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Capital markets perspective on sustainability:

How finance will drive the green transformation

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“The financial sector is expected to play a key role in financing the transition to a greener and more sustainable economy…”

The European Commission’s 2018 Action Plan

Green View – mining & metals among worst polluters

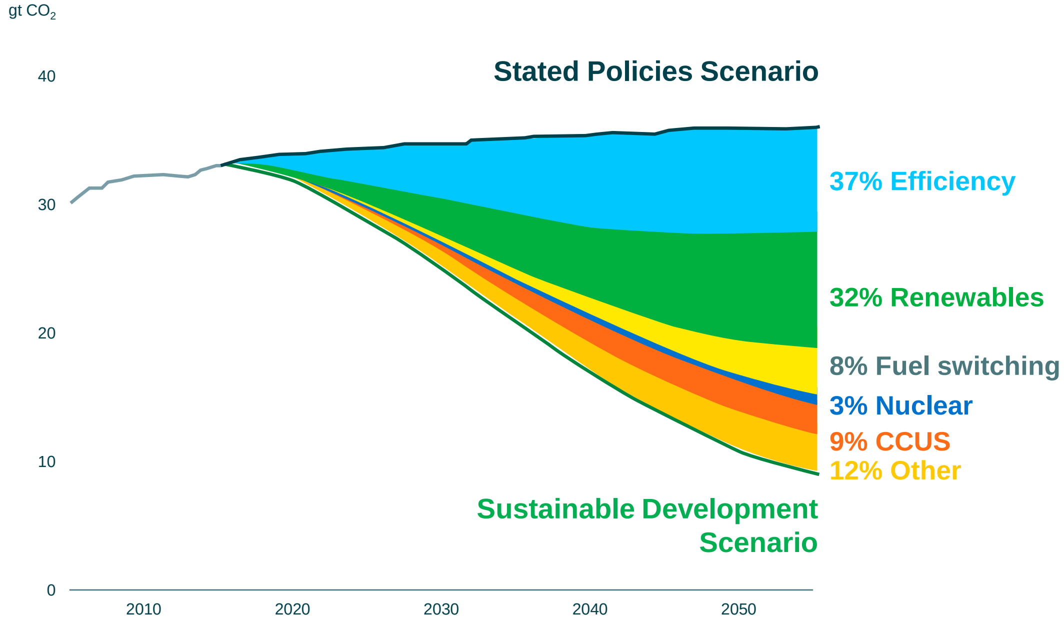
Metals & Mining among top polluting sectors…

Aluminium increasingly in scope for policymakers

1.76% of global GHG emissions[1]
most energy / emissions intensive of major metals[2]

ASI established in 2012

Vast majority of CO_2 emission savings to depend on mix of *efficiency gains & energy source/mix*



Technological transformation needed reduce GHG emissions by 2050

Sources: Company Information, EEA, Eurostat, Equity Research, IEA, CAIT, RIO Climate change 2019, World Energy Outlook

Notes: (1) post processing and beneficiation; (2) as of production

ESG – moonshot trend or to stay?

from voluntary activity to strategic imperative – why corporates should care…

Growing awareness & transparency:

raise awareness of position w/in peer group & ambition levels re: sustainability performance targets, i.e. via publication of sustainability reports / ESG ratings

Paris Climate Agreement *(2016)*:

195 countries agreed to reduce GHG emissions to keep global average temperature < 2° C

Investing sentiment:

in both, equity & debt capital markets; ESG scores become relevant distinctive factors when forming investment decisions impacting investor choices

EU taxonomy:

succinct direction of capital flows to sustainable business activities; EU reg. putting for first time non-fin. and fin. KPIs on level playing field

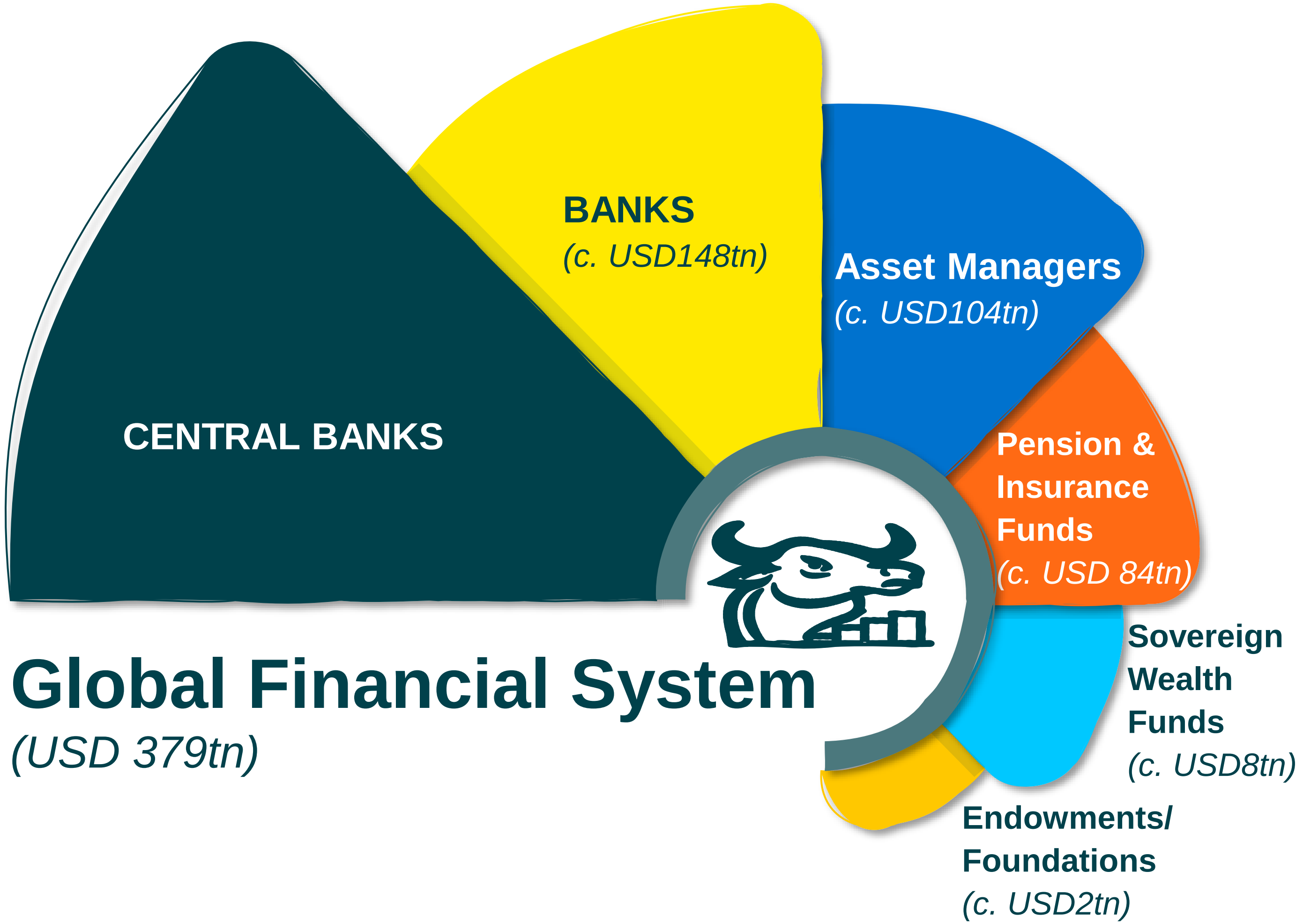
Banking ESG risk frameworks:

increasing attention to ESG risks in banks‘ B/S; EUR banks instructed to incorporate climate related and environmental risks into credit scores

Source: EU Comission

ESG – gaining momentum

increasingly embedded in financial services w/ financiers being assigned mandate to police change



Global Financial System

(USD 379tn)

Asset Owners & Managers

"Net Zero" Emission Portfolios

- moving to portfolios generating less emissions or having equivalent amounts of offsets/removals
- **increasing pressure on high emitters and energy transition laggards**

Banks

"Net Zero" Financed Emissions

- large diversified banks with increasing **commitments to sustainable financing targets** (2030) and **"net zero financed emissions"** (2050)
- measures incl. **funding restrictions** for fossil fuel industry and allowances for climate- and ESG-related solutions

Central Banks

Climate-related Supervision & Investing coming

- central banks globally taking responsibility for accounting for and supervising of financial institutions climate change endeavours
- "greening" of reserve portfolios

ESG – what's the capital market impact

capital market observations show far reaching impact with more to come?

Unprecedented changes underway across the financial system...

- **commitment to sustainability escalating** across all players in the financial system
- **just over 1% of global financial assets needed to support sustainability goals**
- **governments stepping up policies and direct financing** for sustainable activities
- **asset owners & managers seeking increasingly impact** in addition to ESG risk management
- but **more work needed to align sources of financial assets with areas of financial needs**

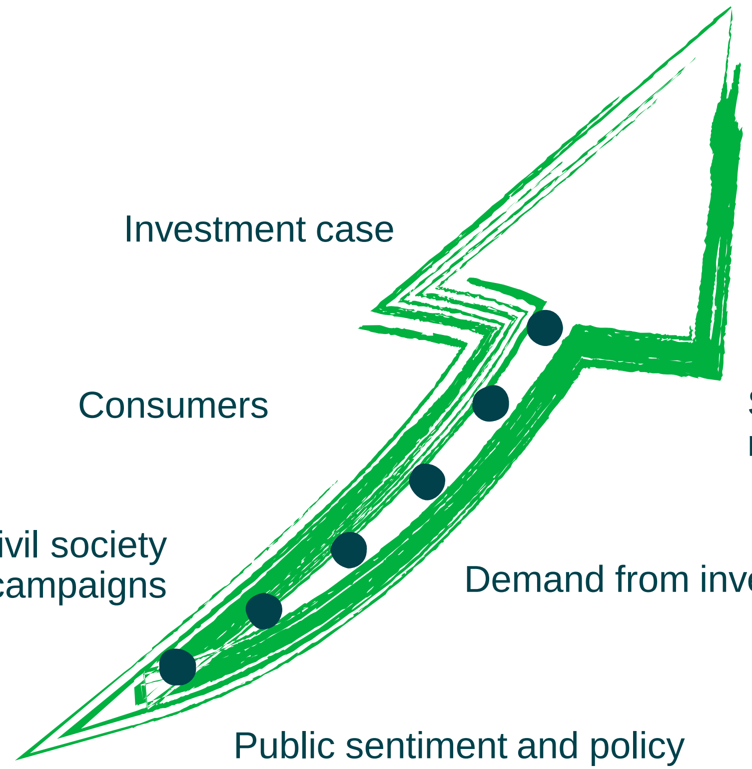
...are having sustained impacts on asset valuation & cost of capital

- **clear "greenium"** in the sustainable debt market
- **significant multiple expansion** for pure-play "transition enablers" and fund flows will support premium valuation
- **ESG-themed SPACs in high demand despite early development stage**
- higher engagement with "transition stories" means **more divergence of capital flow between leaders & laggards**
- **growth in alternative investments funds** financing early stage technologies and innovation

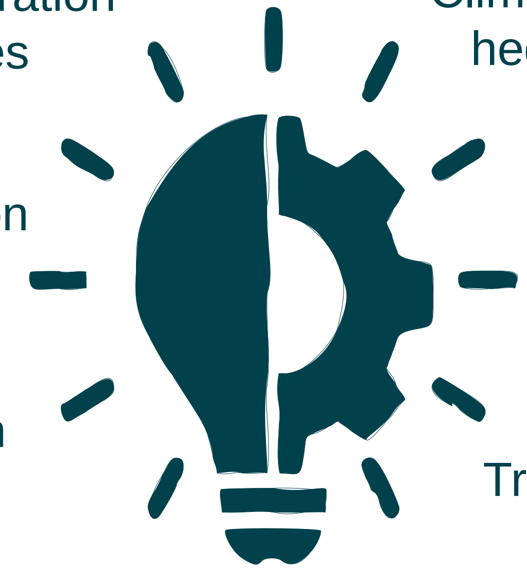
ESG – a new asset class emerged

over 5 years, sustainable investments have more than doubled

Unprecedented changes underway across the financial system…



PRODUCT INNOVATION



Note: (1) illustrative samples chosen across range of fixed income, equities, and alternative strategies (liquid, illiquid/high impact)

ESG – Capital market response
time for action on active ownership and climate change

ESG RISKS

01 **Regulatory CO_2 pricing impact**

02 **Reg. intervention** *(cost risk for highly-exposed emitters)*

03 **Consumer risk** *(preferences shift, civil society activity)*

04 **Disruptive innovation risk** *(tech fall-back)*

05 **Loss in funding access** *("stranded asset dilemma")*

06 **Increased cost situation** *(CAPEX, OPEX, insurance etc)*

07 **Climate damages** *(facilities, supply chain disruptions etc)*

08 **Value chain redefinition**

MACRO THEMES / OPPORTUNITIES

01 **Green energy and related infra-structure**

02 **Smart everything** *(Cities, built environment etc)*

03 **Food & Agriculture**

04 **Water & Oceans**

05 **Ageing, Health & Inclusion**

06 **Robotics & Automation**

07 **Splinternet** *(tech supremacy & sovereign interests)*

08 **Space** *(final area of exploration)*

Actions

01 Assess the portfolio

02 Reduce its carbon intensity

03 Integrate climate risk assessments into the investment process

04 Shifting into companies providing climate solutions

Note: (1) risks and opportunities sel'd and of indicative character only

ESG – bold and coordinated actions required

government policies & spending drive speed of transition

once-in-a-generation challenge with all encompassing scope **requiring policy frameworks**
EU internationally well advanced with i.e. EU Green Deal, EU Finance Taxonomy frameworks etc

Frame rules of compliance

- climate-related regulation and policies **essential** for accelerating / forcing private sector transition to low carbon world
- frameworks **increase investment visibility and certainty** enabling the transition of asset portfolios to net zero GHG emissions by 2050

Encourage capital shifts

- governments can **sway emerging technologies/industries** deemed to be critical to the transition
- **trigger private investor capital** increasing the flow towards sustainable investments

Lower financing costs

- **Reduce and incentivize risk taking** by sharing the burden of high costs of making new emerging technologies scalable with government incentives
- these incentives can take be designed in a number of ways, i.e. grants, tax credits, R&D support etc.

ESG – EU sustainable finance taxonomy

proposal for establishment of level playing field for green finance

6 environmental objectives

01 **Climate change mitigation**

02 **Climate change adaptation**

03 **Sustainable use and protection of water and marine resources**

04 **Transition to a circular economy**

05 **Pollution prevention and control**

06 **Protection of healthy ecosystems**

Source: EU Commission

ESG – impact on corporate credit ratings

how clients and credit processes will be affected (1/2)

EUROPEAN CENTRAL BANK
BANKING SUPERVISION

November 2020

ECB published a final guide on climate-related and environmental risks for banks

Bank

Among other matters, institutions are expected to

- explicitly include climate-related and environmental risks in their risk appetite framework
- incorporate climate-related and environmental risks as drivers of existing risk categories into their existing risk management framework
- consider climate-related and environmental risks at all relevant stages of the credit-granting process and to monitor the risks in their portfolios.

Identified climate-related and environmental risk drivers

Transition

- policy and regulation
- technology
- market sentiment

Physical

- extreme weather events
- chronic weather patterns

ESG – impact on corporate credit ratings

how clients and credit processes will be affected (2/2)

Climate-related risks are to become integral part of banks' loan processes in coming years

2021

Development of qualitative climate risk scores;
to be incorporated into corporate ratings

01 analysis of ESG risk exposure of a sector

02 degree of physical risks and transition risks

03 ability to mitigate those risks

Defined goals 2021-2022:

stepwise integration of climate risk scores (commencing w/ large corporates) to complement credit ratings

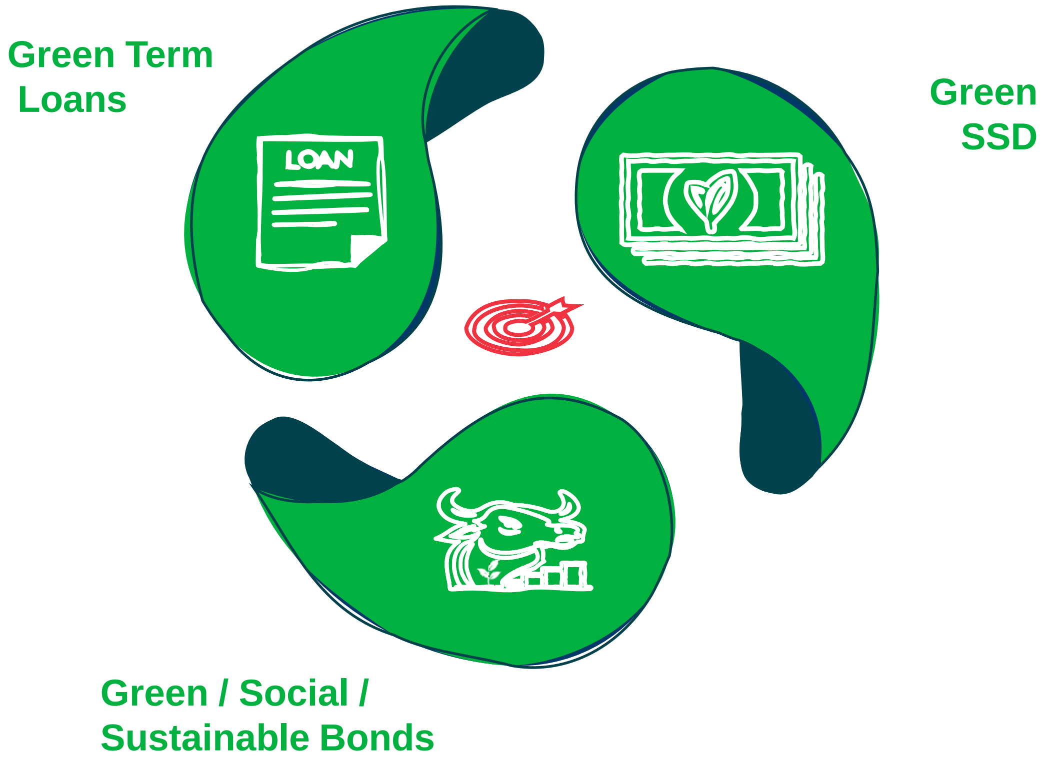
2022+: precise understanding of extent of CO_2 emission financing w/in loan portfolio, and degree of conformity with Paris Agreement

2024+: climate risk score to be incorporated into credit rating w/ impact credit score

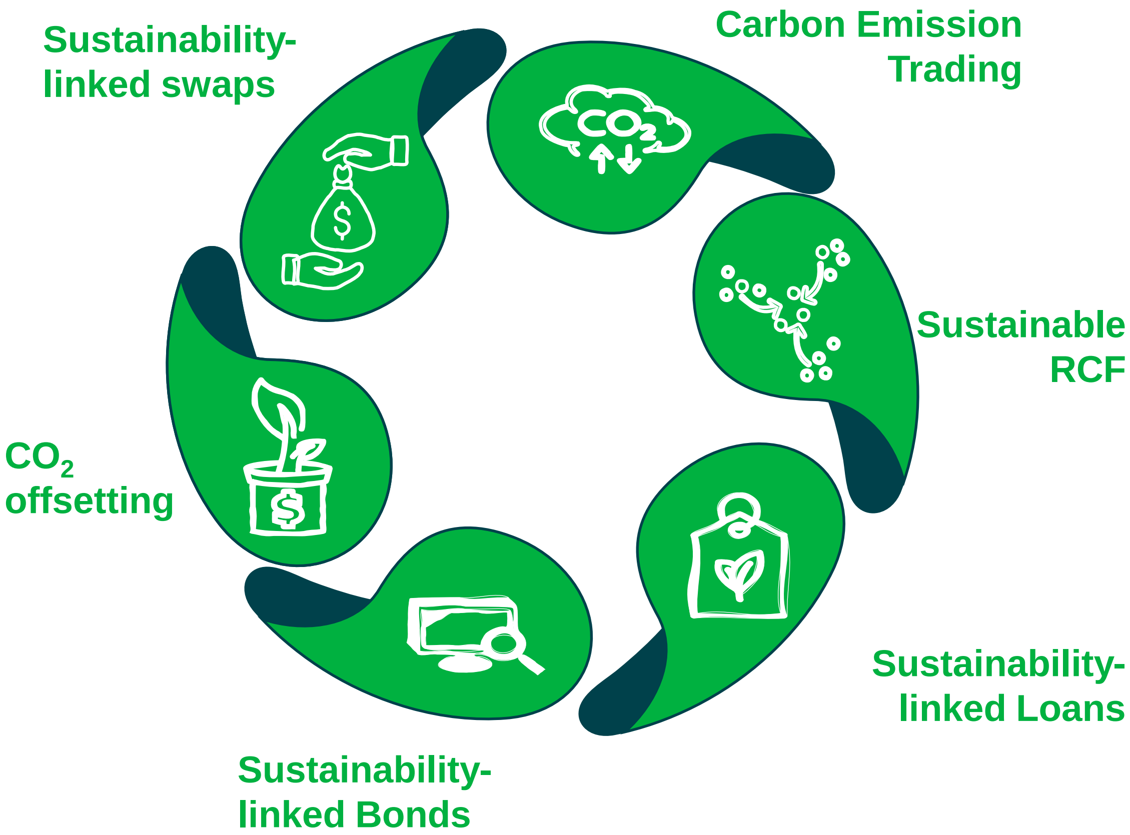
Sustainable finance

standard debt products overview

Focus on "use of proceeds"

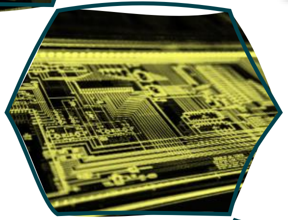


Focus on issuer's "sustainability performance"



Metals transformation – key themes & green finance impact

likely needing LT regulatory / policy framework to facilitate industrial transformation



Best In Class Operators *(ST-MT footprint)*

- reduction in energy density by **employment of BAT**
- **increase secondary production rates**, i.e. scrap recycling

Energy Mix Adaptation / Green Infra Build *(~MT footprint)*

- shift to **renewable power** sources, CCU/CCS and new (inert anode) smelting
- significant full life cycle **energy consumption reduction** possible

Breakthrough Tech *(MT-LT footprint)*

- requires **low / zero tech pathways**, i.e. biomass anodes / CO_2-free processes
- ELYISIS technology understood most advanced[1]

Value Chain Optimisation & Redefinition *(LT footprint)*

- **geographic divergences** in energy footprint, shipping requirements etc.
- **re-imagine value chain** to reduce total cost vs impact function

Scope 3 View *(ST-LT handprint)*

- **key element in green economy** providing supply tailwind
- **benefits from usage of best suitable element** (TLCCP)[2], i.e. intra-ind. or steel[3]

Notes: (1) RIO and Alcoa's ELYSIS technology understood as most advanced; however, anticipated capital costs as at today require government policy support and/or clear and functioning carbon price signal to incentivise respective investments in new ELYSIS smelters and/or retrofitting; (2) Total Lifecycle Cost perspective incl. internalised CO_2 costs; (3) i.e. (a) by steeping global cost curve from internalisation of CO2 costs in IND or CHN and (b) vs conventional BF-BOF route

Thank you.

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