전환금융 세미나 2026년 6월

왜 지금 전환금융인가?

전환금융의 등장 배경, 개념과 구조, 글로벌 정책 동향과 시사점

현석

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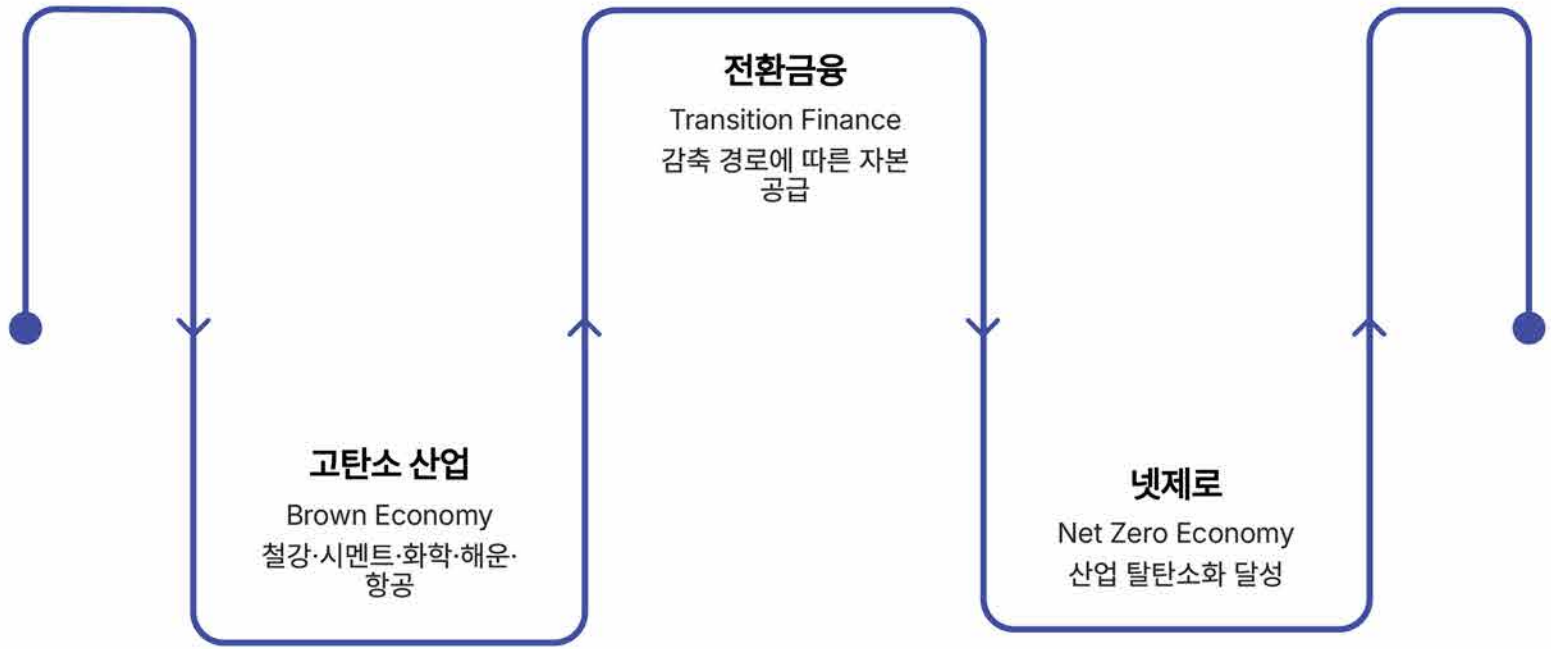
SLIDE 1

왜 지금 전환금융인가

넷제로의 병목은 고탄소 난감축 산업(Hard-to-Abate Sectors)

철강·시멘트·화학 등 중공업과 해운·항공 등 난감축 부문은 글로벌 배출의 상당 부분을 차지하며, 이들 부문의 탈탄소화 없이는 넷제로 달성이 어려움.

현행 녹색금융 체계는 이미 친환경적인 활동만을 지원하며, 고탄소 산업의 전환 경로를 평가하는 메커니즘을 갖추지 못하고 있음.



녹색금융의 한계

- 이미 친환경적인 활동에만 자본 배분
- 고탄소 산업의 전환 경로 평가 기준 부재
- 난감축 부문의 자본 접근 사실상 차단

전환금융의 역할

- 신뢰할 수 있는 감축 경로를 조건으로 자본 공급
- 고탄소 산업의 단계적·과학 기반 탈탄소화 지원
- 넷제로 달성을 위한 필수적 금융 인프라

SLIDE 2

전환금융의 이론적 기반

시장실패에서 생산적 금융으로

전환금융의 등장은 ESG 유행이 아니라, 외부효과로 인한 탈탄소 투자 과소공급이라는 시장실패에 대한 제도적 대응.

동시에 전환금융은 기후 리스크를 회피하는 금융이 아니라, 산업전환 투자를 만들어내는 생산적 금융.

① 시장실패 (Market Failure)

- Pigou(1920): 탄소 외부효과의 사회적 비용 내재화 필요
- 사적 수익률 < 사회적 수익률 → 탈탄소 투자 과소공급
- 탄소가격 부재 또는 불충분 → 전환투자 유인 미흡
- 정보 비대칭 → 전환계획 신뢰성 검증 곤란

② 생산적 금융 (Productive Finance)

- Minsky(1986): 금융은 투자를 창출하는 능동적 행위
- Mazzucato(2013): 공적금융의 임무 지향적(Mission-oriented) 역할
- 전환금융 = 산업전환을 위한 목적 지향적 자본 배분

③ 관민 위험분담 (Risk-Sharing)

- 전환투자의 특성: 장기·고위험·높은 불확실성
- 정책금융의 선도적 위험 인수(First-loss tranche)
- 복합금융: 공공자본으로 민간자본 유인
- GFANZ·개발은행(MDB)의 촉매적 역할

SLIDE 3

전환이 지연되는 이유

기술 부족이 아닌 조정 실패(Coordination Failure)의 문제

수소환원제철을 예로 들면, 철강기업 혼자 투자를 결정해도 작동하지 않음.

Rodrik(2004)의 조정 실패 이론에 따르면, 아래 다섯 가지 조건이 동시에 충족되어야 비로소 전환투자가 경제성을 확보 가능.

① 재생에너지 전력
청정수소 생산을 위한 전력 공급 기반

② 수소 인프라
생산·저장·운송 체계의 동시 구축

③ 탄소가격제
전환투자의 경제성 확보를 위한 가격 신호

④ 기업 설비투자
장기 불확실성 하의 전환 결정

⑤ 정부 위험분담
정책금융·규제·구매수요의 동시 정렬

조정 실패 (Coordination Failure)

- 각 행위자는 다른 행위자가 먼저 움직이길 기다림
- 개별적으로는 합리적이나, 집합적으로는 과소투자
- 시장 혼자서는 동시적 조정을 만들어낼 수 없음

탄소 고착화 (Carbon Lock-in)

- 기존 화석연료 인프라의 경로 의존성
- 매몰비용이 전환 결정을 지연
- Unruh(2000): 기술·제도적 고착화 메커니즘

좌초자산 리스크 (Stranded Assets)

- 탄소집약 자산의 가치 상실 위험
- 전환 지연 → 좌초자산 규모 확대
- NGFS(2023): 무질서한 전환의 금융 리스크

SLIDE 4

전환금융의 개념

분류체계(Taxonomy)에서 경로 기반 평가(Pathway-based)로

기존 녹색금융이 '현재 녹색인가'를 묻는다면, 전환금융은 '신뢰할 수 있는 경로를 따라 저탄소로 이행되고 있는가'를 평가.

이는 정적 적격성 심사에서 동적 경로 평가로의 패러다임 전환을 의미.

분류체계 기반 [Static / Taxonomy-based]

- 평가 기준: 현재의 친환경성
- 방법론: 녹색 vs 비녹색 이분법적 적격성 심사
- 프레임워크: 정적(Static) — 시점 기준 판단
- K-택소노미(2022)는 LNG 발전·블루수소 등 7개 활동을 포함하는 '전환 부문'을 별도 운영하나 특정 기술 기준(Threshold) 충족 여부를 따지는 정적(Static) 방식에 머물러 있음
- 한계: 기업의 전체적인 탈탄소 경로 평가 불가
- 사례: EU Taxonomy, K-택소노미

경로 기반 접근 [Dynamic / Pathway-based]

- 평가 기준: 미래 감축경로의 신뢰성
- 방법론: 과학 기반 목표(SBT) + 투자계획 + 이행성과 모니터링
- 프레임워크: 동적(Dynamic) — 경로·속도·이행 능력 평가
- 특징: 고탄소 산업의 단계적 전환 지원 가능
- 특징: 그린워싱 방지를 위한 외부검증 필수
- 사례: 일본 전환 로드맵, ICMA CTBG(2025)

SLIDE 5

전환금융의 구조: CTB와 SLB

자금용도 기반(Use-of-Proceeds) vs 성과연계 기반(KPI-Linked)

전환금융은 크게 두 가지 구조로 실행.

2025년 ICMA CTBG 발표는 전환금융이 발행 기업의 추상적 전환계획 논의에서 채권 발행 단계의 구체적 검증·공시 체계로 이동하고 있음을 보여줌.

기후전환채권 (CTB) / Climate Transition Bond

Use-of-Proceeds 구조

- 특정 전환 프로젝트에 자금 배분
- 적격 프로젝트: CCUS·수소 설비·연료전환·공정전환
- 자금 용도 추적 의무(Ring-fencing & Tracking)
- 프로젝트 단위 환경성과 검증
- 2025년 ICMA CTBG 발표: 기후전환채권 라벨의 발행 절차와 검증 기준이 독립적으로 정교화
- 장점: 자금 배분 투명성 / 단점: 발행 유연성 제한

지속가능연계채권 (SLB) / Sustainability-Linked Bond

KPI-Linked 구조

- 자금 용도 제한 없음(
- KPI 미달성 시 금리 상승(Step-up Coupon, 통상 25bp)
- 기업 전체 전환 경로 및 전략 평가
- KPI의 과학적 근거 및 외부검증 필수
- 그린워싱 논란: KPI 수준 미흡 시 신뢰성 훼손
- 장점: 발행 유연성 / 단점: KPI 엄격성 확보 어려움

SLIDE 6

신뢰성 있는 전환계획의 조건

선언이 아닌 검증 가능한 이행 능력

ICMA CTBG(2025)는 신뢰성 있는 전환계획의 요건을 네 가지 축으로 제시.

신뢰성 있는 전환계획은 선언적 목표가 아니라, 기업 전략·투자계획·과학 기반 감축목표·거버넌스·공시·외부검증이 결합된 실행 계획.

01

전환전략과 거버넌스

- 이사회·경영진의 책임 명시
- 전환계획의 핵심 사업모델 통합

02

환경적 중요성

- 핵심 사업모델과 감축전략 연계
- Scope 1·2·3 배출량 포괄

03

과학 기반 목표 (SBT)

- 1.5°C 또는 파리협정 정합성
- SBTi 인증 또는 동등 기준

04

이행 투명성

- CapEx·OpEx·KPI 공시
- MRV 체계 + 독립 외부검증(SPO)

SLIDE 7

단일 글로벌 표준은 없다 — 산업구조가 모델을 결정한다

각국은 산업구조·에너지 믹스·금융시장 구조·정치경제적 조건에 따라 서로 다른 전환금융 모델을 발전시키고 있음.

글로벌 전환금융은 수렴보다는 분기(Divergence)의 방향으로 가고 있음.

국가/지역	접근 방식	핵심 제도	특징	한계
일본	경로 기반 + 산업정책 주도	GX 전략, GX 경제이행채, 부문별 로드맵	세계 최초 전환국채, 10년 150조 엔 민관투자	암모니아 혼소 등 그린워싱 논란
EU	분류체계 + 공시 규제 중심	EU Taxonomy, CSRD, SFDR	엄격한 기준, 높은 신뢰성	고탄소 산업 전환 지원 제한; Omnibus Package 등 규제 단순화 논의 병행
캐나다	이중 라벨(Green + Transition)	캐나다 지속가능금융 분류체계	천연자원 의존 경제 현실 반영	기준 유연성 → 신뢰성 우려
싱가포르/ASEAN	신호등 체계 + 일몰 조항	ASEAN Taxonomy, ACMF 가이드라인	석탄 발전 조기 퇴출, 전환활동의 일몰기한 (Sunset Date)	개발도상국 현실과의 긴장

SLIDE 8

2025~2026 최신 이슈: 규제 분기와 시장 신뢰성

기준의 정교화 vs 규제의 분기 — 동시에 진행 중인 두 흐름

공시·검증 기준은 정교화되는 반면, 규제 강도와 정책 모델은 분기되고 있음. 이 두 흐름은 동시에 진행중.

기준의 정교화 (Standards Tightening)

- ICMA CTBG(2025.11): 기후전환채권 원칙 업데이트
- 별도 발행 프레임워크로 정교화
- Use-of-Proceeds + KPI 연계 하이브리드 구조 허용
- 그린워싱 방지를 위한 외부검증 요건 강화
- 발행기업 전사 차원(Entity-level)의 과학 기반 감축 경로 정렬 요구
- 발행체 전환전략과 자금용도 정합성 설명 요구 강화

규제의 분기 (Regulatory Divergence)

- SEC 기후공시 규칙(2024): 바이든 행정부 도입
- 2026년 5월 SEC: 2024년 기후공시 규칙의 전면 철회 제안
- EU CSRD·SFDR: 공시 의무 유지 및 강화
- EU-US 규제 분기 심화 → 글로벌 자본시장 이중 기준
- 다국적 기업의 규제 차익(Regulatory Arbitrage) 우려

SLIDE 9

일본 GX 사례: 성과와 한계

전환금융의 가능성과 한계를 동시에 보여주는 선도 사례

일본은 2023년 GX 추진전략과 법제화를 기반으로, 2024년 2월 세계 최초의 국가 전환채권인 GX 경제이행채를 발행.

전환금융을 단순한 금융상품이 아닌 국가 산업전략의 실행수단으로 설계한 대표 사례.

✅ 성과 (Achievements)

- GX 경제이행채: 2024년 세계 최초 국가 전환채권 발행, 20조 엔 규모
- 10년간 150조 엔 이상 민관 GX 투자 유도 목표
- 주요 배출 부문별 기술 로드맵 및 16개 GX 우선 분야별 투자전략 수립
- GX Acceleration Agency: 전담 실행체계 구축
- 2026년도 ETS 본격 시행 예정

⚠️ 한계 (Limitations)

- 암모니아 혼소(20%): 국제 기관의 그린워싱 논란
- 화석연료 인프라 연장 → 탄소 고착화 우려
- 일부 시장에서 제한적 그리니엄과 유동성 우려 제기
- 해외 기관투자자의 신뢰성 문제 제기
- 국제 기준(ICMA, GFANZ)과의 정합성 논란

SLIDE 10

한국의 전략적 과제

경로·거버넌스·데이터 인프라의 동시 구축

한국의 과제는 전환금융이 신뢰받을 수 있는 제도적 기반을 구축하는 것.

철강·석유화학·시멘트·조선·해운·전력 등 주요 산업이 경제의 핵심을 이루는 한국에서 전환금융은 곧 산업정책의 문제.

① 경로 수립 (Pathway Design)

- 철강·석유화학·시멘트·조선·해운·전력 부문별 탈탄소 로드맵
- 산업부·환경부 공동 수립, 과학 기반 감축목표(SBT) 정합
- 부문별 기술 경로 및 투자 소요 추정
- K-택소노미 위에 경로 기반 평가체계 결합

② 거버넌스 조정 (Governance Alignment)

- 환경부·산업부·금융위원회·재경부·금융감독원 범부처 추진체계
- 전환금융 트라이앵글: 환경정책(감축목표) + 산업정책(기술경로) + 금융정책(자본공급)
- 민관 협력 플랫폼 구축
- 국제 정합성 확보: ICMA CTBG, GFANZ 기준 반영

③ 데이터 인프라 (Data Infrastructure)

- ISSB 및 EU CSRD와 정합성을 갖춘 한국형 공시 인프라 구축
- Scope 1·2·3 배출량 공시 의무화 및 공급망 MRV 체계 구축
- 국제 투자자 신뢰 유지를 위한 외부검증(SPO) 시장 육성

결론

전환금융: 세 가지 핵심 명제

전환금융은 단순한 ESG 금융상품이 아니라, 고탄소 산업의 탈탄소 전환을 지원하는 경로 기반 정책·금융 플랫폼.

한국형 전환금융의 성공은 경로·거버넌스·데이터를 얼마나 일관되게 제도화하느냐에 달려 있음.

① 현재가 아닌 경로를 평가

- 평가 기준: '현재 녹색인가'가 아닌 '신뢰할 수 있는 경로를 따라 전환하고 있는가'
- 정적 분류체계(Taxonomy) → 동적 경로 기반 평가(Pathway-based)로의 패러다임 전환
- 과학 기반 목표(SBT) + 이행 모니터링 + 외부검증이 신뢰성의 핵심

② 자금보다 로드맵과 조율이 먼저

- 전환금융은 자금 조달 이전에 산업별 로드맵과 정책 조율이 선행되어야 함
- Rodrik의 조정 실패: 환경·산업·금융 정책의 동시적 정렬 없이는 전환이 어려움
- 일본 GX 사례: 거버넌스와 결합될 때 전환금융은 작동

③ 신뢰할 수 있는 데이터 없이는 자본도 없음

- 정보비대칭 해소 없이는 투자자 신뢰도, 그리니엄도 없음
- Scope 1·2·3 공시, MRV 체계, 외부검증이 전환금융의 인프라
- 한국형 전환금융의 성공은 경로·거버넌스·데이터의 제도화 수준에 달려 있음

経済産業省

Overview of Japan's GX Strategy and Transition Finance

June 2026

Takayuki MOTOHASHI

Director for Climate Finance Policy
Environmental Finance office, GX Policy Group
Ministry of Economy, Trade and Industry, Japan

Agenda

1. GX Policy
2. Transition Finance
3. Advancing Transition Finance Globally
4. Way Forward

Agenda

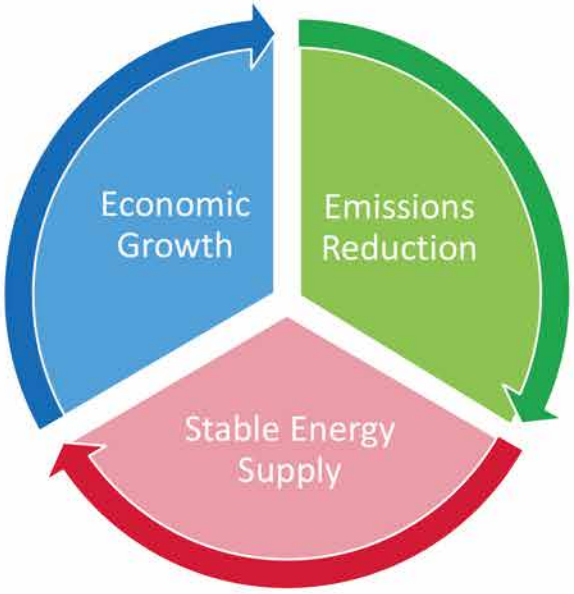
1. **GX Policy**
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Green Transformation “GX”

Triple breakthrough

Japan aims to simultaneously achieve

- **Energy Security**
- **Economic Growth**
- **Emissions Reduction**



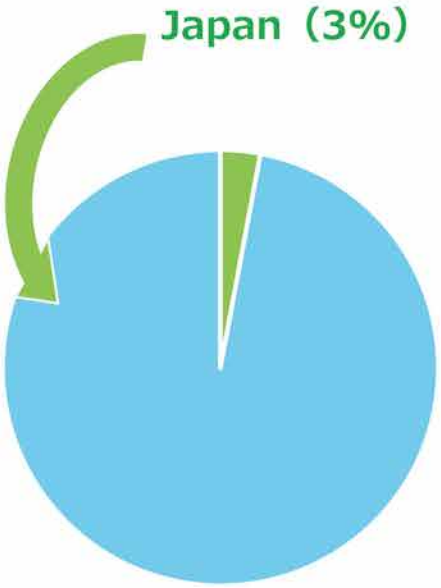
One goal, various pathways

Toward our common goal of achieving net zero, we will make practical energy transitions through various pathways depending on the circumstances of each country.



Solution to the world

Japan will decarbonize itself, but also contribute to global decarbonization by providing solutions outside Japan.



Trajectory of GX Policy

- Japan's GX policy is grounded in the "**GX Basic Policy**" (2023 Cabinet decision) and the **"GX Promotion Act**" (amended May 2025) and **continues under the Takaichi Administration**.
- **"Consistency"** and **"Predictability" are key principles.**

2020 Oct — ***Former Prime Minister Suga's 2050 Carbon Neutrality Declaration***

2023 Feb — **GX Basic policy**
Promoting decarbonization through Green Transformation (GX), including Carbon Pricing (CP) and GX Economy Transition Bonds

May — **GX Promotion Act**
Introducing the GX Promotion Strategy, CP, GX Economy Transition Bonds, and establishment of the GX Acceleration Agency

G7 Hiroshima Leaders' Communique
Transition Finance plays a key role in advancing economy-wide decarbonization

July — **GX Promotion Strategy & Sector-Specific Investment Strategies**

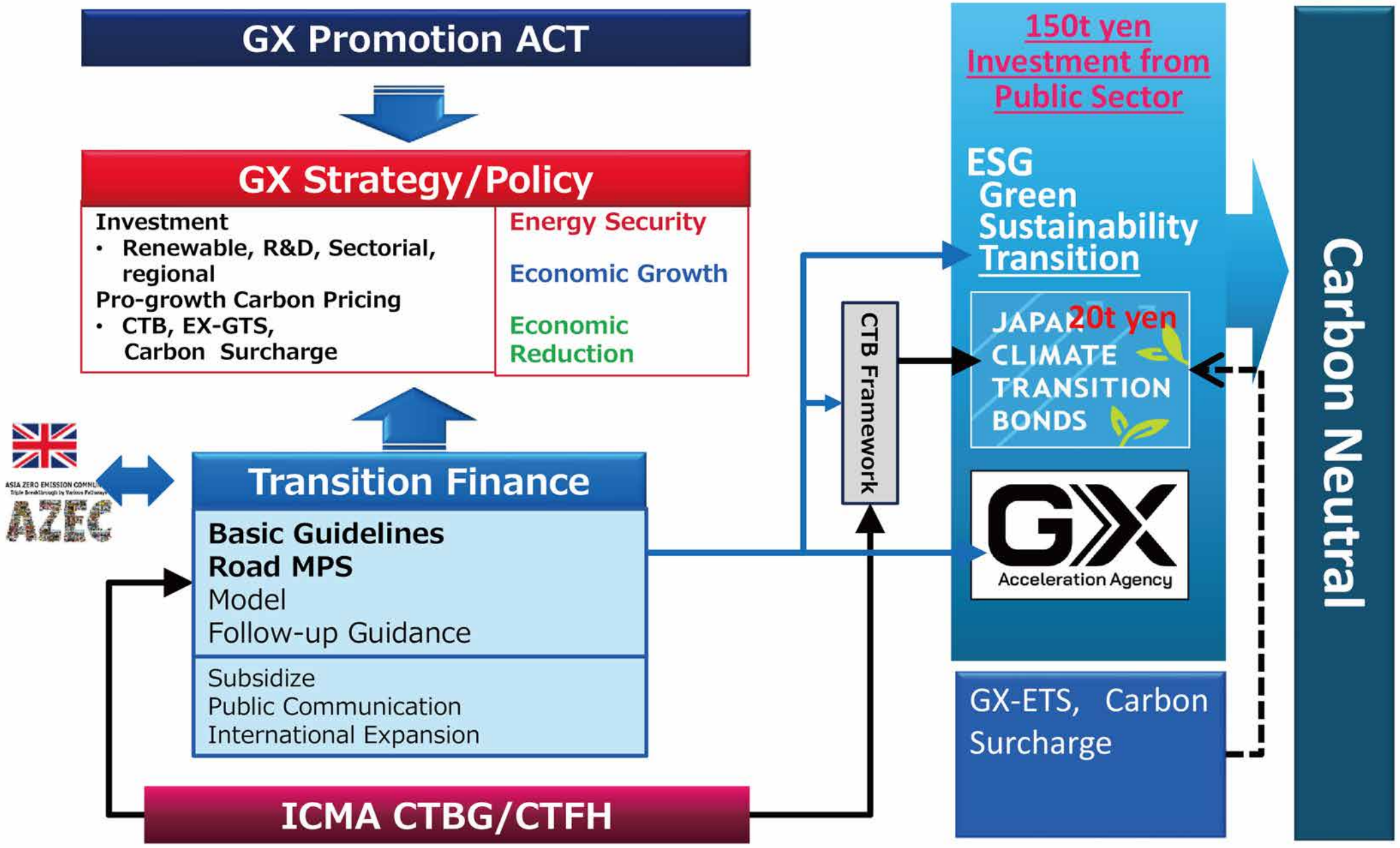
Nov — **"Japan Climate Transition Bond Framework"** was published

2024 Feb — **World's First Sovereign "Climate Transition Bond"** was issued

2025 Feb — **7th Strategic Energy Plan**
2040 GX Vision Revised GX Promotion Strategy

May — Amended **GX Promotion Act**

Transition Finance for realizing GX Policy



GX Strategy and implementation

- Transforming the fossil fuel–oriented economic and industrial structure to a clean energy-oriented one, while achieving **energy security**, **economic growth**, **and emissions reduction** simultaneously (Green Transformation: GX)
- To realize GX, mobilizing **150 trillion yen of in public and private investment in 10 years** under **Pro-Growth Carbon Pricing Concept** (GX Promotion Act) including the use of **Transition Finance**

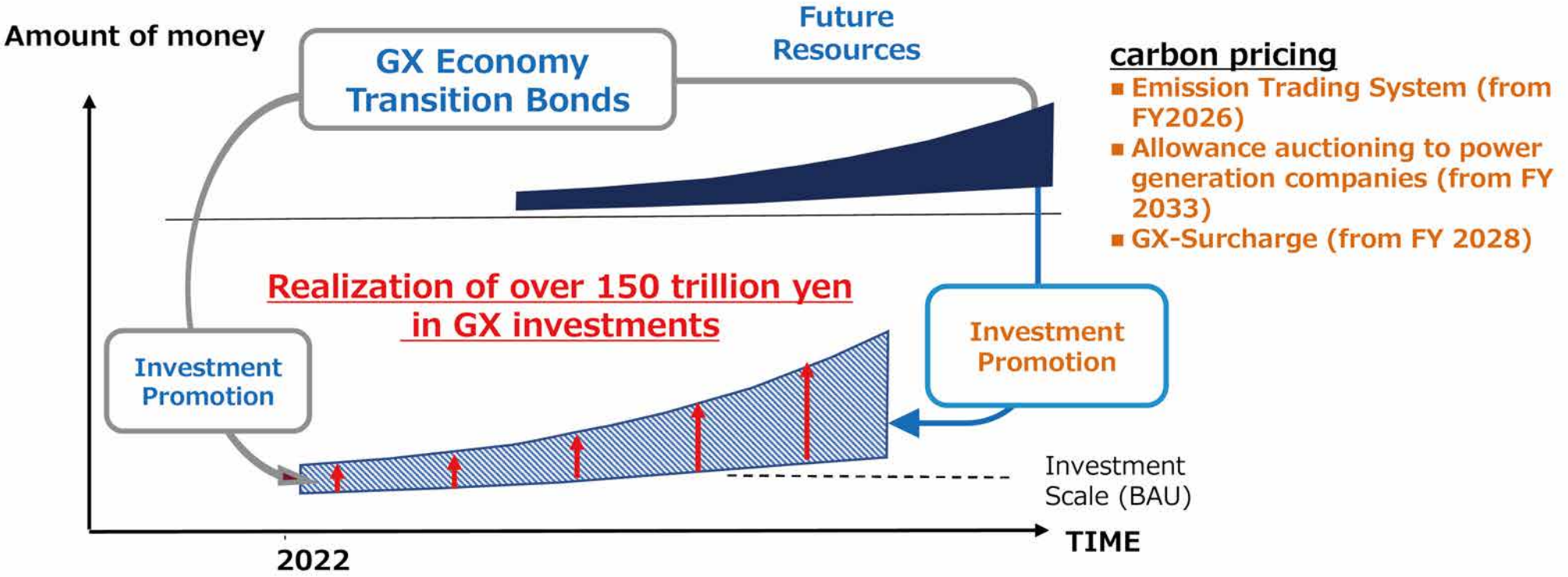
GX Promotion Strategy / GX2040 Vision

Green Transformation based on Steady Supply Energy and long-term foresight for GX investment	**Pro-Growth Carbon Pricing Concept**
✓ Energy Saving, Nuclear Energy ✓ Development of Renewable energy and R&D ✓ Realize GX Industrial Structure/ GX Industrial Location ✓ Initiative on Sector Specific Investment ✓ Just transition..	✓ **Upfront investment support through GX Economy Transition Bonds-20 trillion yes in 10 years** ✓ Adoption of Pro-Growth Carbon Pricing-GX ETS, Carbon surcharge

Pro-Growth Carbon Pricing Concept

Pro-Growth Carbon Pricing Concept for GX Investment

1. **Upfront public support**
   – GX Economy Transition Bonds to mobilize early investment
2. **Carbon pricing framework**
   – ETS (from FY2026) and phased auctioning (from FY2033) to drive GX incentives
3. **GX surcharge (from FY2028)**
   – Stable funding source from fossil fuel supply
4. **Public–private finance mobilization**
   – Strengthened support through blended finance (e.g. GX Acceleration Agency)



Outlook for Energy Supply and Demand in FY2040

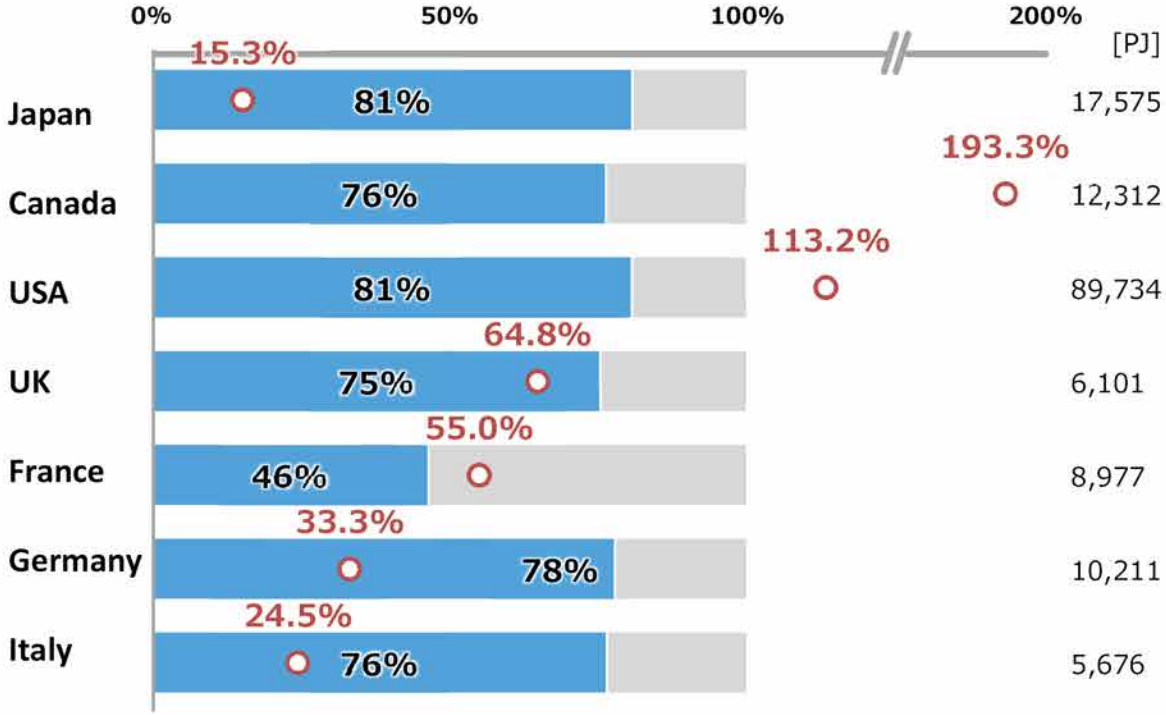
■The outlook for energy supply and demand in FY2040 is presented as a certain range using multiple scenarios, keeping in mind the existence of various uncertainties, while also referring to analytical methods used in other countries.

		Fiscal Year 2023 (Preliminary figures)	Fiscal Year 2040 (Forecast)
Energy self-sufficiencyrate		**15.2% (in %)**	**Approx. 30-40%.**
Amount of electricitygenerated		**985.4 billion kWh**	**1.1 to 1.2 trillion kWh approx.**
Power Supply Configuration	**Renewable energy**	**22.9% (%)**	**Approximately 40-50%.**
	Solar	9.8% (9.8%)	Approx. 23% to 29%
	Wind power	1.1% (1.1%)	Approx. 4-8%
	Hydraulic power	7.6% (7.6%)	Approx. 8-10%
	Geothermal power	0.3% (0.3%)	Approx. 1-2%.
	Biomass	4.1% (4.1%)	Approx. 5-6%
	Nuclear power	**8.5% (8.5%)**	**Approx. 20%**
	Thermal power	**68.6% (%)**	**Approx. 30-40%.**
Final energy consumption		**300 million kL**	**Approx. 2.6 to 2.7 billion kL**
Percentage reduction in greenhouse gas emissions (compared to FY2013)		**22.9% (%) (Actual results for FY2022)**	**73%**

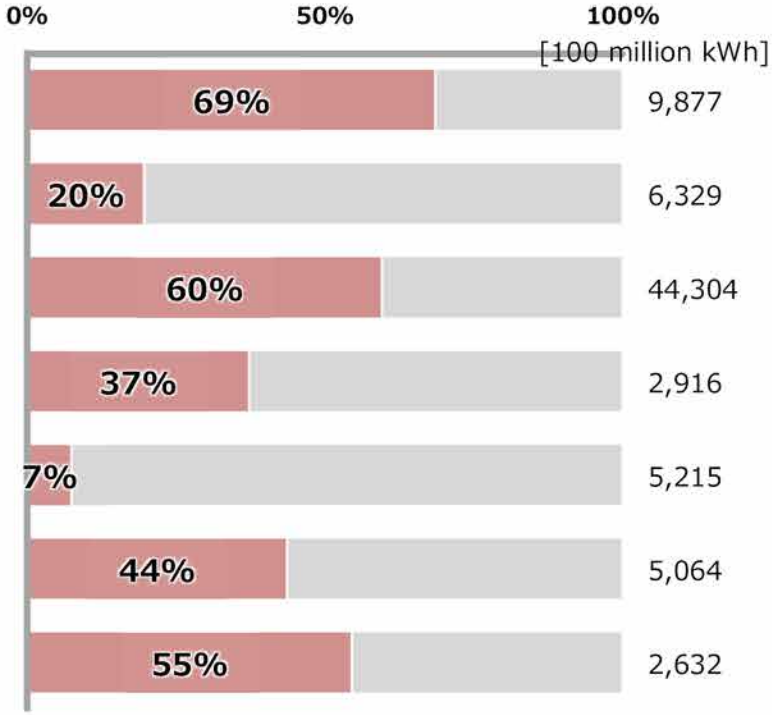
GX as a Key for "Energy Security"

- Fossile Fuels sitill domionate primery energy supply- paricuraly in Japan- while rising instability in rhe Middle East amplifing enegy security risks due to concentrated import dependance
- GX (Green Transformation) is increasingly critical to reduce this reliance and bolster security, self-efficiency, indutrial competitiveness, and overall reliance.

Fossil Fuels share in Primary Energy Supply & Self-Sufficiency Rate (white dots)



Fossil Fuels share in Power Generation Mix

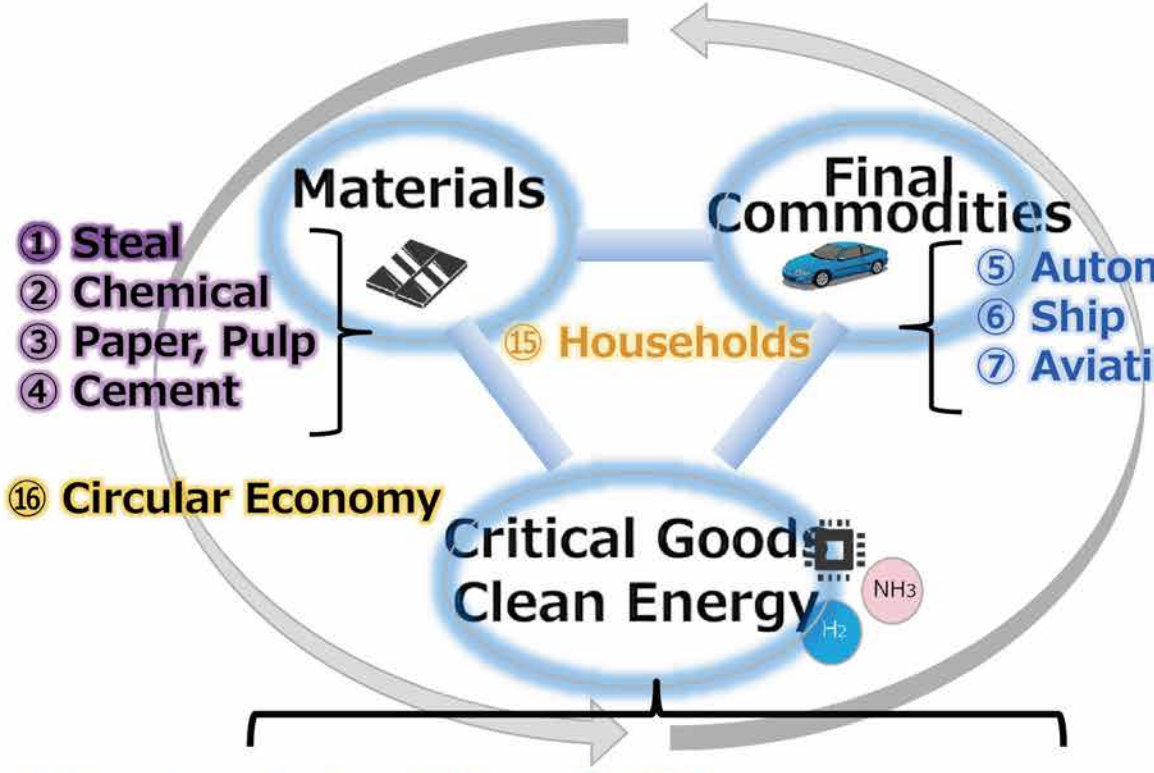


Sources: Compiled based on *World Energy Balances*, IEA, and Comprehensive Energy Statistics. Japan is in FY2023. Other figures are for 2023.

GX as a Key for "Economic Growth"

- 16 Priority Areas in GX Policy for focused national support.
- The following seven specific sectors have been identified as "key products & technologies" under forthcoming Japan's new Growth Strategy.

16 Sectorial Investment Strategies



① Steal
② Chemical
③ Paper, Pulp
④ Cement
⑤ Automobile
⑥ Ship
⑦ Aviation
⑮ Households
⑯ Circular Economy
⑧ Semiconductor Chips
⑨ Storage Battery
⑩ SAF
⑪ Hydrogen
⑫ CCS
⑬ Next-Generation Renewables
⑭ Nuclear Power

"Key Products & Technologies" under Japan's Growth Strategy

(1) Next-Generation Solar Cells (Perovskite Solar Cells, etc.)

(2) Hydrogen, etc.

(3) Green Steel

(4) Next-Generation Geothermal

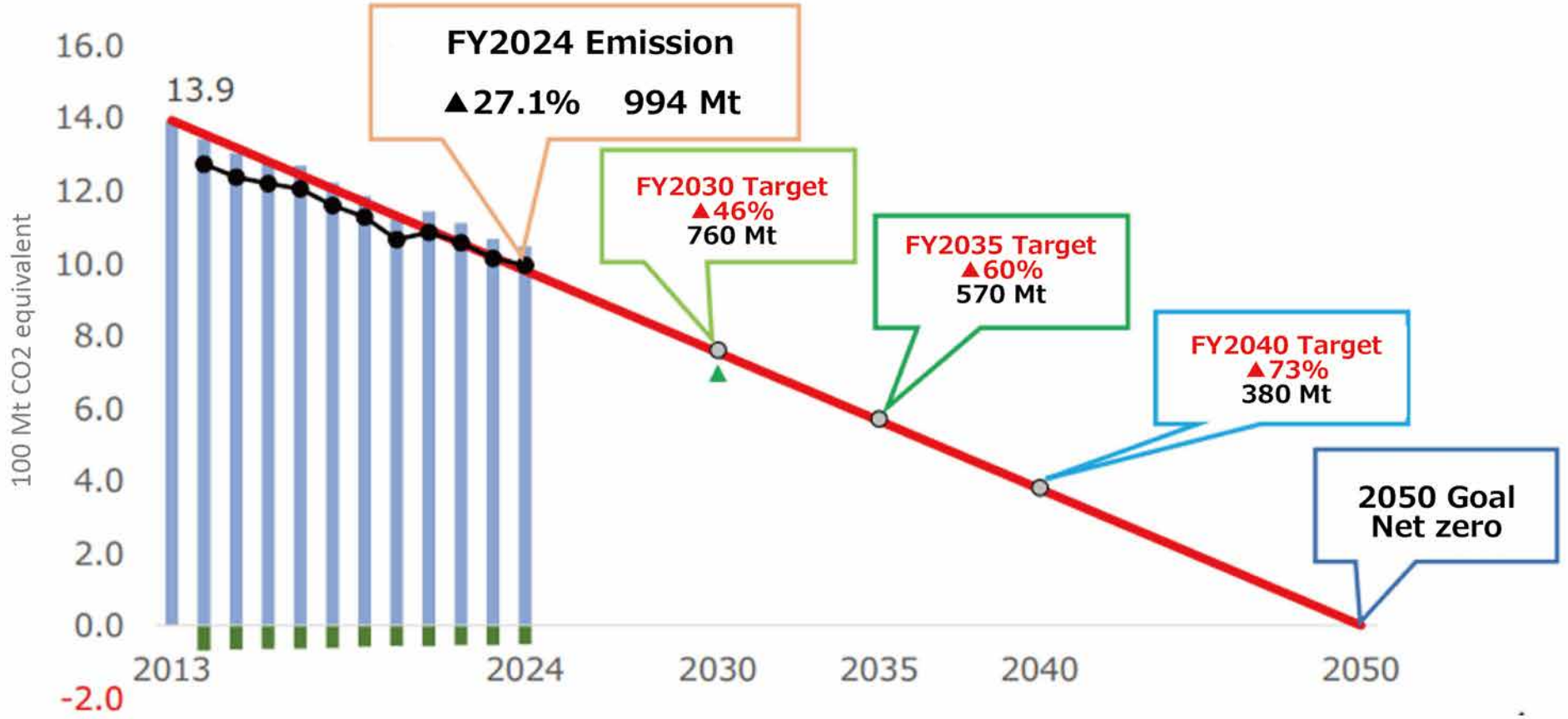
(5) Offshore Wind Power

(6) Next-Generation Innovative Furnace

(7) Green Chemicals

GX as a Key for "Emission Reduction"

- The lowest record on FY2024.
- Comparing to other advanced economies, emissions reductions toward net zero by 2050 are progressing steadily.
- FY2024 greenhouse gas emissions and removals totaled 994 Million tones (Mt) CO2e, down 1.9% (−18.8 Mt) from FY2023



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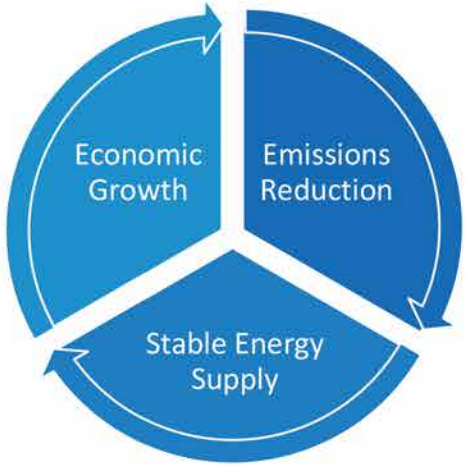
Transition Finance as a Key Pillar of GX Policy

Transition finance: it mobilizes private capital by ensuring the credibility of investments aligned with long-term decarbonization strategies, even where emissions may persist or temporarily rise in energy-intensive economies.

Its core is ensuring investor credibility: companies demonstrate alignment through transition strategies, KPIs and disclosure supported by Japan's guidelines and sectoral technology roadmaps which were developed by Japanese government in line with ICMA standers.

Japan has institutionalized this approach as GX Policy : advancing a "Japan model" that integrates **energy security**, **economic growth**, and **emissions reduction**, with transition finance serving as a key mechanism to mobilize capital and build trust through public–private collaboration.







Japan's 4-Step-Policy-Tools on Climate Transition Finance

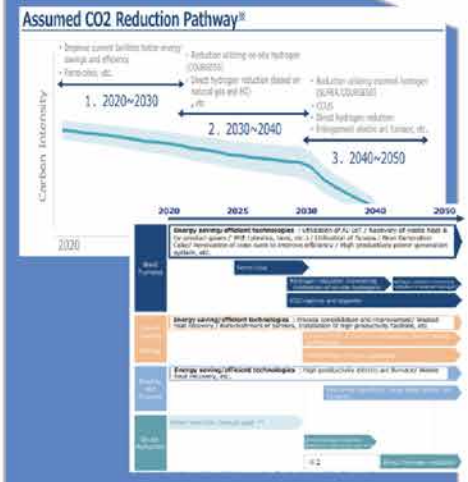
- Transition finance is a key instruments for Japan's decarbonization under credible standards. In 2021, METI, MOE, and FSA issued **the *Basic Guidelines on Transition Finance,*** aligned with ICMA (CTFH) to ensure consistency with global standards.
- They assess overall transition credibility**, focusing on strategy, feasibility, and transparency—not just use of proceeds.**
- To encourage private finance flow for transition, **Japan has developed 4-step-policy tools**. Companies can utilize these tools to develop a credible transition strategies.

Basic Guidelines



Aligned with 4 ICMA CTFH Principles, thereby enhancing the credibility of user's framework

Sectoral Technology Roadmaps



Covers 10 HtA sectors. companies can use the roadmaps to shape strategies while financial institutions can assess clients' transition plans

Model Projects



Model Cases aligned with the Basic Guidelines to promote broader global adoption

Follow-up Guidance



Approaches to project follow-up for financial institutions, emphasizing the importance of ongoing issuer–investor engagement

Basic Guidelines

- In May 2021, METI, MOE and FSA released "**the Basic Guidelines on Climate Transition Finance**".
- These guidelines serve as a framework for fundraising under the name "**Transition**" and outline **the four key elements** expected of issuers in transition finance. A revision was made in March 2025.

Overview of the Basic Guidelines

- **Aligns with ICMA CTFH**, ensuring consistency with international standards
- **Provides a credible framework** for issuing Transition Bonds/Loans, enhancing market trust
- **Strengthens market integrity** through transparency, disclosure, and clear positioning of transition finance
- **Recognizes diverse transition pathways across countries and regions**, reflecting varying approaches to achieving decarbonization





Four elements

Element 1	Fundraiser's Climate Transition Strategy and Governance
Element 2	Business Model Environmental Materiality
Element 3	Climate Transition Strategy to be Science-based Including Targets and Pathways
Element 4	Implementation Transparency

Sectoral Technology Roadmaps for Transition Finance

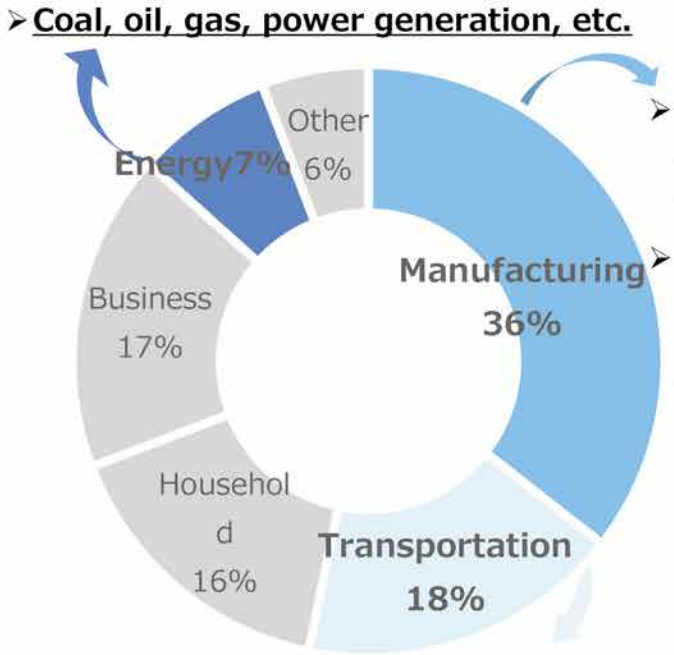
- Sectoral Technology Roadmaps for Transition Finance were developed **for 10 high-emission sectors** between FY2021 and FY2022 to **clarify transition pathways toward carbon neutrality by 2050.**
- They summarize **sector-specific characteristics** and decarbonization pathways.
- By using these roadmaps, **fundraisers can strengthen the credibility of their transition strategies**, while **financial institutions and investors can reference them in their evaluations.**

Field of Technology Roadmap Formulation

Energy	Electric Power	Gas
	Petroleum	
Materials Manufacturing Industry	Steel	Cement
	Chemistry	Paper Pulp
Transportation System	Automobile	
	Shipping *	Aviation *

*Formulated by the Ministry of Land, Infrastructure, Transport and Tourism

CO2 Emissions by Domestic Sector (FY 2020)



- The **manufacturing industry** accounts for **nearly 40%** of Japan's total emissions.
- The 4 industries of steel, chemicals, cement, and pulp and paper account for **70%** of the total.

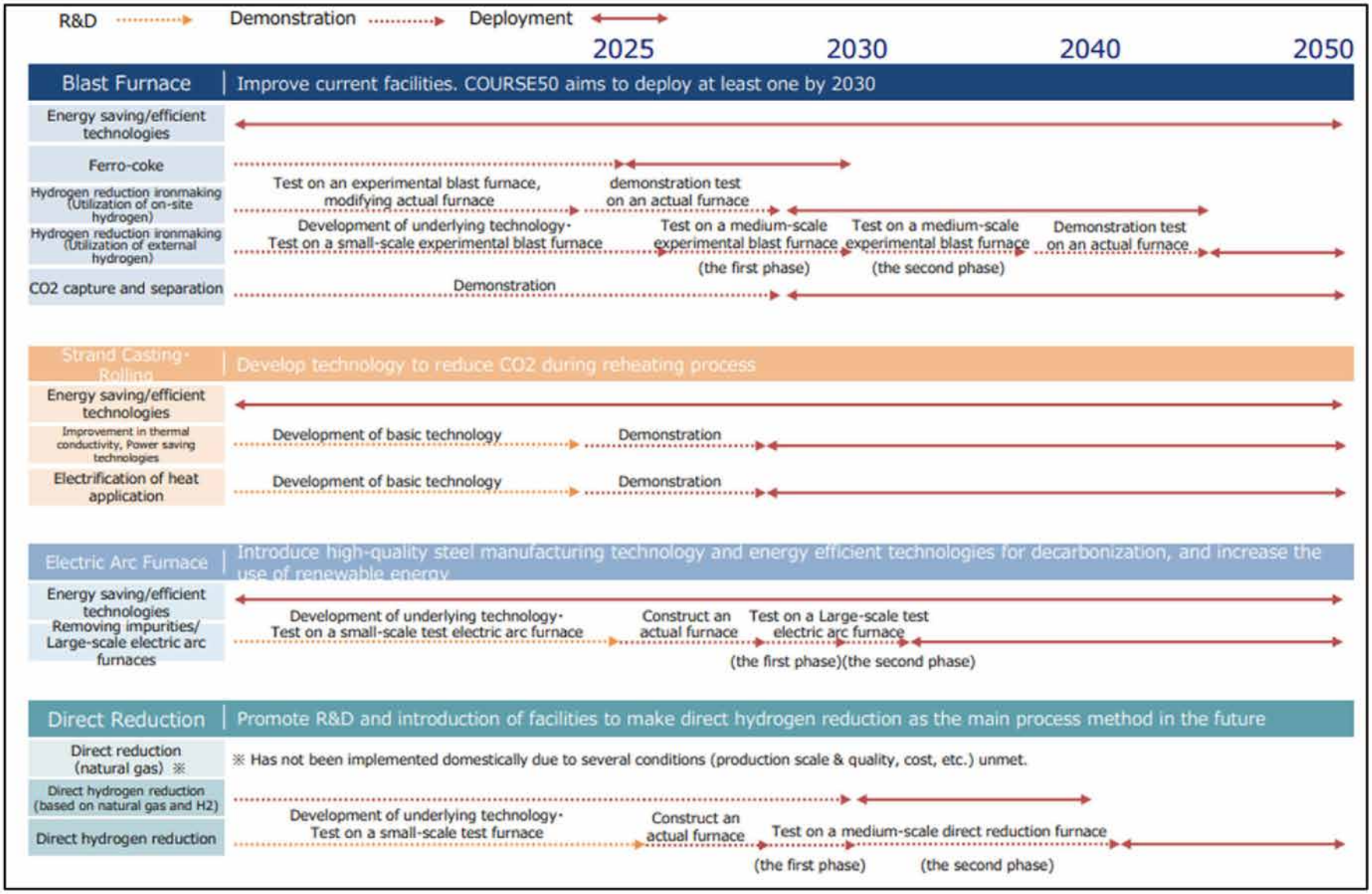
- **Nearly 90%** of the transportation sector is related to **automobiles**
- Domestic **aviation and shipping** each account for **about 5%**

Source: National Institute for Environmental Studies Japan Greenhouse Gas Emissions Data (FY 2020 Final Report)

Sectoral Technology Roadmaps for Transition Finance

Example: Technology Roadmap for "Transition Finance" in Iron and Steel Sector

https://www.meti.go.jp/policy/energy_environment/global_warming/transition_finance.html



Sectoral Technology Roadmaps for Transition Finance

Example: Technology Roadmap for "Transition Finance" in Iron and Steel Sector

https://www.meti.go.jp/policy/energy_environment/global_warming/transition_finance.html

3. Technology Pathways to Decarbonization | ③Scientific Basis/Alignment with the Paris Agreement

- The Technology Roadmap is aligned with the Paris Agreement and Japanese policies aimed to achieve carbon neutrality.
- It is focused on achieving 2050 carbon neutrality by steady low-carbonization and implementing innovative technologies whilst sustaining and enhancing the Japanese iron and steel industry.

Reference/ Evidence

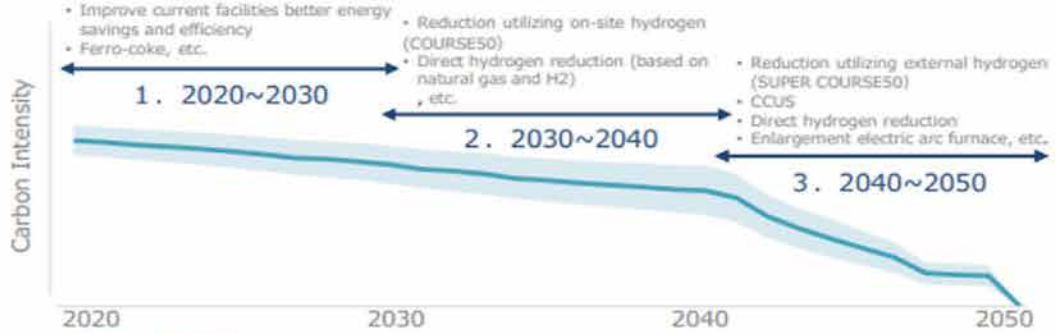
Government Policies

- ✓ Green Growth Strategy Through Achieving Carbon Neutrality in 2050 (Carbon recycling, materials)
- ✓ R&D and Social Implementation Plan about " Hydrogen utilization in iron and steelmaking processes " project
- ✓ Environment Innovation Strategy
- ✓ Strategic Energy Plan
- ✓ The Plan for Global Warming Countermeasures
- ✓ Roadmap for Carbon Recycling Technologies

International Scenarios/ Roadmaps, etc. aligned with Paris Agreement

- ✓ Clean Energy Technology Guide (IEA)
- ✓ Energy Technology Perspective 2020 (IEA)
- ✓ Industrial Transformation 2050 (Material Economics)
- ✓ Science Based Target initiative

Assumed CO2 Reduction Pathway※



1 2020~2030
The Japanese iron and steel industry already meets the world's best standards on energy efficiency, though further efforts will be made for low-carbonization through energy efficiency in blast furnaces and other means. Moreover, high-quality steel such as eco products that are expected to grow in demand will be produced. This income will be the foundation of future R&D and demonstration for decarbonization technology.

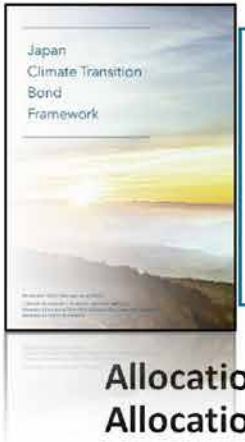
2 2030~2040
Along with increased energy savings and efficiency, new technologies as COURSE50 will be introduced and establish innovative technologies for decarbonization through continuous R&D and demonstration.

3 2040~2050
Assuming hydrogen infrastructure and CCUS to be introduced, innovative technologies such as hydrogen reduction ironmaking will achieve immense reduction of CO2 by 2050 and hence reach carbon neutrality.

※This only illustrates the assumption of overall Japanese iron and steel industry's decarbonization pathway. In reality, decarbonization will be achieved based on each company's long-term strategy and hence, will not necessary be the reflection of this assumption.

Issuance of Japan Climate Transition Bonds

- Japan issued **the world's first sovereign transition bonds, "Japan Climate Transition Bonds,"** in February 2024.
- **The Framework was established** in November 2023 and **Second Party Opinions (SPOs) were obtained** from external reviewers (JCR and DNV) to confirm alignment with international standards.
- **The impact report for bonds issued in FY2023 was published** in January 2026.
- **Alignment with ICMA's "Climate Transition Bond Guidelines (CTBG)" was confirmed**, with SPOs from JCR and DNV.



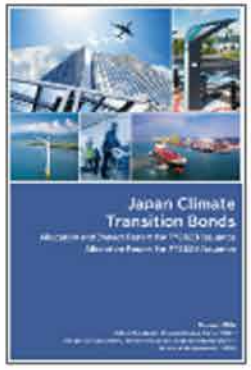
Japan Climate Transition Bond Framework (based on ICMA Standards)

- ✓ **Issuer's transition strategy**
- ✓ **Use of proceeds**
- ✓ **Management of proceeds**
- ✓ **Reporting** (Allocation reporting + Impact reporting)

Allocation and Impact Report for FY2023 Issuance
Allocation Report for FY2024 Issuance



Japanese



English

Framework Third-Party Evaluation Report for CTBG <JCR/DNV>


NEWS RELEASE

JCR Sustainable Evaluation

The Government of Japan

Japan Climate Transition Bond Framework

Affirmation

<Confirmation Results of Alignment with Climate Transition Bond Guidelines>

The bond is aligned with Climate Transition Bond Guidelines

Overall Evaluation: Green 1(F)(F)

Greenness Evaluation (Use of Proceeds): g1(F)

Management, Operation and Transparency Evaluation: m1(F)



ANNEX - SECOND PARTY OPINION

The Government of Japan
Climate Transition Bond Framework
(CTBG additional application)

CTBG: Climate Transition Bond Guidelines, International Capital Market Association (ICMA)

Planned Issuance of Japan Climate Transition Bonds (FY2026)

■ Japan issued JPY 1.6 trillion in transition bin FY2023, JPY 1.4 trillion in FY2024, JPY 1.2 trillion in FY2025, and will issue **1.0 trillion in FY2026 with 5- and 10-year maturities**.

Bidding schedule for FY2026

Bid date	25th May, 2026	August, 2026	November, 2026	February, 2027
Maturity	5 years	10 years	5 years	10 years
Amount	About 250 billion yen	About 250 billion yen	About 250 billion yen	About 250 billion yen

< reference>Bidding results for FY2025

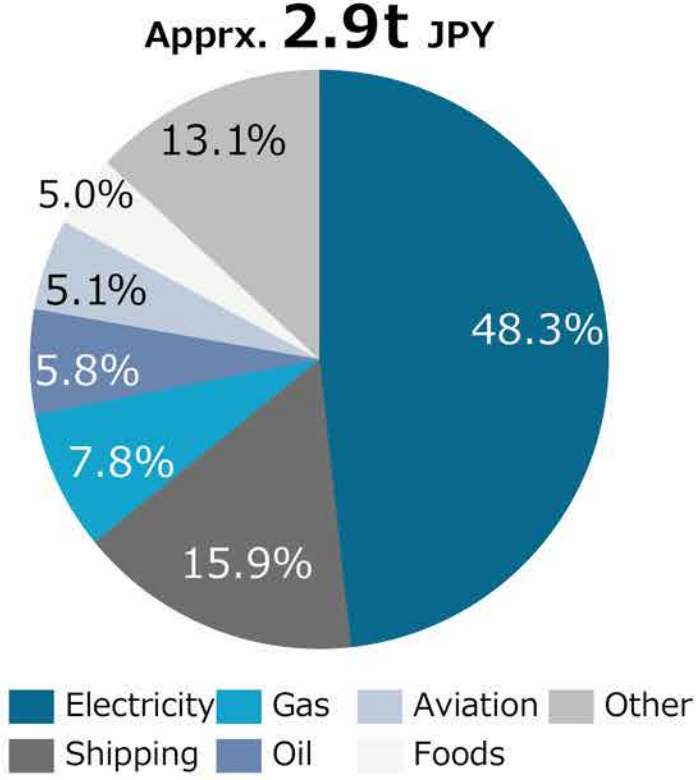
Bid date	15th July, 2025	21st October, 2025	26th January, 2026	13th March, 2026
Maturity	5 years	10 years	5 years	10 years
Coupon Rate	1.0%	1.6%	1.6%	2.1%
Bid amount	1,193.6 billion yen	1,067.5 billion yen	1,045.4 billion yen	1,026 billion yen
Allotment amount	299.8 billion yen	299.8 billion yen	299.9 billion yen	299.9 billion yen
Accepted yield (Highest winning yield)	1.098%	1.680%	1.684%	2.195%

*Dutch auction method: Winners are allocated in order from the lowest bid yield; all successful bidders purchase at the highest accepted yield that fills the planned amount. That yield, rounded down to two decimal places, becomes the coupon rate.
*Reopening auctions held on October 6 and January 7.

Domestic Private Transition Finance

- The cumulative domestic issuance of transition-labeled bonds and loans **reached approximately JPY 2.9 trillion** as of December 2025.
- **The power and gas sectors account for the largest share**, with **growing uptake of transition finance across a wide range of industries**, including chemicals, shipping, and pulp and paper.

Cumulative Domestic Issuance of Transition Finance and Its Breakdown (2021.1~2025.12)



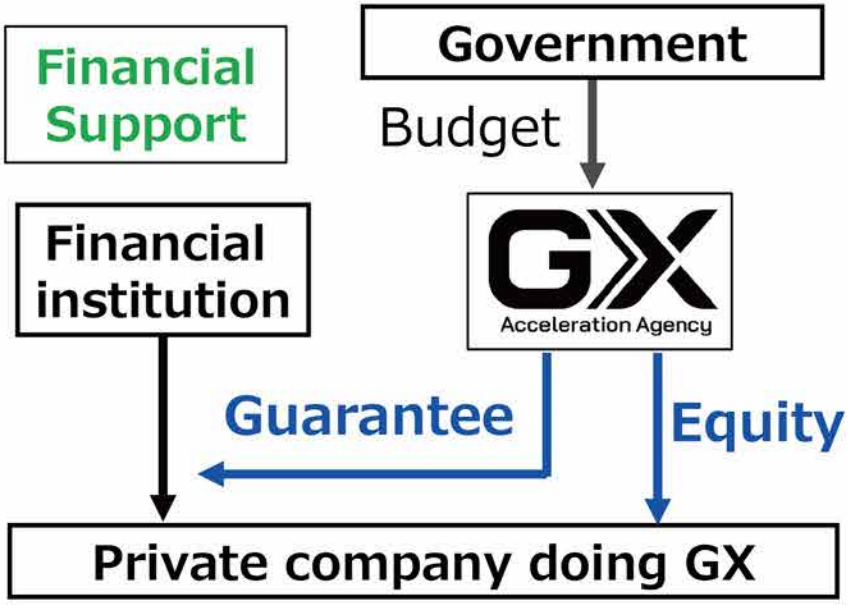
Examples of Transition Finance Projects

Issuer / Borrower	Type	Amount	Period	Sector
Teijin	Transition Link Loan	Private	January 2025	✓ Chemicals
NS United Shipping	Transition Loan	Private	December 2027 (planned)	✓ Shipping
Daio Paper	Transition Link Finance	Private	2025 Annual (planned)	✓ Pulp & Paper
JFE Holdings	Transition Bond	Undecided	Undecided	✓ Steel

*Projects selected for FY2024 and FY2025 (based on announcements as of December 2025)

GX Acceleration Agency

- **GX Acceleration Agency** has been launched in July 2024
- **Objective**
  - ✓ Mobilize **JPY 150T GX investment (next 10 years)**
  - ✓ Achieve **carbon neutrality by 2050** while strengthening **competitiveness & growth**
- **Key Actions**
  - ✓ **Promote private investment** (guarantees, equity support) 5 investments/guarantees completed by FY2025
  - ✓ **Implement ETS & carbon pricing** (from FY2026)
- Serve as **"GX Hub"** (R&D, collaboration, policy, global outreach)
  → Launch **"GX Future Academy" initiatives**





Act as the secretariat of "**GX Future Consortium**" which integrates TCFD Consortium and GX League

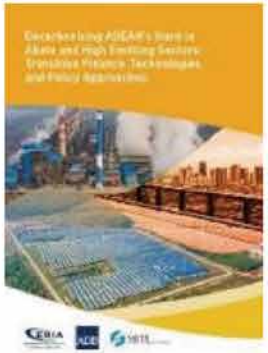
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International Trends in Transition Finance

- Internationally, **the need for a pragmatic transition** that balances decarbonization with energy security is **increasingly gaining international recognition**, as highlighted in the IEA's October 2025 report.
- Japan is promoting international cooperation and contributing to the **development of the global transition finance market** through various international fora including **the Asia Zero Emission Community (AZEC).**

ERIA/ADB/METI Reports (October 2025)



IEA Report (October 2025)



International Trends

United Kingdom	• Established the Transition Finance Council and published draft Transition Finance Guidance in March 2026.
Korea	• In February 2026, Transition Finance Guidelines were established, defining transition finance on a roadmap basis beyond taxonomies. • Shinhan Bank issued the world's first Transition Samurai bond in November 2025.
Turkey	• QNB Bank issued CTBG-aligned transition bonds in December 2025. IFC provided advice and invested US$100 million.
South Africa	• In December 2025, FirstRand Bank developed a transition framework aligned with the CTBG and GTL exposure drafts.

What does it take to scale transition finance?

Concept: Securing reliability of transitions as a system	
Limitations in the capacity of business entities	◆ Limitations in the sophistication of transition plans (only a limited number of business entities can be supported) ◆ Role of third parties such as financial institutions, governments, and local governments
Limitations of ex-ante scrutiny to prevent risks (e.g., carbon lock-in)	◆ High uncertainty about the future ◆ Implement an ex-post monitoring approach to ensure accountability
Limitations of tailor-made approaches that require scientific scenario analysis	◆ Lack of easy-to-understand criteria, such as green categories, due to context-dependency ◆ Promote a common understanding of transition technologies and assets (technology roadmaps or technology lists depending on the context of region/industries)

Agenda

1. GX Policy
2. Transition Finance
3. Advancing Transition Finance Globally
4. **Way Forward**

Way forward

- **Necessity of capacity building in promoting inclusive Transition Finance in EMDEs**
  - ✓ **Role of government** is critical in promoting transition finance.
  - ✓ **Taxonomies alone are not sufficient**. Transition strategy and related policy measures are needed as a country based on public-private dialogue.
  - ✓ **G to G dialogues may be needed** to promote large scale transition projects.
- **Promote cross-border inclusive Transition Finance by private sectors**
  - ✓ **Developing technology lists/ roadmaps** may be effective to promote understandings.
  - ✓ Need to share understanding that eligibility of transition can be **judged in the context of destination country (NDCs, long term goals).**
- **Promote blended finance for inclusive transition(MDBs, ECAs)**
  - ✓ Support for **early retirement of coal is not sufficient**.
  - ✓ Promote **concrete projects in EMDEs** (e.g. coal to gas, grid infrastructure, energy efficiency improvement of fossil fuel related facilities etc.)


Thank you for
your attention.

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WHEN TRUST MATTERS

Why Transition Finance in Korea?

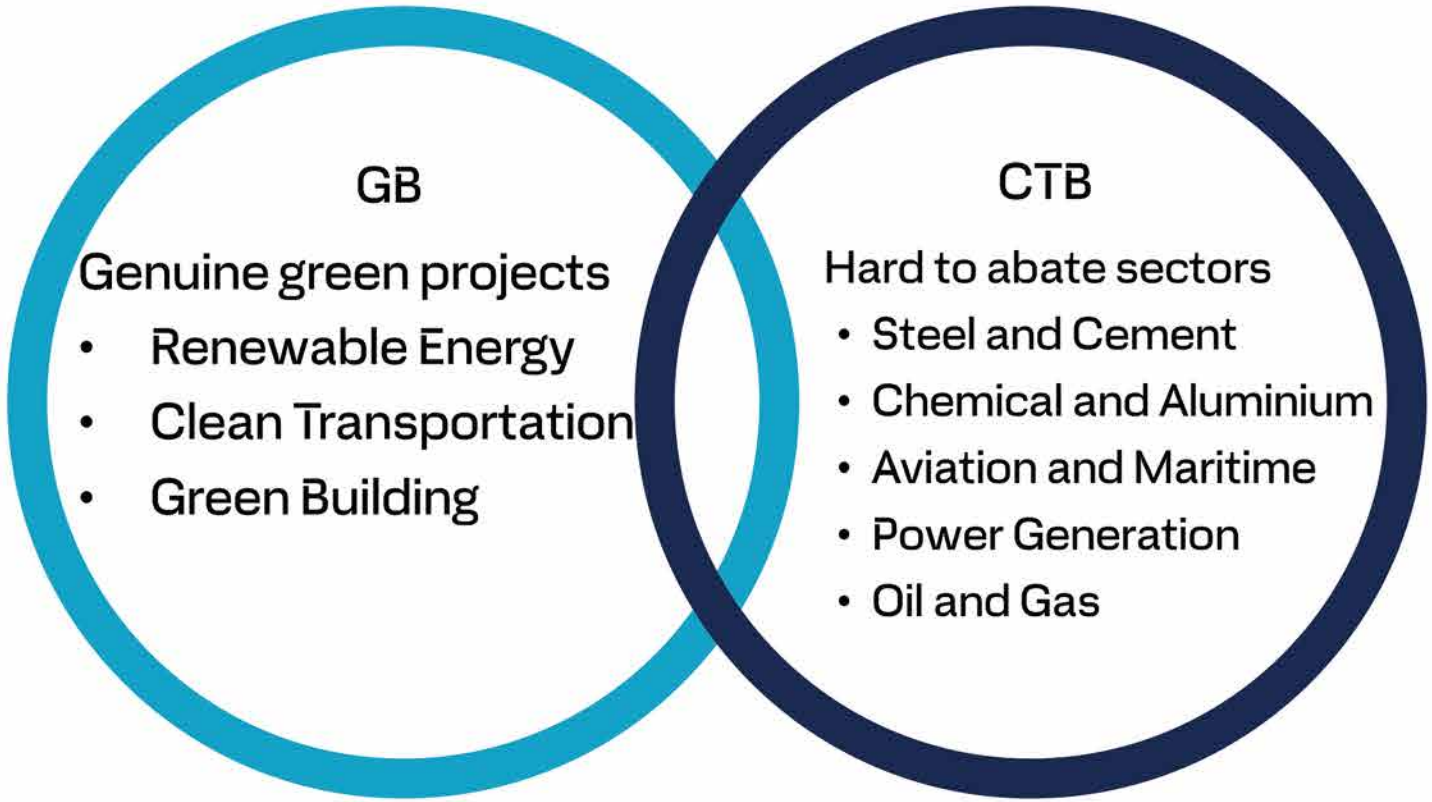
2026 I DNV Energy Systems

Contents

1. Climate Transition Bond Guideline
2. Why Korea needs climate transition financing
3. Transition bond example: Shinhan Bank
4. Korea Transition Finance Guideline

Climate Transition Bond Guidelines (CTBG)

Climate Transition Bond (CTB) beyond Traditional Green Bond (GB)





- USD 30 billion is needed in decarbonising high emitting industries
- CTB classifies early decommissioning of high emitting facilities and related R&D as eligible transition projects.

CTB Framework

Step 1. Use of Proceeds

- Definition of climate transition projects: examples
- Five safeguards

Step 2. Project Evaluation & Selection

- By whom and how are the projects selected?
- Are environmental and social externalities considered?

Step 3. Management of Proceeds

It is all about earmarking

- Transparent tracking of proceeds with use of dedicated finance register.

Step 4. Reporting

- Report use of proceeds and environmental impact

CTB five safeguards

1. Existence of an issuer-level sustainability and/or climate transition strategy in line with CTB Framework
2. Analysis supporting the technological and/or economic unfeasibility of low-carbon alternatives for the issuer
3. Alignment with global or national green taxonomy , decarbonisation pathways and roadmaps, and/or int'l and national decarbonisation policy frameworks
4. Mitigation of sustainable and quantifiable GHG emissions beyond BAU
5. Mitigation of Carbon Lock-in: Identification of carbon lock-in risks and minimization (including sunset provisions)

Additional Safeguards for Fossil Fuel

Beyond efficiency improvement and committing to decommissioning

Planning & Sunsetting

- Activity- or asset-level plans
- Sunset: Commitment to decommission/phase-out assets or switch to a low-carbon alternative within a certain timeframe
- Annual reporting on progress through external verification
- Implementation of accompanying investments and flanking measures to enable low-carbon alternatives

No Expansion & Tech

- Limitations to fossil fuel capacity expansion or assets' lifetime extension
- Limitation of CT Project eligibility to assets already in existence as of a certain date (i.e. brownfield investments)
- Commitment to implement CCUS for further abatement

Why Korea needs transition financing?

Korea is heavily exposed to high-emitting industries

- Korea's economy is manufacturing-driven (steel, cement, chemicals, shipbuilding, power etc.)
- Power and industry sectors account for ~70% of decarbonization effort needed*
- Without tackling emission from these sectors, it would be infeasible to achieve Net Zero by 2050

CTB sector	Korea exposure
Steel	• ~40% of industrial emissions from steel alone**
Cement	• High due to construction demand
Chemicals	• Major petrochemical exporter
Shipping	• Top global shipbuilder + trade dependence
Power (coal/gas)	• Fossil-heavy generation mix

*https://country-ambition.cgs.umd.edu/south-korea
*https://www.khan.co.kr/article/202411192020015
**https://www.theclimategroup.org/our-work/news/how-south-korea-can-become-home-net-zero-steel

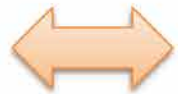
DNV ©

Global regulations for products from high emitting industries

Export-driven economy

Korea exports:

- Steel
- Petrochemicals
- Ships
- Automobiles



Global markets impose:

- CBAM (EU carbon border tax)
- Scope 3 disclosure
- Low-carbon supply chain requirements

Failure to decarbonize these sectors lead to loss of competitiveness

Project examples

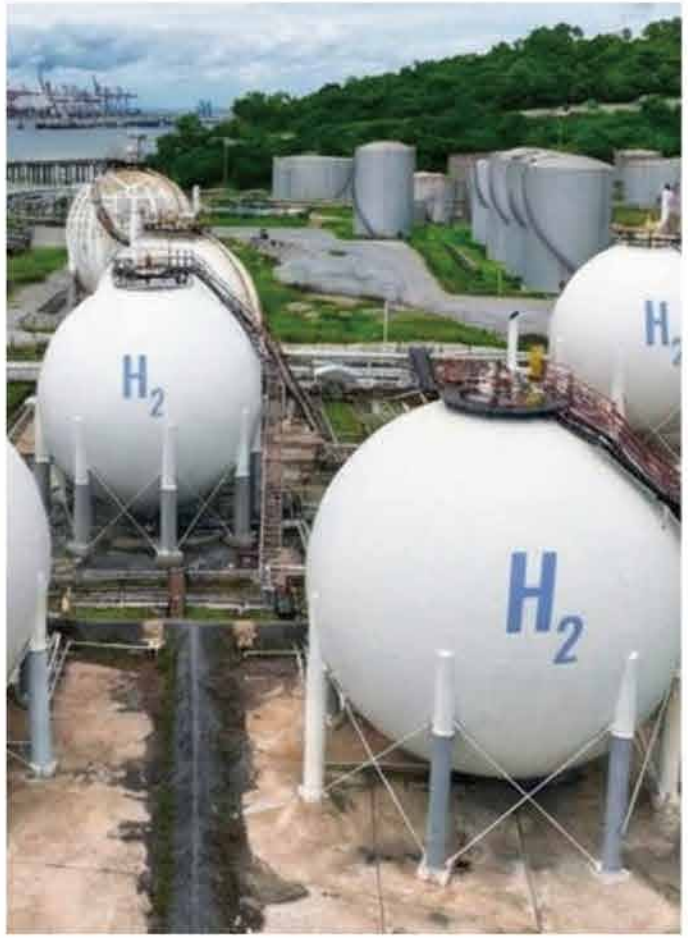
Fossil Fuel Switch (e.g. coal to gas)
Demonstrably replacing a higher emitting fuel and subject to infrastructure design allowing the future integration of low-carbon alternatives

Early retirement and decommissioning of high-emission assets

CCUS and carbon removal
Fossil-based energy and industrial applications

Lower-carbon fuels
Production, use, purchase, and enabling infrastructure investments

Methane and flaring abatement in oil & gas infrastructure
Existing oil and gas (green field exploration to be excluded)



Korea Transition Bond Example: Shinhan Bank

The first transition bond in Korea: Shinhan Bank

- Issued in Japan market in 2025: JPY 40 billion
- Nomura securities as one of joint bond arrangers participated
- DNV Korea and Japan collaboratively worked on providing second party opinion on eligibility of the projects



SECOND PARTY OPINION

Issuer
Transition Bond Framework
October 2025

Prepared by: DNV Business Assurance Korea
Location: Seoul, Republic of Korea
Date: 30 October 2025
Ref. Nr.: DNV-2025-ASR-10591040

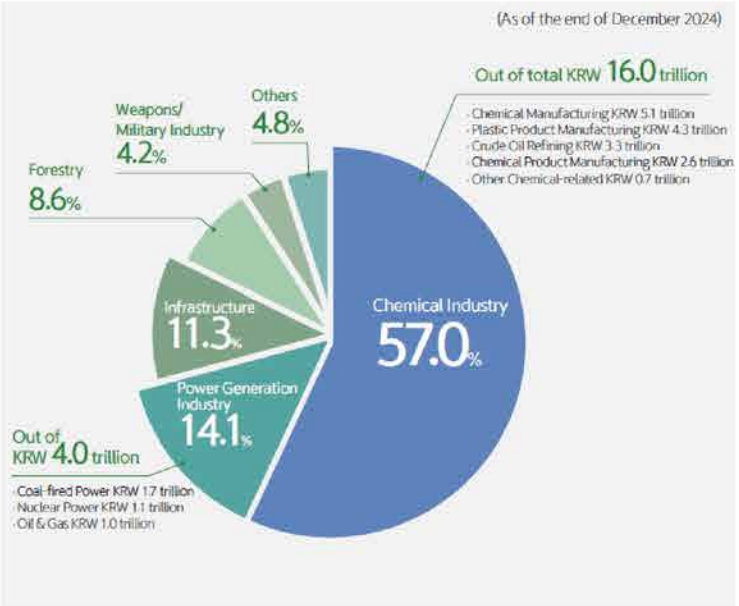
DNV Business Assurance Korea

30 October 2025

Chang Rok Yun
Project Team
Senior Auditor
DNV Business Assurance Korea

Masato Kanedome
Quality Reviewer
Principal, SCPA Sustainability Service Dept.
DNV Business Assurance Japan K.K.

Shinhan Bank’s exposure portfolio



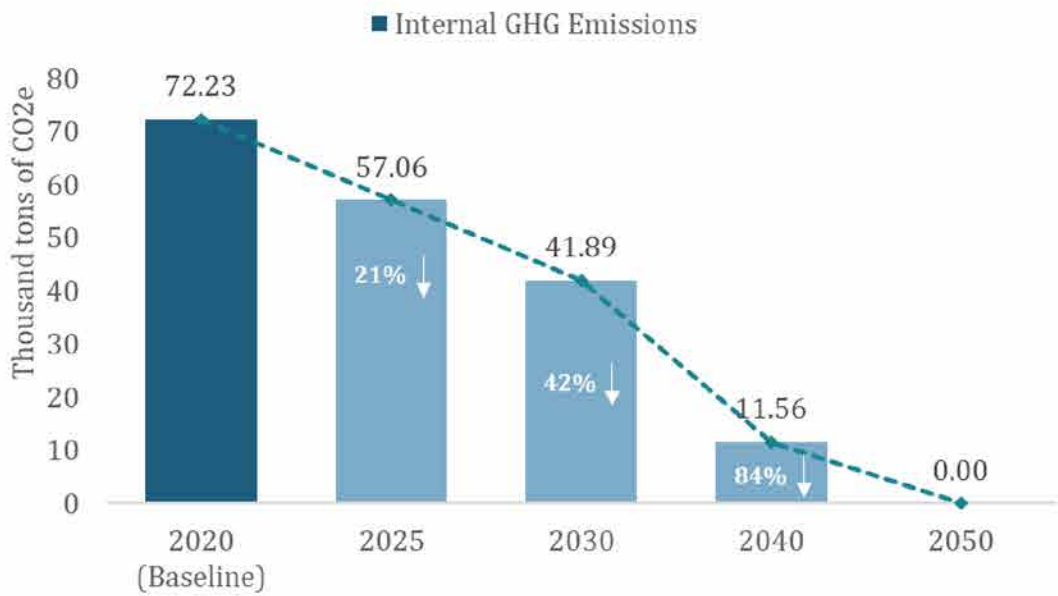
Shinhan Financial Group Exposure to Significant Area

As of the end of December 2024, the Shinhan Financial Group’s exposure to the Chemical Industry was the highest of all the industries, reaching KRW 16.0 trillion, accounting for 57.0% of the total exposure, and followed by the Power Generation Industry and the Infrastructure Industry

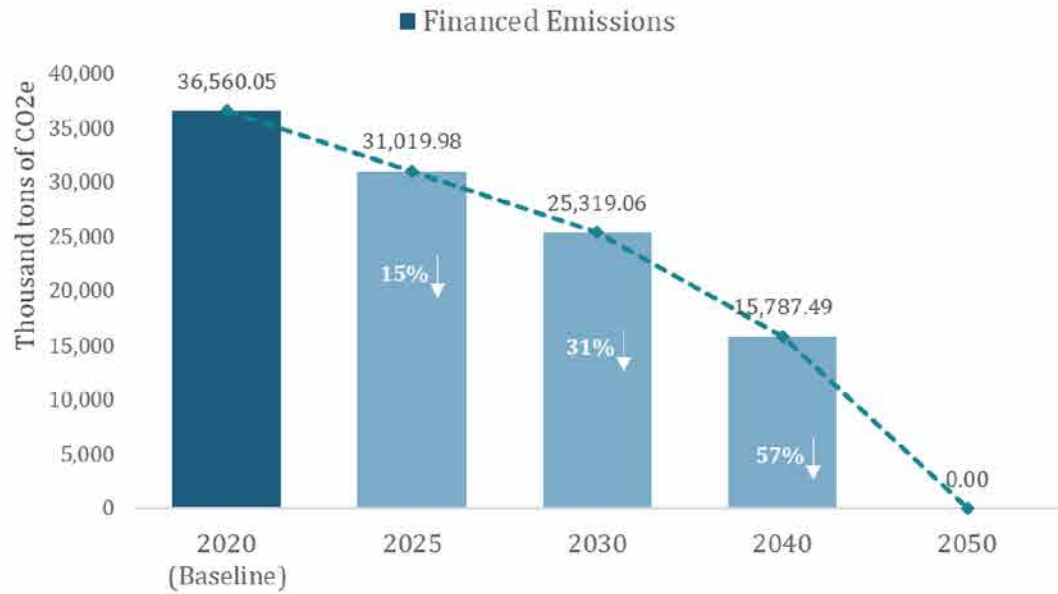
Shinhan Bank

DNV

Shinhan Bank’s target for achieving Net Zero



Shinhan Bank Internal GHG Emissions Reduction Targets – Scope 1, 2



Shinhan Bank Financed Emissions Reduction Targets – Scope 3

전환 금융 이해하기

転換金融の理解



Date	2026. 6. 17. (Wed) 14:00 ~ 17:00
Venue	Daishin Finance Center 5F
Hosted by	Daishin Economic Research Institute / Det Norske Veritas

DNV

Shinhan Bank's transition projects

- Manufacture of organic basic chemicals: Construction, operation and maintenance of manufacturing facilities of high value chemicals (ethylene, propylene, butadiene) and aromatics
- Waste heat recovery for manufacture of basic chemicals: Construction, operation and maintenance of waste heat recovery facilities from the manufacture of basic chemicals, including steam generation facilities from waste heat recovery.
- Point-source capture of carbon dioxide: Construction, operation and maintenance of carbon capture facilities from a point source in hydrogen production industrial facility.

DNV assessment: Classfied as amber project in accordance with Singapore Taxonomy or green projects in accordance with the EU Taxonomy and Korea Taxonomy

DNV assessment_Projects

Eligible Transition Asset Category	Eligibility Criteria	DNV Findings
Manufacture of organic basic chemicals	Construction, operation and maintenance of manufacturing facilities of high value chemicals (ethylene, propylene, butadiene) and aromatics that meet the below requirements: • At least 50% of annual production by volume is high value chemicals ("HVC") and/or aromatics; • Organic chemicals produced need to meet the below life-cycle GHG emission thresholds: ✓ HVC: 0.693 tCO_2e/t of HVC ✓ Aromatics: 0.137361tCO_2e/t of raw material	• At least 505 of annual production comes from HVC and/or aromatics: It is in alignment with the Technical Screening Criteria (TSC) of Amber Projects in Singapore-Asia Taxonomy of Sustainable Finance 2023 (S-A Taxonomy). • HVC: 0.693 tCO_2e/t of HVC: It is in line with TSC of the EU Taxonomy. • Aromatics: 0.137361tCO_2e/t of raw material: It is in line with TSC of the Korean Green Taxonomy (K-Taxonomy).

What else for eligibility checking?

1. The projects are material to the company's transition strategy?
   - By the Group's latest Double Materiality Assessment, 23 material issues were identified, while "Response to Climate Change" was selected as one of the most material issue among them.
2. Investment plan
   - In order to implement its Net Zero strategy, the Group will increase the amount of green and transition finance to KRW 30 trillion by 2030, which accounts for 60% increase compared to 2024.
3. Just transition, mitigation of negative impact, avoidance of lock-in:
   - When implementing green and transition finance, the Issuer considers four elements, "Activity", "Eligibility", "Exclusion", and " Do No Significant Harm (DNSH)".
   - The Equator Principles has been adhered to by the Bank
   - The Issuer adopted a "Coal Phase-Out Finance" policy in 2021, committing to cease project financing and bond underwriting for new coal-fired power plants globally.

Korea Transition Finance Guideline

DNV

Korea Transition Finance Guideline

전환금융 가이드라인

2026. 2.

금융위원회 · 기후에너지환경부 · 금융감독원

Two Pathways

1. Alternative 1: K-Taxonomy based approach
2. Alternative 2: Firm-level strategy based approach

CTFH vs Korea Transition Finance Guideline 1

Overall comparison

Category	ICMA Climate Transition Finance (CTFH)	Korea Transition Finance Guideline
Nature	Principles-based (voluntary market guidance)	Government-issued practical guideline (policy-oriented)
Regulatory strength	Non-binding	Non-binding but policy-backed (semi-regulatory guidance)
Primary focus	Transparency of issuer's transition strategy	Eligibility + implementation for financial institutions
Target users	Financial institutions + corporates	Financial institutions + corporates
Core philosophy	"Credible transition narrative"	"Achievable transition aligned with national policy & taxonomy"

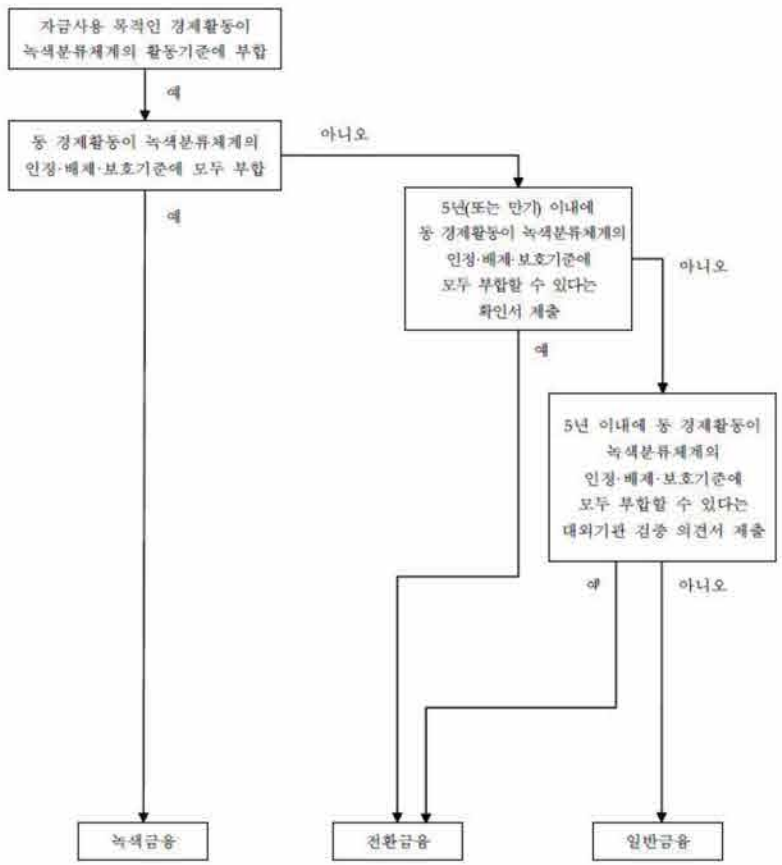
CTFH vs Korea Transition Finance Guideline 2

Activity Eligibility

Category	ICMA (CTFH)	Korea Guideline
Definition of transition project	Not strictly defined → must support issuer's transition strategy	Defined via two approaches: • **Taxonomy-based transition** • **Strategy-based transition**
Eligibility approach	Strategy-driven (top-down)	Hybrid: • Taxonomy (activity-level) • Strategy (firm-level)
Project-level criteria	No fixed thresholds (principles-based): still able to refer thresholds of taxonomies	Can rely on **K-Taxonomy criteria** + future compliance requirement (e.g., 5-year improvement)
Time-bound transition requirement	Implicit (via transition pathway)	Explicit: must meet taxonomy criteria **within 5 years or bond maturity (whichever shorter)**

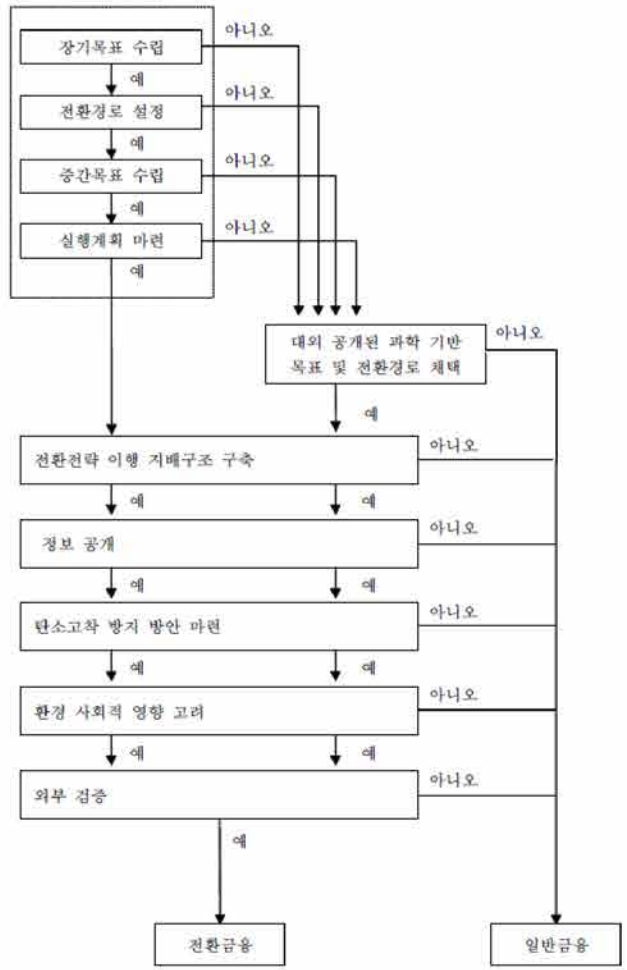
Korea Transition Finance Guideline_Taxonomy based

□ 녹색분류체계 기반 전환금융



Korea Transition Finance Guideline_Strategy based

□ 전환전략 기반 전환금융



WHEN TRUST MATTERS

Our vision

A trusted voice to tackle global transformations

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WHEN TRUST MATTERS

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Session 5

Case Study 사례 소개

Sharing External Review / SPOs experiences for the **Power**, **Chemicals**, and **Other** sectors

EXTERNAL REVIEW
DNV
Second Party Opinion



DNV Business Assurance Japan, K.K.
마사토 카네도메
Energy System, Sustainability Finance, Head of Section Japan

Today's Contents 목차

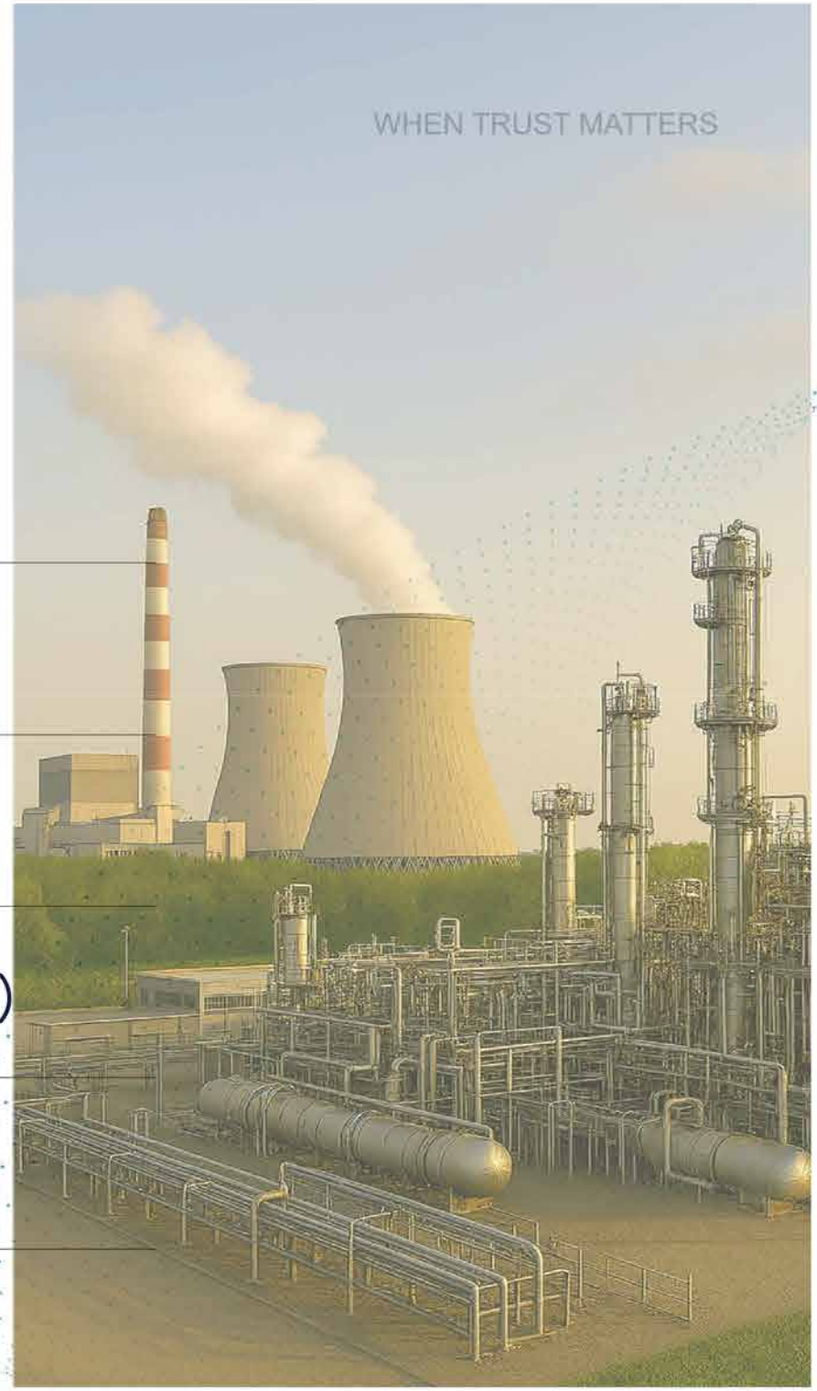
0. **Introduction**

1. **Transition Finance Experience** in Japan

2. **Case Study-1** Electricity (JERA)

3. **Case Study-2** Chemical Industry (Sumitomo Chem)

4. **Case Study-3** Maritime (Mitsui O.S.K. Line)



0. Introduction 자기소개



Masato Kanedome 마사토 카네도메

- **Hokkaido University,** Master's degree of Engineering in 2003
- **Seoul National University** official exchange student program in 2001
- **Professional Engineer, Jp.** 2010.

2003-2018 before joining DNV (technology background):
- **Energy System**
- **Chemistry, Metallurgy**
- **Environment, etc**

2018-2026 after joining DNV ;
- **ESG finance** external reviews
- **Corporate risk management** advisory services



JCTB Investor Relations in LA with METI MOF

In the ESG finance field, He contributes ESG finance initiatives through ;
- **METI Transition Finance** committee member
- **METI Asia Transition Finance acceleration** committee member
- **MOE Green Finance** committee member
- **JPX Sustainable Finance** committee member
- **SPO provider for JCTB** (Japan Climate Transition Bond)



平成13年度（第２回）韓国派遣学生レポート　119

平成13年度（第２回）韓国派遣学生レポート

日韓原子力学会協力協定に基づく日韓原子力学生交流事業「日韓原子力学生交流
トしました。第２回となる平成13年度は，北大・金留正人氏がソウル国立大に派遣
その報告です。

ソウル国立大学滞在記

北海道大学大学院工学研究科
物質工学専攻修士１年　金 留 正 人

ソウルでの生活

札幌新千歳空港からわずか２時間45分，日本に最も近い国，韓国。その首都ソウルは1392年の開城以来，様々な戦禍の歴史を経て，今では人口1,200万を抱える世界でも有数の近代都市です。1980年代の高度経済成長「漢江の奇跡」としてたたえられている漢江も，混沌としたソウルの街を悠然と流れている。私がソウルを訪れたのは梅雨真っ只中の７月でした。北海道の爽やかすぎる夏に慣れてしまっていた私は，額からにじみ出る汗を拭きながら，気持ち新たに「ここで，何かを得て日本に帰ろう！」と熱い思いを誓った。ソウルの街は想像以上に活気に満ちあふれていた。

私にとって初めての海外。私がお世話になったソウル国立大学校(Seoul National University)は，1946年創立の韓国でも有数の総合大学です。1975年にソウル中心部からソウル市南部の山の中腹に広大なキャンパスを移転し，その広さは構内をバスが循環しているほどでした。学校の寮に１ヵ月半お世話になったあと，残りの１ヵ月は研究室の先輩の家で過ごしました。

ソウルについてまず最初にしたことは食事でした。初日はトルソッ(石焼き)ビビンバ。次の日には焼き肉，その次は……。なんといっても韓国料理はすべておいしかった。そして，すっごい辛さだった。何度お尻の調子を壊したことかわかりません。あらゆる韓国料理を食べました。犬鍋だけが食べられなかったのが残念ですが……。韓国での食事はほとんどが学生食堂でしたが，いつも先輩に「Masato どうした？」と聞かれ，「いや，美味くて，スープが熱くて(hot)，辛くて(hot)しかも暑くて(hot)，もう言葉になりません」と毎食hot! hot! hot!を連呼していたような気がします。本当においしかった。

ソウルの街はとにかく人が多かったです。一番驚いたのは日本語を話せる方がたくさんいたということです。特に韓国の年配の方は日本語が話せます。それは，日本が昔，韓国を占領していた時代に強制的に日本語を覚えさせたからで，彼らは自主的に日本語を学んだわけではないので

す。私が一人で
と，「お前は日本
島問題について聞
うど私が韓国に滞
小泉首相の靖国神
行いとそのことに
の関係について
で，韓国の若い人
の若者文化にとて
勉強していつか日本へ行きたいという有名にもたくさん会いました。

日本はもっと韓国に関心を持つべきだと思いました。観光とか旅行としての韓国，日本に一番近い国だというだけでなく，日本がかつて韓国を占領し自由を奪った歴史，それに今を生きる我々にとって韓国はエネルギー事情の似ている日本と共に技術先進国として協力しあい発展していくべきだと強く思います。私はこの韓国留学で，内から見た韓国がわかると同時に，外から見た日本の姿もわかりました。良いところも悪いところもたくさん。そして，自分が日本人であるという自覚と，誇りを持つことができました。

研　究

研究は，朝の９時から夜遅くまで，午前様も珍しくないという生活をしていました。しかし，一度も大変だと思ったことはありませんでした。私がソウル大にお世話になっ

第１図　SNUの仲間達と(右から２番目が筆者)

日本原子力学会誌，Vol. 44, No. 1 (2002)　(119)

0. Introduction ~ Chronicle 역사~

Phase-1 Ignition ~2020

2019 -----
Hong Kong CLP Climate Action Bond

----- 2019
AXA IM Transition Guide

2021 -----

----- 2020
ICMA CTFH

----- 2020
UK Cadent Gas Transition Bond

----- 2020
Italy SNAM Transition Bond

Phase-2 Growth (2021-2023)

日本郵船
NYK Japan 1stTB
----- 2021
METI CTFBG &Subsidy Program

----- 2021
K-Taxonomy

九電グループ
ずっと先まで、明るくしたい。
----- 2022
METI Loan Interest Subsidy

----- 2023
>28 cases
>117 billion USD

Phase-3 Stable & Expand (2024-2025)

----- 2024
1st JCTB
16 trillion KRW

----- 2024
1st Nuclear Transition Bond

----- 2025
Yokohama Carbon Neutral Port

Phase-4 Boost (2025-)

Sapporo/Hokkaido Area Transition
2025 -----

----- 2025
METI CTBFG Updated

----- 2025
Shinhan Bank Transition Bond

Next Phase !

1. Transition Finance Experiences 전환 금융 실적

Legend "※"Grenn finance

Electricity/전력

- 東北電力 (より、そう、ちから。)
- 九電グループ (ずっと先まで、明るくしたい。)
- 関西電力※ (power with heart)
- ほくでん
- 四国電力 (しあわせのチカラになりたい。)
- J-POWER
- jera (Energy for a New Era) 中部電力
- TEPCO※
- 北陸電力

Oil&Gas/석유&가스

- TOKYO GAS
- 大阪ガス Daigas Group (あしたがすてきに!)
- 東邦ガス
- 西部ガスグループ (いつもの朝と、新しい明日を。)
- INPEX※
- idemitsu
- ENEOS※ ENEOS

Maritime/해상 운송

- 日本郵船
- MOL 商船三井

Paper/제지

- 大王製紙株式会社
- 王子ホールディングス※

Chemistry/화학

- 住友化学

製造業/제조업

- 三菱重工

Government /국가·지방자치단체

- JICN
- TSH (GXで世界の先頭へ, Team Sapporo Hokkaido)
- OPEN YOKOHAMA
- KOBE CITY of DESIGN

Food&Beverage/식품

Joy brings us together

- KIRIN

Financial Institution /금융기관

- SMBC 三井住友銀行 (SUMITOMO MITSUI BANKING CORPORATION)
- 一生涯のパートナー 第一生命 Dai-ichi Life Group
- 三菱HCキャピタル
- Tokyo Century
- FUYO LEASE GROUP
- MIZUHO みずほリース

鉄鋼/철강

航空/항공

自動車/자동차

DNV

1. Transition Finance Experience 대표적인 사례

전력

Energy for a New Era

https://www.jera.co.jp/en/ir/esgfinance/transition





写真-1 プロジェクト① JERA 碧南火力発電所 4 号機

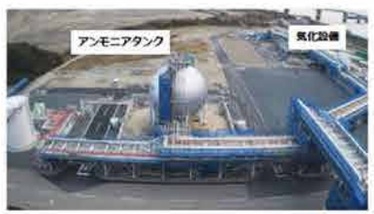


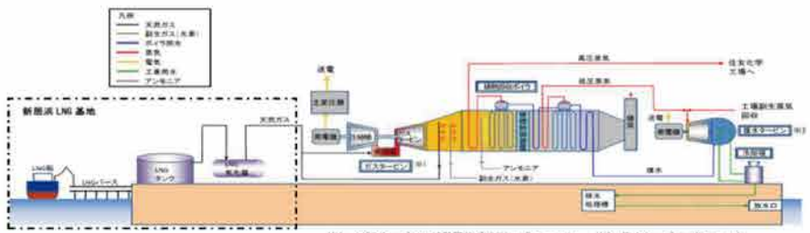
写真-2 プロジェクト① アンモニアタンクエリア工事状況
(2024 年 3 月時点)

화학

住友化学
Sumitomo Chemical

https://www.meti.go.jp/policy/energy_environment/global_warming/transition/transition_finance_case_study_sumitomochem_eng.pdf





※1：（ガスタービン＋排熱回収ボイラ）×3 ユニット、 ※2：蒸水タービン×2 ユニット

해상 운송

MOL
商船三井

https://www.mol.co.jp/en/sustainability/finance/





DNV

2. Case Study-1 ~Electricity 전력~

Energy for a New Era

1KRW=0.1JPY

No.	date	type	outline
01	2022.May	CTB	**Amount :** 120b-KRW 10year, 80b-KRW 5year **UoP :** ▪ H_2&NH_3 Co-firing project ▪ Retirement of low-efficient thermal power
02	2022.Aug	CTLL	**Amount :** confidential (DBJ) **KPI :** CO_2 emission factor **SPT :** -20% by 2030 (vs gov.plan)
03	2023.Apr	CTLL	**Amount :** 176b-KRW (syndicate)
04	2024.Feb	CTLB	**Amount :** 100b-KRW 10year
05	2024.Nov	CTLB	**Amount :** 150b-KRW 7year
06	2025.Feb	CTLB	**Amount :** 122b-KRW 10

CTB/CTL : **UoP type** Climate Transition Bond/Loan
CTLB/CTLL : **Link Type** Climate Transition Linked Bond/Loan

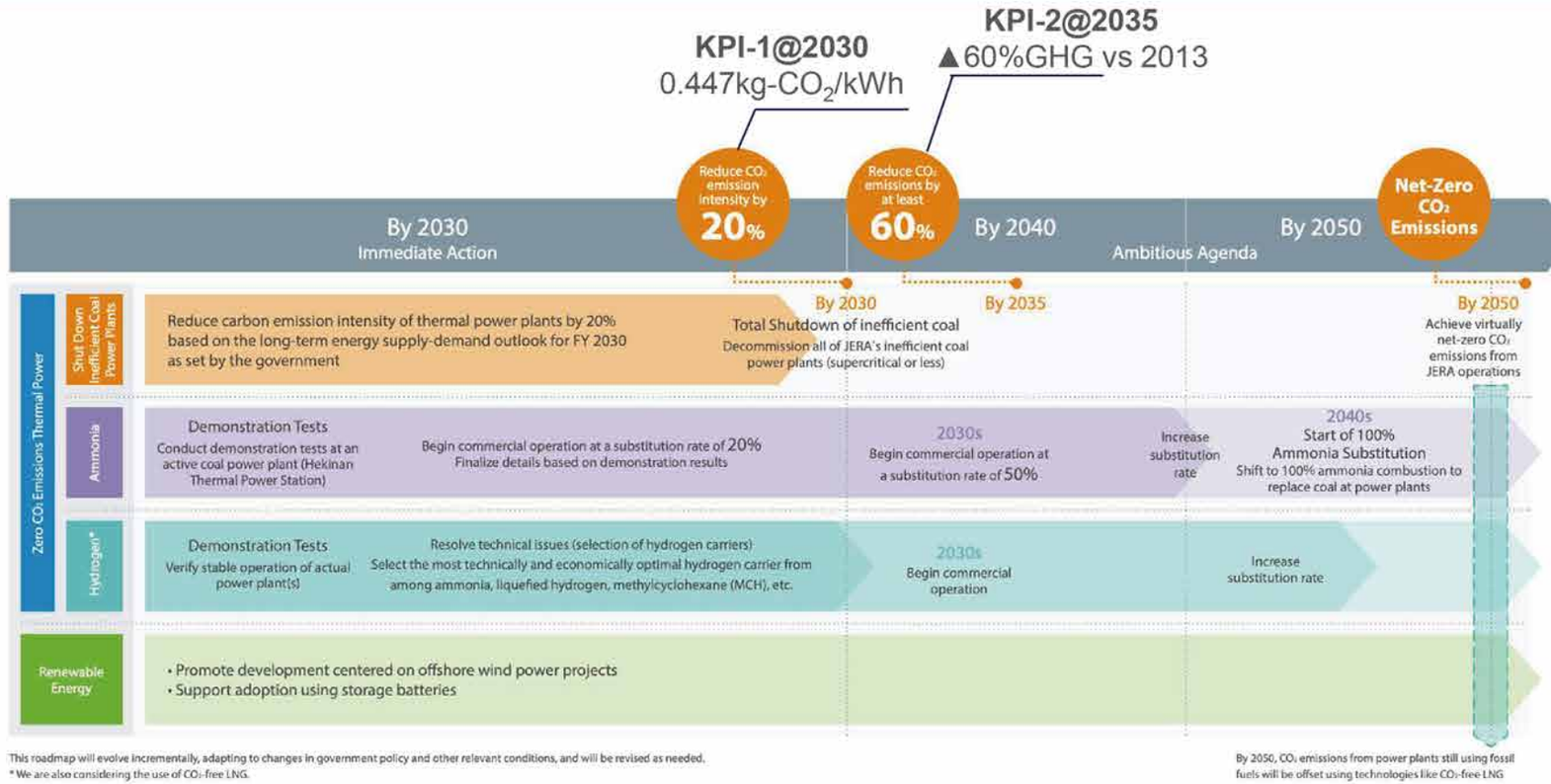




写真-1 プロジェクト① JERA 碧南火力発電所 4 号機



写真-2 プロジェクト① アンモニアタンクエリア工事状況
(2024 年 3 月時点)





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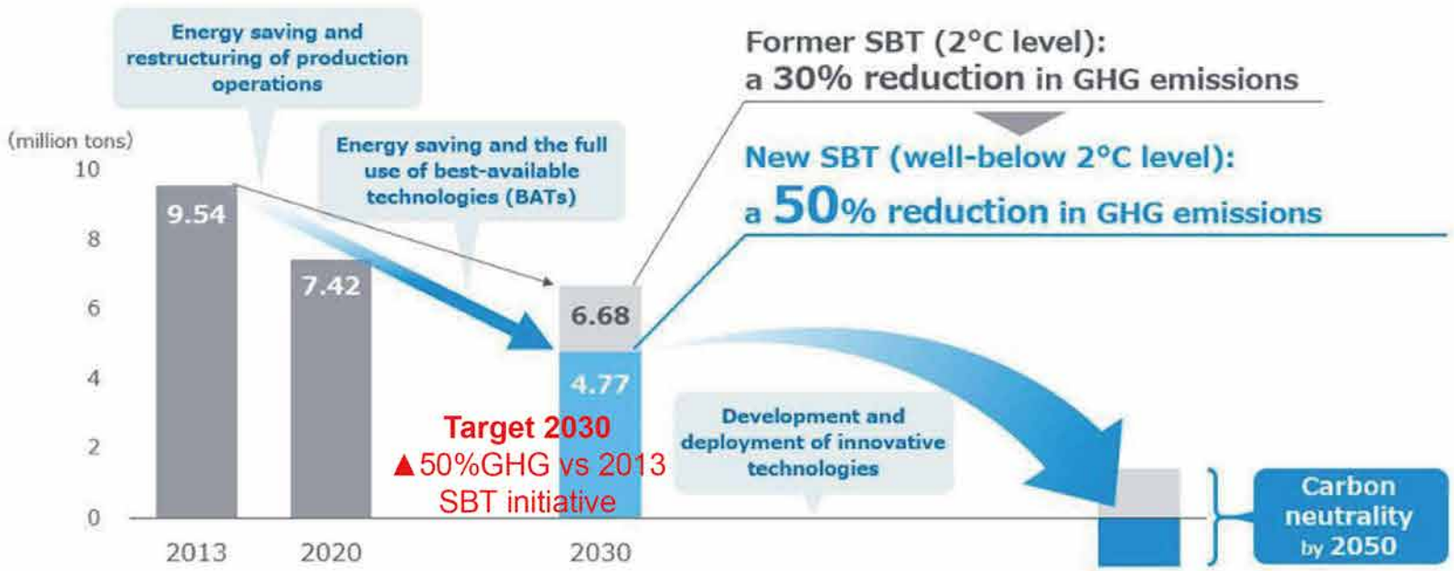
3. Case Study-2 ~Chemical Industry 화학~

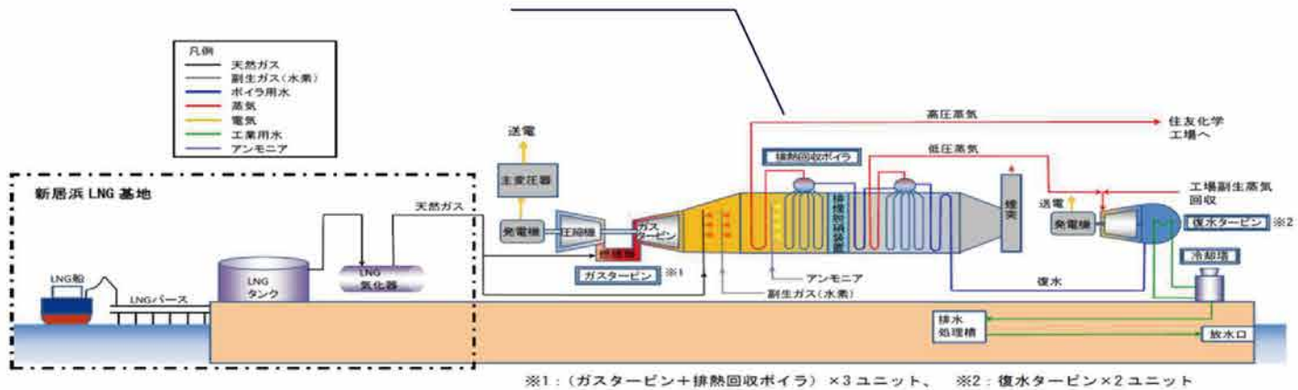
住友化学
Sumitomo Chemical

1KRW=0.1JPY

No.	date	type	outline
01	2022.Mar	CTL	**Amount :** 80b-KRW 9year (Syndicate, Sumitomo Mitsui Bank) **UoP :** ▪ High-efficiency GTCC
02	2022.Sep	CTL	**Amount :** 100b-KRW 10year (Syndicate, Sumitomo Mitsui Bank) **UoP :** ▪ High-efficiency GTCC

CTB/CTL : **UoP type** Climate Transition Bond/Loan
CTLB/CTLL : **Link Type** Climate Transition Linked Bond/Loan





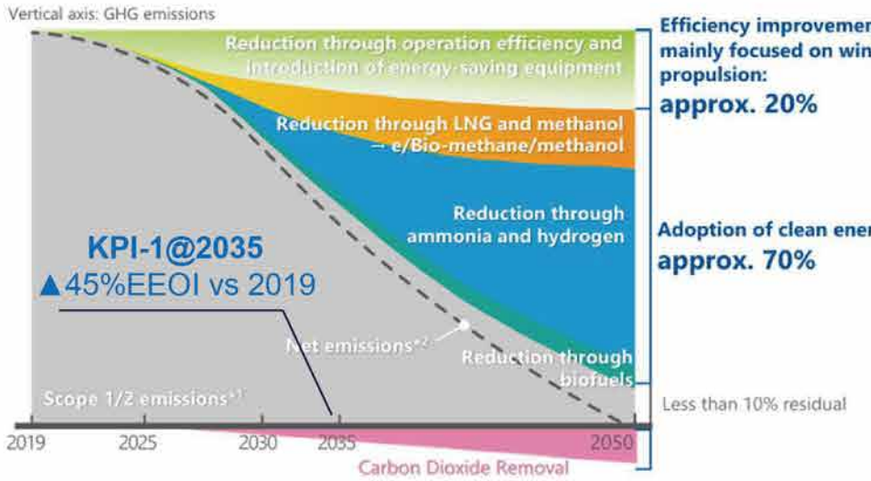
4. Case Study-3 ~ Maritime 해상 운송~

MOL 商船三井

1KRW=0.1JPY

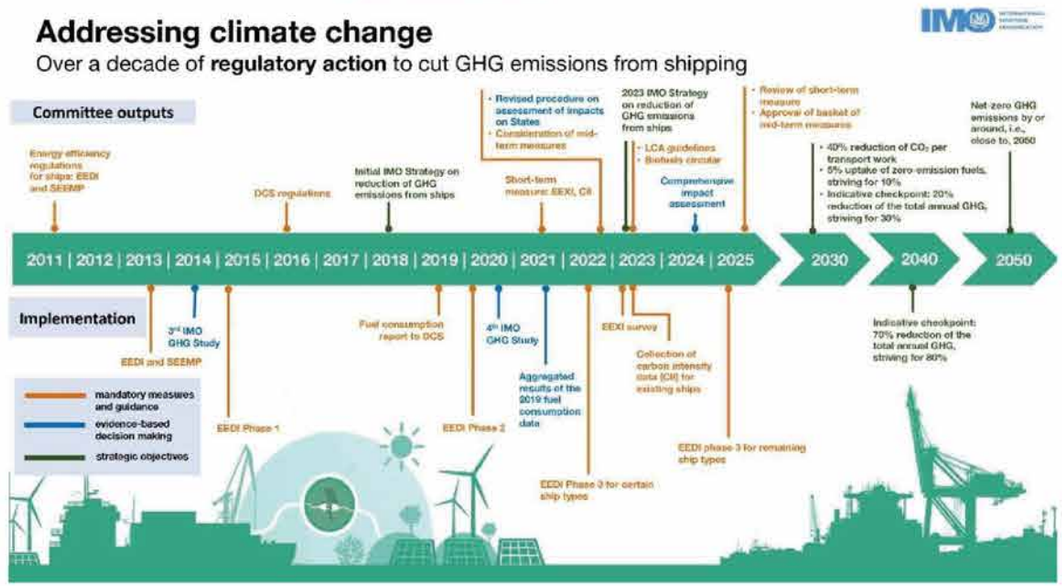
No.	date	type	outline
01	2022.Dec	CTLL	**Amount :** Confidential **KPI :** EEOI(Energy Efficiency Operation Indicator g-CO_2/mile/Ton) **SPT :** ▲45% by 2030 (vs 2019)
02	2023.Mar	CTLL	Same above CTLL
03	2023.Dec	CTLL	Same above CTLL
04	2023.Dec	CTL	**Amount : confidential** **UoP :** LNG fuel (dual) construction×2
05	2023.Dec	CTL	**Amount : confidential** **UoP :** Wind Challenger bulker
06	2023.Dec	CTL	**Amount : confidential** **UoP :** LNG fuel (dual) construction×2
07	2023.Dec	BB	**Amout :** 200b-KRW **UoP :** Offshore wind power, operation efficiency, Ballast water treatment, SO_X scrubber
08	2023.Dec	CTLL	Same above CTLL
09	2024.Apr	CTLL	Same above CTLL
10	2024.Sep	CTLL	Same above CTLL
11	2025.Jul	CTLL	Same above CTLL
12	2026.Mar	CTLL	Same above CTLL

CTB/CTL : **UoP type** Climate Transition Bond/Loan, BB **: UoP type** Blue Bond
CTLB/CTLL : **Link Type** Climate Transition Linked Bond/Loan





Project : Wind Challenger with LNG fuel
Route : Korea (Busan) – Nagasaki (Japan)



About DNV

WHEN TRUST MATTERS

About DNV

Driven by our purpose of safeguarding life, property and the environment, DNV enables organisations to advance the safety and sustainability of their business. With our origins stretching back to 1864, we are today a leading provider of services for managing risk, with a global presence of more than 300 offices in over 100 different countries. Our 16,000 professionals are dedicated to helping customers make the world safer, smarter and greener.

Combining leading technical and operational expertise, risk methodology and in-depth industry knowledge, we empower our customers' decisions and actions with trust and confidence. We continuously invest in research and collaborative innovation to provide customers and society with operational and technological foresight. This means continuously developing new approaches to health, safety, quality and environmental management, so businesses can run smoothly in a world full of surprises.

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DNV

Sustainable Finance Markets and Transition Finance in Japan

2026. 6. 17

Introduction

The Nomura Group marked its 100th anniversary on December 25, 2025. The spirit that has been passed down since its founding is reflected in the purpose established in 2024: “We aspire to create a better world by harnessing the power of financial markets”.

As a leading Japanese securities firm, Nomura provides services through the capital markets to individual investors and a wide range of corporate clients.

In its Investment Banking division, Nomura supports corporate clients in raising capital through underwriting and enhancing corporate value through M&A services.

Globally, Nomura has approximately 27,000 professionals and has built a strong platform connecting more than 100 locations across about 30 countries and regions worldwide.



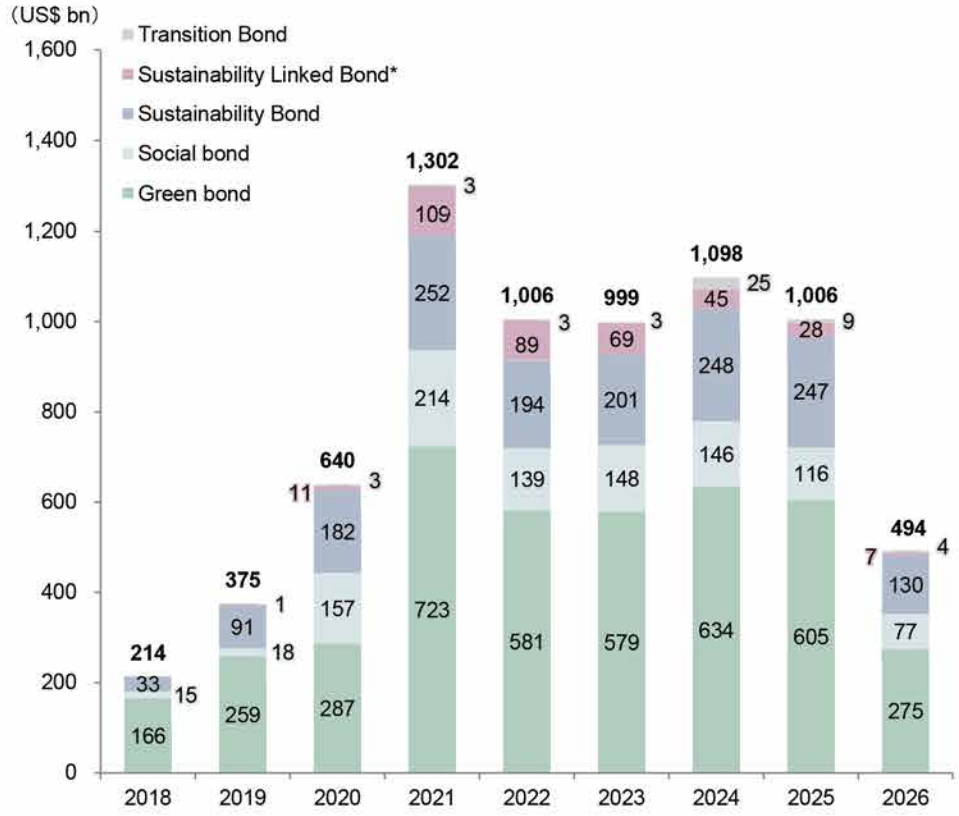
Nomura Holdings issued JPY50 billion (approximately KRW455 billion) in green bonds in May 2026 to finance the acquisition of retained floor space in the new Nihonbashi headquarters building. Nihonbashi Nomura Mitsui Tower, to which our headquarters will be relocated, is scheduled to obtain DBJ Green Building certification as a property that demonstrates consideration for the environment and society.

Source:

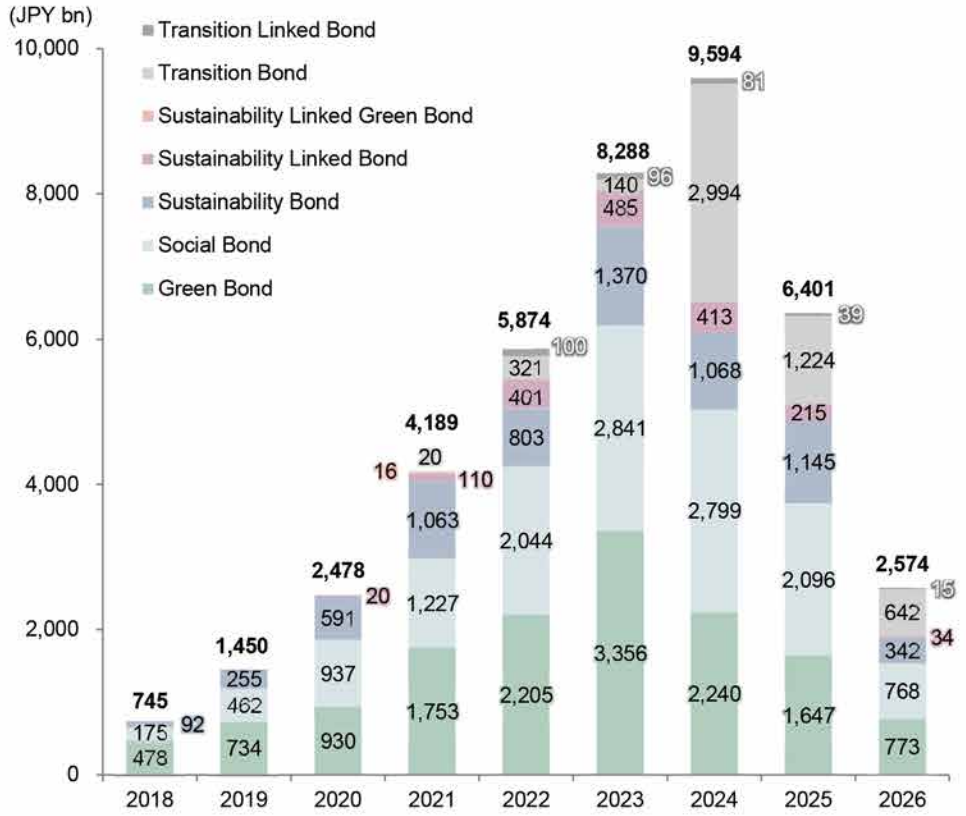
Overview of the Sustainable Finance Market

- **Global sustainable bond issuance rose in 2024 vs 2023 and remains steady in 2025 with green bonds still the leading label.**
- **In Japan issuance fell in 2025 as issuers favored faster unlabeled bonds amid rising rate expectations since labeled deals take longer to execute**
- **Japan Climate Transition Bond started to issue in 2024 and have issued continuously on the back of government's transition projects.**

Global Sustainable Finance debt issuance



Domestic Sustainable Finance debt issuance (Japanese issuers)

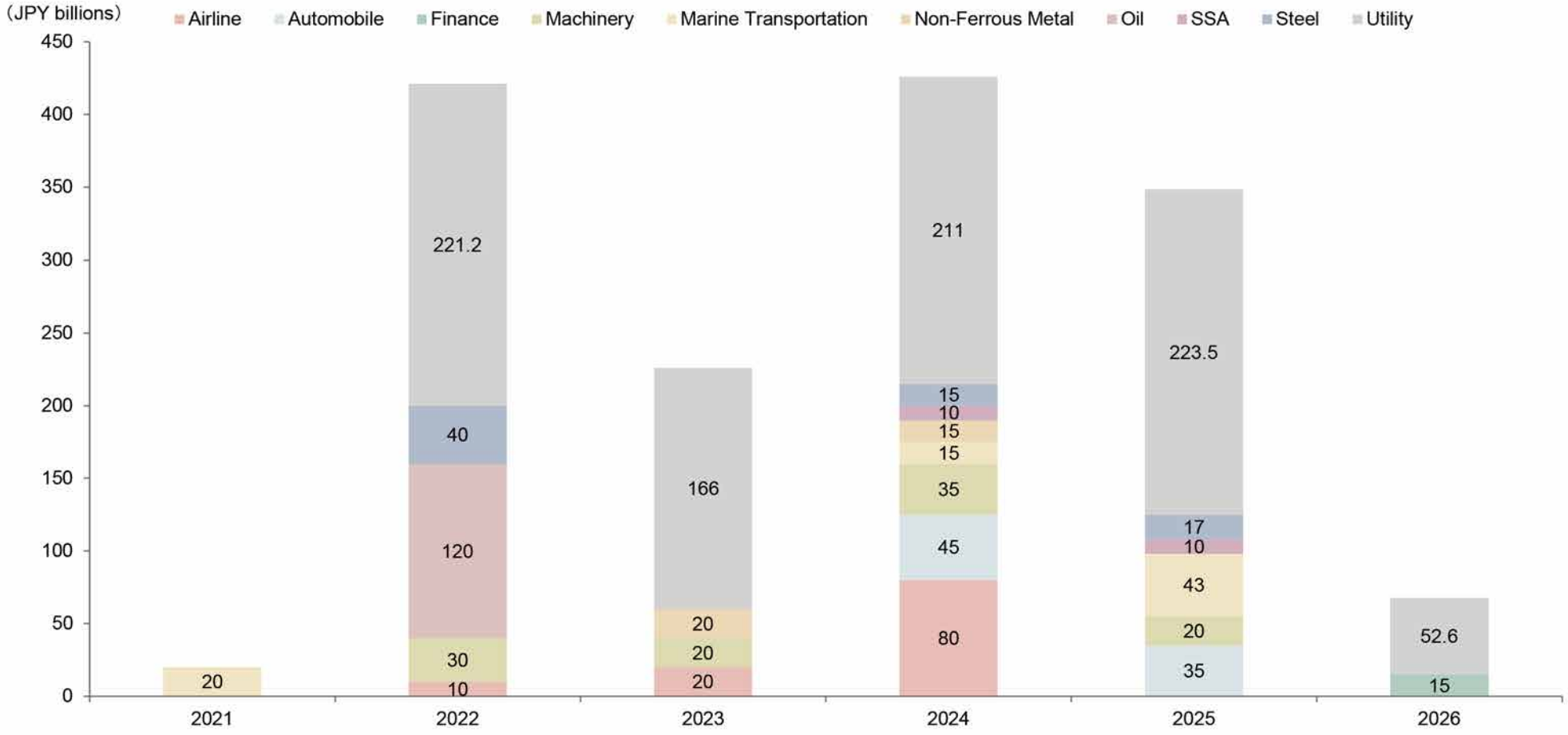


** When a bond has both Sustainability-linked bonds and other ESG labels, tallied in the sustainability-linked bond.*
Source: Nomura, Bloomberg (as of May 22, 2026)

Transition Finance in Japan

- **Historically, Japan has had a significant number of large manufacturing industries with substantial CO_2 emissions**
- **Financing the transition from a Brown economy to a Green economy is crucial to support technological advancement during the transition phase and to achieve maximum emission reductions**

Issuance of Transition Bonds by Japanese Corporates



Source: Market Data

Basic Structure of the Transition Finance Framework (Use of Proceeds)

NOMURA

- **A Transition Finance Framework aligned with documents such as the Green Bond Principles, Climate Transition Bond Guidelines, and Climate Transition Finance Handbook must be formulated when issuing transition bonds (include Sustainability-Linked Bond Principles if issuing transition-linked bonds)**
- **It is vital that the framework presents a clear transition strategy (decarbonization plans and targets) along with the issuer's commitment to decarbonization in order to ensure the transparency of transition bonds**

[Structure of the framework]

Introduction
Company profile, overview of the framework, etc.

Transition strategy (Alignment with CTFH disclosure requirements)

Alignment with ICMA GBP/CTBG*

1	Use of proceeds For each green/CT project	■ Eligibility criteria for green/CT projects ■ Alignment with CT project roadmaps, handling of carbon lock-in risk ■ Future decarbonization plans for CT projects
2	Process for project evaluation and selection	■ Method for selecting green/CT projects, process (incl. confirming alignment with roadmaps) ■ Handling of risk that a project may have a material negative social or environmental impact
3	Management of proceeds	■ Method for managing proceeds of green/CT bonds ■ Method for using unallocated funds and timing of allocation
4	Reporting For each green/CT project	■ Overview, allocated/unallocated funds, and rate of refinancing for each project ■ Eligibility criteria, impact reporting items for each project

[A clear climate transition story]

1. Issuer's climate transition strategy and governance
2. Business model environmental materiality
3. Climate transition strategy and targets to be science-based
4. Implementation transparency

- Clearly state alignment with the four elements set out in the ICMA's Climate Transition Finance Handbook, Basic Guidelines on Climate Transition Finance, etc.
- The transition story must include the issuer's medium- to long-term decarbonization strategy and reduction targets, alignment with the METI roadmap, etc., and a basic investment plan to implement the transition

**The above assumes the issuance of use-of-proceeds (UoP) bonds. In the case of sustainability-linked (non-UoP) bonds, include the five elements in line with ICMA Sustainability-Linked Bond Principles, etc.*
Source: Nomura Securities

Transition Finance Initiatives by Major Japanese Investors

- **Japanese asset owners, including life insurers, have formalized and published specific investment guidelines for transition finance.**

Nippon Life Insurance Company	Nippon Life established its "Transition Finance Implementation Guidelines" in June 2024 to define specific evaluation criteria and processes. The guidelines clarify quantitative standards to assess whether corporate GHG reduction plans are scientifically aligned with the Paris Agreement's 1.5 degrees pathway. Currently, the framework prioritizes the Power and Steel sectors, where financial support for decarbonization is most critical.
Dai-ichi Life Insurance Company	Revised its "Policy on Transition Finance" in April 2026, Dai-ichi Life's policy actively supports companies aiming to transform their business models, equipment, and technologies for a net-zero society. The firm provides proactive financing for GHG reduction efforts that are rooted in long-term transition strategies. The ultimate objective is to achieve a net-zero emissions investment portfolio by 2050 while contributing to a decarbonized economy.
Government Pension Investment Fund (GPIF)	In its "Sustainability Investment Policy" published in March 2025, GPIF positions ESG Integration as one of its "Main Initiatives" for future operations. This policy serves as a foundational framework for its sustainability-conscious investment activities. The fund's track record in ESG bond investment explicitly includes Japan's "Climate Transition Bonds" (GX Economy Transition Bonds)..

Source: Created by Nomura Securities based on Nipppn Life (June 2024) "Transition Finance Implementation Guidelines" , Daiichi Life(April 2026)"Policy on Transition Finance" and GPIF(March 2025) "Sustainability Investment Policy" .

Case Study : JFE Holdings Transition Bond

JFE Holdings Transition Bond

- The JFE Group (The Group) regards the issue of climate change as a critically important management challenge. The Group has formulated the "JFE Group Environmental Management Vision 2050" aimed at achieving carbon neutrality, as well as "JFE Vision 2035," a long-term target for 10 years ahead, and the Eighth Medium-Term Management Plan, its growth strategy for realizing that vision, and is advancing its GX (green transformation) strategy across the entire group. To raise the funds necessary for these initiatives, the Group also plans to continue utilizing transition finance.

Series	JFE Holdings #36 Unsecured bonds (Transition Bonds)	JFE Holdings #37 Unsecured bonds (Transition Bonds)	JFE Holdings #38 Unsecured bonds (Transition Bonds)	JFE Holdings #39 Unsecured bonds (Transition Bonds)
Tenor	5 years	10 years	5 years	10 years
Amount	JPY25bn	JPY5bn	JPY15bn	JPY17bn
Credit Ratings	A(R&I)、AA-(JCR)		A+(R&I)、AA-(JCR)	A+(R&I)、AA-(JCR)
SPO provider	JCR		JCR	JCR
Coupon	0.330%	0.579%	0.823%	2.184%
Pricing	Jun. 3, 2022		Jul. 4, 2024	Oct. 17, 2025
Book Runners	Nomura, Mitsubishi, Mizuho	Mizuho, Nomura, Daiwa	Daiwa, Mizuho, Nomura, SMBC Nikko	SMBC Nikko, Daiwa, Nomura, TokaiTokyo
Structuring Agent	Nomura		Nomura	-

Source: JFE Holdings website and market data (Translated by Nomura)

Case Study : JFE Holdings Transition Bond

Excerpt from Green / Transition Finance Eligible Projects in "Use of Proceeds"

Use of Proceeds Category and Sub-category		Project Examples	Reporting Items
Development of ultra-innovative steelmaking processes		▪ R&D expenditures related to carbon recycled blast furnaces, CCU, hydrogen steelmaking, and high-grade steel manufacturing in electric furnaces.	▪ Disclosure of research results to the extent possible
Transition to Low-Carbon Manufacturing Processes		▪ Expenditures related to the expansion of existing electric furnaces and the introduction of high-efficiency, large-scale electric furnaces (capital investment funds) ＊ ▪ Expenditures related to the production of reduced iron (capital investment and equity investments), and costs associated with procuring low-carbon reduced iron ▪ Expenditures related to the expansion of LNG supply network capacity (capital investment funds) ▪ Expenditures related to the construction of hydrogen infrastructure (capital investment funds) ＊ ▪ Expenditures related to CCS-related facilities (CO_2 separation, capture, liquefaction, storage, and shipping facilities) (capital investment funds) ▪ Investment for the utilization of direct reduced iron in blast furnaces	▪ CO_2 reduction amount (t-CO_2(e)) ▪ Expected environmental benefits
Energy Saving and High Efficiency Initiatives	**Introduction of Cyber-Physical Systems (CPS)**	▪ Deploying DS technology (AI/IoT) to detect abnormal signs and predict heat conditions in blast furnaces to optimize operational stability(CAPEX)	▪ Estimated CO_2 reduction amount of the allocated equipment (t-CO_2)
	Expansion of Scrap Utilization	▪ R&D and CAPEX aimed at increasing scrap usage in converters (Targeting > 20% scrap ratio)	
	Equipment Upgrades & Coke Oven Refurbishment	▪ Coke oven refurbishment to improve combustion efficiency ▪ Renewal of hot blast stoves, boilers, and air separators.	
	Waste Heat & By-product Gas Recovery	▪ Expenditures for the effective utilization of waste heat and by-product gas generated at steelworks	
	Resource Conservation	▪ Expenditures aimed at reducing the volume of reducing agents (coke/coal) used in blast furnaces	

＊= *Projects recognized as green projects*
Source: JFE Holdings Green/Transition Framework

Case Study : JFE Holdings Transition Bond

Excerpt from Green / Transition Finance Eligible Projects in "Use of Proceeds" (Continued)

Use of Proceeds Category and Sub-category		Project Examples	Reporting Items
Manufacturing eco-friendly products *	**High-Value-Added Electrical Steel Sheets**	▪ Manufacturing and establishment of processing centers for top-grade non-oriented electrical steel (essential for EV motors)	▪ Estimated CO_2 reduction through the introduction of electrical steel sheets
	Manufacturing of equipment for offshore wind power generation	▪ Expenditures related to the manufacturing of equipment for offshore wind power generation (capital investment funds, research and development funds, and working capital)	▪ Number of units corresponding to the manufacturing portion (estimated), power generation capacity (estimated)
Renewable energy *	**Biomass, Geothermal, and Solar Power**	▪ Renewable energy business initiatives including Engineering, Procurement, Construction (EPC) and operations	▪ Facility capacity (MW) ▪ Power generation (kWh) ▪ CO_2 reduction amount (t-CO_2(e))
Circular Economy Initiatives *	**Resource Recovery of Waste Plastics**	▪ Expenditures for the recycling and resource recovery of waste plastics used as raw material in steelmaking	▪ Amount of waste recycled (tons) ▪ CO_2 reduction amount (t-CO_2(e))
	Horizontal recycling of PET bottles	▪ Expenditures related to the horizontal recycling of PET bottles (equity investments, loans)	
	Food recycling	▪ Expenditures related to the conversion of food waste into electricity and fertilizer (capital investment)	▪ Power generation (kWh), CO_2 reduction amount (t-CO_2(e))
	Chemical recycling of waste	▪ Expenditures related to the process of gasifying waste and synthesizing ethanol from purified gas (R&D)	▪ CO_2 reduction amount (t-CO_2(e))

* = *Projects recognized as green projects*
Source: JFE Holdings Green/Transition Framework

Case Study : JFE Holdings Transition Bond

Funding Allocation Status / Impact Reporting

	Eligible Project Category	Specific Project / Item	Allocated Amount	Estimated CO_2 Reduction (Impact)
36th & 37th Transition Bonds June 9, 2022 JPY30.0bn	Energy Saving & High Efficiency	Coke oven refurbishment,, and Waste heat recovery	JPY17.2bn	264k t-CO_2 / year (Aggregate for steel projects)
		Resource conservation	JPY11.2bn	
		Waste heat recovery	JPY0.5bn	
		AI/IoT & Cyber-Physical Systems (CPS) for blast furnaces	JPY0.2bn	
	Manufacturing of Eco-Products	High-value-added electrical steel sheets (for EV motors)	JPY0.9bn	1,500k t-CO_2 / year (Avoided emissions benefit)
38th Transition Bonds July 10, 2024 JPY15.0bn	Energy Saving & High Efficiency	Coke oven refurbishment and equipment upgrades	JPY13.8bn	495k t-CO_2 / year (Aggregate for the 38th bond)
	Energy Saving & High Efficiency	Waste heat and by-product gas recovery and effective utilization	JPY0.3bn	
	Energy Saving & High Efficiency	Resource conservation (reduction of agents in blast furnaces)	JPY0.9bn	
Transition Loan February 29, 2024 JPY10.0bn	Energy Saving & High Efficiency	Expansion of scrap steel use	JPY0.8bn	526k t-CO_2 / year (Aggregate for the Transition Loan)
		Coke oven refurbishment and equipment upgrades	JPY3.7bn	
		Waste heat and by-product gas recovery and effective utilization	JPY0.5bn	
		Resource conservation	JPY3.0bn	
		Waste plastic recycling	JPY2.0bn	

Examples of candidates of use of proceeds

Coke furnaces



Eco-friendly products

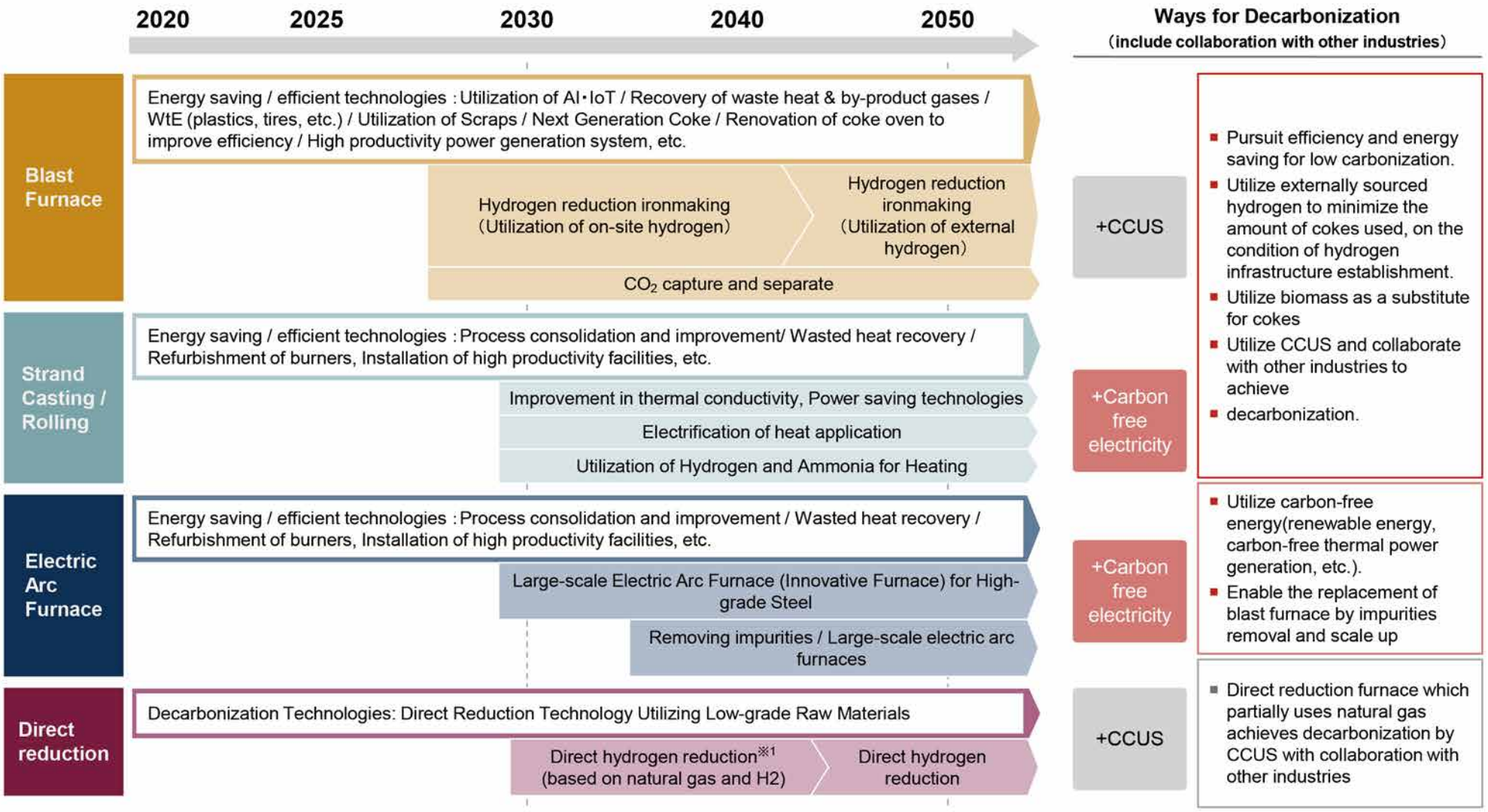


Electrical steel sheets for motor cores

Note 1: Even in cases where proceeds are allocated to only a portion of the equipment, the total CO_2 reduction effects of the relevant equipment are recorded in full.
Note 2: The estimated CO_2 reduction effects may partially overlap with funds raised under other financing items / categories.
Source: Integrated Impact Reporting (Transition Finance) impact_report.pdf (Translated by Nomura)

Case Study : JFE Holdings Transition Bond

METI Technology Pathways to Decarbonation : Technology Roadmap for Iron and Steel (revised 2026 Feb.)



※1 While domestic adoption has been hindered by unmet requirements (such as quality, scale, and cost), the transition from BF to EAF processes may lead to the accelerated use of imported reduced iron.
Source:METI (Translated by Nomura)

Shinhan Bank（The first Transition Samurai）
Case study

NOMURA

Publication Overview

Shinhan Bank

Transition Bond
2 years / 3.25 years / 5 years 40 billion yen

Issuer	**Shinhan Bank**			
Issue Date	November 13, 2025			
Maturity Date	November 12, 2027	February 9, 2029		November 13, 2030
Tenor	2 years	3.25 years		5 years
Issue Size	7.5 billion yen	21 billion yen	1 billion yen	10.5 billion yen
Coupon	FXD	FXD	FRN	FXD
	1.322%	1.556%	TONA Compound +50bps	1.732%
Rating	Moody's: Aa3, S&P: A+, Fitch: A, JCR: AA			
Book Runners	Mizuho, Daiwa, **Nomura**			
SPO	DNV			

Use of proceeds and Impact Reporting Items in the Framework

Eligible Transition Asset Category	Eligibility Criteria	Impact Reporting Items (Example)
Manufacture of organic basic chemicals	Construction, operation and maintenance of manufacturing facilities of high value chemicals (ethylene, propylene, butadiene) and aromatics that meet the below requirements: At least 50% of annual production by volume is high value chemicals ("HVC") and / or aromatics; Manufacture of organic basic chemicals Organic chemicals produced need to meet the below life-cycle GHG emission thresholds: ▪ HVC: 0.693 tCO_2e / t of HVC ▪ Aromatics: 0.137361tCO_2e / t of raw material Where the HVC or aromatics are produced wholly or partially from renewable feedstock, the life-cycle GHG emissions of the manufactured chemical is lower than the life-cycle GHG emissions of the equivalent chemical manufactured from fossil fuel feedstock. Quantified life-cycle GHG emissions are verified by an independent third party.	▪ (Expected) annual GHG emissions reduced / avoided (metric tonnes of CO_2 equivalent) ▪ Carbon / energy intensity of the HVC or aromatics produced
Waste heat recovery for manufacture of basic chemicals	Construction, operation and maintenance of waste heat recovery facilities from the manufacture of basic chemicals, including steam generation facilities from waste heat recovery.	▪ (Expected) annual GHG emissions reduced / avoided (metric tonnes of CO_2 ▪ equivalent) ▪ Tonnes of steam produced from waste heat recovery
Point-source capture of carbon dioxide	Construction, operation and maintenance of carbon capture facilities from a point source in hydrogen production industrial facility.	▪ (Expected) annual CO_2 emissions captured from the CO_2 capture facility ▪ (Expected) annual CO_2 emissions avoided

Source: Created by Nomura Securities based on Bloomberg, framework, explanatory materials, and SPO

Market overview in International JPY Market

- **In 2025, the overall market size has shrunk compared to the previous years, standing at around JPY2.1trn in 2025**
- **3yr or shorter represents nearly 50% of the supply in 2025**

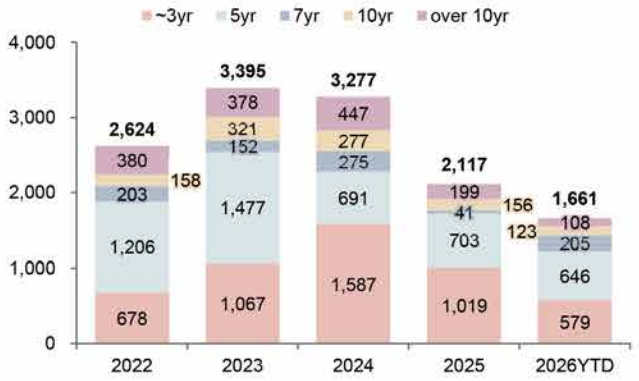
International JPY Primary Issuance Volumes

(JPY bn)

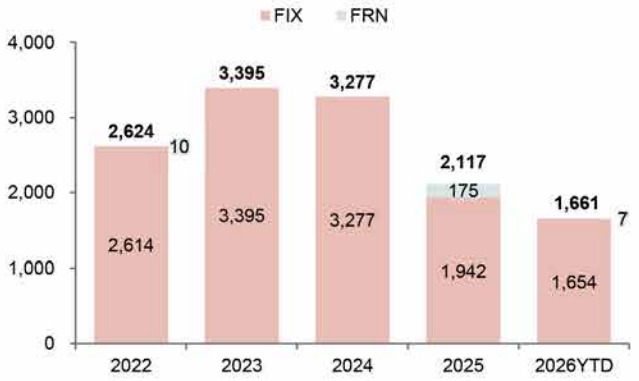
By Quarter



By Tenor



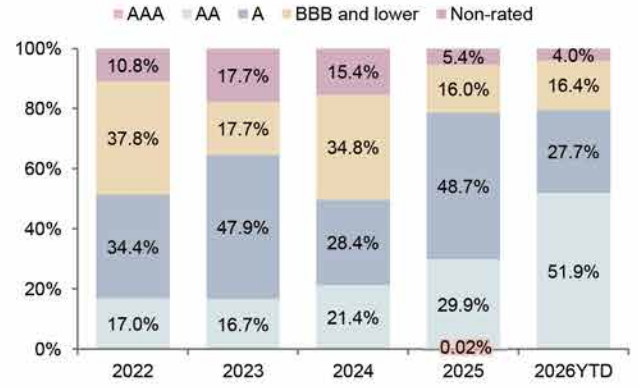
By Coupon Type



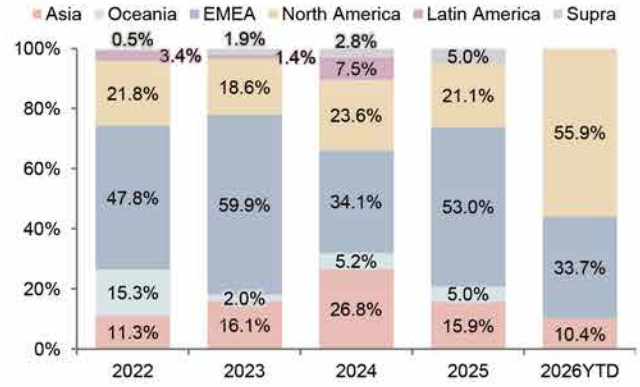
By Sector



By Rating*



By Domicile Region



*Source: Nomura, Bloomberg. As of 22 May 2026 *Including all Samurai, Global-Yen, Euro-Yen, Pro-Bond, Shibosai. Counted based on the lowest rating, non-rated includes JBIC Gtd PP.*

New Issue Market Overview
International JPY market 2025-2026YTD

NOMURA

- **2025 supply reached JPY2.1trn+ with active supply from SSA and FIG space in both Samurai and Euro-Yen formats.**
- **2026 kicked off with Credit Agricole printing total of JPY115bn across 7 tranches composing with various types of products. Poland built the largest ever Samurai by sovereign and Alphabet launched largest ever International Yen transaction in history**

(JPY bn)		2025												2026				
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Asia Pacific	SSA					Indonesia 103.2					Korea 110.0						Indonesia 172.1	
	FIG						ASB Bank 27.6			NAB 60.3		Shinhan Bank 40.0	NAB 18.0					
												Golomt Bank 15.0						
	Corp	KAL 30.0	KT 30.0															
EMEA	SSA							Cote d'Ivoire 50.0			BGK 47.3	Slovenia 31.0	Angola 40.0		Poland 211.6			
												Afrexim 81.8						
	FIG	Credit Agricole 94.3				DB 69.6	Swedbank 46.9			HSBC 101.0	BFCM 67.0		BPCE 77.3	Credit Agricole 115.0			First Abu Dhabi Bank 16.0	Barclays 75.0
						Nordea 53.5	BPCE 101.9			OP Bank 11.1								AFLAC 65.9
						Credit Agricole 85.0												
	Corp				LSEGA Financing 40.0		Severn Trent Utilities Finance 10.0	EDF 75.8				Renault 95.2						Renault 159.0
Americas	SSA									CAF 20.9								
	FIG				Athene Global Funding 12.137	Aflac 74.9	Federation des caisses Dejardins 20.0	RBC 26.0		TD Bank 14.0		Berkshire Hathaway 210.1		Pacific Life Global Funding II 14.0			Berkshire Hathaway 272.3	
					Berkshire Hathaway 90.0													
	Corp																	Alphabet 576.5

: Samurai : Global / Euro-Yen : JBIC Guaranteed : Shibosai (PP)

*Note: *Including all Samurai bonds, all syndicated deals, and sole-led Euro-Yen / Global-Yen deals over JPY10bn*

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