



Food and Agriculture
Organization of the
United Nations

The role of forests and forest products in a bioeconomy transition – supply and demand perspectives

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Market Discussion, 2023 Pattaya
International Tropical Timber Organisation
November 2023

GLOBAL TRENDS IMPACTING FORESTS

SNAPSHOT OF GLOBAL FOREST RESOURCES

FACTORS INFLUENCING DEMAND FOR FOREST PRODUCTS

**WHY DO WE NEED TO EXPAND THE USE OF SUSTAINABLE
FOREST PRODUCTS?**

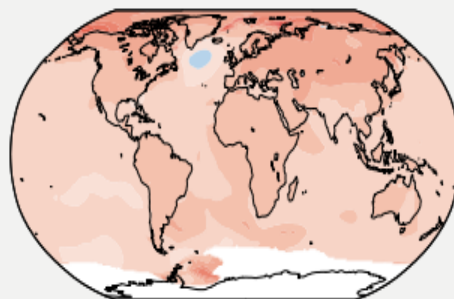
FOREST SECTOR OUTLOOK

THE NEED TO ADDRESS CLIMATE CHANGE

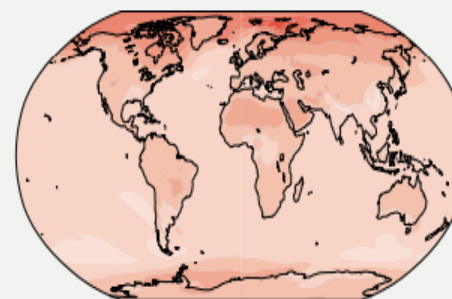
(a) Annual mean temperature change (°C) at 1°C global warming

Warming at 1°C affects all continents and is generally larger over land than over the oceans in both observations and models. Across most regions, observed and simulated patterns are consistent.

Observed change per 1°C global warming



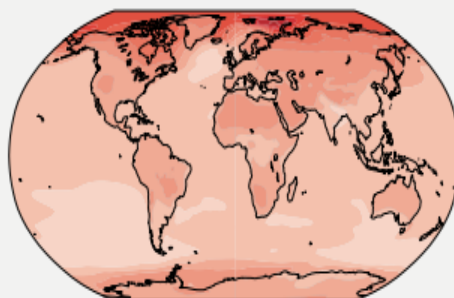
Simulated change at 1°C global warming



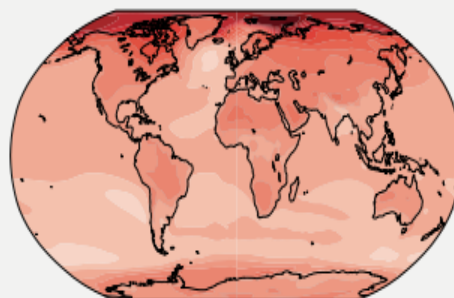
(b) Annual mean temperature change (°C) relative to 1850–1900

Across warming levels, land areas warm more than ocean areas, and the Arctic and Antarctica warm more than the tropics.

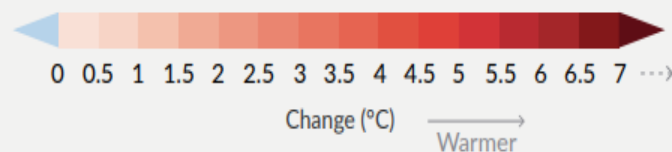
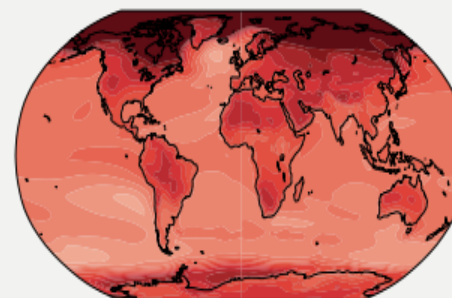
Simulated change at 1.5°C global warming



Simulated change at 2°C global warming



Simulated change at 4°C global warming



THE WORLD HAS A NATURE & BIODIVERSITY CHALLENGE

↓ 47 %

Natural ecosystems ↓

↓ 25 %

~25% of species threatened with extinction

↓ 23 %

Biotic Integrity ↓ in terrestrial communities

↓ 82 %

Global biomass of wild mammals ↓

THE WORLD IS DEMANDING MORE MATERIALS

7.7 bn
2019



9.7 bn
2050

Global population ↑

92 bn
tonnes
2017



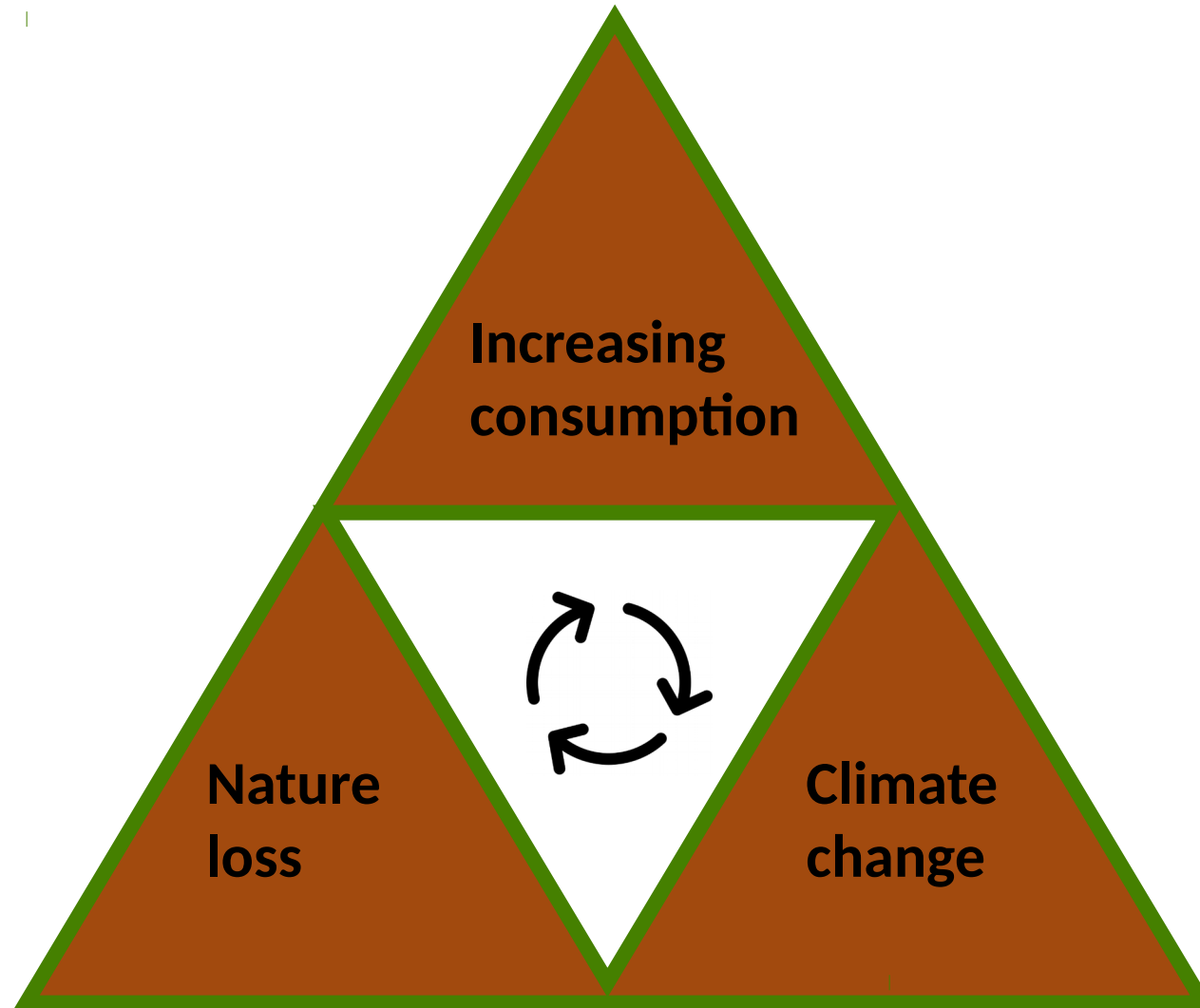
190 bn
tonnes
2060

Doubling consumption of natural resources

75% non
renewables

**Bulk of material demand met with non
renewables**

THREE INTERLINKED CHALLENGES



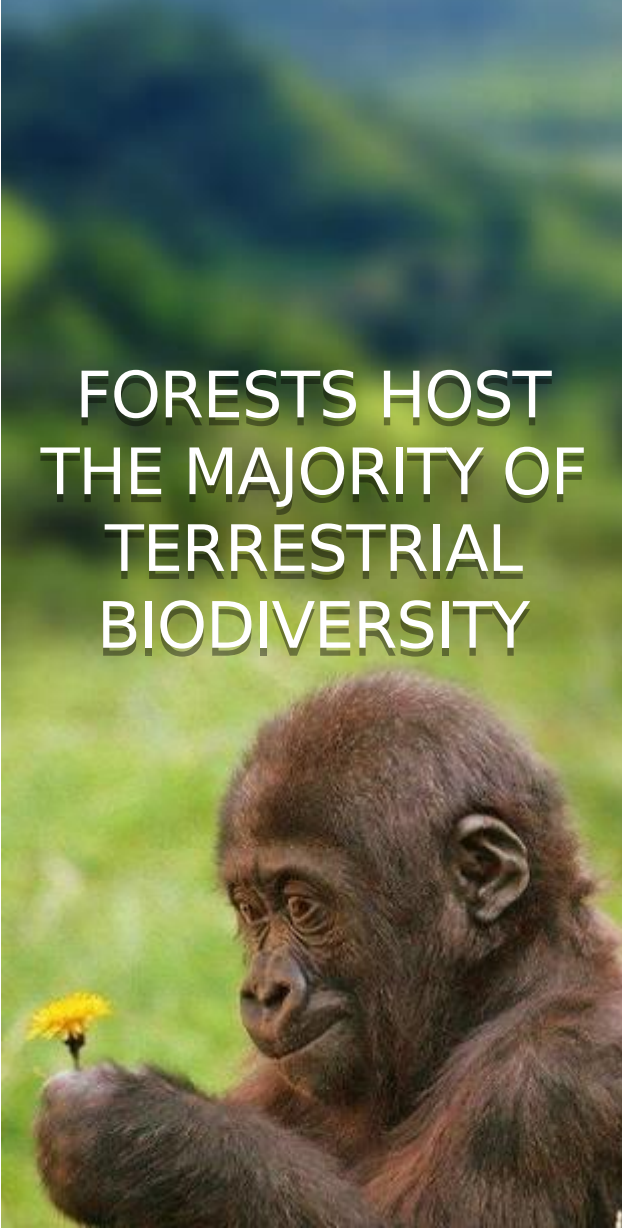
FOREST - A “FORCE OF NATURE” TO ADDRESS THE “FOREST, ENERGY AND LIVELIHOODS” NEXUS...



WITHOUT
FORESTS, CLIMATE
GOALS CANNOT
BE MET



75% OF
ACCESSIBLE
FRESHWATER
COMES
FROM FORESTED
WATERSHEDS



FORESTS HOST
THE MAJORITY OF
TERRESTRIAL
BIODIVERSITY



KEY ROLE IN
RESTORING
DEGRADED
LAND

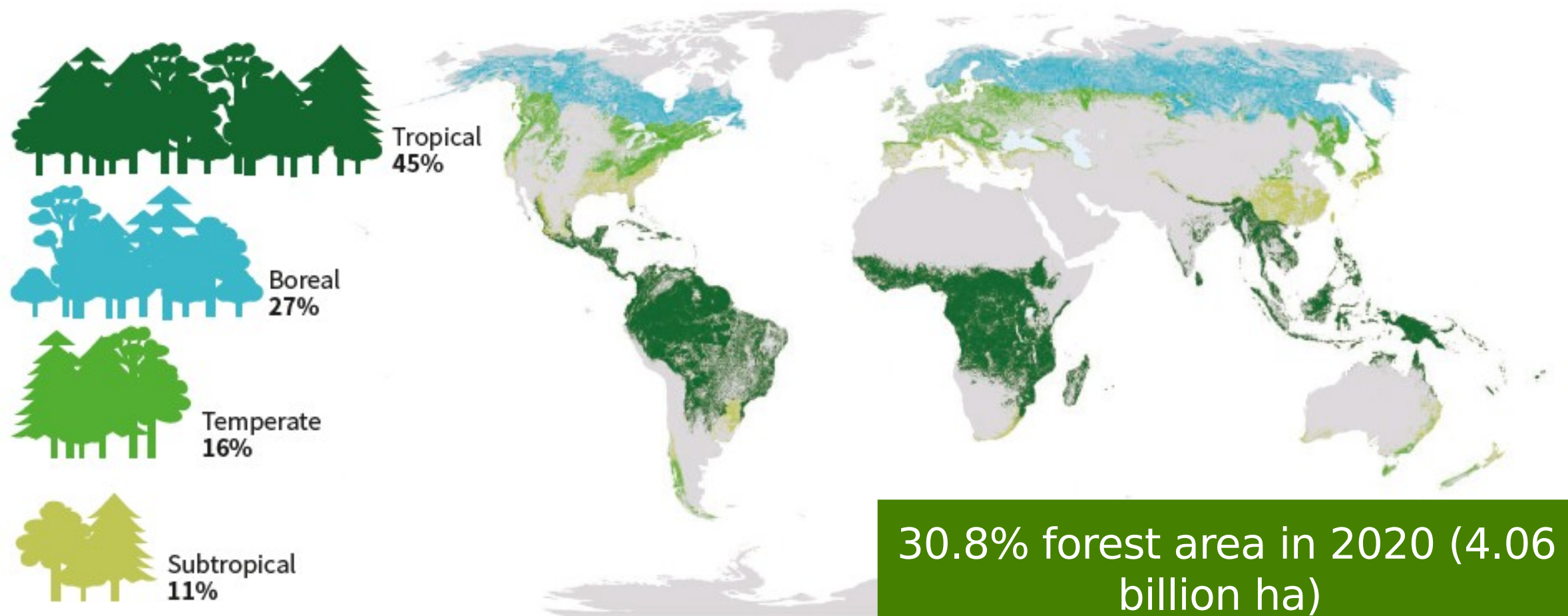
NUMEROUS PRODUCTS FOR EVERYDAY LIFE



SNAPSHOT OF GLOBAL FOREST RESOURCES

FOREST BIOMASS RESOURCES AND KEY TRENDS

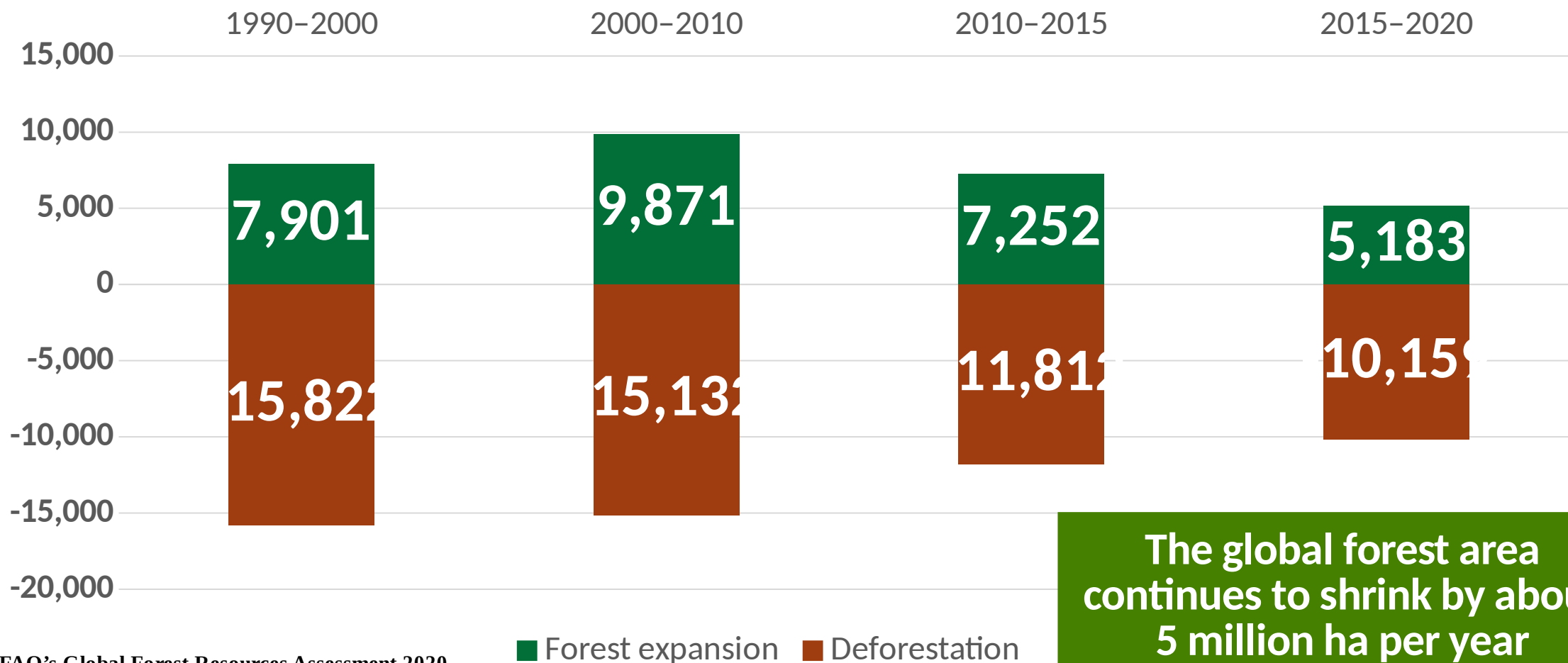
GLOBAL FOREST AREA AS A PROPORTION BY CLIMATIC DOMAIN



Source: FAO's Global Forest Resources Assessment 2020

FOREST BIOMASS RESOURCES AND KEY TRENDS

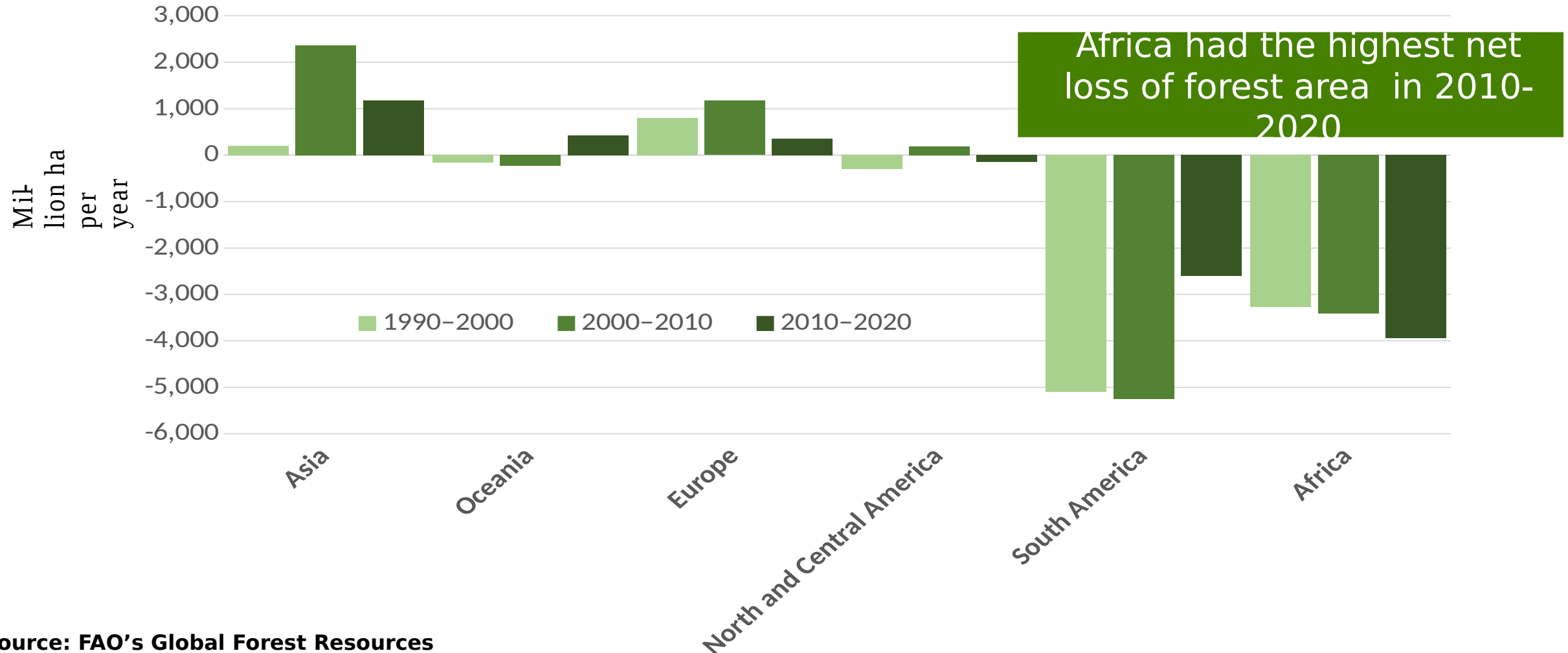
GLOBAL ANNUAL RATE OF FOREST EXPANSION AND DEFORESTATION, 1990–2020



The global forest area continues to shrink by about 5 million ha per year

FOREST BIOMASS RESOURCES AND KEY TRENDS

ANNUAL FOREST AREA NET CHANGE BY DECADE AND REGION, 1990-2020



ECOSYSTEM RESTORATION



Around 2 billion hectares of degraded land worldwide

~the size of South America

Can we utilize some of these lands, in a sustainable manner, to help meet these demands for wood?

FACTORS INFLUENCING WOOD DEMAND

FOREST BIOMASS RESOURCES AND KEY TRENDS

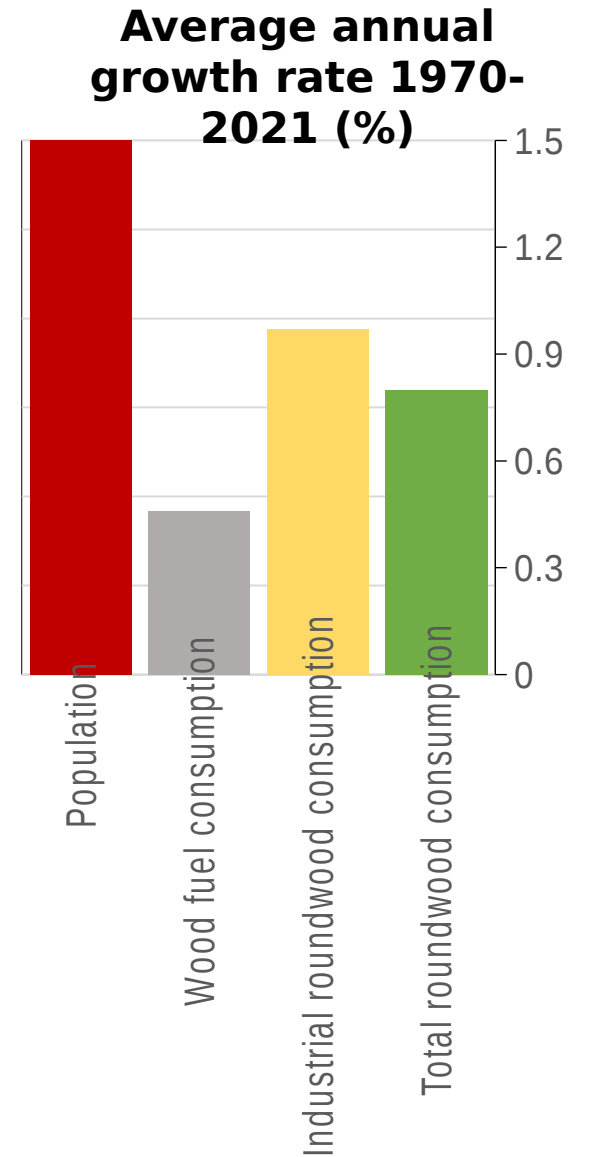
GLOBAL ANNUAL ROUNDWOOD CONSUMPTION, 1970-2022

Roundwood consumption (billion m³)

Population (billions) & roundwood consumption (m³/10 inhabitants)

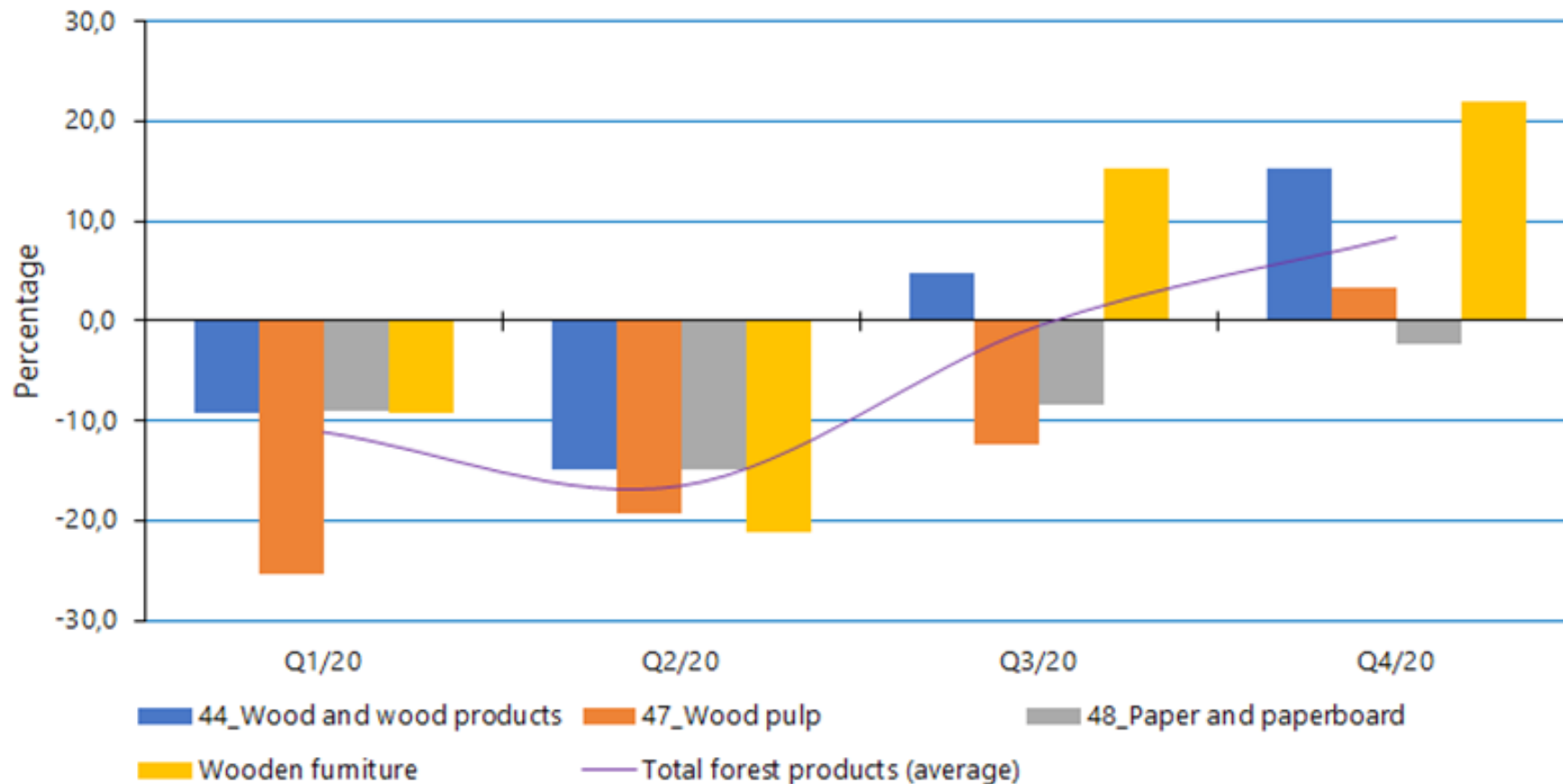
Wood fuel Industrial roundwood Per capita apparent consumption

Population



FOREST BIOMASS RESOURCES AND KEY TRENDS

Impact of the COVID-19 pandemic on global exports of the selected forest products - quarterly comparison 2020 to

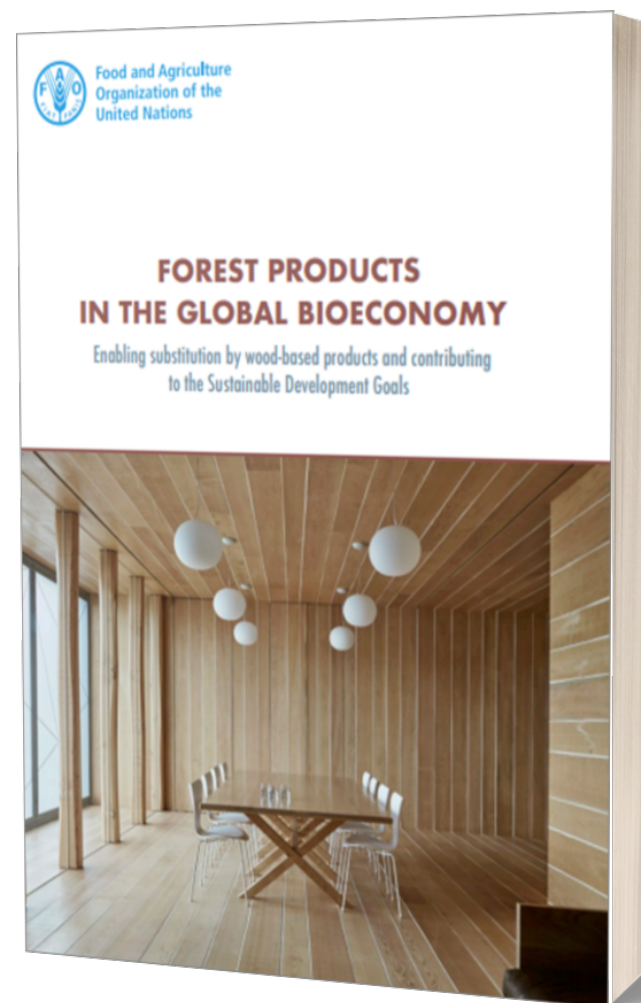


FOREST PRODUCTS IN THE GLOBAL BIOECONOMY

Forest products in the global bioeconomy: possible actions for substitution to contribute to the SDGs

KEY AREAS TO FOSTER FOREST-BASED BIOECONOMY:

1. Graphic paper
2. Wood products for construction
3. Resins and its chemical derivatives
4. Wood based fibres for textiles

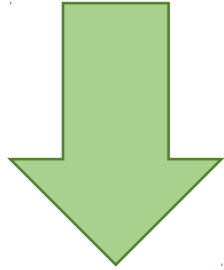


In collaboration with



FOREST PRODUCTS IN THE GLOBAL BIOECONOMY

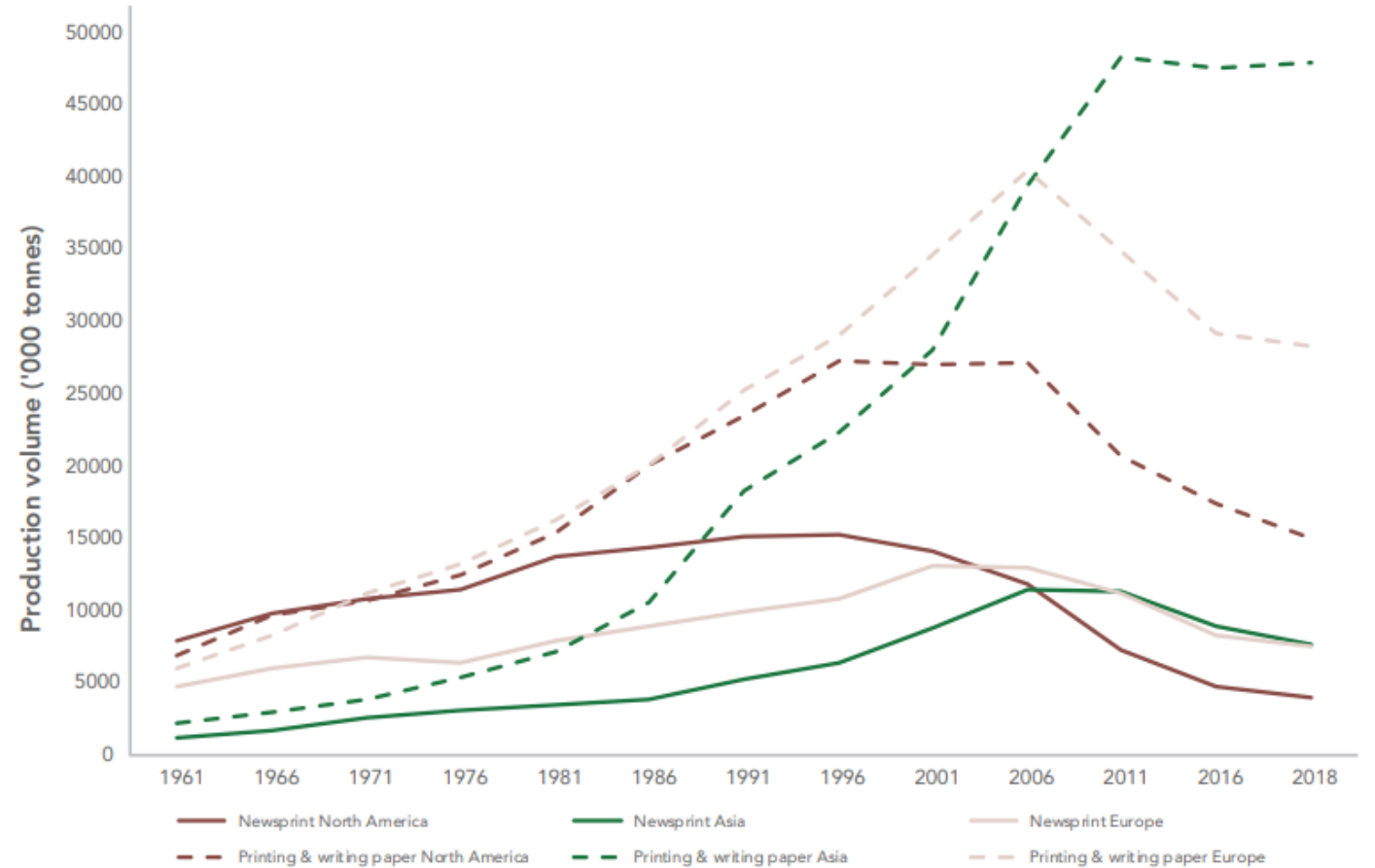
GRAPHIC PAPER



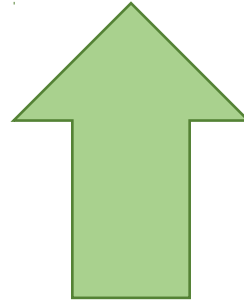
2012 - 2030:

Newsprint consumption ~35M T lower

Printing & writing paper consumption
77-87 M tonnes lower



FOREST PRODUCTS IN THE GLOBAL BIOECONOMY CONSTRUCTION



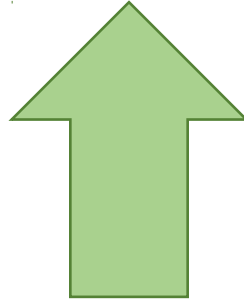
Construction will continue
to drive the demand for
wood

2050:
+102 % veneer/plywood
+72 % particle/fibre board



FOREST PRODUCTS IN THE GLOBAL BIOECONOMY

RESIN & CHEMICAL DERIVATES



~1.4 M tonnes
~USD 5 billion (2019)

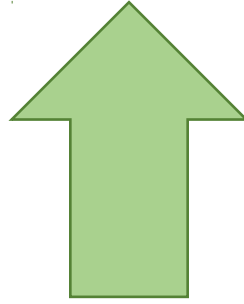
Pine chemicals: 3.5%
annual growth rate

Opportunity for
continued growth



FOREST PRODUCTS IN THE GLOBAL BIOECONOMY

WOOD BASED FIBRES FOR TEXTILES



2020: ~6.4 M tonnes

2027: ~8.6 M tonnes



WHY DO WE NEED TO EXPAND THE USE OF SUSTAINABLE FOREST PRODUCTS

Construction & the built environment

≈ 40% of global energy & process-related GHG emissions

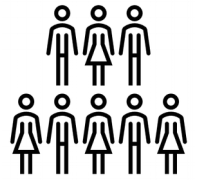
≈ 55% of developed-countries waste

For every 1kg of carbon in wood that replaces a non-wood material in a building system could produce an emission reduction of about 0.9kg of carbon

Substituting conventional materials with mass timber could reduce global emissions 14-31 % (UNEP 2023)

Construction will drive the demand for wood

~3 billion people (40 % world population)
will need new housing by 2030



≈ 300 million new dwellings (World Bank, 2016)

Majority are in the global south



Construction will drive the demand for wood

- * 2020 - 2060, expected to add 240 billion m² of new floor area
- * ~New York City, every month, for 40 years
- * 75% of infrastructure for 2050 yet to be built (IEA 2022 & Architecture 2030.org)

FOREST SECTOR OUTLOOK

Global forest sector outlook 2050: Assessing future demand and sources of timber for a sustainable economy



GLOBAL FOREST SECTOR OUTLOOK 2050



FAO's Forestry Working Paper in collaboration with International Tropical Timber Organization (ITTO) and Unique Consultancy.

Support policy making for a sustainable bioeconomy:

- Forest resource base & production to sustainably supply future demand for wood products up to 2050 in a business-as-usual and in a bioeconomy scenario?
- Policy & investments needs to support the transition to a sustainable wood-based bioeconomy?

Business as usual scenario - outlook 2050

Basic demand for primary processed wood products
(based on Global Forest Products Model - GFPM)

Trajectories of future wood fuel demand, supply and options, 2050

- **Sawnwood**
- **Wood-based panels:** Veneer, Plywood, Particle board, Fibre board
- **Wood Pulp**

Industrial roundwood demand and related supply requirements

Investment and employment requirements

Bioeconomy scenario - outlook 2050

Demand for selected products to substitute for non-renewables

- **Mass timber**
- **Manmade cellulose fiber (MMCF)**

Industrial roundwood demand and related supply requirements

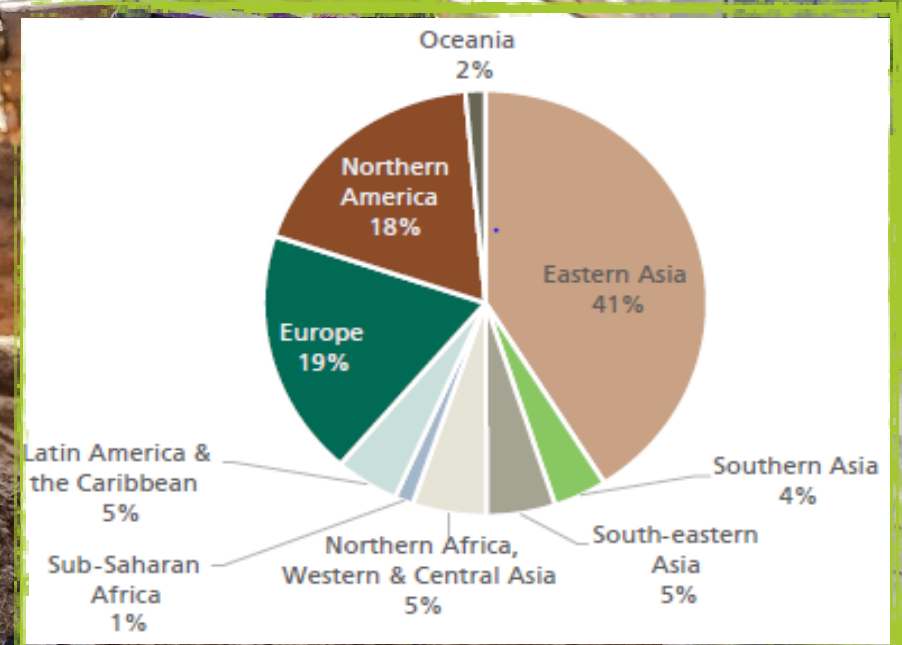
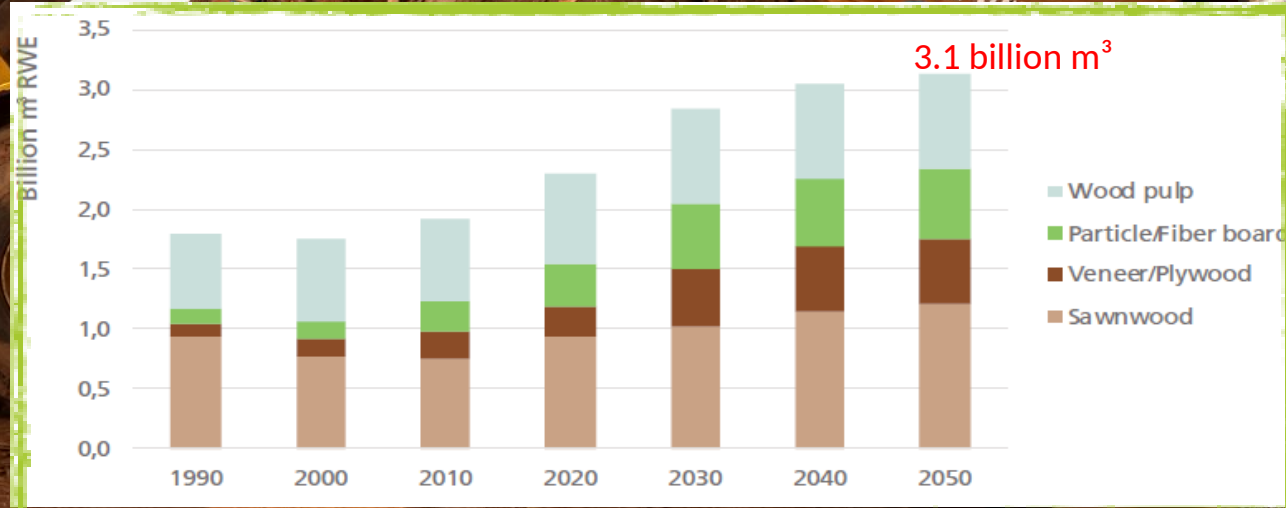
Investment and employment requirements

Global forest sector outlook 2050

Business-as-usual scenario

**Global
consumption of
primary processed
wood products will
increase by
37 %
until 2050**

Eastern Asia will
expand its leading
role, consuming
41 %



Global forest sector outlook 2050 - Bioeconomy scenario

**Additional
consumption of
98 - 272 million m³
may be triggered by
substitution of non-
renewable materials:
mass timber and
MMFC**



**Mass timber products in construction: 41 - 123 M m³
(10 - 30% of global housing built with timber)**

**Manmade cellulose fiber in textiles: 57 & 149 M m³
(6 - 16% global textile production)**

GLOBAL FOREST SECTOR OUTLOOK 2050

Investments required to produce primary processed wood products to meet the future demand of 3.1 billion m³ in 2050

may amount to **USD 25 billion per annum from 2020 to 2050** to set up new production



units and modernize existing industries; increasingly allocated in emerging world regions.

Additional investment required to produce mass timber and MMCF to substitute for non-renewable materials may be between **USD 1.4 billion and USD 2.5 billion per annum.**

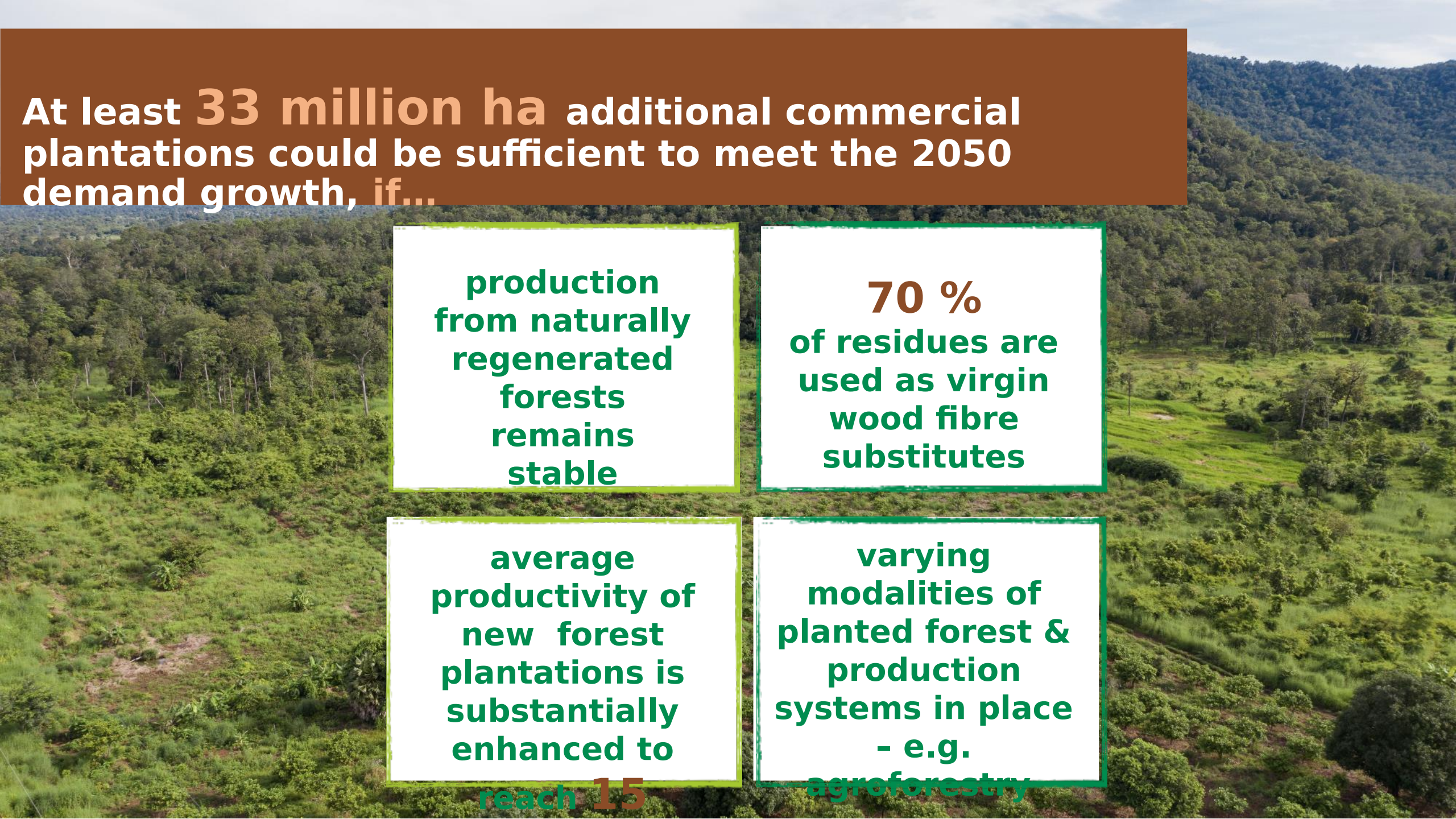


Providing the related industrial roundwood supply from forest plantations would require another **USD 1.4 billion to 4.5 billion** in investments per annum.





While naturally regenerated forests present a trend of stability, the supply of wood to meet the projected consumption will most likely come from planted forests.



At least **33 million ha** additional commercial plantations could be sufficient to meet the 2050 demand growth, if...

production
from naturally
regenerated
forests
remains
stable

70 %
of residues are
used as virgin
wood fibre
substitutes

average
productivity of
new forest
plantations is
substantially
enhanced to

reach **15**

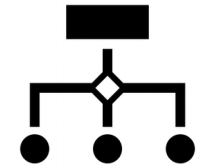
varying
modalities of
planted forest &
production
systems in place
- e.g.

agroforestry

Actions to sustainably supply projected forest sector demands

Cross-cutting

- Supportive policy & enabling environment
- Capacity and skills development
- Finance & investment



Applied:

- Forest asset development: linked with markets and value chains
- Data and information on future supply and demand trends
- Organizing & scaling up SMEs in forest-based value chains
- Product & market and development
- Development of innovative business models
- Green procurement and support for green buildings
- Innovation along the supply chain, including to improve plantation productivity and resource use efficiency



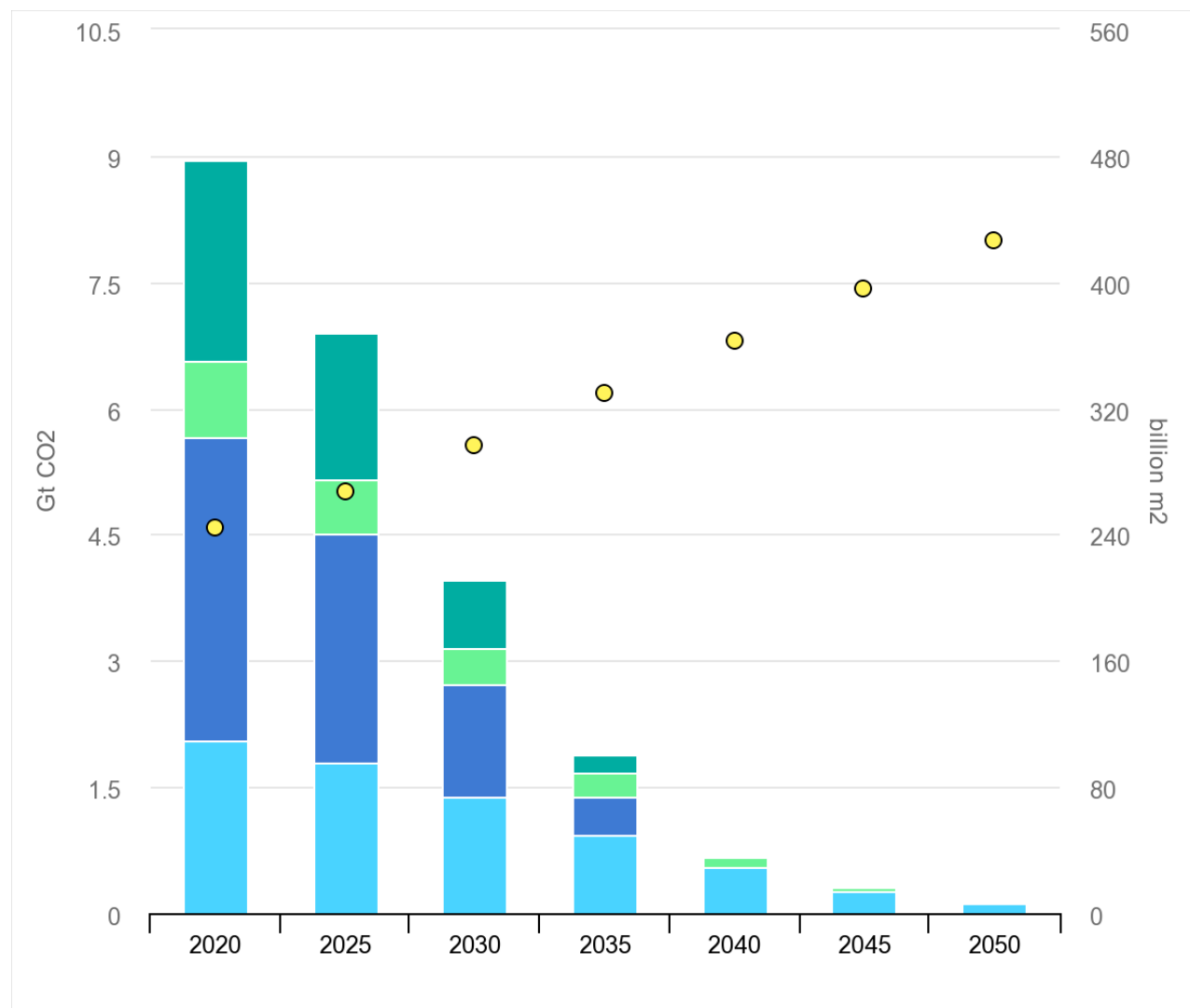


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THANK YOU FOR YOUR
ATTENTION

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Construction will drive the demand for wood



● Residential (direct) ● Residential (indirect) ● Non-residential (direct) ● Non-residential (indirect) ● Floor area

Source: IEA