UN-REDD PROGRAMME

The Economics of REDD+

REDD+ Academy

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Expected Learning Outcomes

This module will provide an overview of the various economics and financial aspects of REDD+. In particular you will learn:

Part 1
The Green Economy in the context of REDD+

Part 2
Demystifying results-based actions (RBA) and results-based payments (RBP)

Part3
Policies and measures for results-based actions (RBA)

Part 4
Summarizing this module

PART 1

THE GREEN ECONOMY IN THE CONTEXT OF REDD+

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Overview part 1

- Integrating REDD+ in a broader Green Economy
- The challenges
- Different means that can lead to results-based actions and payments
  - Level 1. Market value forest-carbon
  - Level 2. Forests in a Green Economy: different means to achieve REDD+
  - Level 3. Exogenous factors affecting forests
- Summary
- Exercise: differentiating between spatial costs and benefits of REDD+.

Integrating REDD+ in broader Green Economy

- Green Economy: ***"an economy that results in improved human well-being and social equity, while significantly reducing environmental risks"***

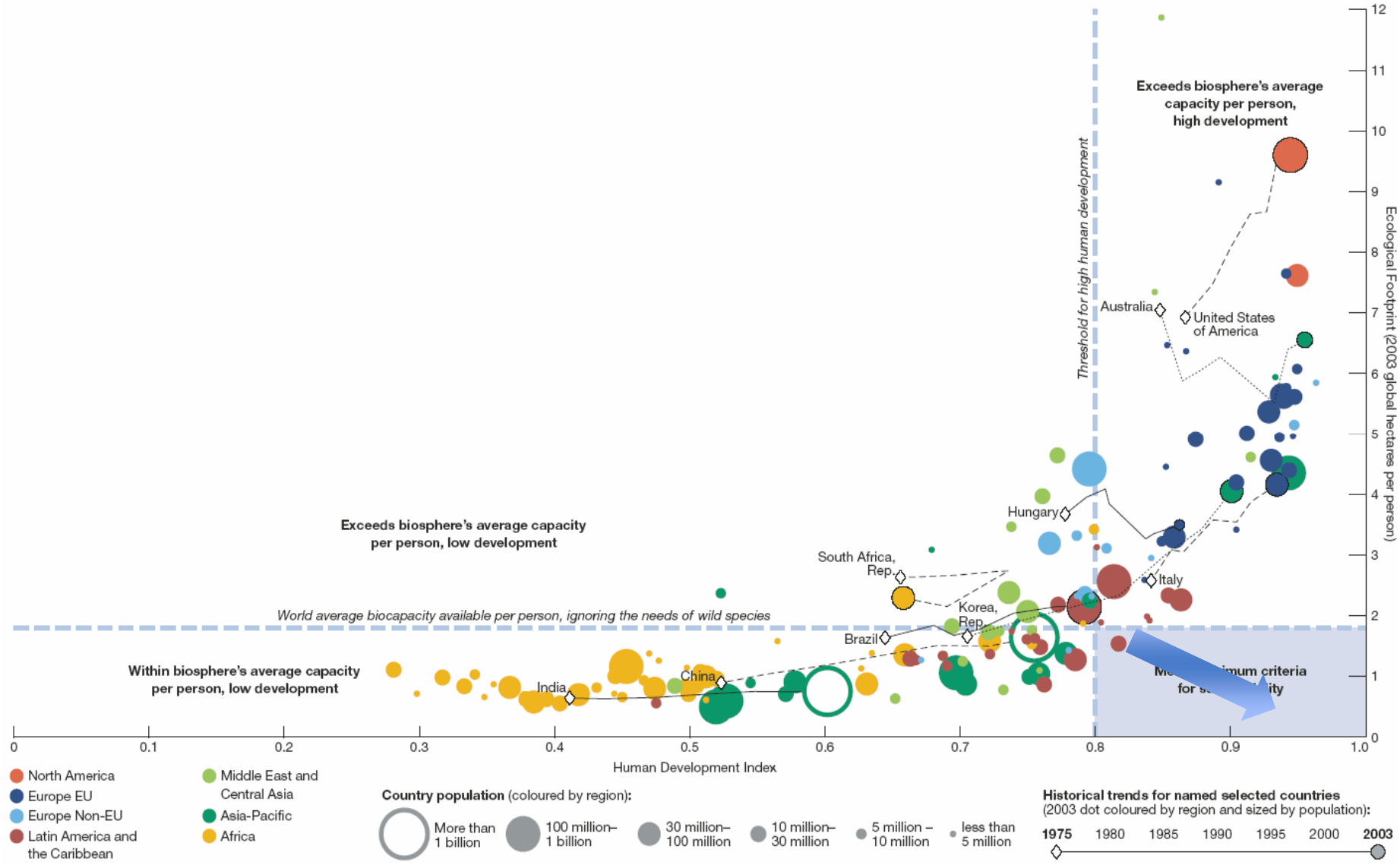
- Using forest resources in a more sustainable way are an important way for countries to move to ***low-carbon***, ***resource efficient*** **and** ***equitable economy***.

- Need to **decouple** economic growth from ecosystem impacts and the **creation of (green) jobs** that are based in sectors that extract fewer resources for the same value added

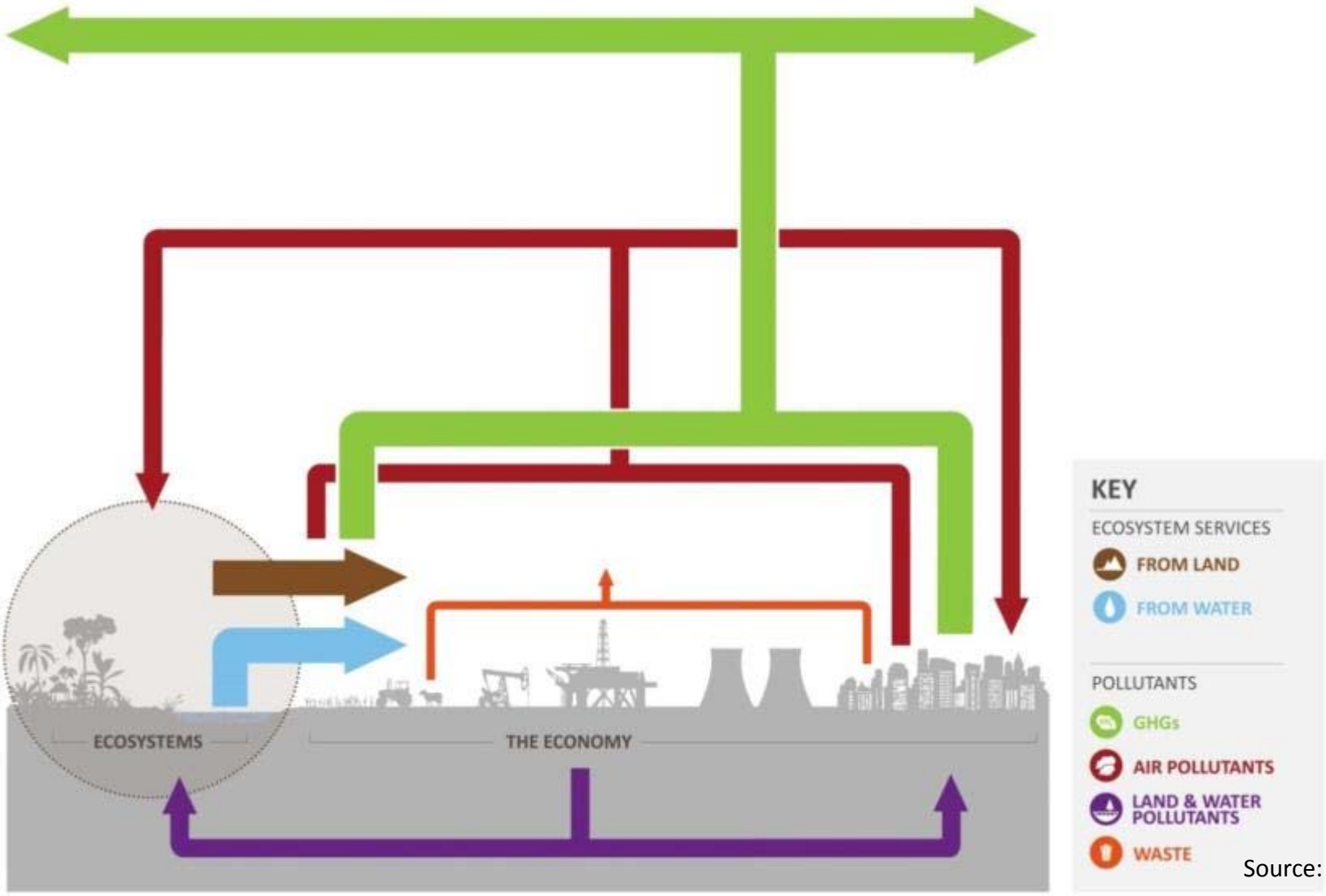
The Challenges: decouple economic growth and human development from environmental degradation

- *"In the coming 40 years we need to produce as much food as we produced in the last 8000 years"* WWF
- 3 billion more middle class consumers by 2030
- 40% water shortfall by 2030
- > 100% increase in real commodity prices since the year 2000

The Challenges: decouple economic growth and human development from environmental degradation

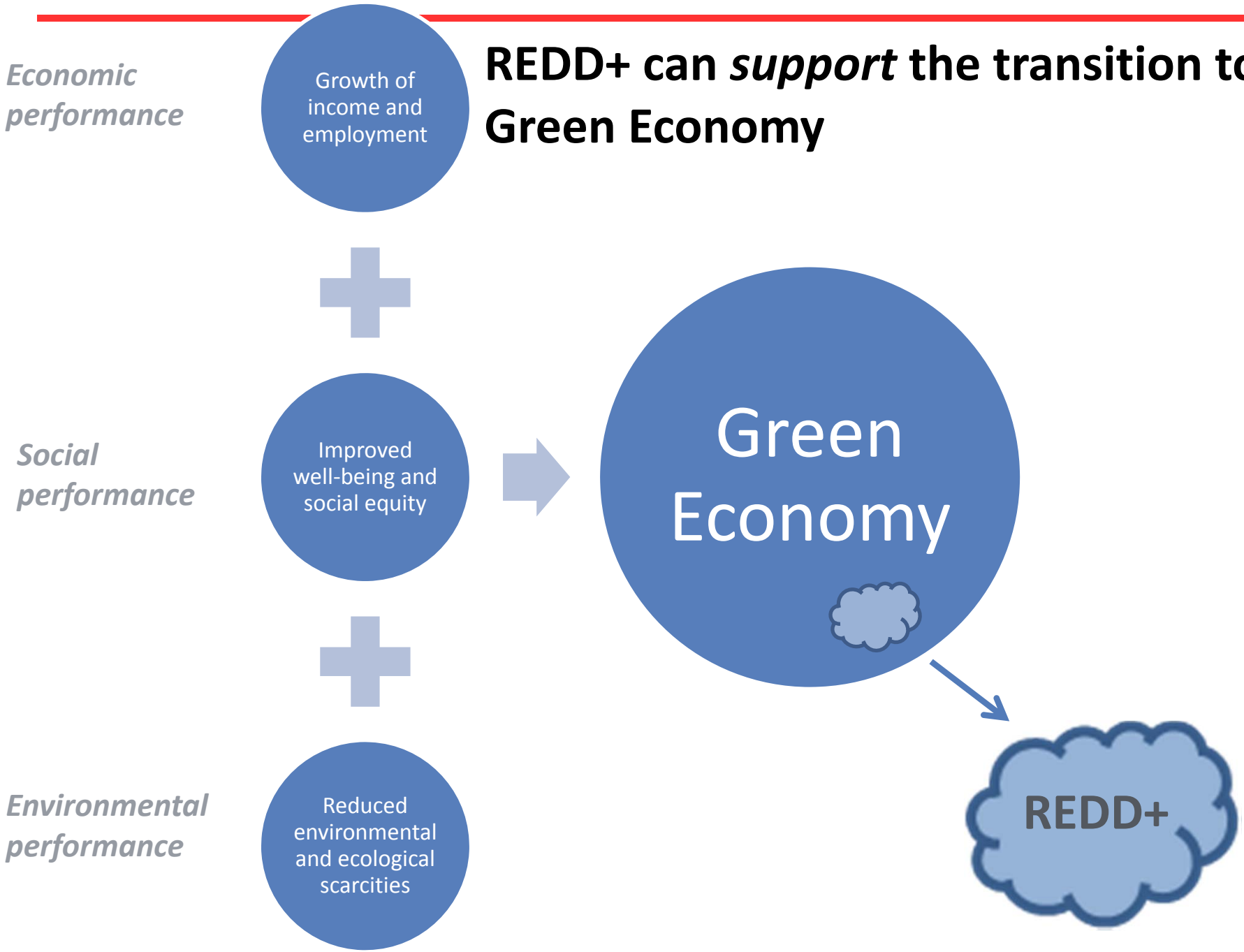


The relationship between ecosystems and the economy



Source: Trucost

REDD+ can *support* the transition to a Green Economy



VIDEO

FORESTS – HEART OF A GREEN ECONOMY

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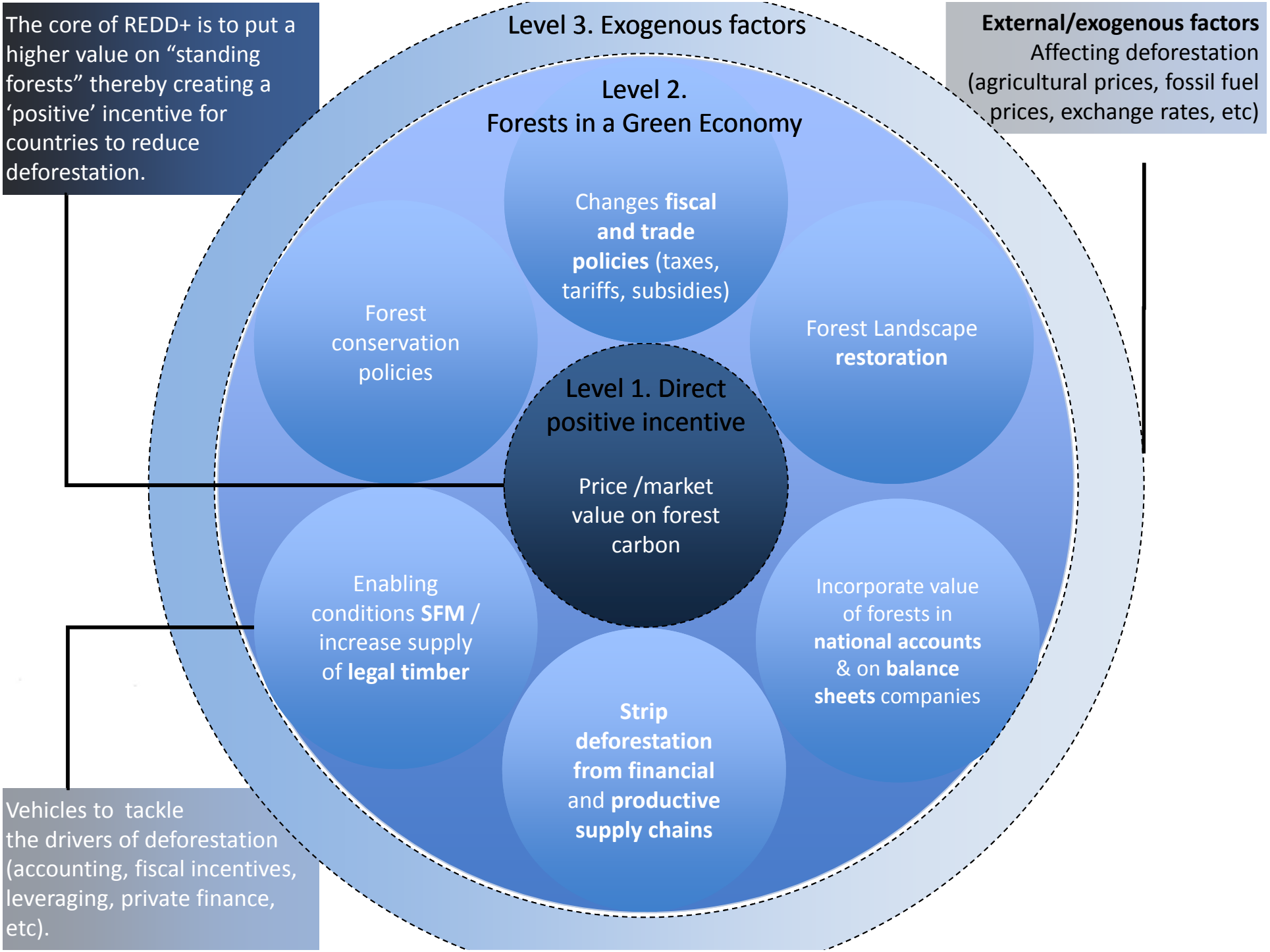
Different means that can lead to results-based actions and payments

REDD+ vehicle to financially reward developing countries for their verified emission reductions and removals of greenhouse gases through a variety of options.

Creating a **substantial (long-term, credible, light) market value on forest carbon** and other (forest) ecosystem services is a **positive incentive** to protect and sustainable use forests. In that sense, REDD+ is both a *means* (the price signal is "the vehicle") to the *"end"* (which is a reduction in deforestation).

There are **several means to reduce deforestation** and **generate results-based actions (RBA) that generate results-based payments (RBP)**. This can be done through changes in fiscal or trade policy, by stimulating private finance towards conservation and sustainable forests management, tackle illegal deforestation, stimulate governments to include the value of their (forest-related) natural capital in their national accounts and for private companies to reflect on their balance sheet, etc – are all different "vehicles" to tackle the drivers of deforestation.

The means vary nationally/locally, but **the end result is what counts: verified** (MRV) **reductions or removals of forest carbon emissions compared to a reference emission level** (FREL/FEL) that **complies with Cancun safeguards**.

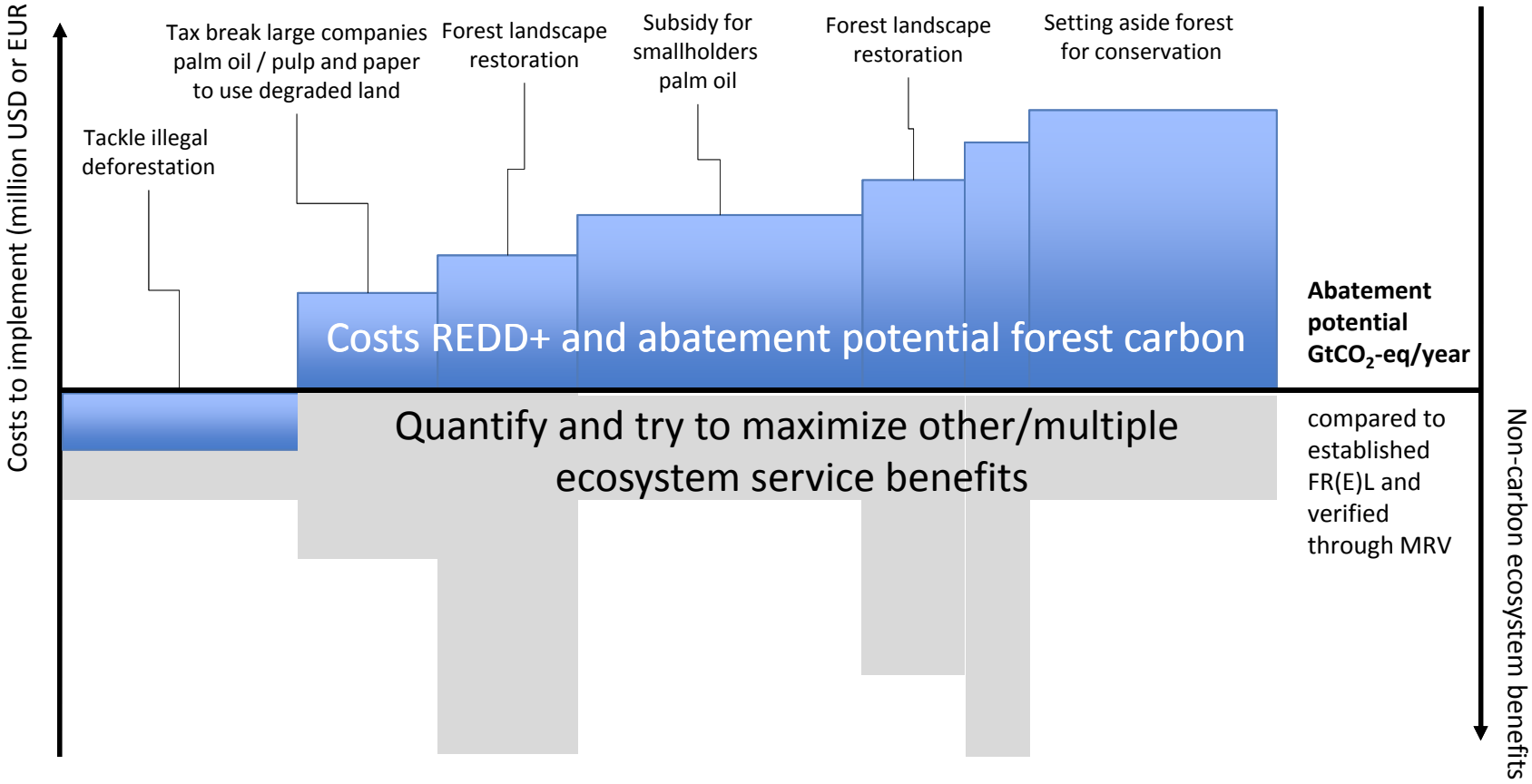

The core of REDD+ is to put a higher value on "standing forests" thereby creating a 'positive' incentive for countries to reduce deforestation.
Level 3. Exogenous factors
External/exogenous factors
Affecting deforestation (agricultural prices, fossil fuel prices, exchange rates, etc)
Level 2.
Forests in a Green Economy
Changes fiscal and trade policies (taxes, tariffs, subsidies)
Forest conservation policies
Forest Landscape restoration
Level 1. Direct positive incentive
Price /market value on forest carbon
Enabling conditions SFM / increase supply of legal timber
Incorporate value of forests in national accounts & on balance sheets companies
Strip deforestation from financial and productive supply chains
Vehicles to tackle the drivers of deforestation (accounting, fiscal incentives, leveraging, private finance, etc).

Level 1. REDD+: a direct positive economic incentive

- Problem with deforestation has its origination in that our current **global can national *economic systems hardly value forest ecosystems (beyond timber)***. Hence its value is *perceived* to much lower than alternative land-uses.
- In economic terms **forest ecosystem services** as regarded as **externalities**
- The basis for REDD+ to provide a **positive financial incentive (results-based actions, RBA, leading to results-based payments, RBP)** for governments and ultimately for local communities and (other) private landowners to conserve and sustainably use forests.
- REDD+ has the *potential* to be a **global-scale Payment for Ecosystem Service scheme** (whether in the form of direct payments between governments, via the Green Climate Fund or through a market)

REDD+ RBA Abatement Cost Curve: a potential model for results-based payments

Compare various results-based actions that countries can take in terms of the potential to reduce forest-carbon emissions compared to FR(E)L and the costs it takes to implement them, while trying to maximize non-carbon benefits each option generates. See scheme below (for **illustrative purposes**)



Source: Mulder, UNEP

Level 2. Forests in a Green Economy: different means to achieve REDD+

- A positive financial incentive to conserve forests may not be sufficient by itself. It needs to be **embedded** in a country's broader transition to low carbon, resource efficient and equitable Green Economy.

- It needs to be **part of national efforts to increase the value of natural capital** to **address the long term impact of climate change**, which will heavily impact on development of in particular developing countries located in the tropics.

- A country has **various ways how it can reduce forest emissions levels**. They will require 1) different efforts from governments and/or companies; 2) each option may receive different levels of support or opposition; 3) will have different effects on the economy.

- **Enabling conditions or means to reduce forest emissions levels** include but are not limited to:
  - Stripping deforestation from productive and financial supply chains
  - Conservation policies
  - Target illegal logging and stimulate the legal supply of timber
  - Fiscal and trade policies (subsidies, tariffs and taxes)
  - Incorporate natural capital in a country's national accounts and on the balance sheets of companies
  - Forest landscape restoration
  - Avoidance of forest fires
  - Improved management of peatlands (e.g. in Indonesia)

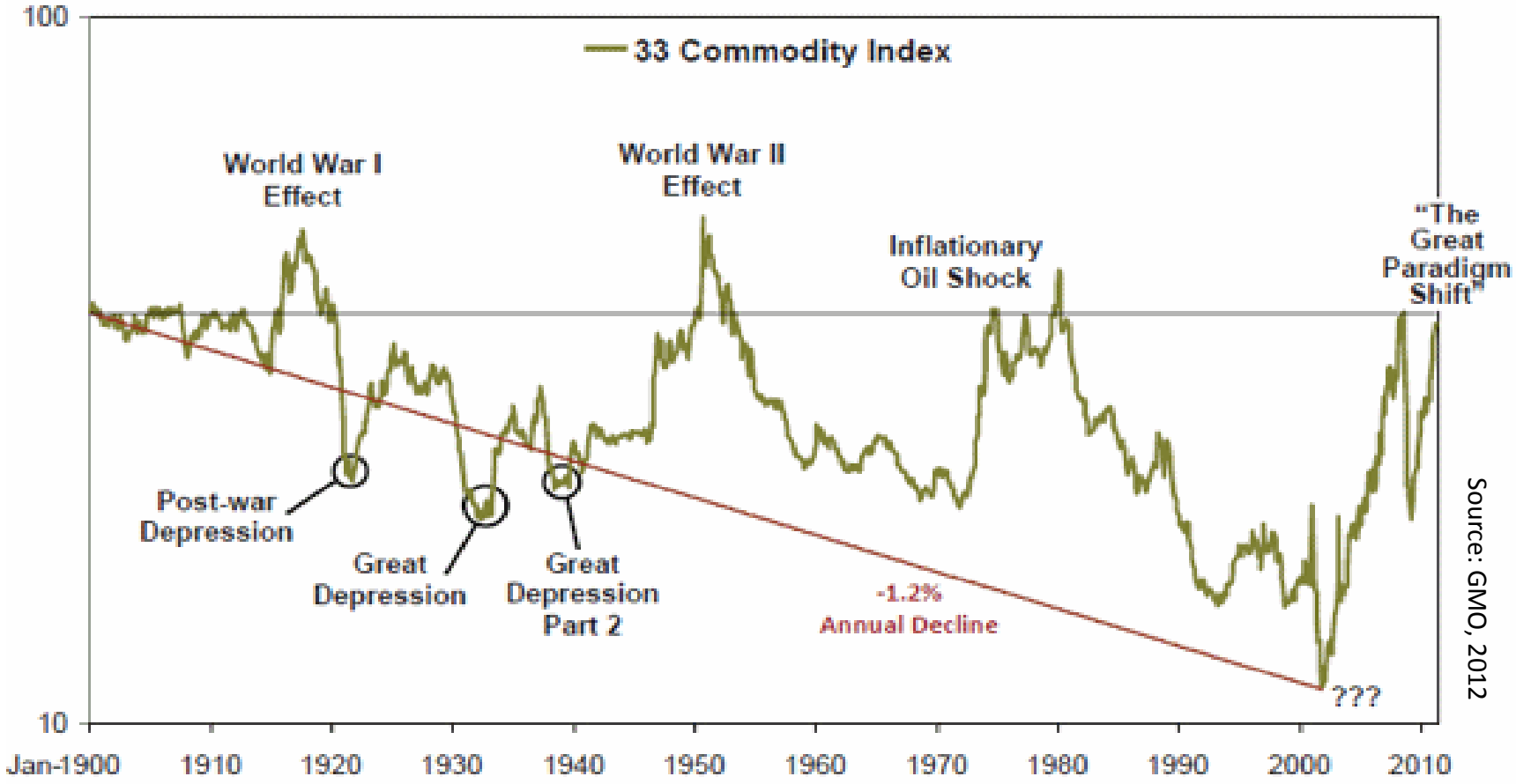
“Wall of finance” currently moving in opposite direction

Level 3. External factors affecting forests

- Often shaded from our eyes there are major financial forces that indirectly affect forests in a massive way.
- These include exchange rates, sovereign ratings, international market price of (soft) commodities, etc
- Some are (partly) **affected by national governments**: for example central banks' monetary policy affect exchange rates.
- Some are **shaped by markets**, including prices for soft commodities (palm oil, soy, beef, etc), metals, etc.

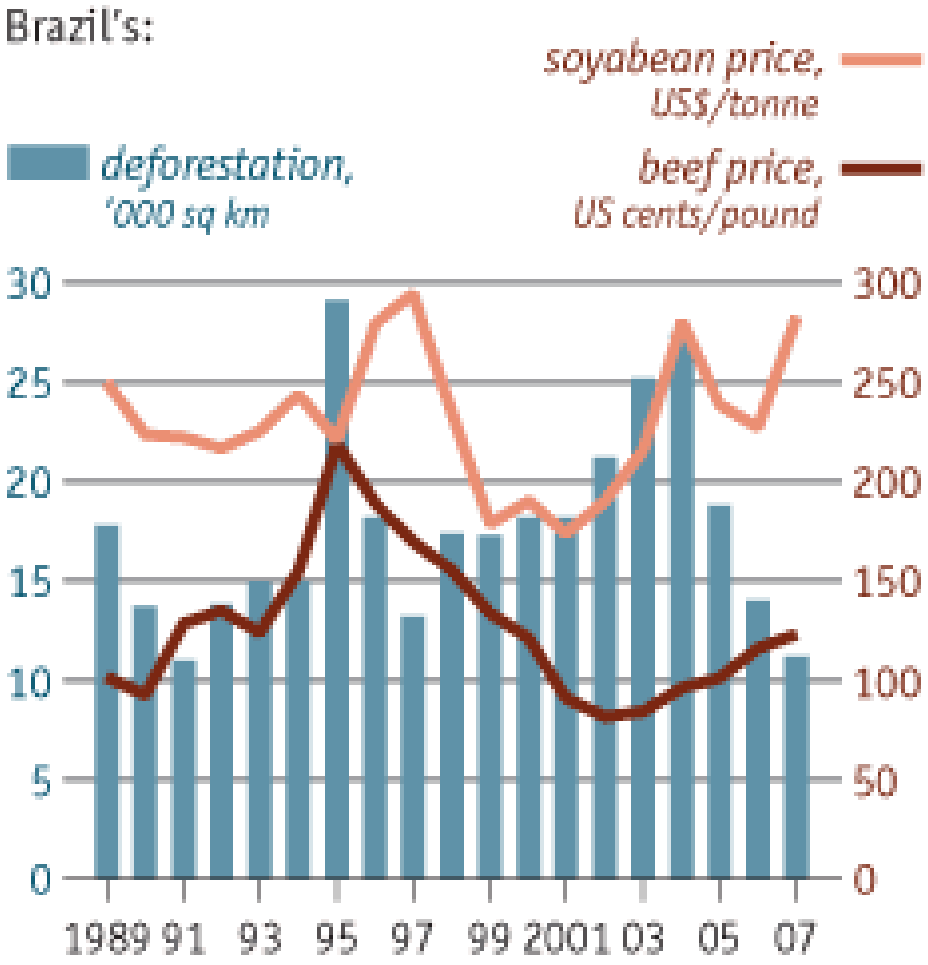
Level 3. Exogenous factors: price commodities

Higher price of (soft) commodities leads to higher pressure to clear forests



Note: The GMO commodity index is an index comprised of the following 33 commodities, equally weighted at initiation: aluminum, coal, coconut oil, coffee, copper, corn, cotton, diammonium phosphate, flaxseed, gold, iron ore, jute, lard, lead, natural gas, nickel, oil, palladium, palm oil, pepper, platinum, plywood, rubber, silver, sorghum, soybeans. sugar. tin. tobacco. uranium. wheat. wool. zinc.

Level 3. Exogenous factors: price commodities



Source: INPE, IMF, The Economist

Part 1: Summary

- **Positive economic incentives needed (REDD+)** needed to turn the tide of (tropical) forest loss.
- REDD+ has the **potential to be a significant economic force** for conservation and sustainable use of forests.
- **Pre-requisite**: Countries will have to **implement the 4 component of the Warsaw Framework** – the 'rule book' – in order to be eligible for results-based payments
- There are **many** large **financial (exogenous) forces affecting forests and the broader landscape**. Without understanding these, results-based payments for forest emission reduction may not be as effective as they could be.
- **Transitioning to a Green Economy means addressing the drivers of deforestation**. A transition requires broad support from civil society and private sector but requires the Government (across different ministries, including agriculture, central planning, finance, etc) to lead and provide incentives to change behaviour.

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PART 2

DEMYSTIFYING RESULTS-BASED ACTIONS (RBA) AND RESULTS-BASED PAYMENTS (RBP)

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Overview part 2

- Green Economy integration in National REDD+ Strategies
- Results-based actions (RBA) and results-based payments (RBP)
- Scale of funding
- REDD+ funding pledged (donors) and received (recipient countries)
- Carbon markets
- Summary

Towards a systematic REDD+ Green Economy Approach in National REDD+ Strategies

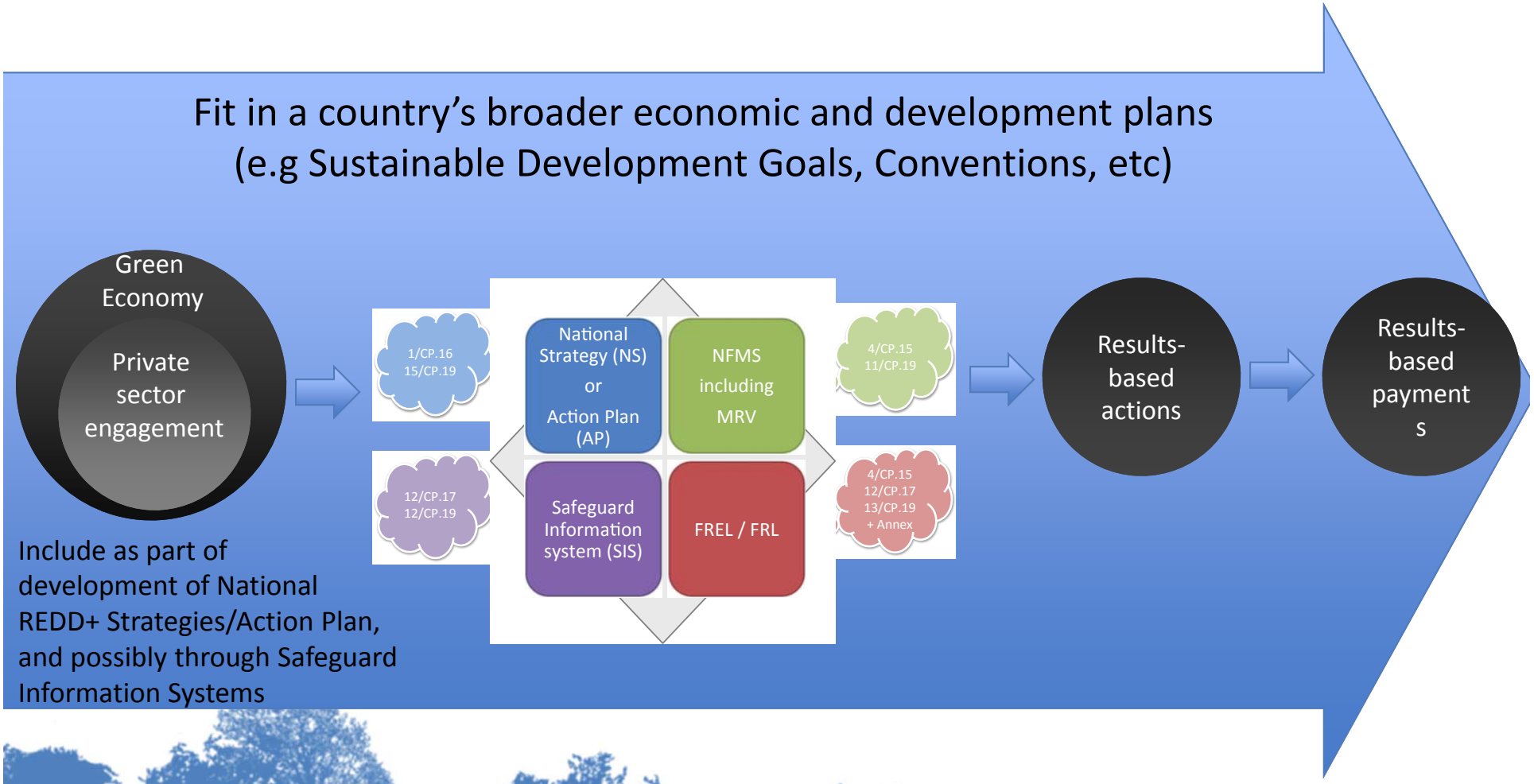
Towards a systematic approach

- Support countries to **complete the 4 components of the Warsaw Framework** work towards **RBP**.
- **Manual** with a **step-by-step approach** how REDD+ can be part of **broader economic and development objectives**.

Critical elements

- Options for **economically-attractive and nationally supported ways** to achieve results-based actions (RBA) that lead to results-based finance (RBF) as part of National REDD+ Strategies
- Private sector: Develop actions, policies and measures, as part of National REDD+ Strategies, which **shape private sector operating models** that deliver emission reductions
- Acceptance about REDD+ **across ministries** to increase chance of success.

How REDD+ Green Economy and Private sector engagement fits with UNFCCC Warsaw Framework



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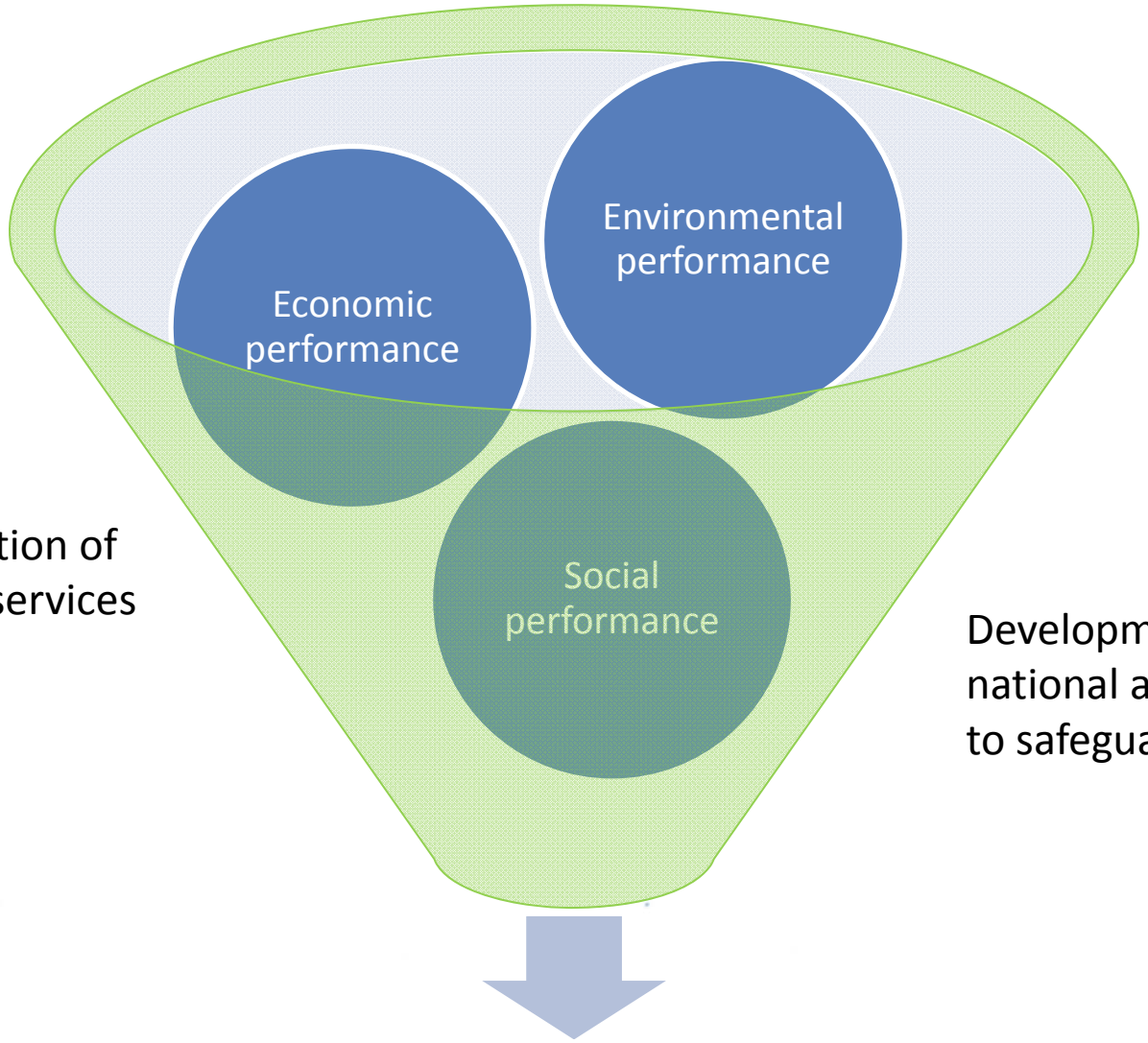
Private sector engagement

Economic valuation of environmental services



Identification and mapping of multiple benefits

Development of national approaches to safeguards

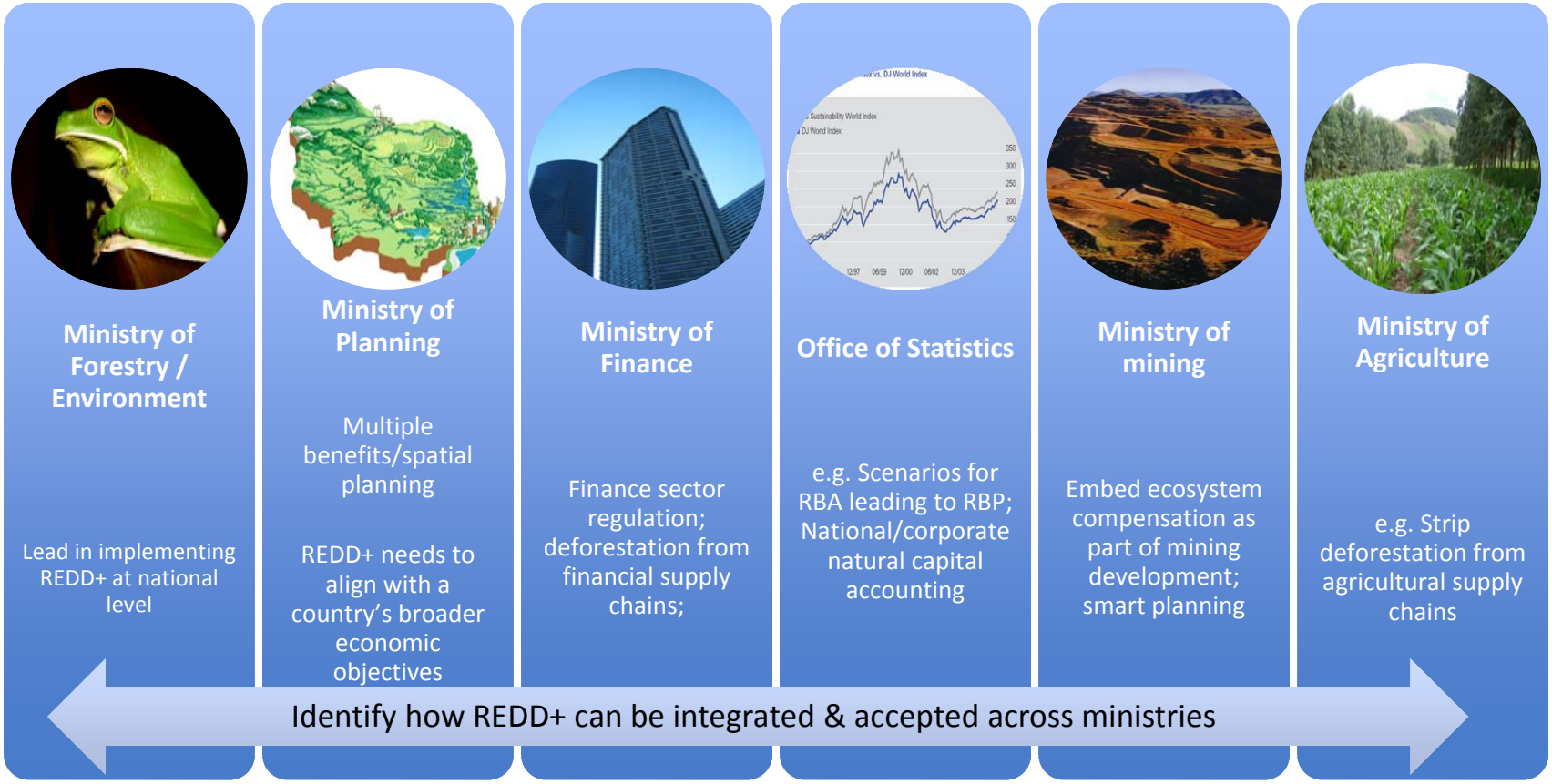
National REDD+ Strategy

Examples (from NY Climate Summit)

- **Brazil** has demonstrated huge progress. By 2013, Brazil had reduced deforestation by 71% compared to the 1996-2005 annual average, while at the same time increasing agricultural production and rural incomes (but in 2013 it increased again with 29%)
- **Indonesia** has embarked on comprehensive reforms to land use policies, customary land rights, regulations and law enforcement to meet its pledge to reduce greenhouse gas emissions 26% by 2020 (41% subject to international support).
- **Colombia** is making progress on its Amazon Vision – an ambitious plan towards meeting the zero net deforestation goal in its Amazon region by 2020.
- **Mexico** has adopted a law on climate change that incorporates the goal of reaching zero net deforestation.
- **Ethiopia's** Climate Resilient Green Economy (CRGE) Facility sets the goal of reaching middle income country status by 2025 with net-zero greenhouse gas emissions growth while building resilience to climate shocks.

Most of these are pledges. It now comes down to implementation!

Integrate REDD+ at inter-ministerial level: use key analysis to embed REDD+ across ministries



Engagement private sector

- Main objective: support countries develop National REDD+ strategies with actions, policies and measures that **shape private sector operating models so that they deliver sustainable REDD+ results**

- Main outcome of consultations: *the UN-REDD Programme can create a safe space for public-private engagement and also develop the tools to assist developing countries in crafting effective and efficient actions, policies and measures to create an enabling environment that will shape private sector operating models.*

- UNEP Finance Initiative and UNDP Green Commodities Programme key supporting organisations.

On-going work on private sector engagement

1. **Convening public-private dialogues to inform the development of REDD+ Programmes and Strategies**. For example:
   - Identifying **policy bottlenecks hampering private financial flows to sustainable business models in agriculture and cattle ranching** compatible with REDD+ objectives (Paraguay)
   - Supporting countries in efforts to determine the **role of the private sector in REDD+ financing and implementation** (Costa Rica, Panama, Paraguay)

1. **Identifying drivers of business as usual and options for change**. For example:
   - Supporting countries in examining the **implications of their fiscal frameworks on deforestation** (how are these affecting private sector operating models, cost structures and investment decisions) and identifying levers for change (Indonesia, Ecuador, Peru and Ghana)
   - Exploring mechanisms for linking **sustainable supply chains in commodities with REDD+**, in general and with Results-Based Finance in particular (Indonesia)
   - Supporting countries in their efforts to **structure interventions that contribute to REDD+ objectives** (Paraguay's market for environmental services compensation)

On-going work on private sector engagement

1. **Working with private sector**. For example:
   - Developing models to **account for corporate and financial "hidden" risk** related to deforestation and forest degradation (focused on Indonesia)
   - Working with commodity buyers to **review their purchasing policies** to ensure that these are compatible with REDD+ objectives (global)
   - Working with financial institutions to **develop investible products** to mobilise private finance to companies with "zero net deforestation" footprints (investment indexes and bond)

2. **Work on economic valuation and accounting**
   - National level **forest economic valuation** studies for Kenya, Tanzania, Zambia, Rep Congo, Panama, Indonesia
   - **Natural capital valuation and accounting** is about to be started in Ethiopia and Nepal

REDD+ *Activities*

The five designated ways to reduce greenhouse gas emissions from forests

1. Reducing emissions from deforestation;
2. Reducing emissions from forest degradation;
3. Conservation of forest carbon stocks;
4. Sustainable management of forests;
5. Enhancement of forest carbon stocks;

Results-Based *Actions*

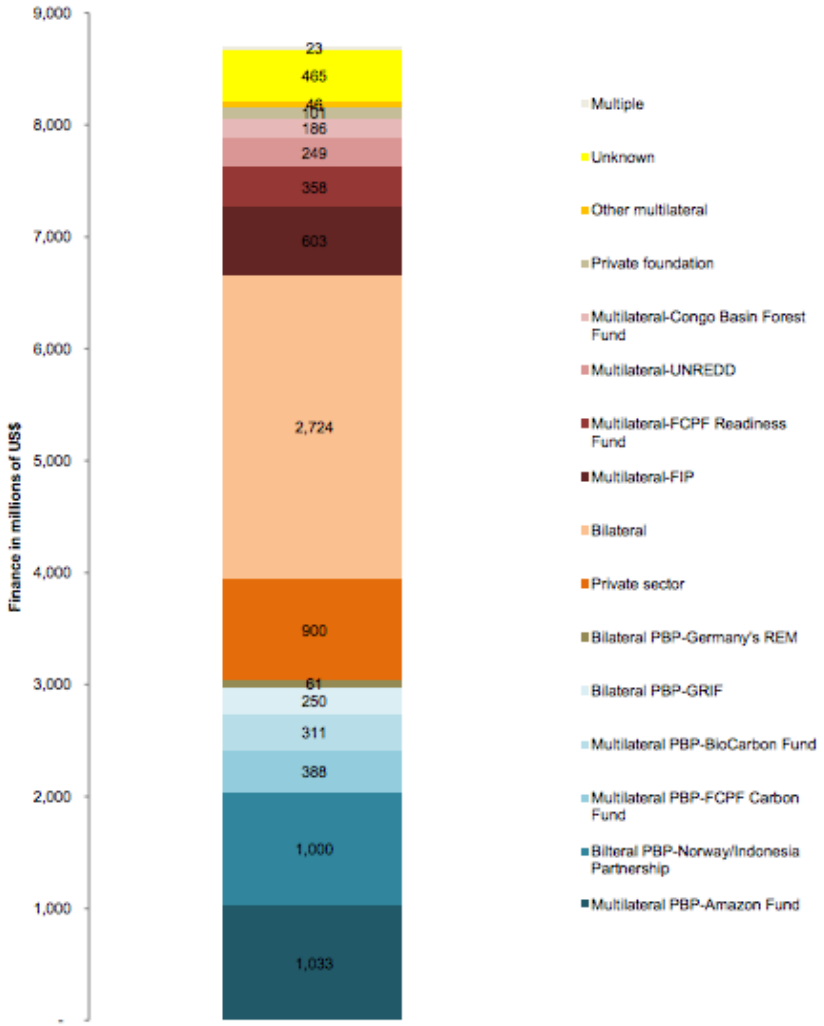
- Referred to in the UNFCCC text in decision 1/CP.16, paragraph 73
- Policies and measures that lead to a verified reduction or removal of forest carbon emissions compared to a forest reference (emission) level (FREL) and that complies with the Cancun Safeguards.
- Basically:
  - Show actual reductions/removals in carbon emissions compared to a benchmark (FREL)
  - Verified through measurement, reporting & verification (MRV) system and periodic monitoring
  - Make sure it complies with environmental and social safeguards (Cancun)
  - The means are not important. Countries are completely free to choose what policies, measures and actions they choose. The end result is important

Results-Based *Payments/Financing*

The ability of recipient countries to receive results-based payments/finance (money) based on successful results-based actions undertaken a (sub)national level.

Scale of REDD+ funding

- Norway, USA, Germany, Japan and the UK provide 75% of total funding to date (20 REDD+ donors).
- Brazil and Indonesia together receive 40% of allocated funding (80 recipient countries in total).
- Global public and private finance pledges USD 8.7 billion (between 2006 and March 2014)
- Public funding: 90%. Private funding: 10%



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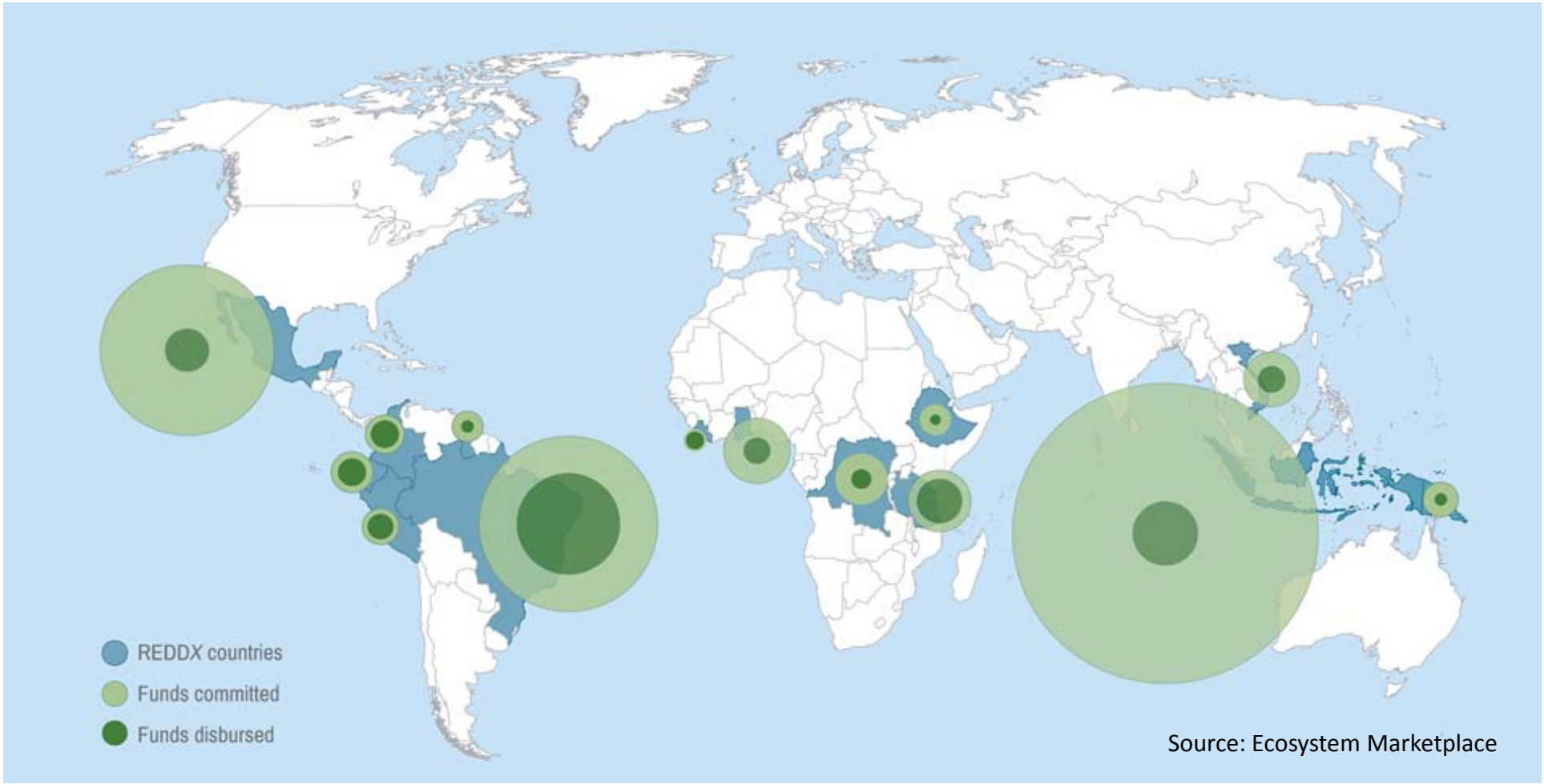
Scale of REDD+ funding

- UN Climate Summit Norway announced US$ 450 million for Peru (US$ 300 million) and Liberia (US$ 150 million).
- Norway also announced support in the amount of US $100 million for indigenous peoples
- Brazil and Indonesia together receive 40% of allocated funding (80 recipient countries in total).
- Global public and private finance pledges USD 8.7 billion (between 2006 and March 2014)
- Public funding: 90%. Private funding: 10%

Scale of REDD+ funding

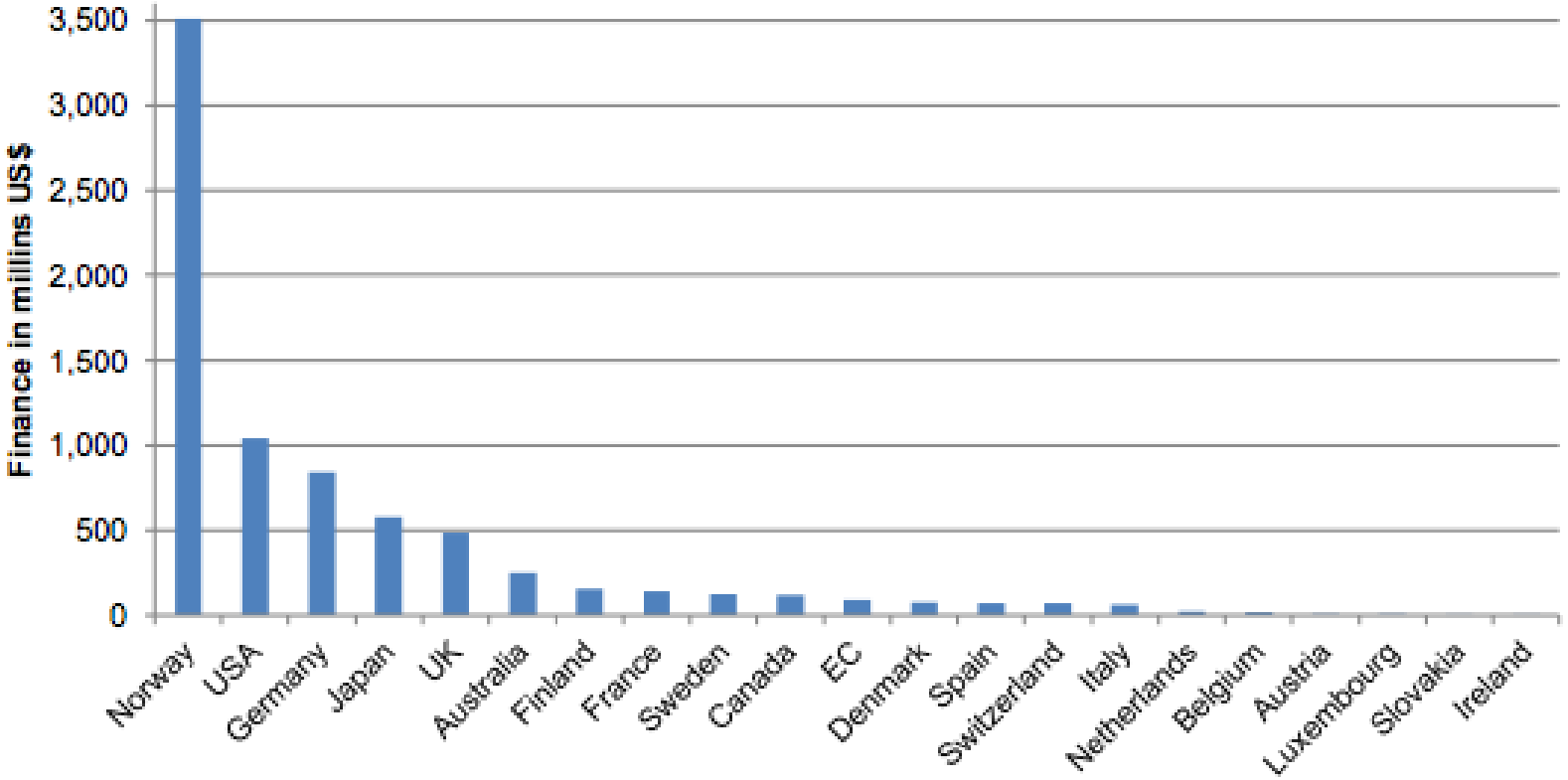
- Indonesia and Brazil most important recipient countries. Mexico important too. DRC and Tanzania among the important African recipient countries



Scale of REDD+ funding: domestic finance emerging

- Increasingly, emerging economies prioritise REDD+ in national budgets:
  - Allocate domestic funds
  - Co-finance international REDD+ funding
- Mexico: domestic contributions of US$ 433 million or 43% of total REDD+ finance
- Ghana: US$ 39 million or 37% of total REDD+ finance
- Wide ranges of domestic funding: e.g. US$ 10 billion/year (Streck and Parker, 2012); US$ 1.6 billion across 39 countries (REDD+ Partnership)

Overview REDD+ funding pledged by donor countries



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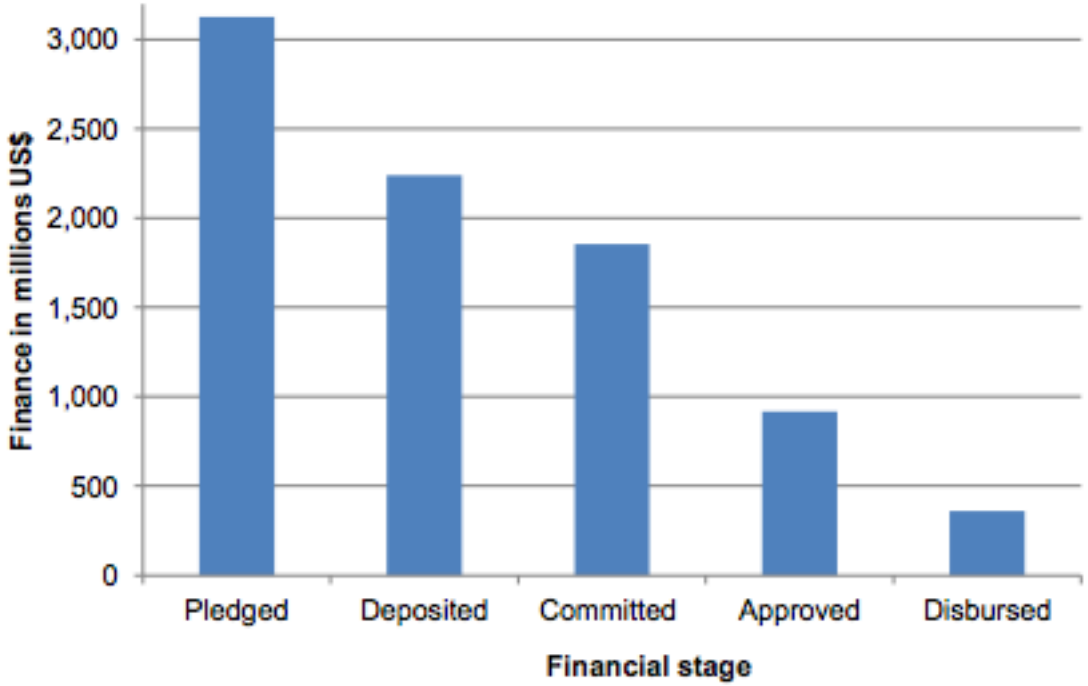
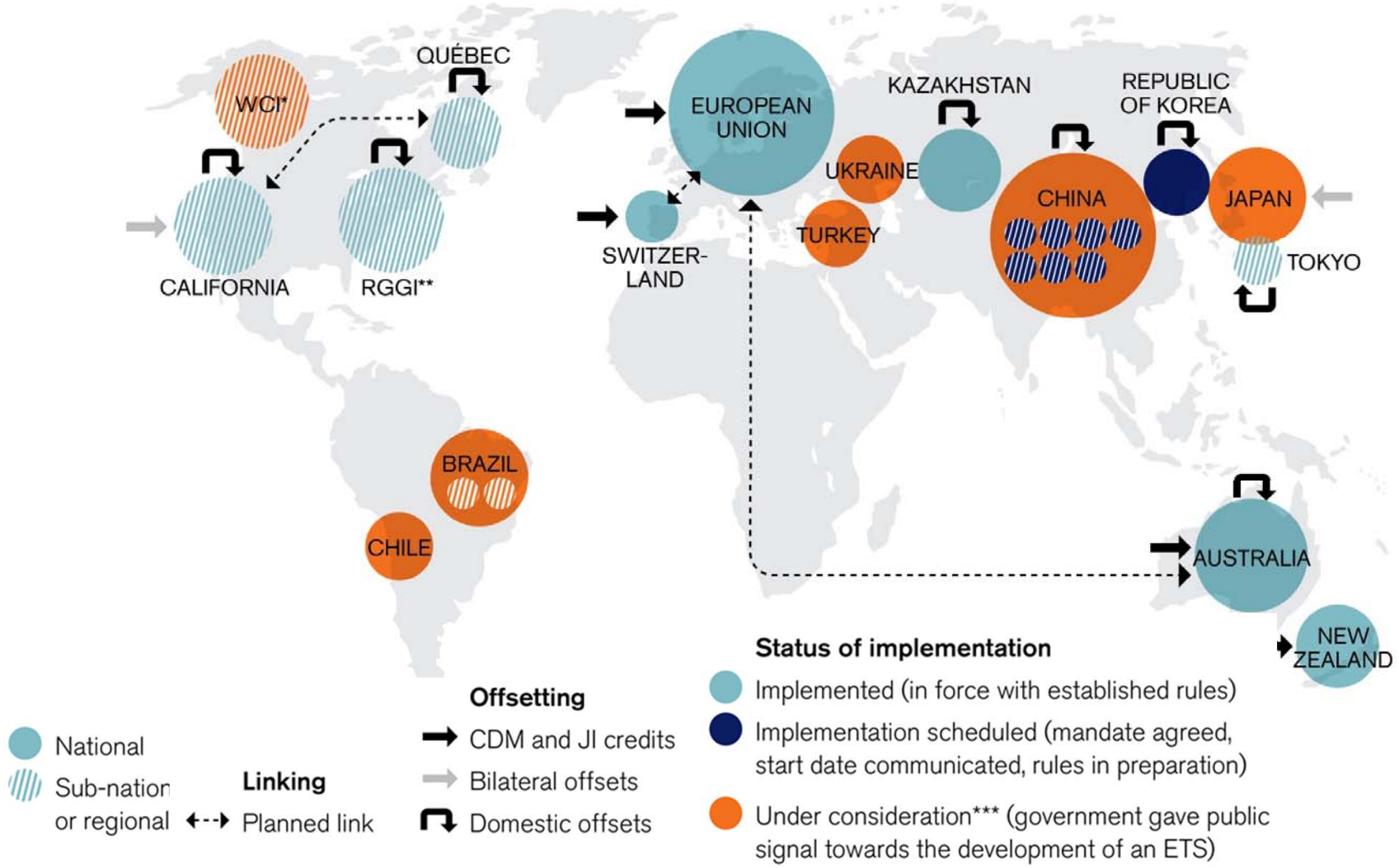
Pledging, depositing…..disbursing



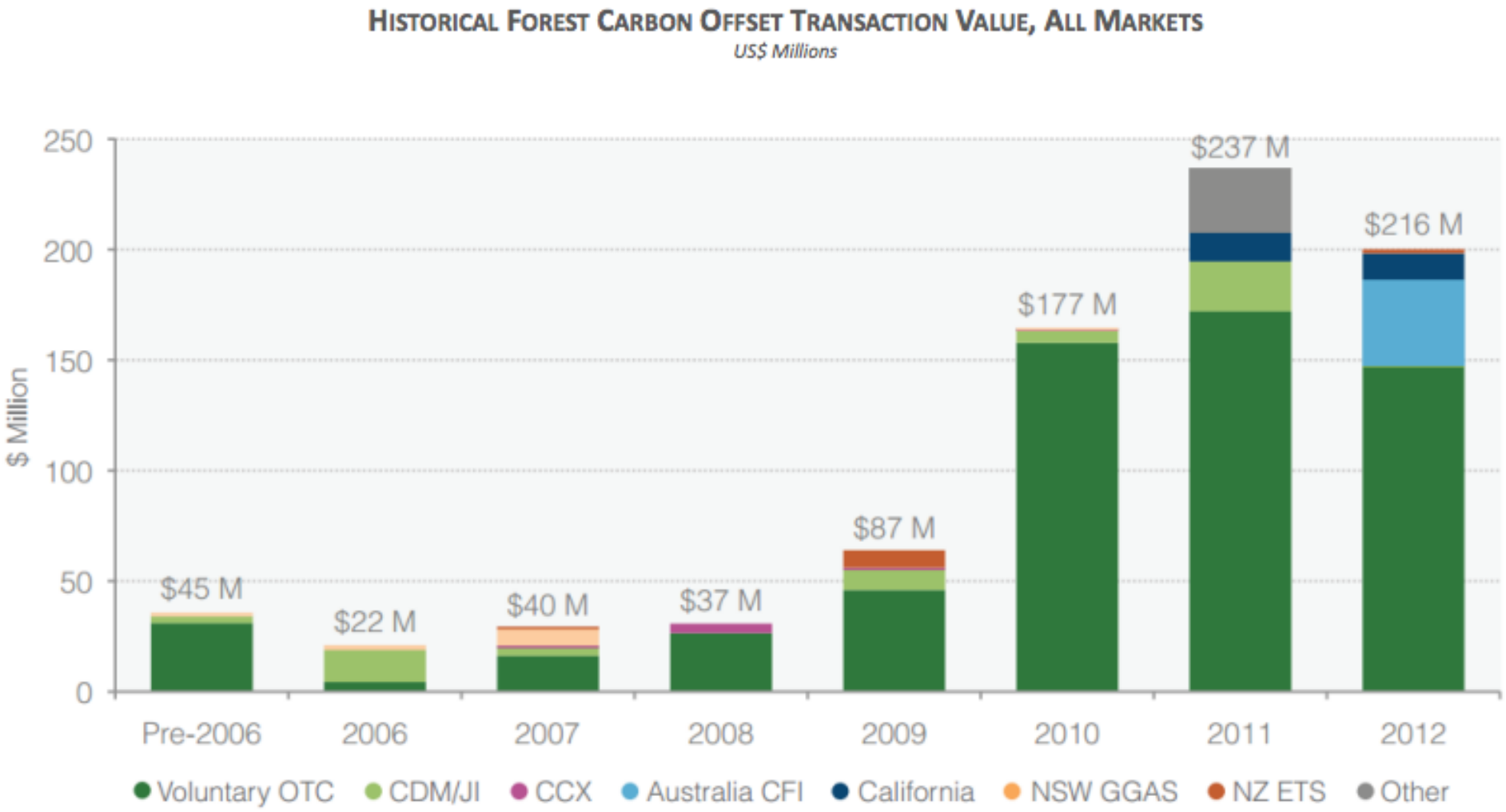
- Donors have deposited about 72% (US$ 2.2 billion) of the US$ 3.1 billion pledged to multilateral development banks.
- 59% of the funds are committed
- 29% of the formally approved
- 11% actually distributed

Carbon markets: developing faster then ever before



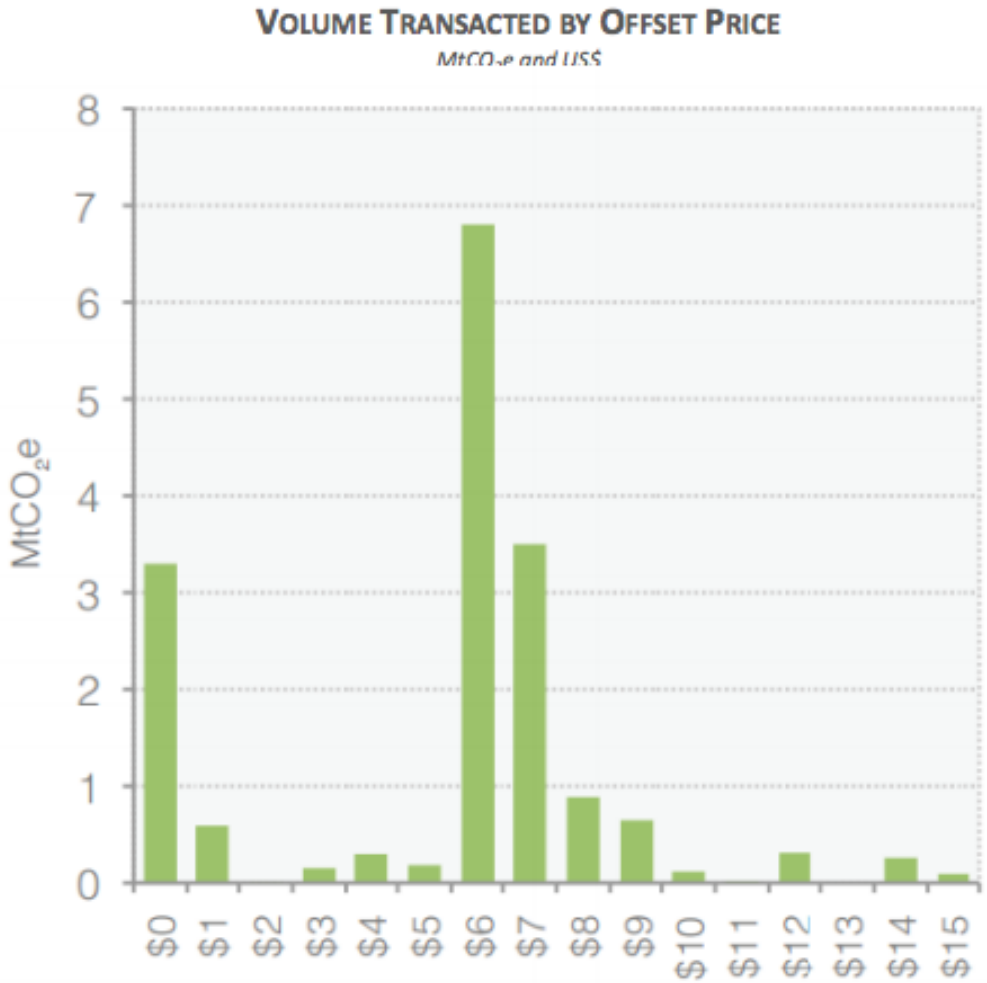
Source: World Bank

Forest carbon markets: US$ 900 million in total to date



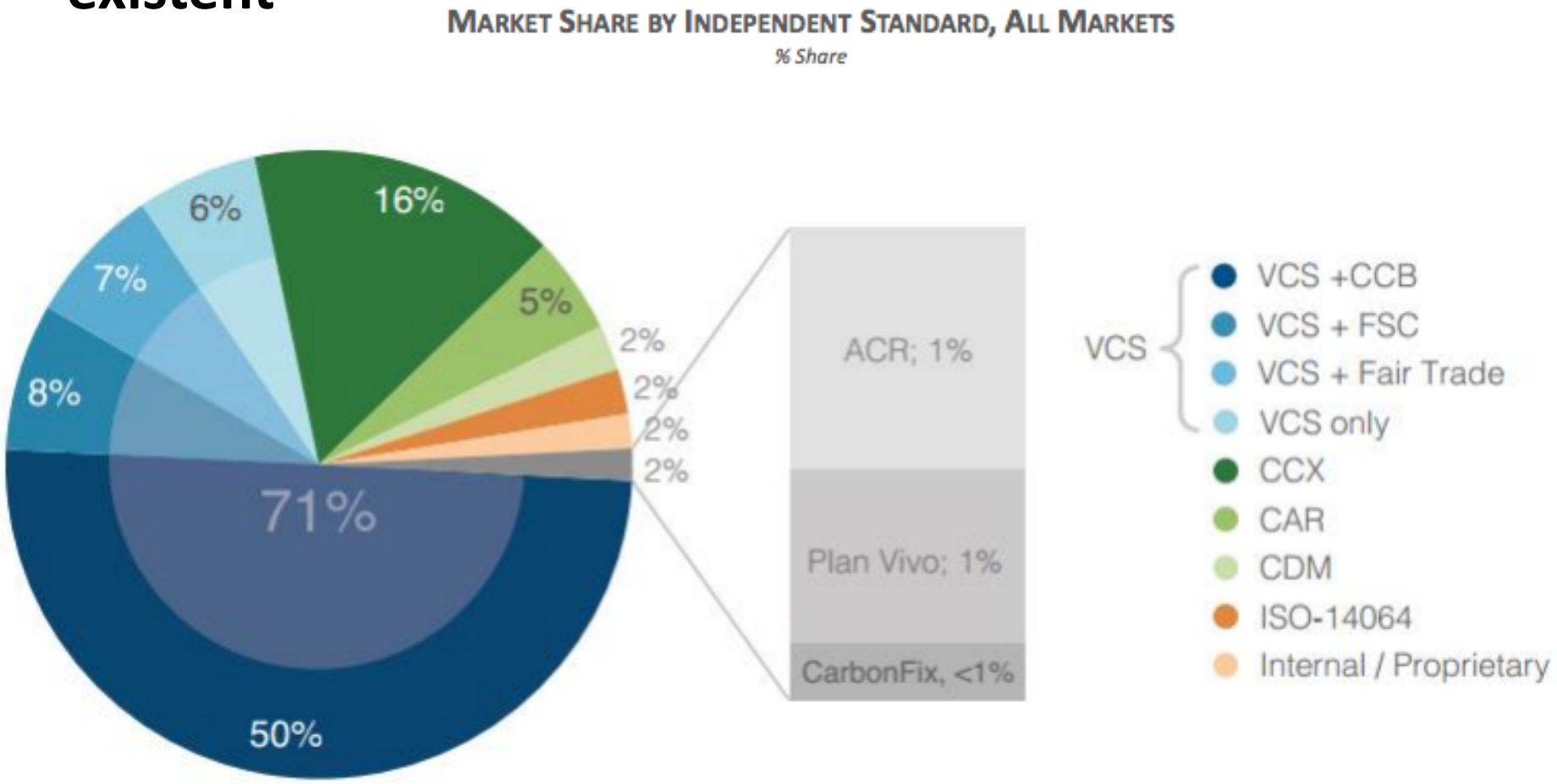
Source: Ecosystem Marketplace

Average forest carbon price: US$ 7.8/tCO_2
CCB premium: US$ 0.2 – 0.5 (for VCS)



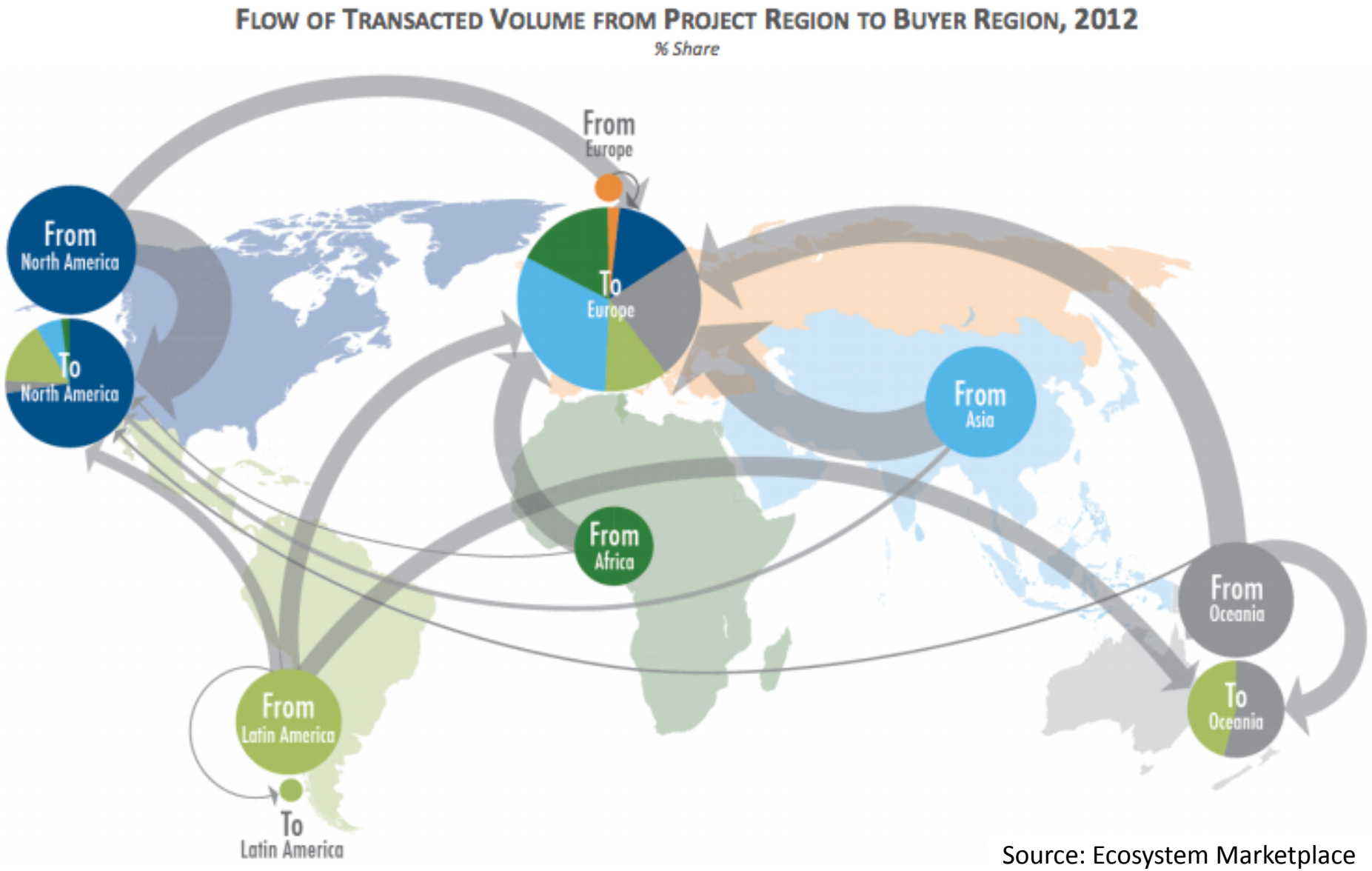
Source: Ecosystem Marketplace

VCS/CCB dominant methodology, CDM almost non-existent



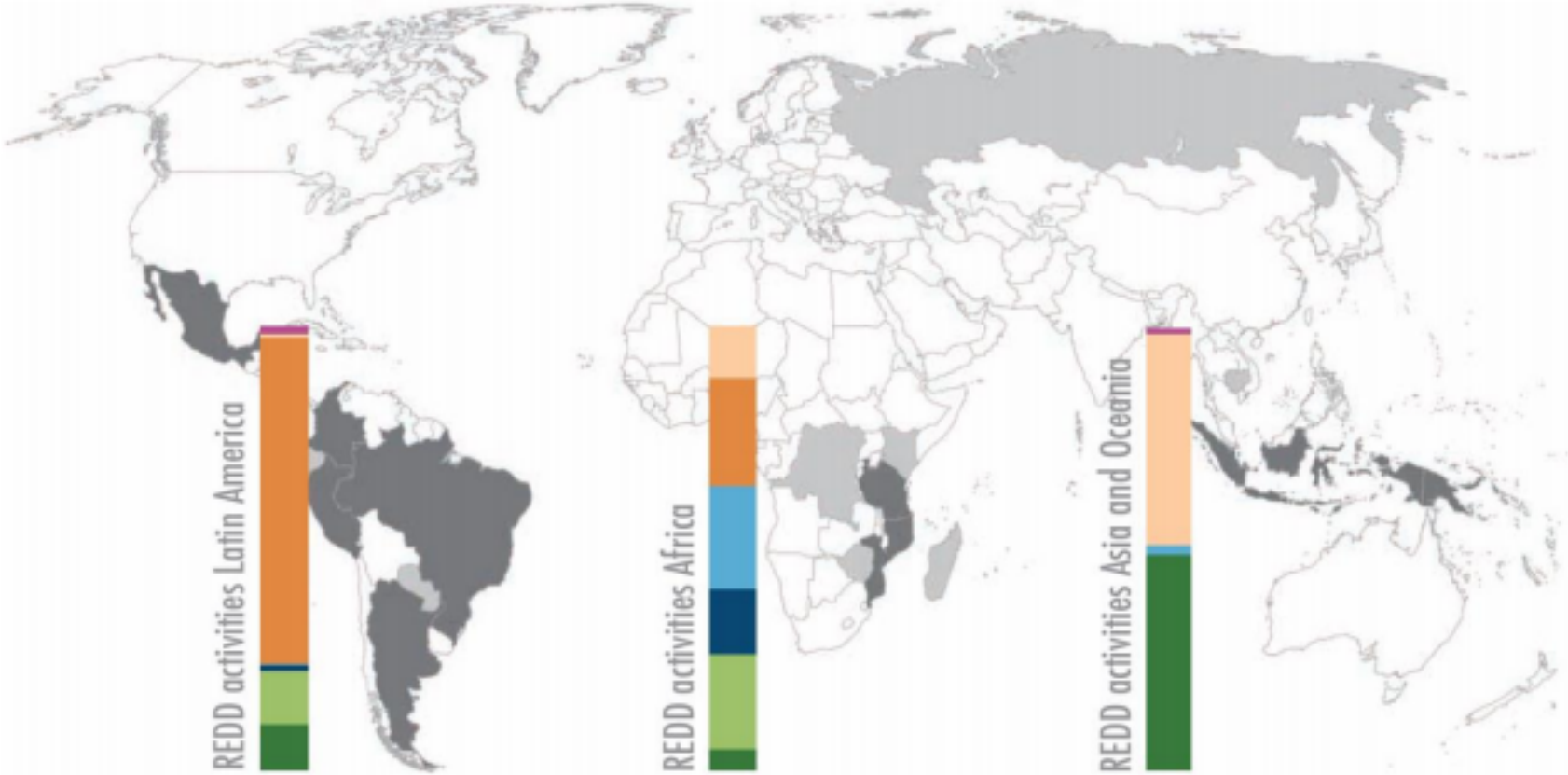
Source: Ecosystem Marketplace

Europe: dominant buyer forest carbon credits



Source: Ecosystem Marketplace

REDD Project Country Locations; Regional Distribution of REDD Activities



Map key: REDD countries REDD countries with projects actively engaged in nesting

Graph key (% transactions tied to these activities):

Smallholder agriculture Afforestation / Reforestation Commercial agriculture
Sustainable energy Sustainable forest management Ecotourism Other

Source: World Bank

Part 2: Summary

- **Results-based actions** are policies and measures that lead to verified (MRV) reductions or removals of carbon emissions compared to a forest reference emission level (FREL/FRL) that complies with Cancun safeguards.
- **Results-based payments** or finance is the ability of recipient countries to be rewarded for results-based actions.
- Private finance through voluntary carbon markets have accounted for about 10% of total funding pledged (which is about US$ 9 billion)
- **5 country donors** (direct – bilateral deals with countries – and indirectly through multilateral financial institutions) account for 75% of REDD+ funding to date.
- **Indonesia and Brazil** receive/have been allocated about 40% of REDD+ funding pledged to date.
- **Voluntary carbon markets** not sufficient to counter funding needed for REDD+ (estimated at US$ 30 billion per year from 2020 to half deforestation)

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PART 3

POLICIES AND MEASURES FOR RESULTS-BASED ACTIONS

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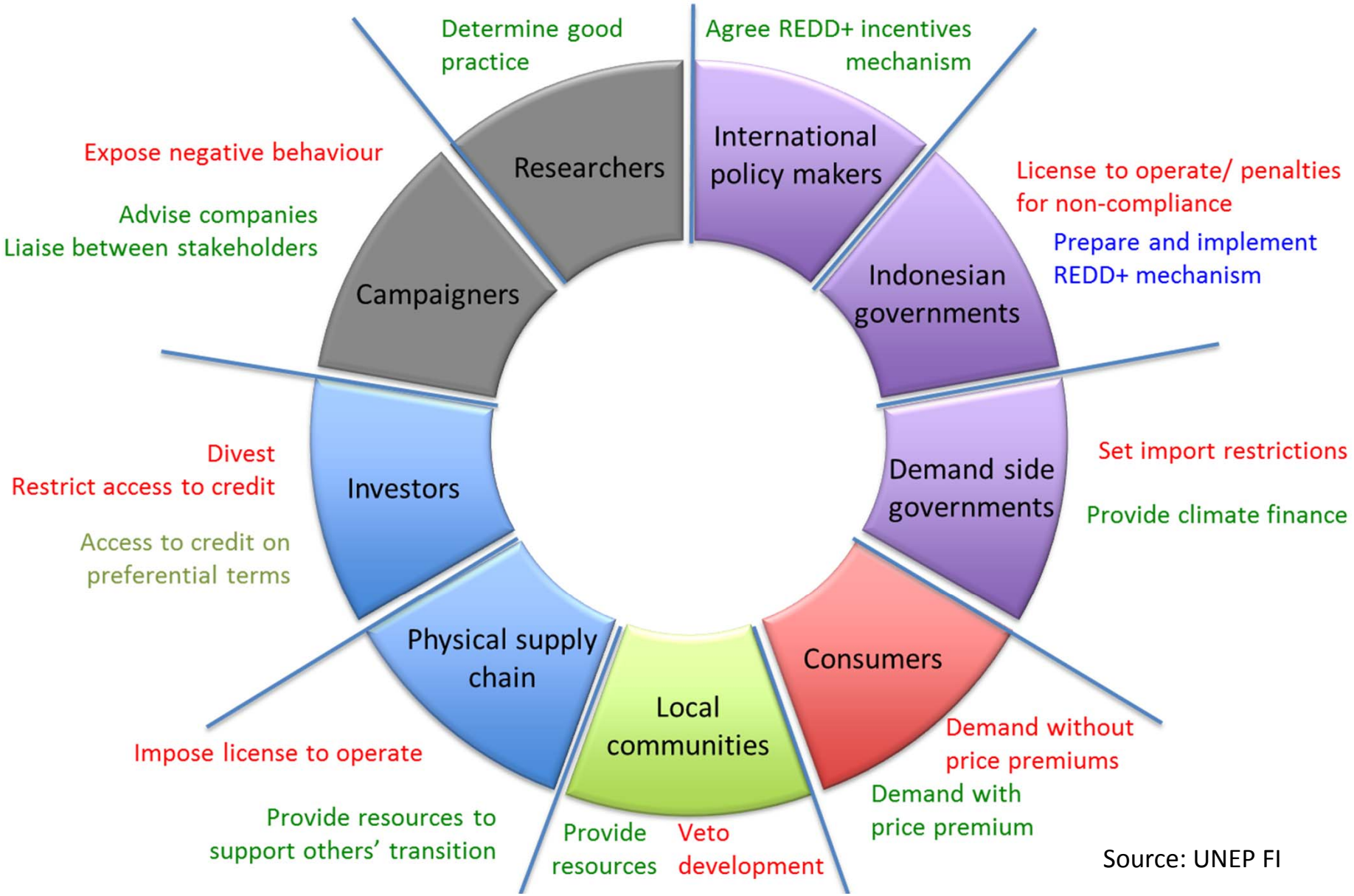
Tools and enabling conditions towards results-based actions

- There is a whole suit of **tools and frameworks available** through the UN-REDD Programme and via other sources to support countries to embed REDD+ in broader objectives of a Green Economy transformation.

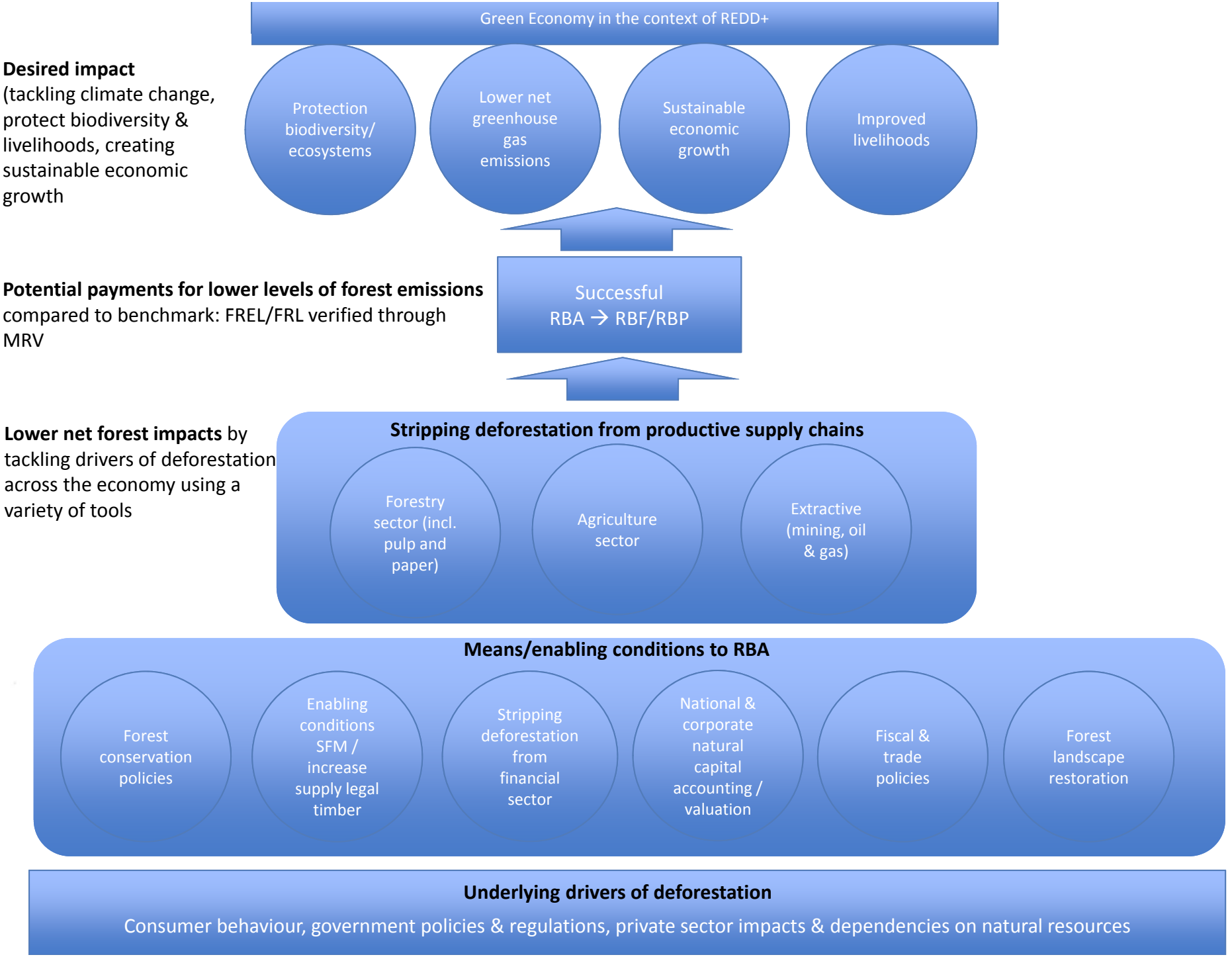
    - Forest economic valuation & accounting to understanding the importance of forests for the national economy and link to national account
    - Spatial analysis of costs and benefits to implement REDD+
    - *Value at risk* of soft-commodity companies due to deforestation
    - Integration natural capital risk indicators in loans, equities and bonds, etc.
    - Integrated Assessment models

- These enable different ministries to understand the value of REDD+ beyond the Ministry of Environment or Forests, but also Ministry of Planning, Finance, Economic Affairs, etc.

Example: Parties driving change towards reduced forest loss in palm oil sector



Source: UNEP FI


Green Economy in the context of REDD+
Desired impact
(tackling climate change, protect biodiversity & livelihoods, creating sustainable economic growth
Protection biodiversity/ ecosystems
Lower net greenhouse gas emissions
Sustainable economic growth
Improved livelihoods
Potential payments for lower levels of forest emissions
compared to benchmark: FREL/FRL verified through MRV
Successful RBA → RBF/RBP
Lower net forest impacts by tackling drivers of deforestation across the economy using a variety of tools
Stripping deforestation from productive supply chains
Forestry sector (incl. pulp and paper)
Agriculture sector
Extractive (mining, oil & gas)
Means/enabling conditions to RBA
Forest conservation policies
Enabling conditions SFM / increase supply legal timber
Stripping deforestation from financial sector
National & corporate natural capital accounting / valuation
Fiscal & trade policies
Forest landscape restoration
Underlying drivers of deforestation
Consumer behaviour, government policies & regulations, private sector impacts & dependencies on natural resources

Tools and their potential use as policies, actions and measures for results-based actions

National natural capital valuation & accounting	Acknowledgement value forests across ministries	A) Higher budgets B) Domestic funding REDD+ C) Co-finance international REDD+ Programmes
Value at Risk: visualizing environmental risks on corporate profits	Understanding by companies how environmental risks translates into financial risk	Stripping deforestation from productive and financial supply chains can lead to reduced impacts on tropical forests
Fiscal and trade policies	Incentive private and public sector operating models towards lower deforestation levels	e.g. incentivise use degraded land through subsidies; discourage unwanted business activities through higher taxes or tariffs

UN-REDD PROGRAMME | REDD+ ACADEMY

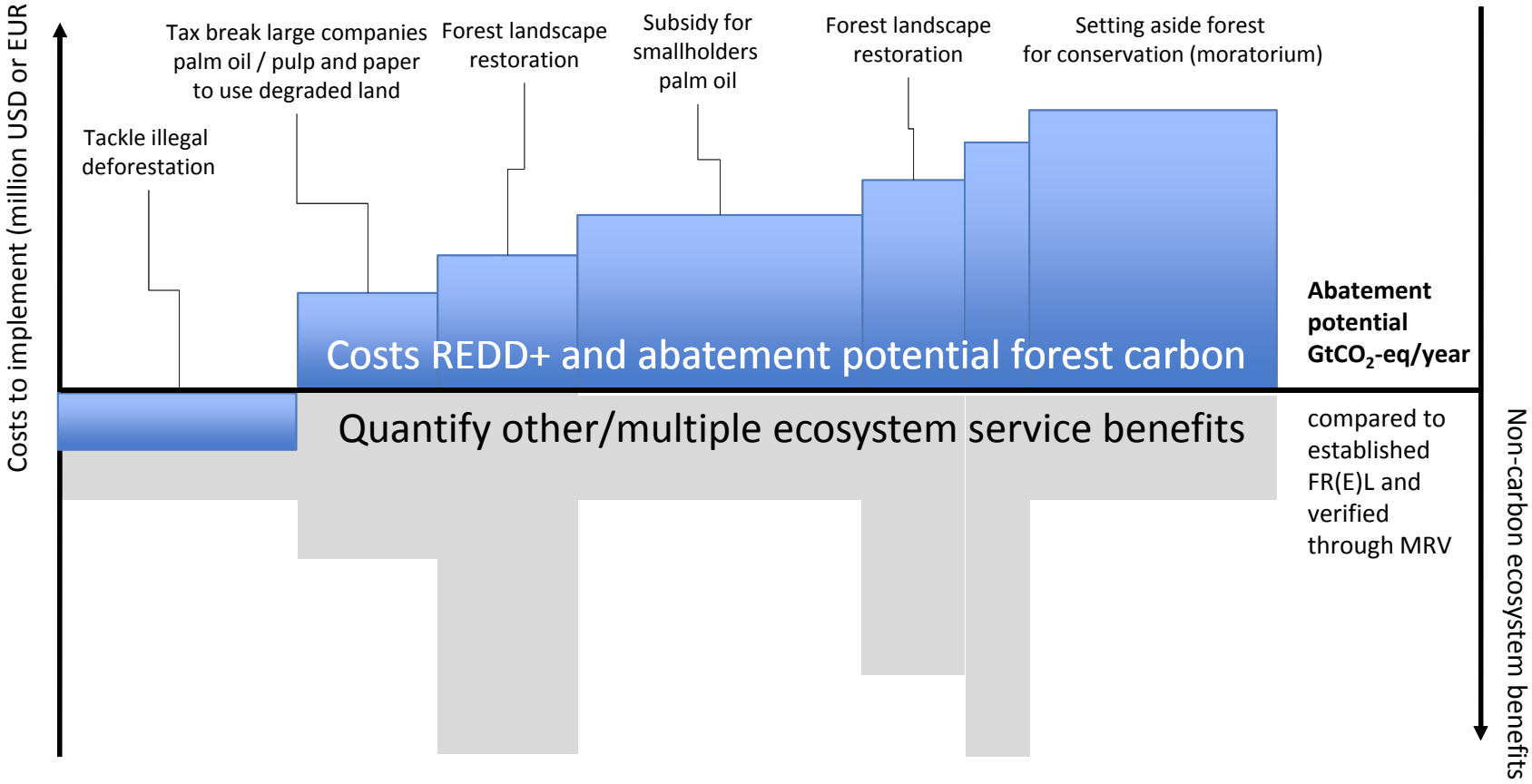
Tools and their potential use as policies, actions and measures for results-based actions

Conservation policies to increase protection of tropical forests	Laws / regulation to regulate use of tropical forests	Through direct enforcement, by working with e.g. financial regulators and others, reduce impact on tropical forests
Forest landscape restoration	Financial incentives (the "+" in REDD+) to stimulate reforestation of degraded areas	Declarations and pledges like the Bonn Declaration to restore 150 million hectares have potential to restore major areas of degraded land
Increase supply legal timber / stimulate Sustainable Forest Management	Incentivise through laws/regulation (e.g. through FLEG-T) to enhance supply legal timber	Reduce impacts on forests from illegal timber extraction & incentivise sustainable forest management

UN-REDD PROGRAMME | REDD+ ACADEMY

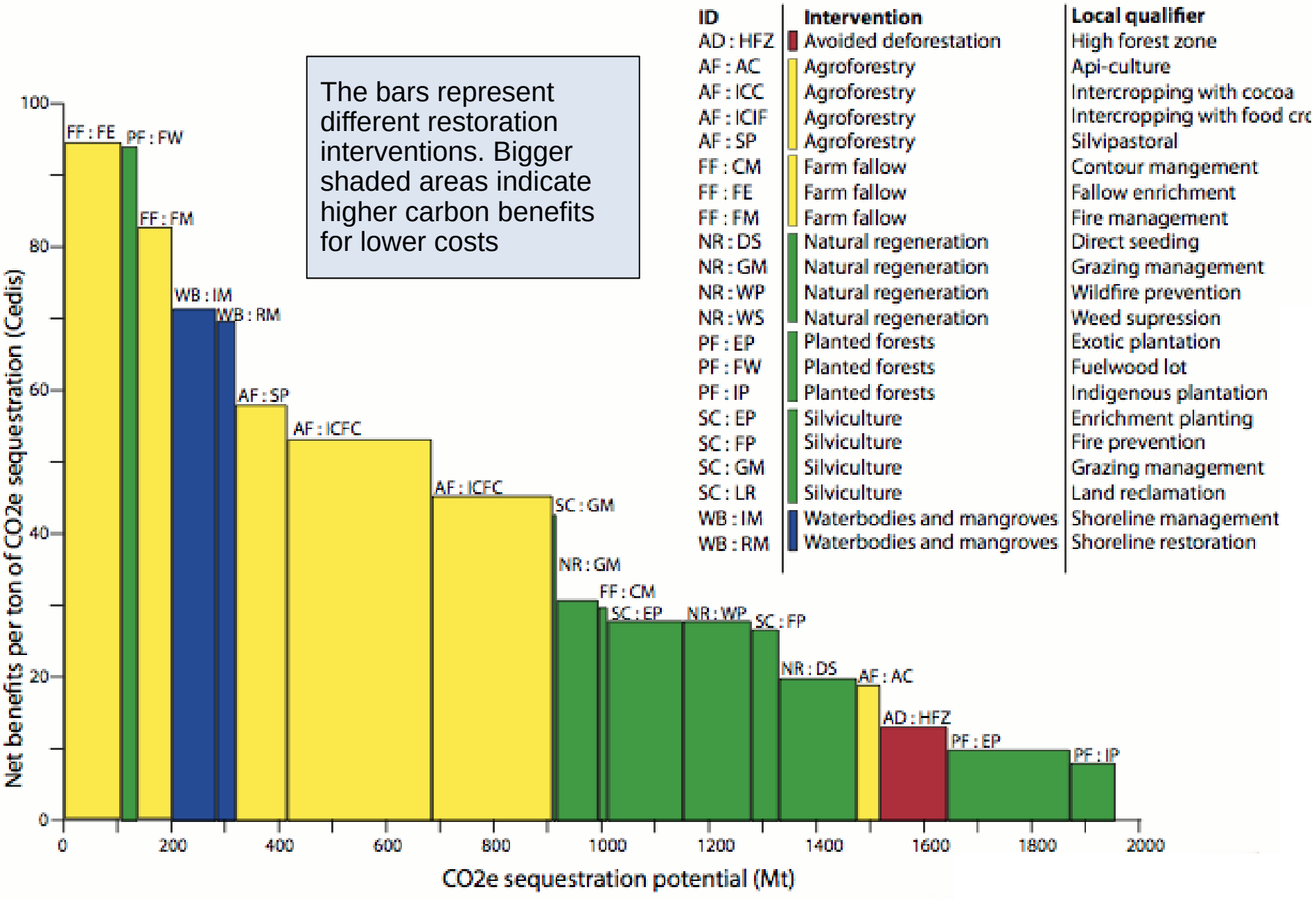
REDD+ RBA Abatement Cost Curve: a potential model for results-based payments

Compare various results-based actions that countries can take in terms of the potential to reduce forest-carbon emissions compared to FR(E)L and the costs it takes to implement them by a country. Also try to non-carbon benefits it generates. See scheme below (for **illustrative purposes**)

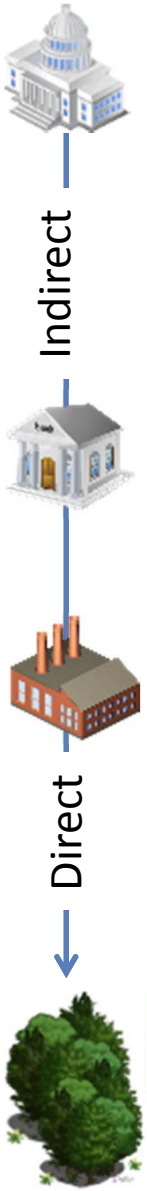


Source: Mulder, UNEP

Ghana: quantification of the potential of different landscape restoration interventions to sequester carbon



Direct and indirect actions, policies and measures



National natural capital accounting

- Core root why ecosystem services are regarded as externalities by our national/global economy.
- WAVES, VANTAGE, TEEB, etc initiatives that tackle these

Corporate natural capital accounting

- Companies factoring ecosystem service externalities in their profit and loss statement and on their balance sheet
- Natural Capital Declaration (NCD), Natural Capital Coalition and other initiatives are some leading ones in this field.

Fiscal and trade policies

- Tax break or subsidy to stimulate palm oil development on degraded land / enhancement of yield per ha (combined with agreement on reduced deforestation).

Forest landscape restoration

- Way to make degraded land productive again.
- FLR fits into REDD+ by enhancing forest carbon stocks
- Global Partnership on Forest Landscape Restoration a leading initiative in this field

Avoidance of forest fires

- Tackles on of the most direct ways why forests are disappearing, for example by regulation and strict enforcement

Countries have **full flexibility** to decide what actions, policies and measures are most effective in their country.

Those measures that are most **economically attractive** and have a **high likelihood of generating actual reductions in forest-carbon emissions** compared to FR(E)L are likely to be most interesting to implement.

Measures that are more direct have a higher likelihood of generating RBP if emission levels are reduced compared to FR(E)L than indirect measures

National natural capital valuation & accounting

Acknowledgement economic, social and ecological value forests across ministries

A) Higher budgets Min Env/Forestry

B) Domestic funding REDD+

C) Co-finance international REDD+ Programmes

TOOL

NATIONAL ECONOMIC VALUATION & ACCOUNTING: VISUALIZING COSTS AND BENEFITS THAT ARE HIDDEN

UN-REDD PROGRAMME | REDD+ ACADEMY

Quantifying costs & benefits

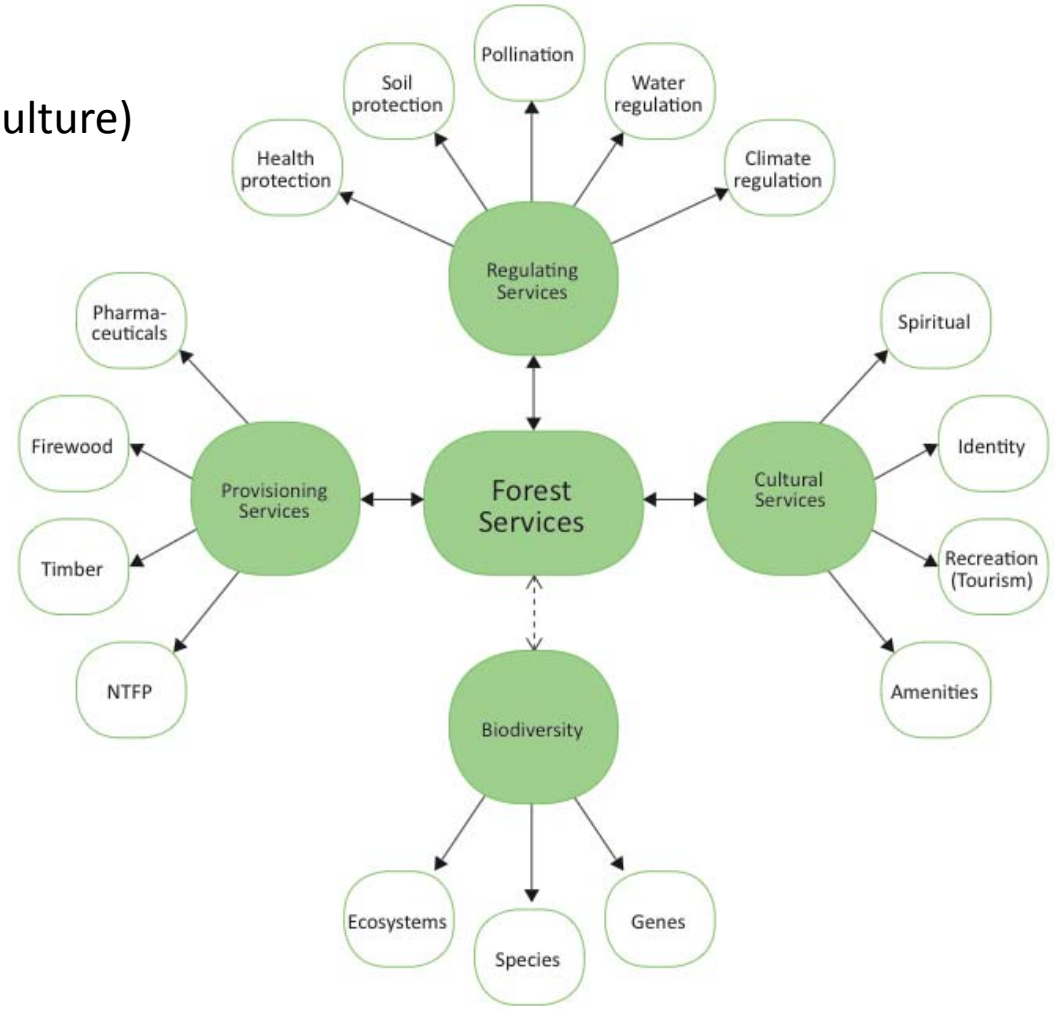
Types of costs:

- Opportunity costs
  - timber
  - alternative land uses (e.g. agriculture)
  - $ per ton CO2 equivalent

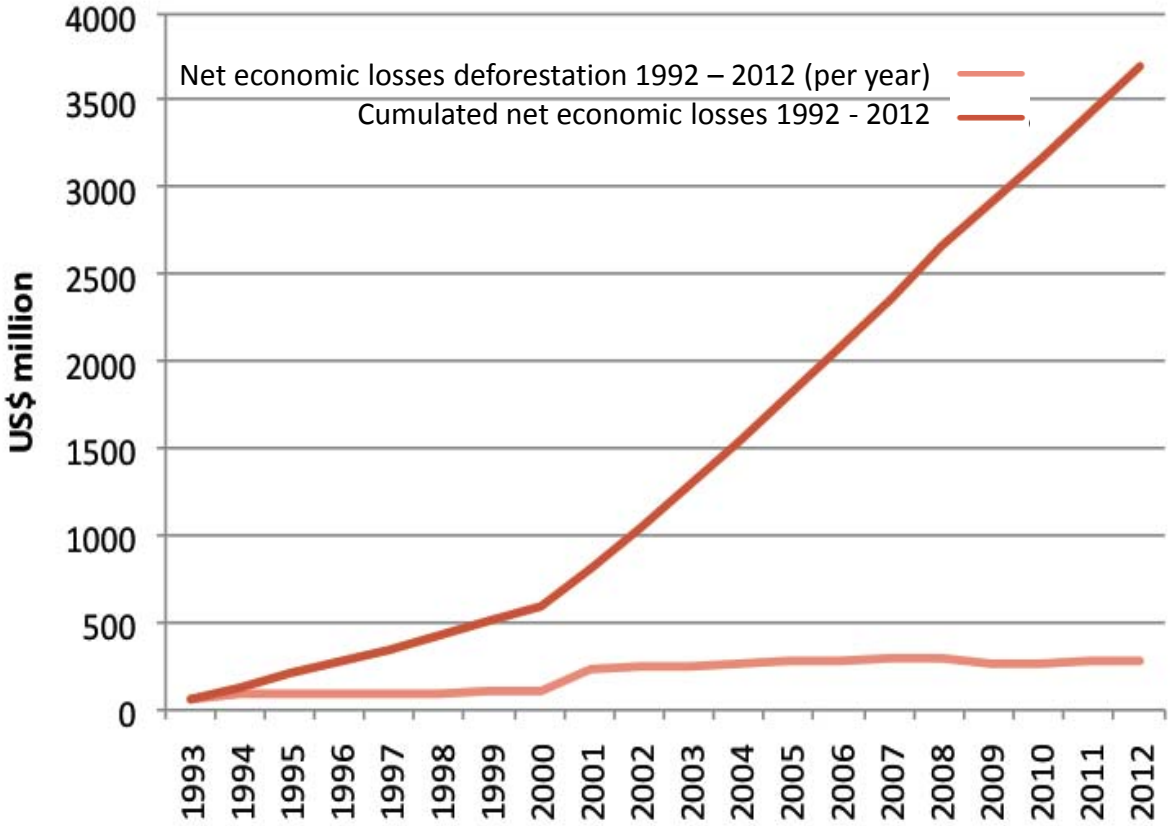
- Transaction & Institutional
  - national consultation
  - reference levels
  - scheme planning
  - feasibility assessmen

- Implementation
  - monitoring
  - reforestation
  - land use planning
  - forest protection
  - administration

Types of benefits:



Example: Economic valuation of Panama's forests ecosystems



Benefits

- sales timber, land agriculture

Costs/losses

- forgone ecosystem benefits (water regulation, soil fertility, sedimentation, carbon emissions)

Note

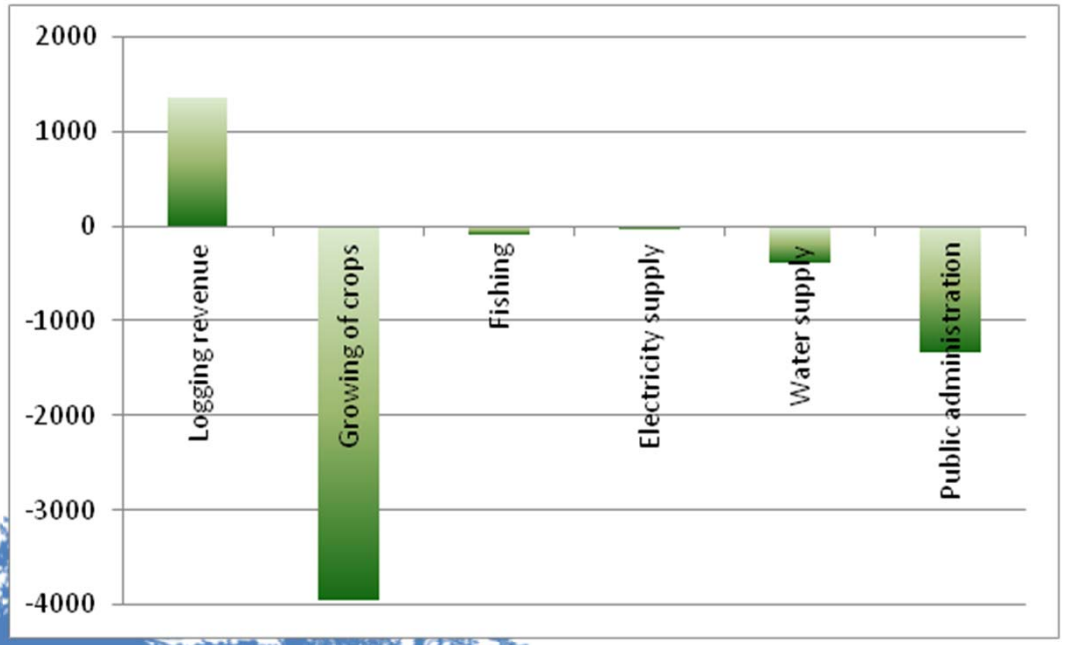
Some losses borne by other sectors in the country (e.g. water regulation, Sedimentation, etc).
Others internationally (carbon emissions)

	2012	1992-2012
Gains from deforestation	334.6	2,927.7
Losses from deforestation	606.4	6,628.3
Net losses from deforestation	271.8	3,700.6

Economic value of Kenya's forest ecosystems ('Water Towers')

The economic valuation study on the role and contribution of montane forests and related ecosystems to the Kenyan economy found that **deforestation in the "Kenyan water towers" deprived the economy of KSH 3,652 million or USD 40 million in 2010**. The report showed that the **contribution of forests in conventional accounts is undervalued by 2.5%**, and estimated that its annual contribution to GDP is around 3.6%.

Impact: deforestation on Kenyan economy (in Million KSH 2010)



UN-REDD PROGRAMME | REDD+ ACADEMY

MULTIPLE BENEFITS OF REDD+ IN THE LANDSCAPE

CURRENTLY AN AREA THE SIZE OF 25 FOOTBALL FIELDS IS BEING DESTROYED EVERY 60 SECONDS REDD+ WILL ENSURE THAT FORESTS AND TREES ARE MORE HIGHLY VALUED IN DECISION-MAKING[1]

REDD is an effort to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development. "REDD+" goes beyond addressing deforestation and forest degradation, and aims to make forest management and land-use more sustainable within the landscape, and promote conservation and restoration of forests.

When REDD+ prevents the loss or degradation of forest, this will result in multiple benefits in addition to protecting or enhancing carbon stocks. These include 'ecosystem-based benefits' such as conservation of forest biodiversity, water regulation, soil conservation, timber, forest foods and other non-timber forest products.

Various factors affect the extent to which these benefits are delivered: the type, location and condition of the forest involved, which REDD+ activity is undertaken, how it is implemented, and the dependence of the local population on forest resources. REDD+ can also lead to direct social benefits, such as jobs, livelihoods, land tenure clarification, carbon payments, enhanced participation in decision-making and improved governance.

INDIGENOUS PEOPLES

60 MILLION
INDIGENOUS PEOPLE DEPEND ON FORESTS[3]

ENERGY CONSUMPTIONS

OVER
2 BILLION
PEOPLE USE WOODFUEL FOR COOKING AND/OR HEATING[19]

FOREST COMMUNITIES

FORESTS CONTRIBUTE TO THE LIVELIHOODS OF
1.6 BILLION
PEOPLE WORLDWIDE[2]

FISHING

INTACT FOREST AND BUFFER ZONES AROUND RIVERS AND LAKES CAN REDUCE SEDIMENTS, BENEFITTING FISH POPULATIONS[16]

BIODIVERSITY

FORESTS ARE THE HABITAT FOR
87%
OF GLOBALLY THREATENED BIRDS[5]

TOURISM

INTERNATIONAL ECOTOURISM IN 2009 EARNED ABOUT USD
60 BILLION[17]

COSTA RICA ALMOST DOUBLED ITS FOREST COVER IN A PERIOD OF
25 YEARS,
REINFORCING ITS GREEN IMAGE AS THE BASIS FOR ITS TOURISM INDUSTRY[18]

TRADE

TRADE IN TIMBER AND OTHER FOREST PRODUCTS, IS ESTIMATED AT US
330 BILLION
DOLLAR PER YEAR[4]

ELECTRICITY PRODUCTION

UP TO 70%
OF OPERATIONAL COSTS OF HYDROPOWER DAMS COME FROM SEDIMENT REMOVAL[15]

46%
OF KENYA'S POWER SUPPLY IS GENERATED BY HYDRO POWER WHICH DEPENDS ON THE COUNTRY'S FOREST WATERSHEDS[15]

PHARMACEUTICALS

WILD PLANTS CONTRIBUTE TO THE DEVELOPMENT OF AT LEAST
25%
OF ALL PRESCRIPTION DRUGS[6]

NON-TIMBER PRODUCTS

FROM FORESTS CAN GENERATE
4 MILLION
PERSON-YEARS OF EMPLOYMENT ANNUALLY[8]

FOREST RESTORATION

IN NORTHERN TANZANIA IT TOOK ONLY 15 YEARS TO RESTORE 2 MILLION HECTARES OF FOREST AND AGRICULTURAL LAND,
DOUBLING
HOUSEHOLD INCOME[2]

POLLINATION

FOREST-BASED WILD POLLINATORS ARE WORTH
BILLIONS
OF DOLLARS ANNUALLY TO FARMERS[9]

FOOD SECURITY

TREE FOODS PROVIDE SOME
30%
OF RURAL DIETS IN BURKINA FASO[8]

BIG CITIES

33 OF THE WORLD'S
105 LARGEST CITIES OBTAIN THEIR FRESH WATER DIRECTLY FROM PROTECTED AREAS[7]

FLOODING

FORESTS CAN HELP REGULATE THE AMOUNT OF WATER REACHING RIVERS AND REDUCE THE RISK OR MAGNITUDE OF FLOODING[8]

WETLANDS

ARE VALUATED TO PRODUCE
$2,800
PER HECTARE OF ECOSYSTEM SERVICES EACH YEAR

MANGROVE SPECIES

ARE ESTIMATED TO SUPPORT 30% OF FISH CATCH AND ALMOST
100%
OF SHRIMP CATCH IN SOUTH-EAST ASIAN COUNTRIES[8]

UN-REDD
PROGRAMME

FAO UNDP UNEP

VIDEO

MAU FOREST, KENYA

UN-REDD PROGRAMME | REDD+ ACADEMY

EXERCISE

SPATIAL COST-BENEFIT ANALYSIS TO DETERMINE SUITABLE AREAS REDD+ IMPLEMENTATION (UNEP-WCMC)

UN-REDD PROGRAMME | REDD+ ACADEMY

Natural capital accounting

- Two major flaws with GDP
  1. It only looks at economic performance in a given year: income. No information about the underlying assets and wealth.
  2. Poor representation of natural capital
- Poor representation of natural capital in GDP leads to unsustainable degradation
- Natural capital is a critical asset, especially for developing countries where it makes up a significant share (36%) of total wealth.

"A private company is judged by both its income and balance sheet, but most countries only compile an income statement (GDP) and know very little about the national balance sheet"
Joseph Stiglitz (Nobel prize winner in Economics)

Natural capital accounting

- Wealth accounting (including natural capital accounting) can provide detailed statistics for better management of the economy,
- UN SEEA framework on Experimental Ecosystem Accounting (EEA).
- Countries developing accounts: Botswana, Colombia, Costa Rica, Madagascar, Philippines.
- Indicators covered include water, forests land and ecosystems

Value at Risk: visualizing environmental risks on corporate profits

Understanding by companies how environmental risks translates into financial risk

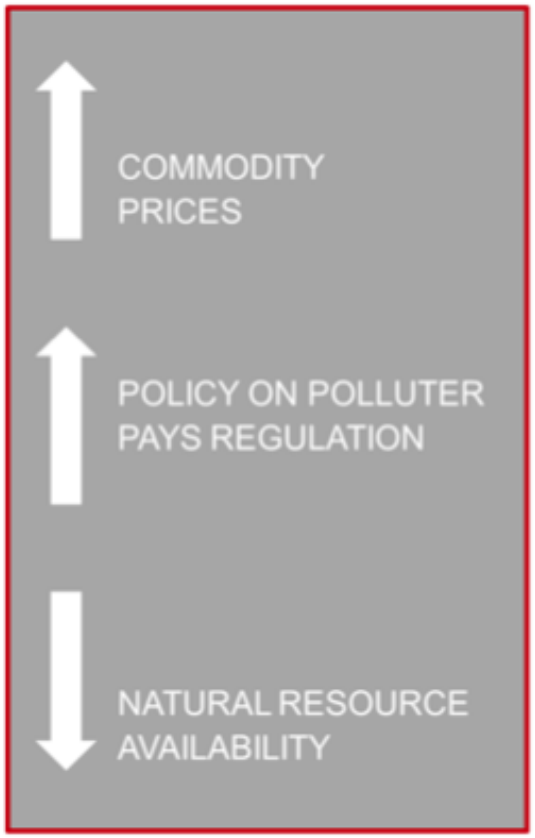
Stripping deforestation from productive and financial supply chains can lead to reduced impacts on tropical forests

TOOL

VALUE AT RISK: DEPRECIATION OF NATURAL CAPITAL LEADS TO BUSINESS RISKS. A CASE TO SUPPORT REDD+?

UN-REDD PROGRAMME | REDD+ ACADEMY

…..Some examples to start with



NEWMONT

Mine project in danger of being cancelled

The project was suspended in 2011 at the request of Peru's central government following protests in Cajamarca by anti-mining activists. Fears are that the mine will threaten water supplies. Cancellation of the project would have serious ramifications for Newmont's growth prospects and revenue.

	2012	2020
REVENUE	X	↓
COST OF GOODS SOLD	X	↑
OPERATING PROFIT	X	↓
OPERATING EXPENSES	X	↑
DEPRECIATION	X	↑
EBIT	X	↓
INTEREST	X	↓
TAX	X	↑
PROFIT AFTER TAX	X	↓

MULBERRY

36 per cent decline in pre-tax profits

The rising cost of raw materials, such as leather, caused Mulberry's gross margins to decline to 61.3 per cent in the six months to the end of September, from 66.2 per cent a year previously

$9.6 billion cost to U.S. power sector of implementing new mercury emission limits

The U.S. Environmental Protection Agency finalized the Mercury and Air Toxics Standards for new coal- and oil-fired power plants. The emission limits are expected to cost the industry around $9.6 billion to implement and have already had an effect on the building of new coal-fired power plants in the U.S

H&M

30 per cent drop in first-quarter net profits.

Cotton prices increased by 150% from 2010 levels. To keep their model of 'cheap chic' H&M decided to internalise the increased input costs, rather than passing through to the consumer.

	2012	2020
MARKET VALUE	X	↓

ADM

Share price falls 12% within a month

Shares in Archer Daniels Midland, the world's largest corn processor, fell as corn prices surged amid fears that a widening U.S. drought will trim size of the corn crop.

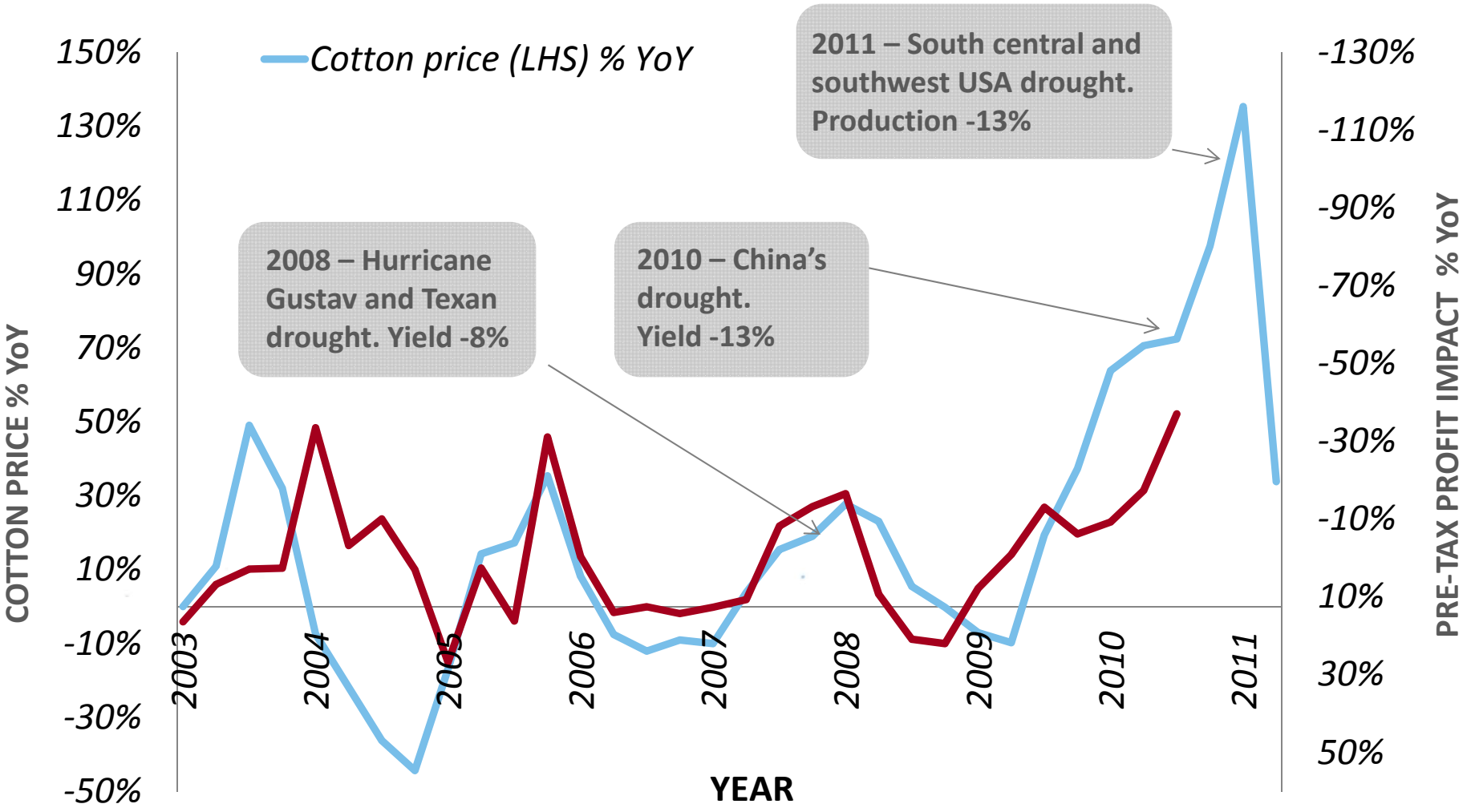
Tyson

Shares fell 6% in a day

Tyson shares fell after the company cut its full-year revenue forecast and posted quarterly earnings that missed analysts' estimates as feed costs rose. Tyson said the 2012 drought in the U.S., which led to higher grain costs, is also leading to increased costs for hog and cattle producers.

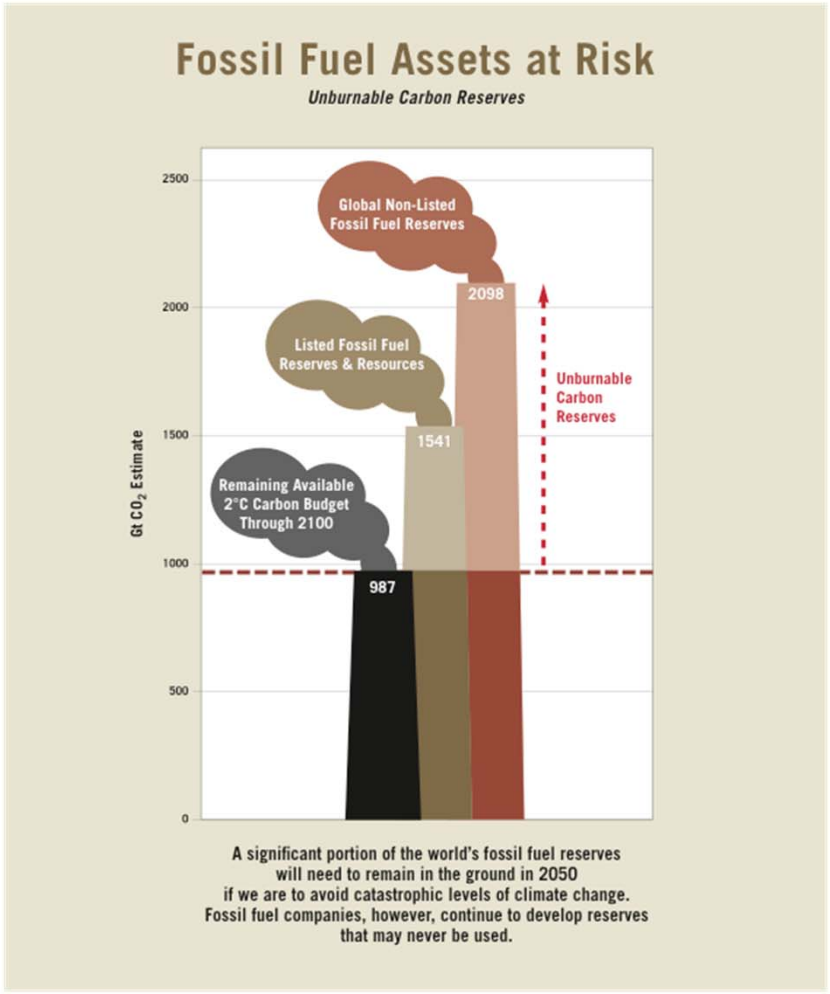
Source: Trucost

Different ways how environmental phenomena affect corporate profits….the case of cotton



Source: Trucost analysis; H&M, Gap & Fast Retailing; Factset data

Stranded assets: potential for assets to decline in value due to (unforeseen) circumstances



Ceres
www.ceres.org

Carbon Tracker Initiative
www.carbontracker.org

Value at Risk (VaR) popular tool in the financial sector. Defined as *the maximum loss not exceeded with a given probability defined as the confidence level, over a given period of time*.

Increasingly being applied by environmental economists: **what is the chance that a company's value is higher/lower because of currently unaccounted for environmental risk** (carbon emissions, deforestation impacts, etc)

Environmental externalities equate *50% of combined company earnings and 7% profits* (Universal ownership; PRI & UNEP FI)

"Unburnable carbon": *60 - 80% of proven fossil fuel reserves* of listed coal, oil and gas companies *cannot be utlized* (see picture); capex for new exploration efforts potentially wasted

Natural Capital Declaration (NCD): An initiative to integrate natural capital risk into financial risk

- The NCD **does not** aim to put a **price on nature**.
- It **does** aim to put a **price on the (credit) risk** that banks are exposed to through loans, investments and insurance and to **catalyze** the development of new products.
- It **does not** aim to be the next PRI or UN GC (in terms of # FIs or companies).
- The NCD **does** focus on the **global financial sector**. Engagement with wider private sector is through other platforms / organisations (WBCSD, NCC, CDP, CBD, etc).
- It does focus on tackling the **technical challenges** of **calculating the business case** and **developing metrics** for lenders, investors and insurers to embed natural capital.

40+ NCD signatories

Financial institution members of NCD Working Groups
We would like to thank the following signatories for providing financial contributions.

Althelia Ecosphere
ASN Bank
Banco Pichincha
Banco Mercantil del Norte, S.A
Caisse des Dépôts
Caixa Econômica Federal
Calvert Investments
China Merchants Bank
Financiera Rural
FIRA-Banco de Mexico
First Green Bank
FMO
IFC
Infraprev
Kenya Commerical Bank
Mongeral Aegon
MN Services
National Australia Bank
Nedbank
Pax World Management Corp.
Pingan Bank
Rabobank International
Robeco
Sovereign
Standard Chartered
Sumitomo Mitsui Trust Holdings
Unicredit
Yes Bank

Observers

BBVA
Banco Multiva
Caledonia Wealth Management
CI Banco
Earth Capital Partners
Forma Futura
Fundación Social
Monte dei Paschi di Siena
Mutualista Pichincha
SNS Asset Management
Vision Banco
Zevin Asset Management

- 40+ institutions have endorsed the NCD at CEO level.
- Most have contributed financially (annual contribution, project contribution).
- A number of institutions have 'observer status'.
- Growing number interested and committed to actively participate in one or more pilot projects.
- 5 FI representatives are part of the NCD Steering Committee

30+ NCD supporters

- 30+ organisations support the NCD: crucial to create broader acknowledgement and support
- A number are part or (planned) pilot projects.
- 2 representatives are part of the NCD Steering Committee

E-RISC Phase II: Towards Market Readiness

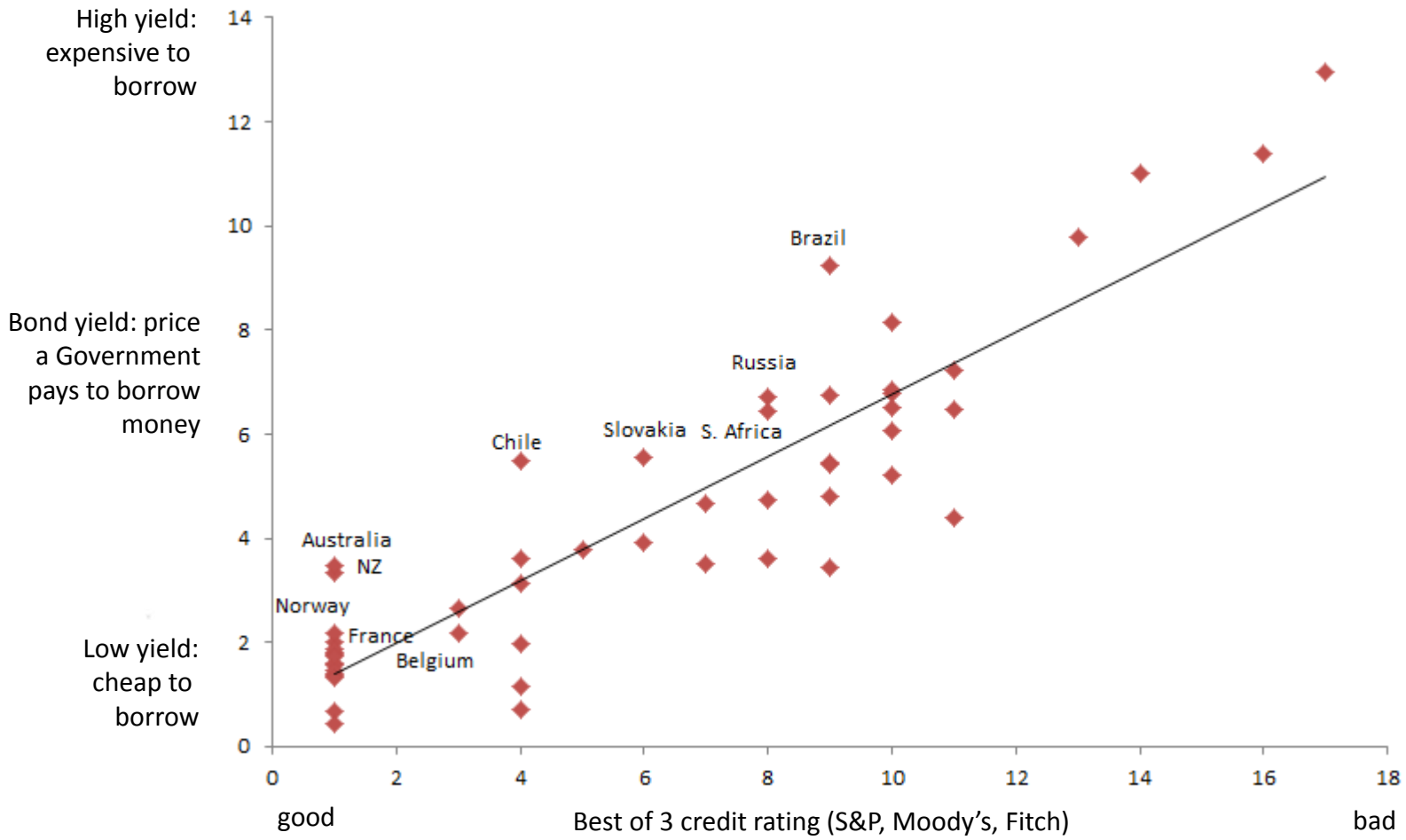
This projects contributes to the implementation of the Natural Capital Declaration

- Develop and refine E-RISC methodology. **Objective: mainstreaming in sovereign credit risk analysis**
- Relevant for i) sovereign credit ratings; and ii) choice and weights of sovereign bonds in an investment portfolio; iii) country risk score
- **Trade-related risks** (how differences in supply-demand of natural resource risks) affect **trade-related GDP** under different price scenarios. Incorporate in macro-economic model to see how trade-related natural resource risks affect the overall economy.
- Will be tested by several participating financial institution, including a major credit rating agency**.**

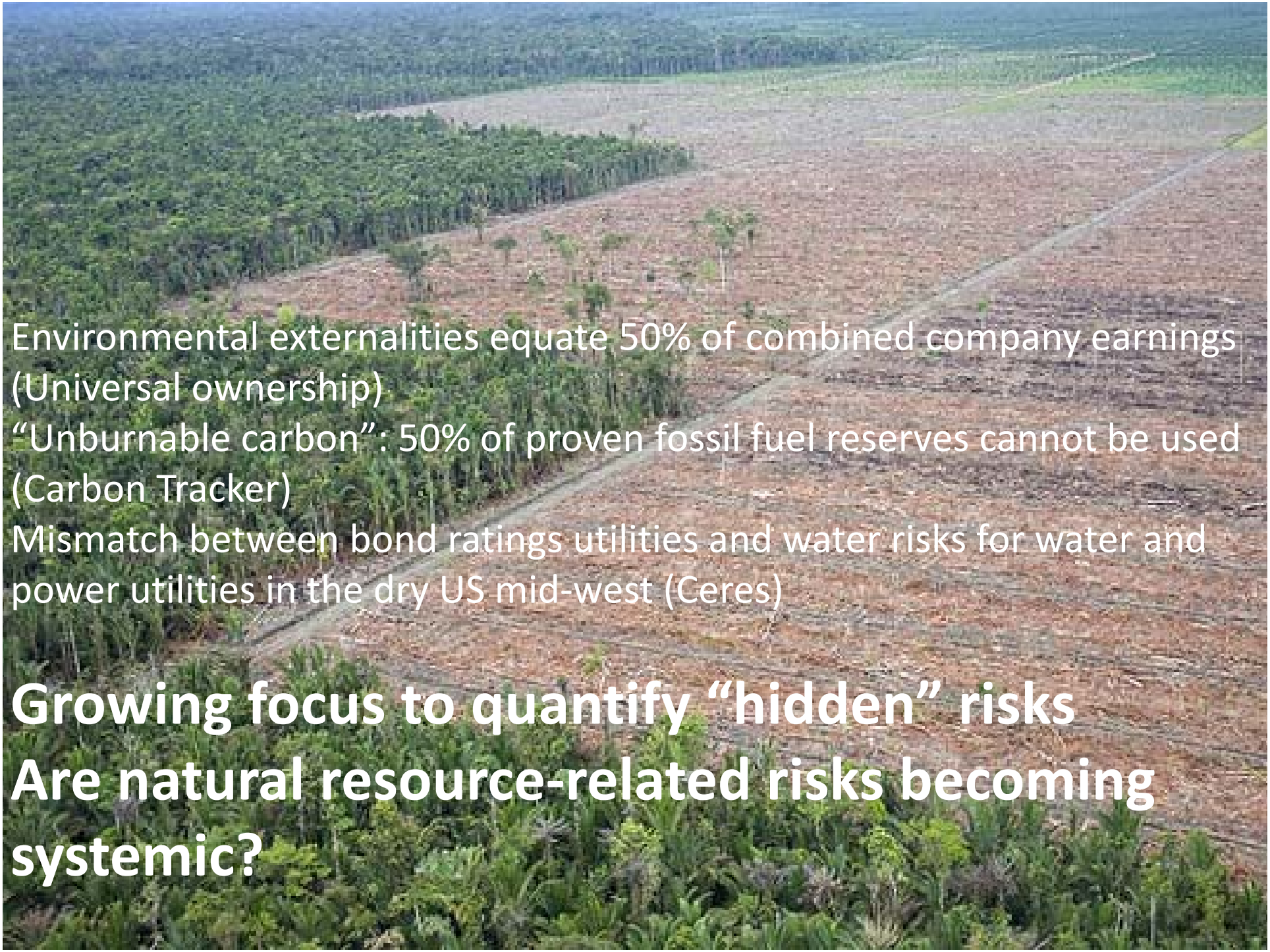
E-RISC: hypothesis: environmental risks affect financial risk of sovereign bonds

- **Bad sovereign ratings** = **higher borrowing costs** (i.e. countries have to pay more when their sovereign credit rating deteriorates & vice versa
- **Linking environmental risks** (e.g. overuse of renewable natural resources (forests, fishing stocks, crops, etc) to **economic and financial impacts**
- **Why can environmental risks be financially material for a sovereign nation?** If countries *overuse and degrade* forest, fish and other renewable natural resources, they need to import more (negatively affecting trade-related GDP).

E-RISC: hypothesis: environmental risks affect financial risk of sovereign bonds



> 6 million hectares of forests lost every year
20% of coral reefs destroyed (MA)
US$ 6.6 trillion in environmental costs externalized to society
USD$ 45 billion “cost of policy inaction” (TEEB) – ecosystem degradation
Science is sound, but weak financial argument



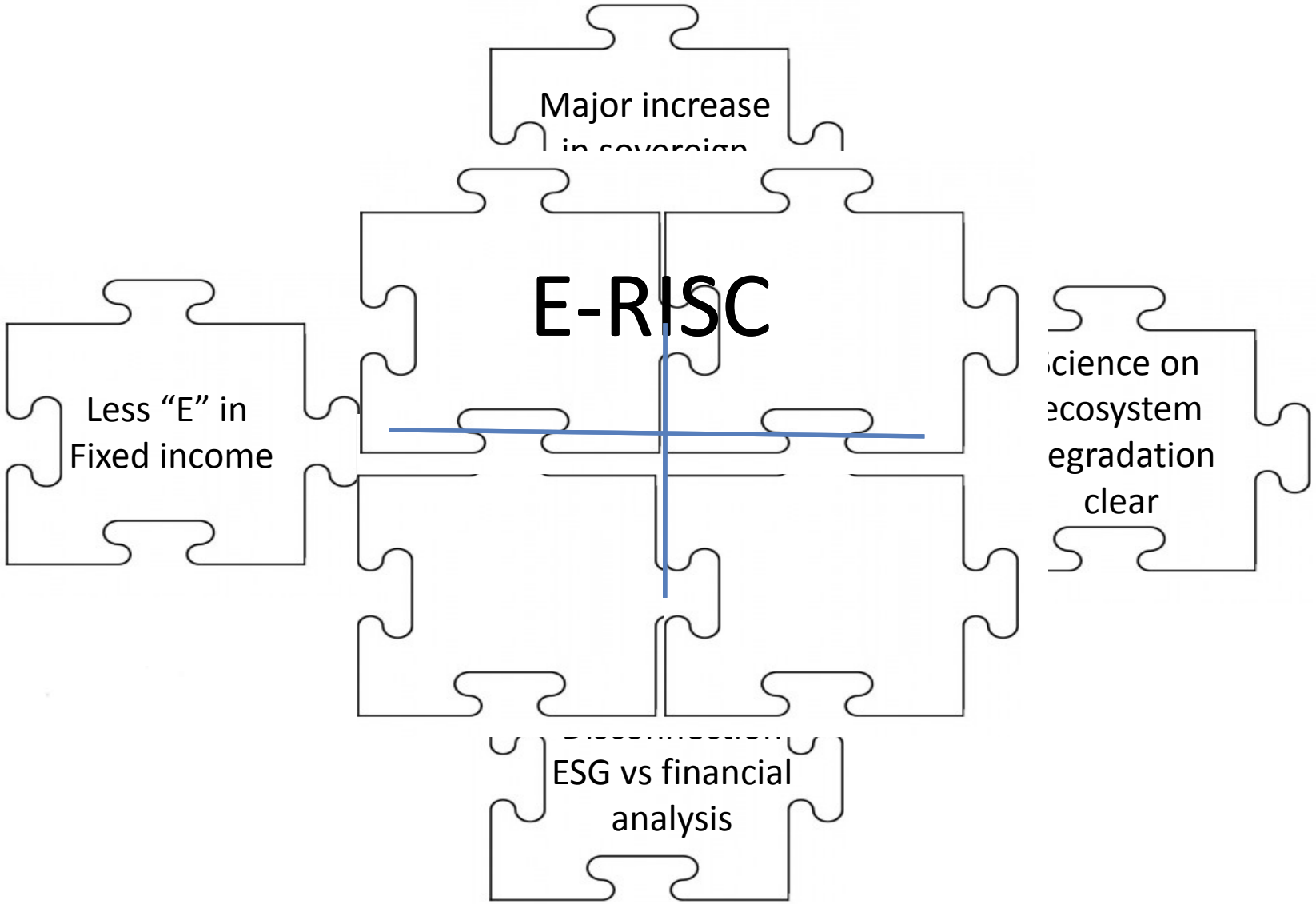
Environmental externalities equate 50% of combined company earnings (Universal ownership)

“Unburnable carbon”: 50% of proven fossil fuel reserves cannot be used (Carbon Tracker)

Mismatch between bond ratings utilities and water risks for water and power utilities in the dry US mid-west (Ceres)

Growing focus to quantify “hidden” risks

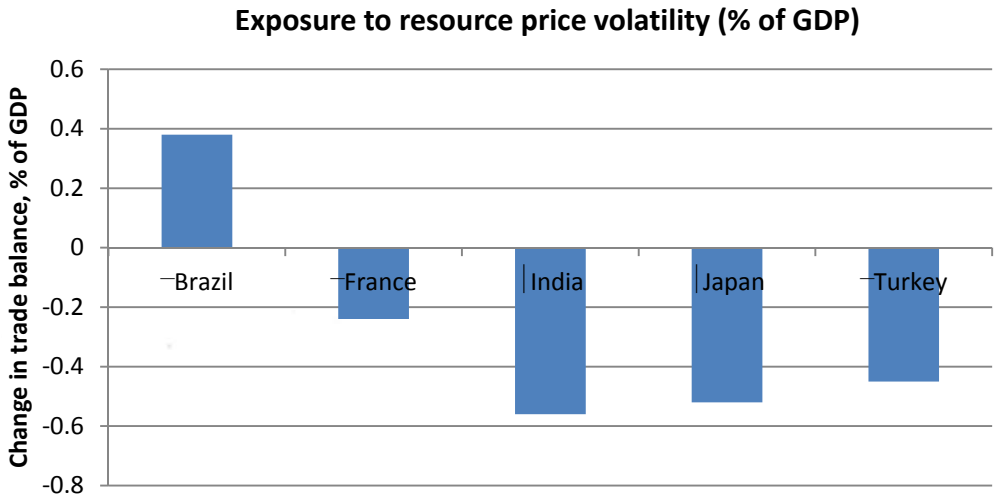
Are natural resource-related risks becoming systemic?


Major increase
E-RISC
Less “E” in
Fixed income
cience on
ecosystem
egradation
clear
ESG vs financial
analysis

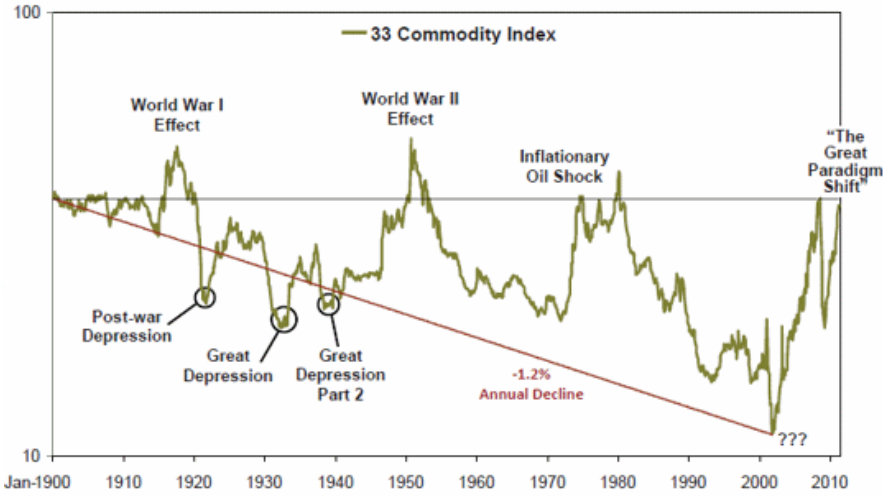
Short-term natural resource risks

- Simulating a **10% rise in natural resource prices** leads to an effect on trade-related GDP of **0.2 – 0.5%**

- Not unlikely scenario as GMO (Grantham) study showed 70% price decline of 33 commodities 20e century was offset in 10 years (2000 – 2012).



Data source: UNCTAD (for trade data), Global Footprint Network (for renewable resources) and US EIA (for fuels).



Note: The GMO commodity index is an index comprised of the following 33 commodities, equally weighted at initiation: aluminum, coal, coconut oil, coffee, copper, corn, cotton, diammonium phosphate, flaxseed, gold, iron ore, jute, lard, lead, natural gas, nickel, oil, palladium, palm oil, pepper, platinum, plywood, rubber, silver, sorghum, soybeans, sugar, tin, tobacco, uranium, wheat, wool, zinc.

E-RISC Phase II: Towards Market Readiness

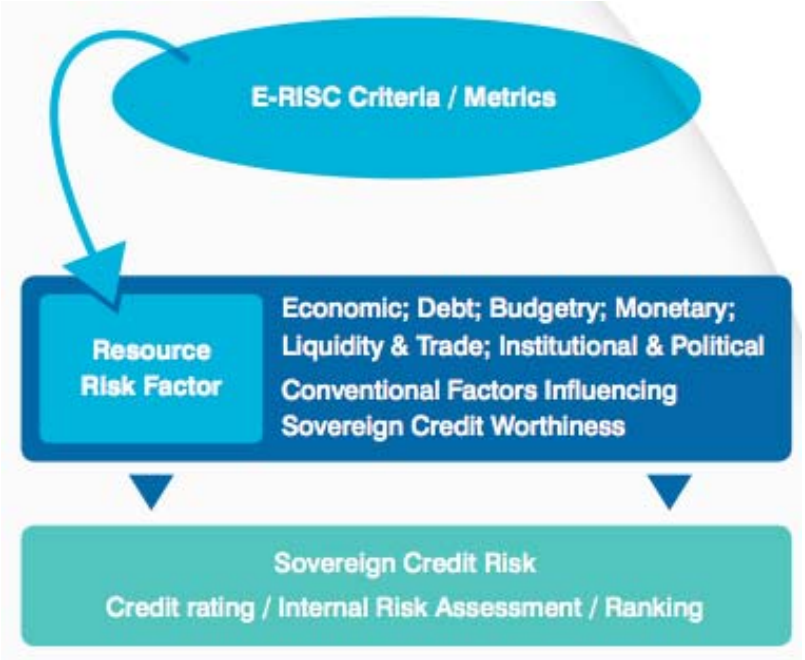
UNEP Finance Initiative
Changing finance, financing change

Global Footprint Network®
Advancing the Science of Sustainability

This projects contributes to the implementation of the

Natural Capital Declaration
Financial sector leadership on natural capital

- Mainstreaming: direct integration in sovereign credit risk analysis (i.e. enhance sovereign credit risk analysis)
- How can it be used: i) sovereign bond valuation; ii) country risk (one factor for corporate loans/bonds) partly based on renewable natural resource risks (forests, fishing stocks, crops, etc); iii) sovereign credit ratings



Stripping deforestation out of productive and financial supply chains

- The ‘value at risk’ approach can be one measure to incentivize companies to rethink their dependency and impacts on tropical forests
- Consumer Goods Forum: pledge by 400 large companies to ‘strip deforestation from productive supply chains’.
- CISL Banking for Environmental Initiative: aligned with the CGF to remove deforestation from financial supply chains.

Supply chains of 'forest-risk' commodities vary considerably but financial institutions are generally involved at different points along the chain in different capacities

Soy supply chain example

Seed production	Growers	Trading	Crushing	Meal / Oil / Food
▪ Dominated by Monsanto, Dupont & Syngenta.	▪ Highly fragmented; grown on family farms and plantations. Size of an average U.S. farm is 314 acres	▪ Dominated by 4 companies: ADM, Cargill, Bunge & Louis Dreyfus	▪ 85% of all soybeans are crushed, with remaining used in food industries	▪ Primarily used for livestock feed and vegetable oils

Key trends in the soy industry

- Highly consolidated into four main companies
- Most companies are vertically integrated and thus control other segments of the supply chain- traders often provide seed and credit to growers for example
- Geographical differences:
  - Private firms located in Asia and Latin America
  - Public firms located in the US and America

Potential entry points for FIs

- Banks as:
  - Providers of loans
  - Underwriters of bond and stock offerings
  - Research providers
- Investors as:
  - Equity investors- can be active (such as putting forward shareholder resolutions) or passive
  - Holders of corporate bonds/debt
- Insurers as:
  - Providers of commercial, market and political risk cover

Leading Companies in the Soya Industry

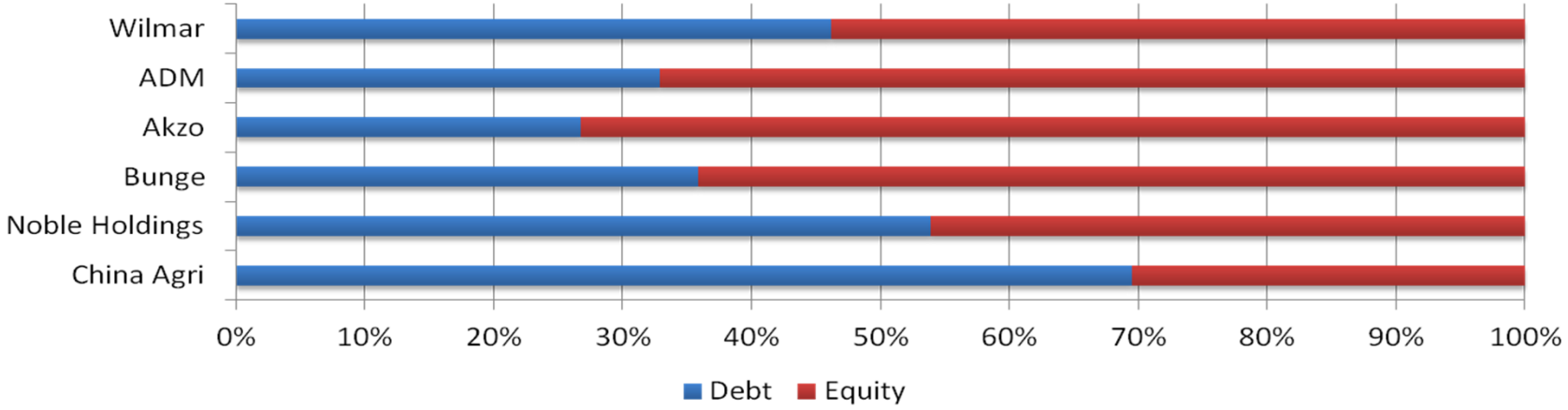
#	Company	HQ country	Company type	Total Revenue* ($M in 2011)
1	Cargill	US	Private	$ 107,882.00
2	Archer Daniels Midland (ADM)	US	Public	$ 85,779.00
3	Noble Holdings	China	Public	$ 78,611.49
4	Bunge	US	Public	$ 55,024.00
5	Wilmar	Singapore	Public	$ 42,588.90
6	Akzo	Netherlands	Public	$ 21,162.73
7	China Agri	China	Public	$ 8,284.07
8	Louis Dreyfus	US	Private	$ 7,925.70
9	Amaggi	Brazil	Private	$ 1,881.40
10	Soya Hellas	Greece	Private	$ 542.22
11	Rasio	Finland	Public	$ 516.05
12	Soya Mills	Greece	Private	$ 407.99
13	Iberol	Portugal	Private	$ 271.04
14	Casa Olearia Italiana	Italy	Private	$ 238.75
15	Oleificio Medio Piave	Italy	Private	$ 201.13

* Total revenue figures are not soy-specific and represent all revenues from company operations

Capital Structure

Bonds allow companies to borrow money for longer period, at cheaper rates vs. borrowing from banks

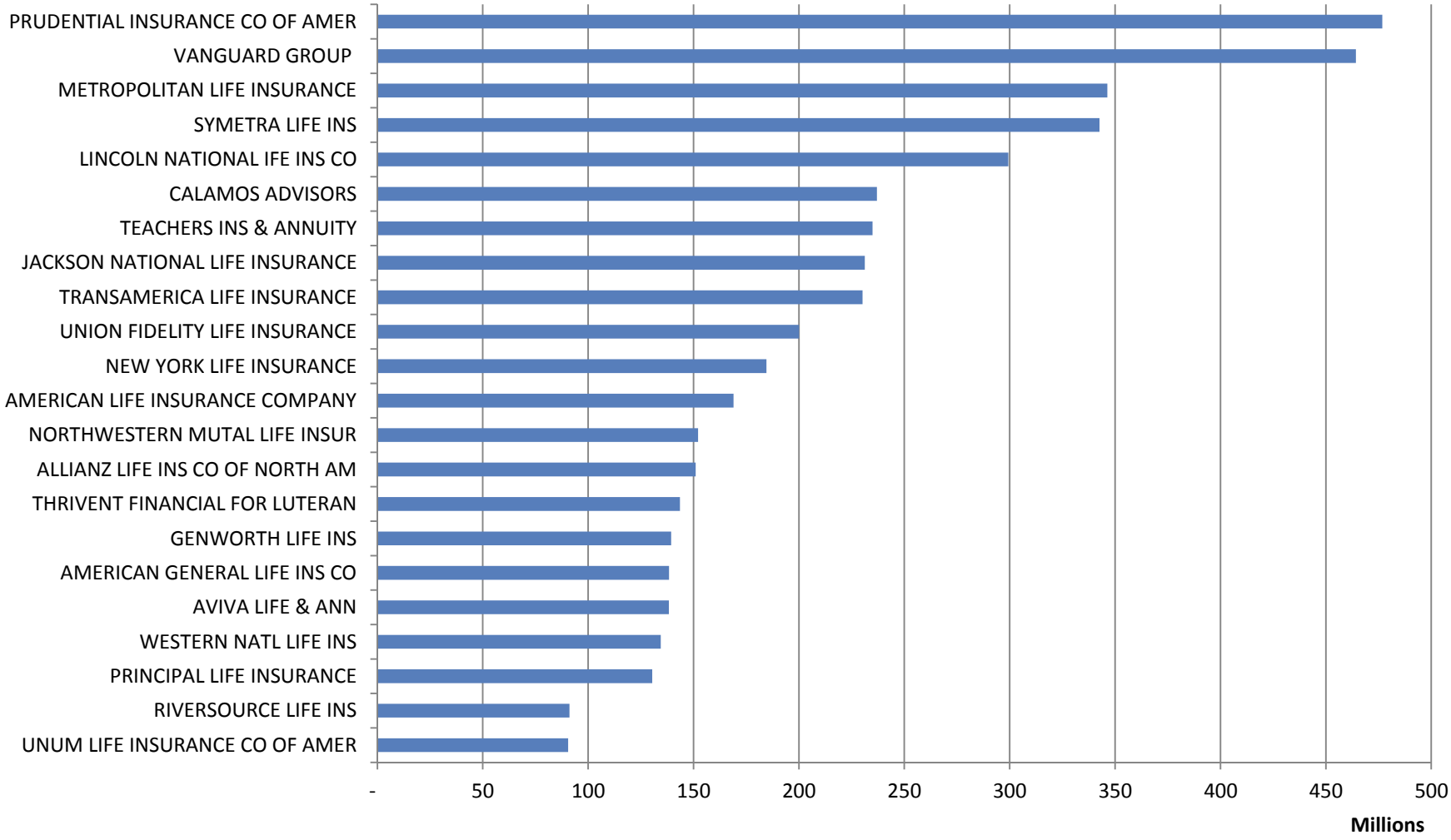
Company	Company type	Market capitalization ($M market value)	Total debt ($M book value)	% Debt	Credit rating
Wilmar	Public	$25,686	$22,026	62%	NA
ADM	Public	$19,403	$9,497	34%	A
Akzo	Public	$12,299	$4,495	27%	A-2
Bunge	Public	$9,020	$5,036	36%	BBB-
Noble Holdings	Public	$6,111	$7,147	59%	BBB-
China Agri	Public	$3,137	$7,147	61%	NA



Top Underwriters for large Soya producers: Overview of number of debt issues 2006-11

	ADM	Bunge	Cargill	Bank total
Citigroup	4	2	5	11 (73%)
JP Morgan	4	4	2	10 (67%)
Barclays Capital	5	-	4	9 (60%)
BNP	4	3	-	7 (47%)
BAML / Bank of America	5	-	-	5 (33%)
HSBC	1	2	1	4 (27%)
Deutsche Bank	2	-	1	3 (20%)
Credit Suisse	-	-	3	3 (20%)
RBS	-	-	1	1 (7%)
Total # of issues per company	**5**	**4**	**6**	**13**
Total debt issued ($mm)	**$5,100**	**$1,750**	**$3,400**	**$10,250**

Top Debt Holders



VIDEO

CONSUMER GOODS FORUM NEW YORK CLIMATE SUMMIT

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Conservation policies to increase protection of tropical forests

Laws / regulation to regulate use of tropical forests

Through direct enforcement, by working with e.g. financial regulators and others, reduce impact on tropical forests

TOOL

CONSERVATION POLICIES: STIMULATE ENFORCEMENT OF POLICIES THAT REDUCE DEFORESTATION

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Smart enforcement of conservation policies

- Since 2005, Brazil has reduced Amazon deforestation 70% below the historical average (even though from 2012 it increased again)
- Financial regulator, innovative approach to enforce conservation policies by not allowing commercial banks to extend credit anymore to farmers and others that do not comply with the law.
- Combination of conservation policies and favourable exogenous factors contributed to a major reduction in deforestation.

VIDEO

BRAZIL'S SUCCESSFUL EFFORTS (UNTIL 2012) TO REDUCE DEFORESTATION

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An increasing body of work is looking at the cost benefit analysis of safeguards. WWF, MSCI and others look at the financial impacts of implementing the Principles & Criteria of Roundtable on Sustainable Palm Oil (RSPO)

Source: WWF, 2012.

Primary Benefits

- Reduction in social conflicts
- Operational improvements through documentation and better management practices
- Improved staff morale and reduced labour turnover
- Increased revenues and access to markets and capital
- Improved yields for smallholders

Primary Costs

- Identification and management of HCV areas
- The audit and certification process
- Engaging smallholders
- Segregation costs

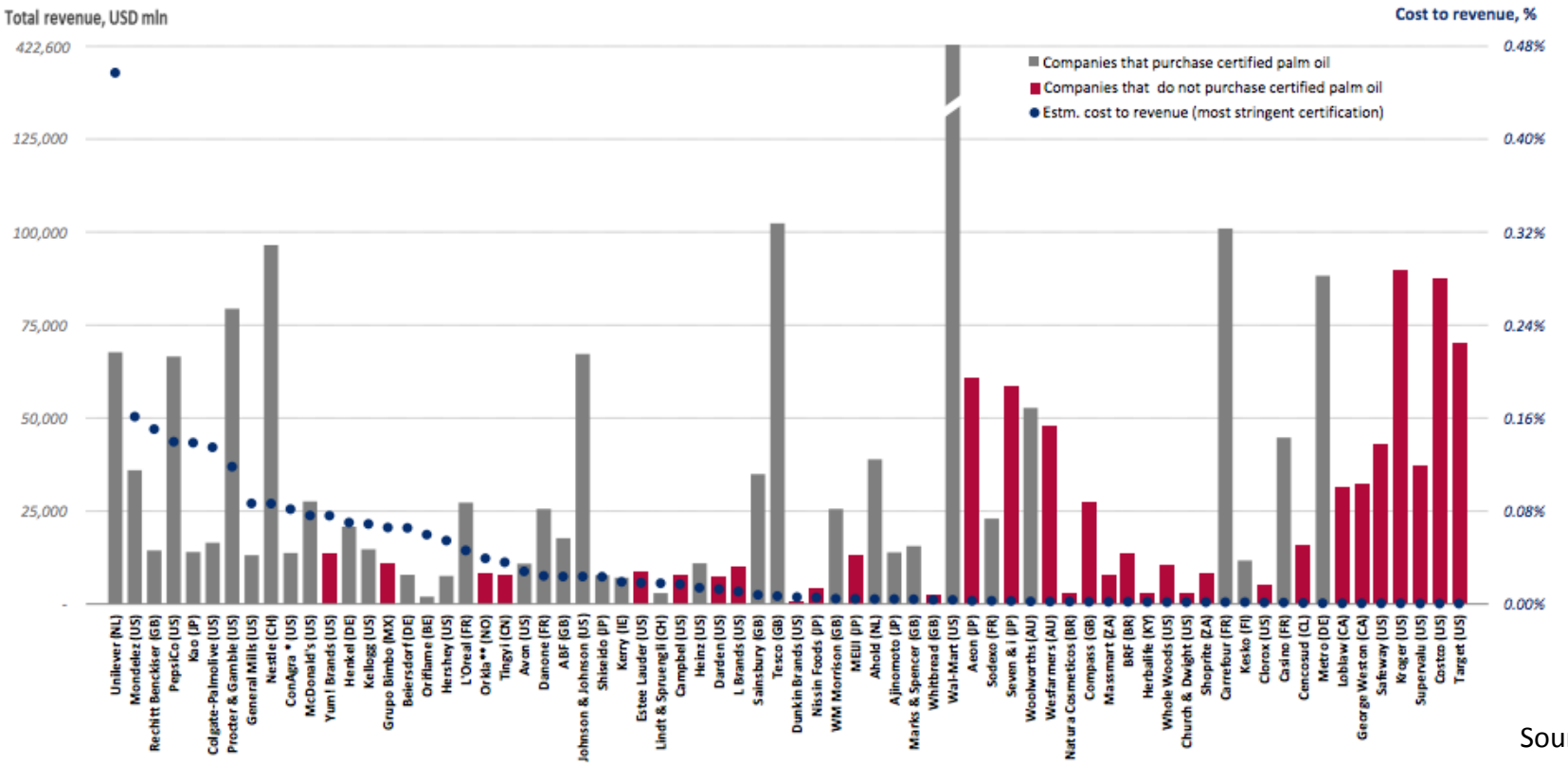
Conclusions

- Each category of benefit could potentially outweigh the RSPO implementation costs
- This often occurs through unexpected or indirect channels
- More evidence required- no ‘one size fits all’ solution

GCF: policy to remove deforestation from supply chains

Compliance to RSPO are low (average = 0.05% of total revenues)

- 47% of companies sourcing palm oil have not made any sustainability commitment.
- > 50% of companies will not meet target of 100% RSPO certification by 2015

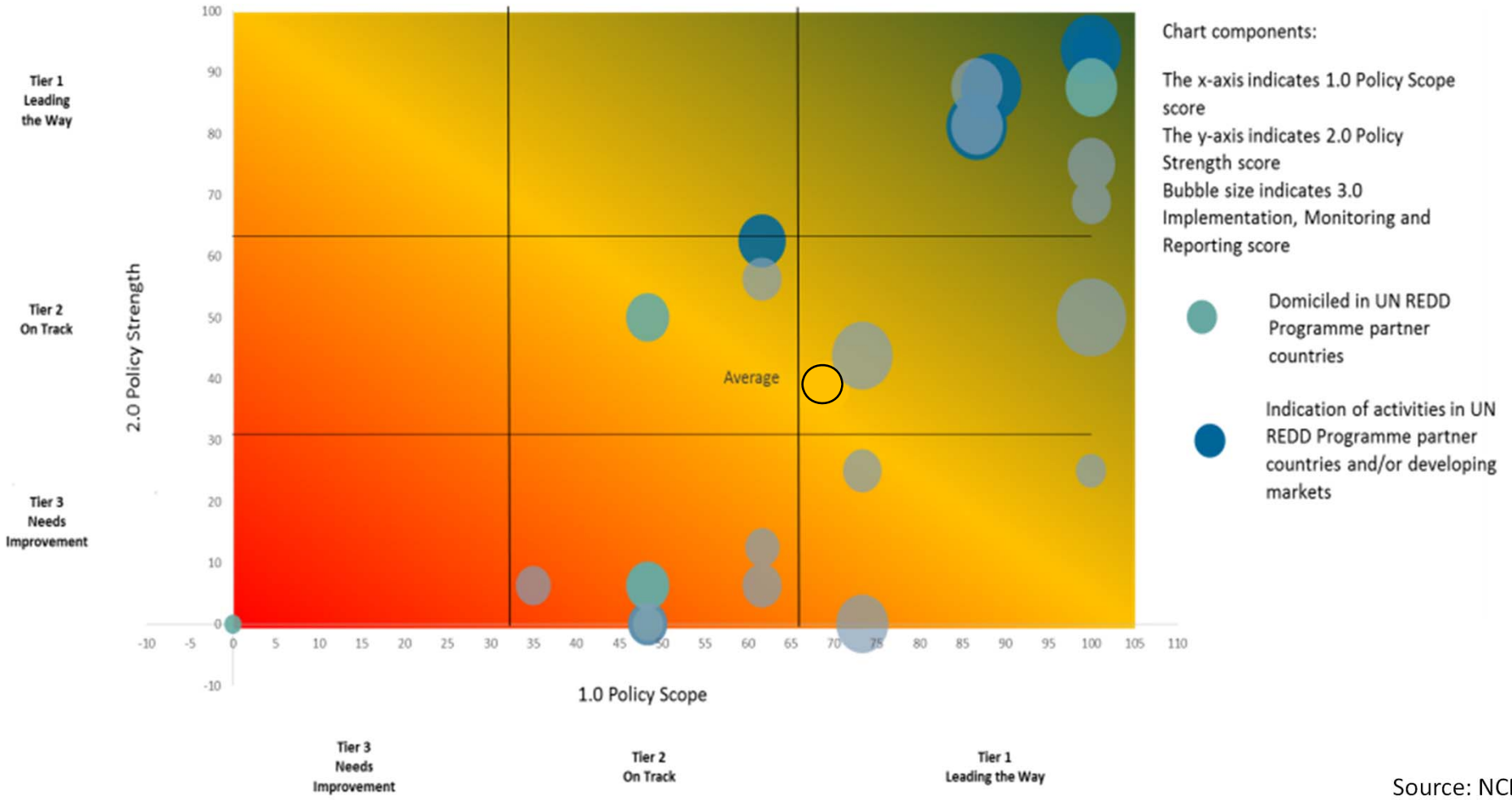


Source: MSCI

NCD: stimulate financial institutions to develop soft commodity policies

- 47% of financial institutions evaluated encourage or require companies to avoid land use conversion in High Conservation Value (HCV) areas, and to respect the rights of local communities.
- 13% of financial institutions assessed have developed financial products and services aimed at promoting the production and trade of sustainable commodities.
- The International Finance Corporation (IFC), the Dutch development bank FMO, HSBC and Sumitomo Mitsui Trust Holdings have developed products and services to support the transition to sustainable commodities production and consumption, often through preferential terms.

NCD: stimulate financial institutions to develop soft commodity policies



Source: NCD

TOOL

OTHER TOOLS

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The role of fiscal and trade policies

- Global, annual, subsidies for fossil fuels and biofuels are respectively US$ 480 billion and US$ 24 billion (in 2011) according to UNEP IRP report.
- About 6% would be sufficient to raise US$ 30 billion/year estimated to meaningfully reduce deforestation from 2020.
- Lowering tariffs for (conventional) palm oil between India and Indonesia to make it equal with RSPO (sustainable palm oil) would enable India to fully take up Indonesia's sustainably sourced palm oil: 3.8 mega tons at a cost of around US$ 100 million.
- Assuming a that certified soft commodities (soy, beef, palm oil, etc) leads to a reduction in deforestation (in Indonesia) would this be one way how REDD+ funding can be used (e.g. through FREDDI?).

Sustainable forest-management and increasing supply legal timber

- US$ 100 billion market value: illegal felling of high value wood species such as mahogany, timber for furniture and building, wood for pulp and paper and charcoal.
- EU has embarked on a process to ban illegal logged wood products from the European market: FLEGT
- FLEGT = **F**orest **L**aw **E**nforcement, **G**overnance and **T**rade.
- The EU's FLEGT Action Plan was established in 2003. It aims to reduce illegal logging by strengthening sustainable and legal forest management, improving governance and promoting trade in legally produced timber.
- VPA: Voluntary Partnership Agreement: ensure that timber and timber products exported to the EU come from legal sources

Sustainable forest-management and increasing supply legal timber

Forest Landscape Restoration

- Bonn Challenge: restore 150 million hectares of degraded land
- Focusing on the “+” in REDD+
- Case studies China and Ethiopia (video)

PART 4

SUMMARIZING: WHAT HAVE YOU LEARNED?

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Thank you!

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