements of Pillar III of France's Socially Responsible Investment (SRI) label	• 20% of equity issuers excluded on the basis of ESG criteria since end-2019 • 30% of corporate issuers will be excluded from 2024 in order to align with the SRI label reform published at end-2023
Objective No. 5	
Contribute to financing social challenges by investing in impact funds and social and sustainable bonds	• EUR 1.4 billion invested in social and sustainable bonds at end-2023 • Investment in a fund supporting affordable housing and a fund backing the social and solidarity sector in 2023
PILLAR 3 → Exercise voting rights and engage with issuers	
Objective No. 6	
Apply a regularly updated voting policy that includes extra-financial provisions	• Voting policy adopted in 2019 • Adjustments made to reflect new fossil fuel exclusions and limit excessive executive pay from 2023 (provisions in force since 2023)
Objective No. 7	
Maintain a general meeting attendance rate of at least 80%	• Attendance rate of 94% in 2023

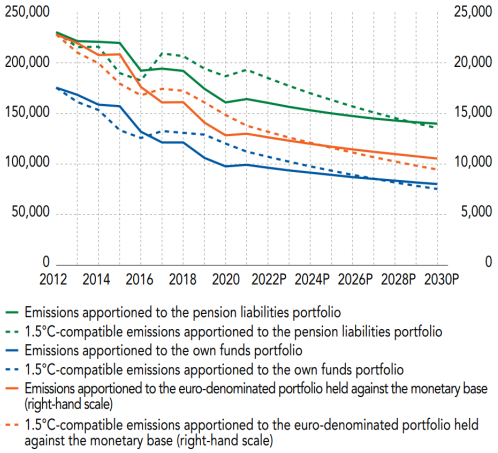
BANQUE DE FRANCE
EUROSYSTÈME

Source: Banque de France

RESPONSIBLE INVESTMENT STRATEGY

C1 1.5°C alignment of portfolio equity components

(carbon emissions in tCO_2-eq)



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Source: Banque de France

2023 SUSTAINABILITY REPORT

The sustainability report was born in a context of evolving international and european sustainability disclosure frameworks

International context:
- October 2023: TCFD Recommendations integrated into ISSB standards
- NGFS Guide on disclosure – 2024 update Enhancement of international disclosure framework (CSRD, TNFD…)

Banque de France and ACPR decided to merge the Climate Action report with the Responsible Investment report, into a new report called « 2023 Sustainability report »

- **Publication in June 2024 of BdF and ACPR's sustainability report**
  - Synthetic approach
  - Covering all BdF and ACPR missions
  - Focus on climate **+ nature**
  - **Section 1 « TCFD » and Section 2 « SRI »**

- Governance:
  - Coordination by the CCC*
  - Contributors from across the Bank
  - In a horizontal network **+ Steering committee**
  - **Separate validation process for SRI**
  - Reporting to the ECCC**

** Climate Change Center*
*** Executive Committee on Climate Change*

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BANQUE DE FRANCE: LEADING BY EXAMPLE
A RESPONSIBLE INVESTOR

Green Central Banking Scorecard

2024 Results

Rank	Country	Research and Advocacy (out of 10)	Monetary Policy (out of 50)	Financial Policy (out of 50)	Leading by Example (out of 20)	Total Score 2024 (out of 130)	Grade 2024 (A+ to F)
1 (1)	France	10	23	47	16	96	B+
2 (3)	Germany	10	28	45	10	93	B+
3 (2)	Italy	10	23	48	10	91	B+
4 (4)	European Union	10	23	44	10	87	B
5 (6=)	Brazil	10	18	33	10	71	B-
6 (6=)	China	5	22	31	3	61	C+
7 (5)	United Kingdom	10	11	24	8	53	C
8 (8)	Japan	6	16	10	10	42	C-
9 (9)	Indonesia	5	14	15	4	38	D+
10 (12)	India	5	5	13	7	30	D+

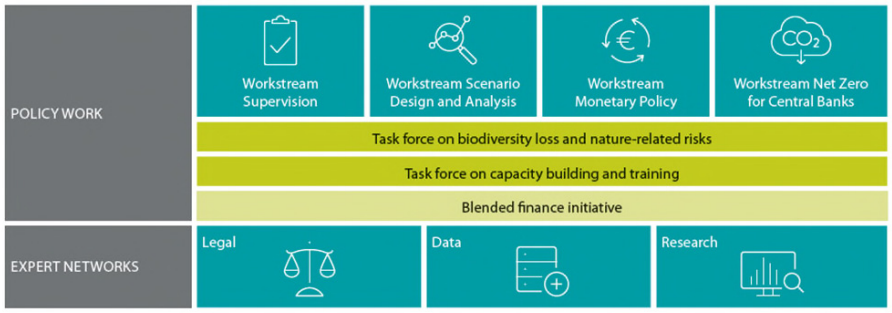
Source: Green Central Banking

THANK YOU FOR YOUR ATTENTION

BANQUE DE FRANCE PROVIDES THE NGFS SECRETARIAT

- The **Network for Greening the Financial System (NGFS)**, launched at the Paris One Planet Summit in 2017, is a is a network of 138 central banks and financial supervisors from all continents that aims to accelerate the scaling up of green finance and develop recommendations for central banks' role for climate change
- Its **secretariat is hosted by the Banque de France**

NGFS organization



Source: NGFS

The Network for Greening the Financial System (NGFS) framework : governance, assessment, work program

FRANCO-JAPANESE FORUM ON GREEN FINANCE – 17 April 2025

Yann MARIN (NGFS Secretary General, Banque de France)

Structure

1. Purpose and structure of the NGFS
2. Focus on the NGFS work on Supervision
3. Latest publications and next steps

1. Purpose and structure of the NGFS

About the NGFS

- **144 members (central banks and supervisors) and 21 observers**, over 5 continents
- **A "coalition of the willing":** the Members define and promote best practices to be implemented within and outside of the Membership, to develop environment/climate-risk management in the financial sector
- NGFS Members' jurisdictions cover the supervision of the majority of the global systemically important banks and internationally active insurance groups

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Our purpose

- The NGFS is **chaired by Sabine Mauderer** (Deutsche Bundesbank), and **co-chaired with Fundi Tshazibana** (South Africa Reserve Bank)
- **Our mission is to**:
  - enhance the ability of the financial system to **manage environment and climate risks**
  - and **mobilize mainstream finance to support the transition** toward a sustainable economy
- To this end, the NGFS Members **exchange experiences, share best practices, and conduct or commission analytical work on green finance**

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An answer to climate urgency

- Climate change is source of **structural changes** in the economy/financial system, with a number of specificities:
  - Far-reaching impact in breadth and magnitude;
  - Foreseeable nature;
  - Irreversibility;
  - Dependency on short-term actions for medium/long term impacts;
  - Non linearity and tipping points.
- The prime responsibility for ensuring the success of the Paris Agreement rests with governments. But **climate-related risks are a source of major financial risk** (in particular physical risks and transition risks) and it is therefore within the mandates of central banks and supervisors to ensure the financial system is resilient to these risks.
- Since its start in December 2017, the NGFS has worked to **improve the resilience of the financial system to climate-related and environmental risks**, and to foster the scaling up of the financing flows needed to **support the transition towards a sustainable economy**.

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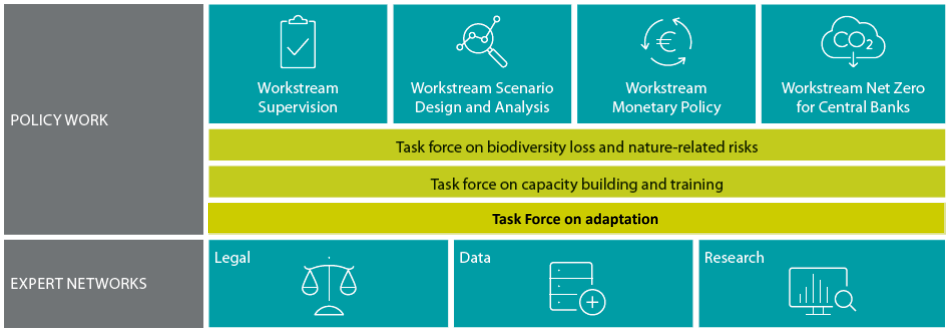
Structure of the NGFS



***The Secretariat of the NGFS is hosted at Banque de France**

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Some (recent) highlights

- The NGFS works on **practical guides** to better equip the community of central banks and supervisors by taking stock of existing practices and fostering knowledge sharing and dissemination of best practices. Recent highlights include :
  - **Climate change and Monetary Policy package** (August – October 2024);
  - **The Transition Plan package** (April 2024);
  - **Conceptual Note on Adaptation** (November 2024);
  - **Nature-related Financial Risks: a Conceptual Framework to guide Action by Central Banks and Supervisors** (September 2023 / July 2024);
  - **Conceptual note on short term climate scenarios** (October 2023).
- The NGFS has developed the **NGFS Climate Scenarios** (1st vintage: June 2020; 5th vintage: November 2024).
- Overall, the NGFS has consistently produced "public goods" to facilitate the climate action of its members and beyond.

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NGFS works aim to support the transition to a sustainable economy

- Since 2021, the NGFS has focused on **implementing and operationalizing central banks' and supervisors' climate actions to support a transition to a net zero economy. Key breakthroughs include**:
  - Improving the NGFS Scenarios yearly and encouraging climate scenario analysis and climate-stress-testing;
  - Laying the foundations for robust climate change considerations in monetary policy strategy and frameworks;
  - Helping shape the prudential approach to transition planning by financial institutions;
  - Mainstreaming climate across all central banking business lines;
  - Focusing on capacity building to help its Members upskill for climate action.
- One major difference has occurred over the past few years: central banks and supervisors are now **taking a forward-looking approach to the transition** (e.g. transition plans, use of scenarios).
  - The use of climate scenarios and climate stress-testing, in particular, has become widespread both in the public and private sector. Scenarios effectively help financial institutions think through the implications of the transition in the short, medium and long term.
- The work of the NGFS **has fostered actions by its members** : most members have used the best practices shared within the Network to take concrete steps and effective policies in their own jurisdictions. This has led to **financial institutions improving their practices all around the world**.

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2. Focus on the NGFS work on Supervision

Work on Supervision

The Mandate

Objective: Foster progress among NGFS members toward **incorporating climate-related and environmental risks** within their supervisory framework and practices.

1. Analyze the needs and potential ways to oversee **transition plans** and the role of supervisors in addressing transition risk.
2. **Conduct deep-dives into the prudential supervision of climate-related** and environmental financial risks.
3. **Update the mapping of supervisory practices** to integrate climate-related and environmental risks into micro-prudential supervision.

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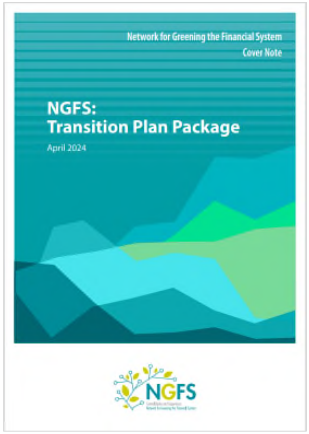
Latest works

Transition plans



Climate litigation risks

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On-going work (2024-2026)

Transition Plans	Governance of climate and environmental risks	Supervision of nature-related risks
• Develop conceptual considerations on the interactions between **scenario analysis** and transition plans • Draft a technical note on **target-setting** and its relevance for supervisors	• **Consolidate and exchange supervisory practices** on the integration of climate and environmental risk into financial institutions' corporate governance and risk management practices	• Exchange **supervisory practices** • Prepare a **compendium** of good supervisory practices • Identify **supervisory principles**

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3. The latest publications and next steps

2023 and 2024 were very productive

Transition plans

Stocktake on Financial Institutions' Transition Plans and their Relevance to Micro-prudential Authorities (May 2023)

Transition Plan Package: three deep-dive analyses : considerations for EMDEs, interlinkages between transition plans of the real economy and financial institutions', credibility of financial institutions' transition plans from a micro-prudential perspective (April 2024)

Climate scenarios

5th **vintage of NGFS scenarios (November 2024)** and conceptual note on short term scenarios (November 2023)

Guidance note on how to best use the NGFS scenarios (January 2024) to explain their purposes, uses cases and to provide guidance on where institutional adaptations and complements are required

Capacity building & training

NGFS Training guide for central banks and supervisors (October 2023)

Net Zero for central banks

Sustainable and Responsible Investment (SRI) package (May 24)

Guide on climate-related disclosure for central banks (June 2024)

Blended finance

NGFS Technical Document on Blended Finance and the demonstrative projects (December 2023)

Adaptation

NGFS **Concept note on adaptation** (November 2024)

Monetary policy

Survey report (July 2023)

Report on central banks' operations "Adapting central bank operations to a hotter world: current progress and insights from practical examples" (2024), which provide an update of a report published already in 2021.

Three reports on the macroeconomic impacts of climate change (2024): acute physical impacts, the green transition and the macroeconomy, and climate macroeconomic modelling handbook.

Nature related risks

Conceptual framework for Nature-related financial risks (September 2023, updated July 2024)

Technical document providing specific recommendations towards the development of **nature-related scenarios** to operationalise a dynamic risk assessment (December 2023)

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Upcoming NGFS work and publications in 2025 and 2026

Supervision

Operational guidance to supervisors on **the role of scenario analysis for transition plans,** on how to integrate ESG risks into the **governance frameworks and** on the way to **integrate nature in supervisory practices**

Climate scenarios

Publishing the first vintage of the **short-term climate scenarios**

Nature related risks

Starting work on **nature related scenarios, and explore further possible case studies for applying the Conceptual framework**

Monetary policy

Building on the series of reports published in 2024, further work in 2025 will aim to facilitate embedding the findings from these reports, and to explore how to bring in climate considerations into monetary policy strategy.

Net Zero for central banks

Collection of know-how on **Greening Central Banks' own Operations** (for NGFS internal use only – expected for December).

Further work should focus on **central banks' own transition plans and climate/nature-related disclosure**

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Next steps

Maintain **capacity to innovate** and **explore** (practices, progress, topics), and continue providing data-driven and evidence-based analysis

Facilitate **implementation** and strengthen Members' ability to take **action**

Better account the **needs and specificities** of Members from **EMDEs, and encourage their greater involvement in NGFS's working groups**

Ensure **impact** of action and **consistency** of approach

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Thank you for your attention

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