

# **The World in 2050:**

## **The Great Transformation to Sustainable Development**

Jeffrey D. Sachs  
University Professor at Columbia University

Federico Caffè Lecture  
December 16-17, 2020

***The Dystopia Threat***

versus

***Sustainable Development Possibility***

@2050

# The Dystopian Threat

*Poverty Traps:*

Africa overwhelmed

*Soaring Inequality:*

The Digital Gulf

*Environmental Collapse:*

Runaway Climate Change

Collapse of Biodiversity

Mega-Pollution

Zoonotic Disease

*Geopolitics on the Brink:*

Big-power rivalry

Mass migration

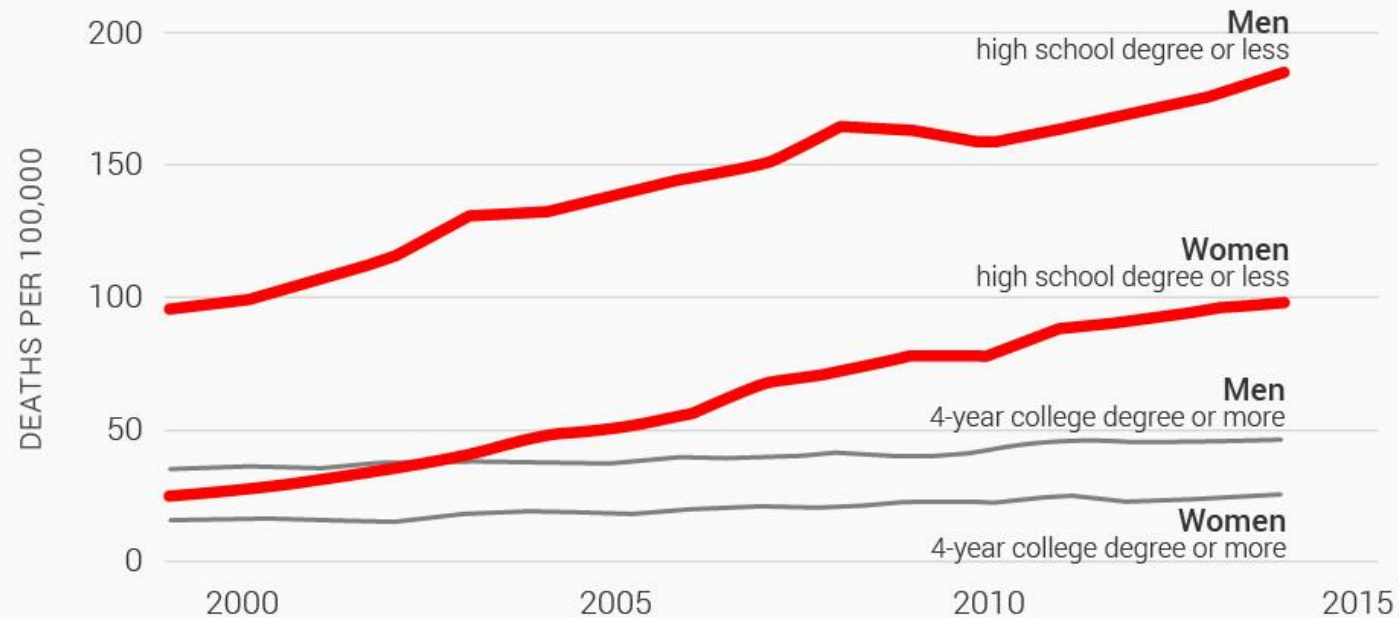
# Yemen: Downward Spiral of Hunger, Conflict, Displacement



# The Working Class Left Behind in the Rich World

## White non-Hispanic midlife mortality from “deaths of despair” in the U.S. by education

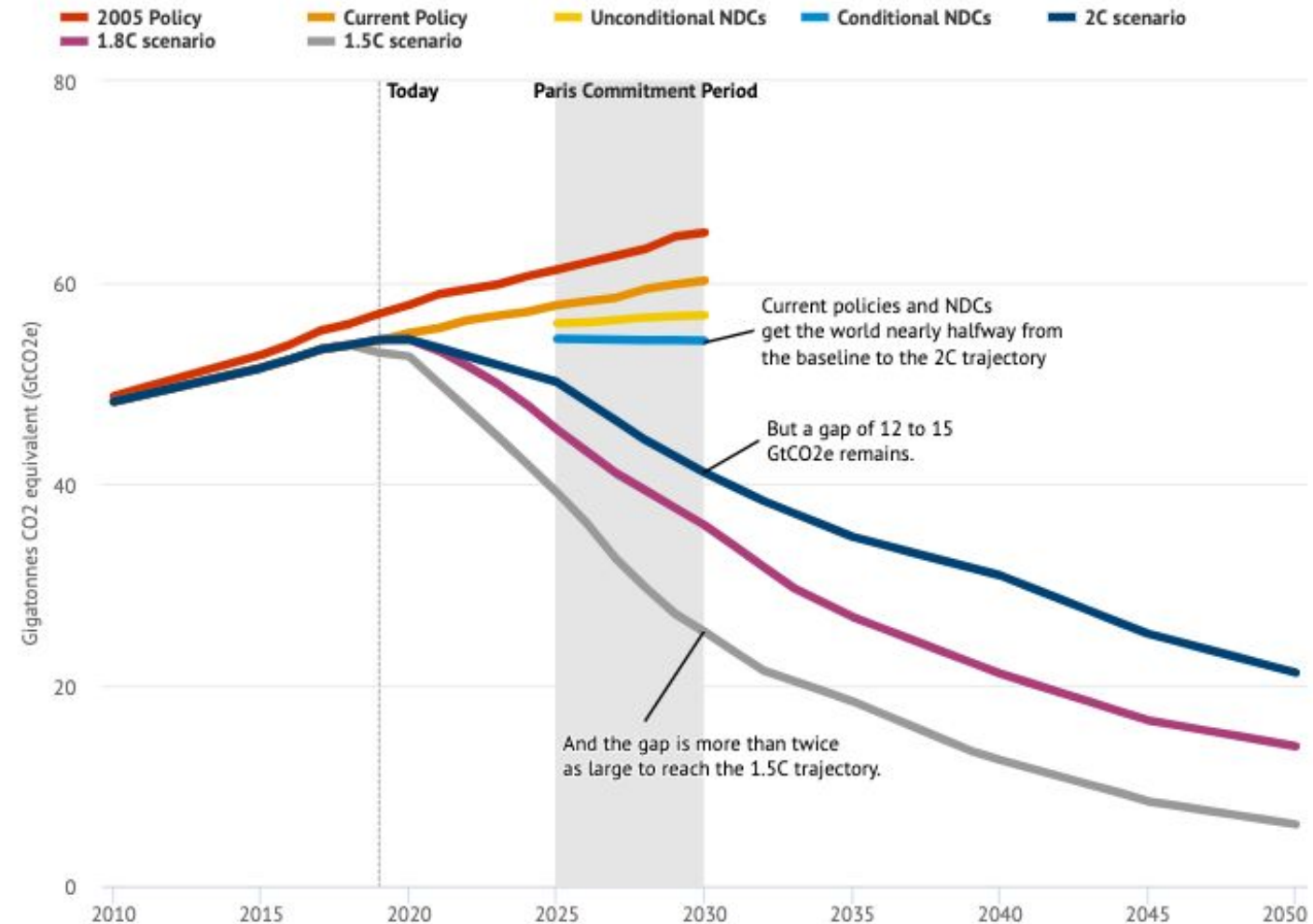
Ages 50-54, deaths by drugs, alcohol, and suicide



**Source:** “Mortality and morbidity in the 21st century”  
by Anne Case and Angus Deaton, Brookings Papers  
on Economic Activity, Spring 2017.

# Global Warming Out of Control

Greenhouse emissions remain far off track for global climate goals



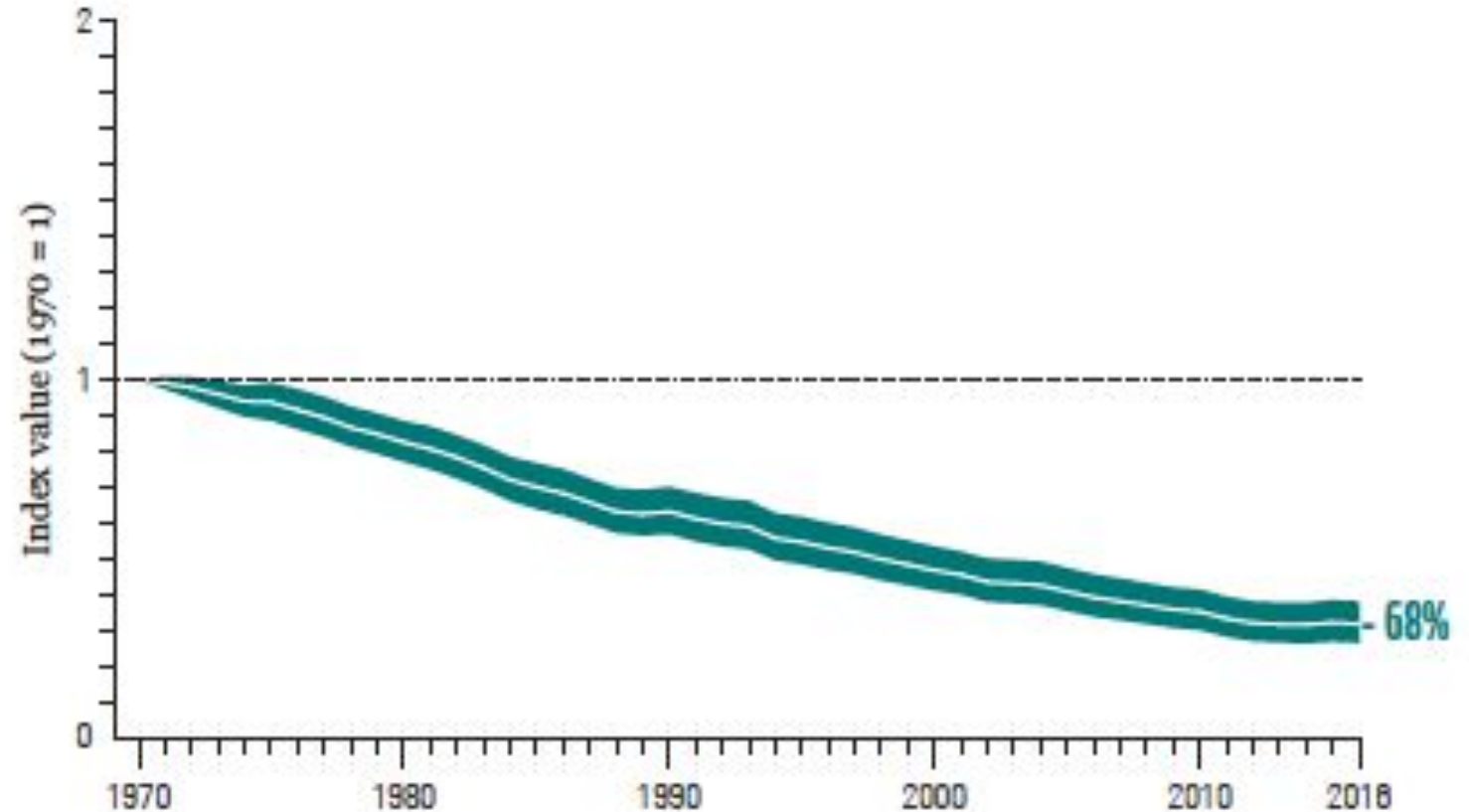


# Collapse of Species Abundance

**Figure 1: The global Living Planet Index: 1970 to 2016**  
Average abundance of 20,811 populations representing 4,392 species monitored across the globe declined by 68%. The white line shows the index values and the shaded areas represent the statistical certainty surrounding the trend (range: -73% to -62%). Source - WWF/ZSL (2020)<sup>107</sup>.

## Key

- Global Living Planet Index
- Confidence limits



Growing food  
system pressures  
on the biosphere  
(GHGs, land,  
freshwater,  
nitrogen,  
phosphorus)

Source:  
EAT-Lancet  
Commission

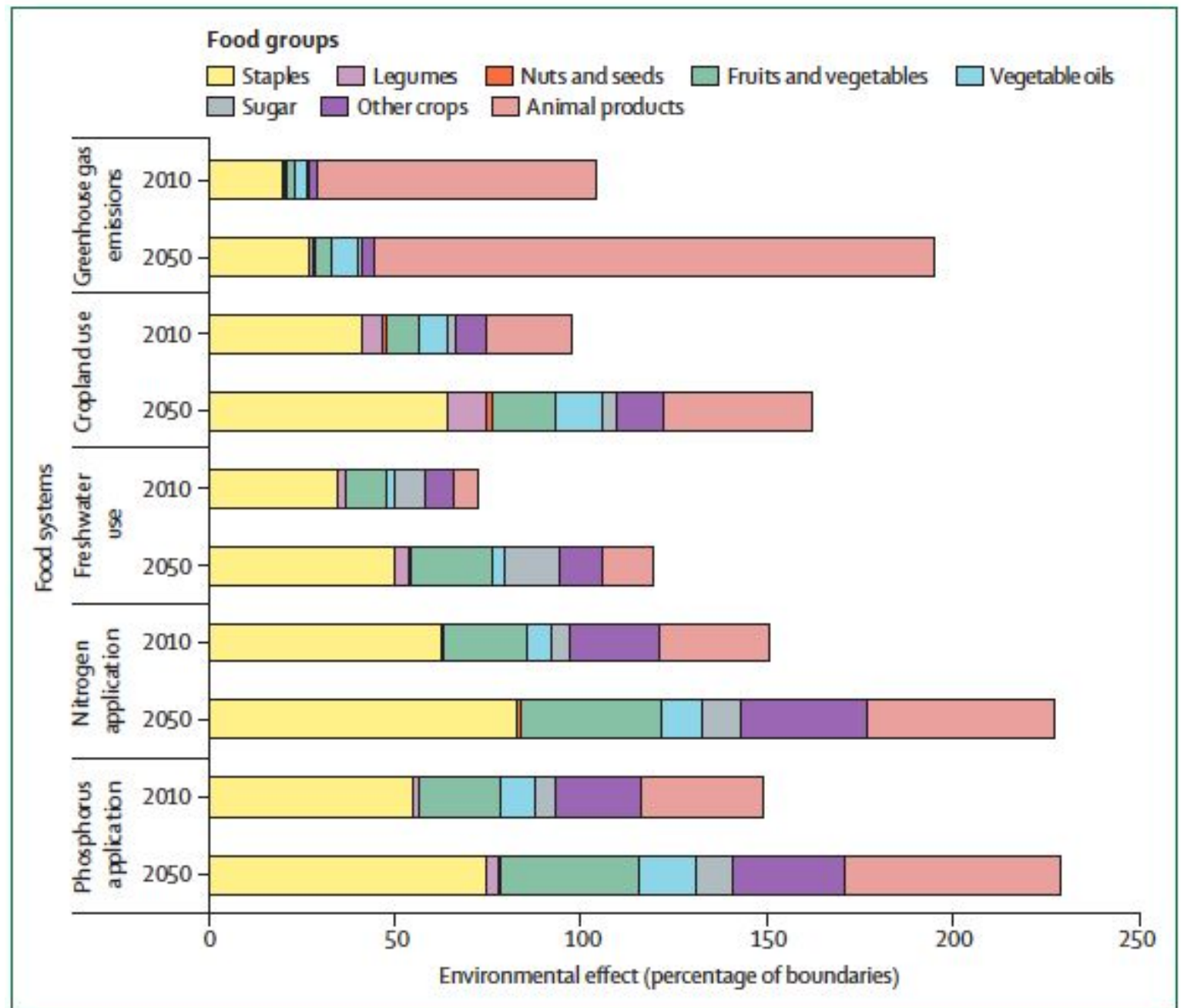
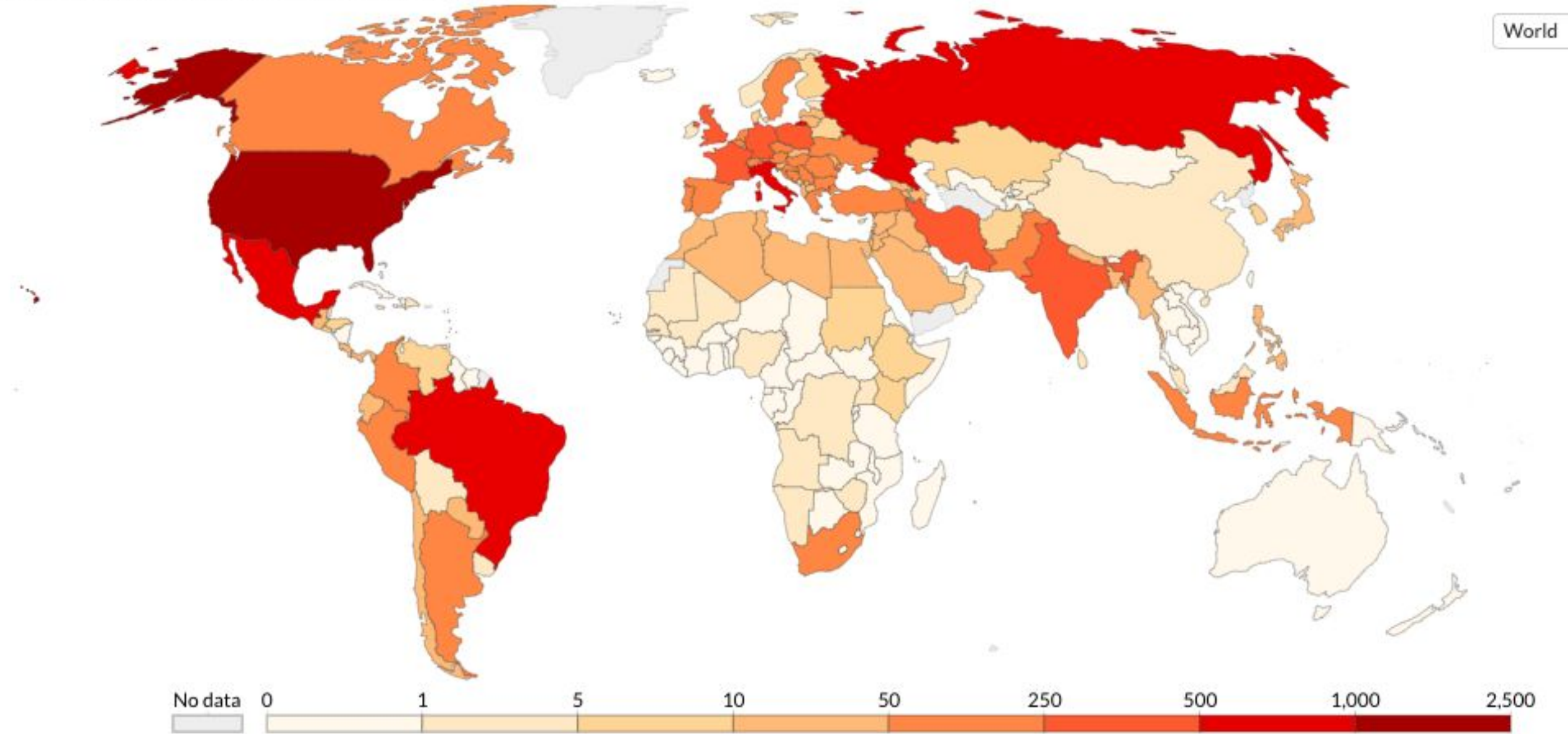


Figure 5: Environmental effects in 2010 and 2050 by food groups on various Earth systems based on business-as-usual projections for consumption and production

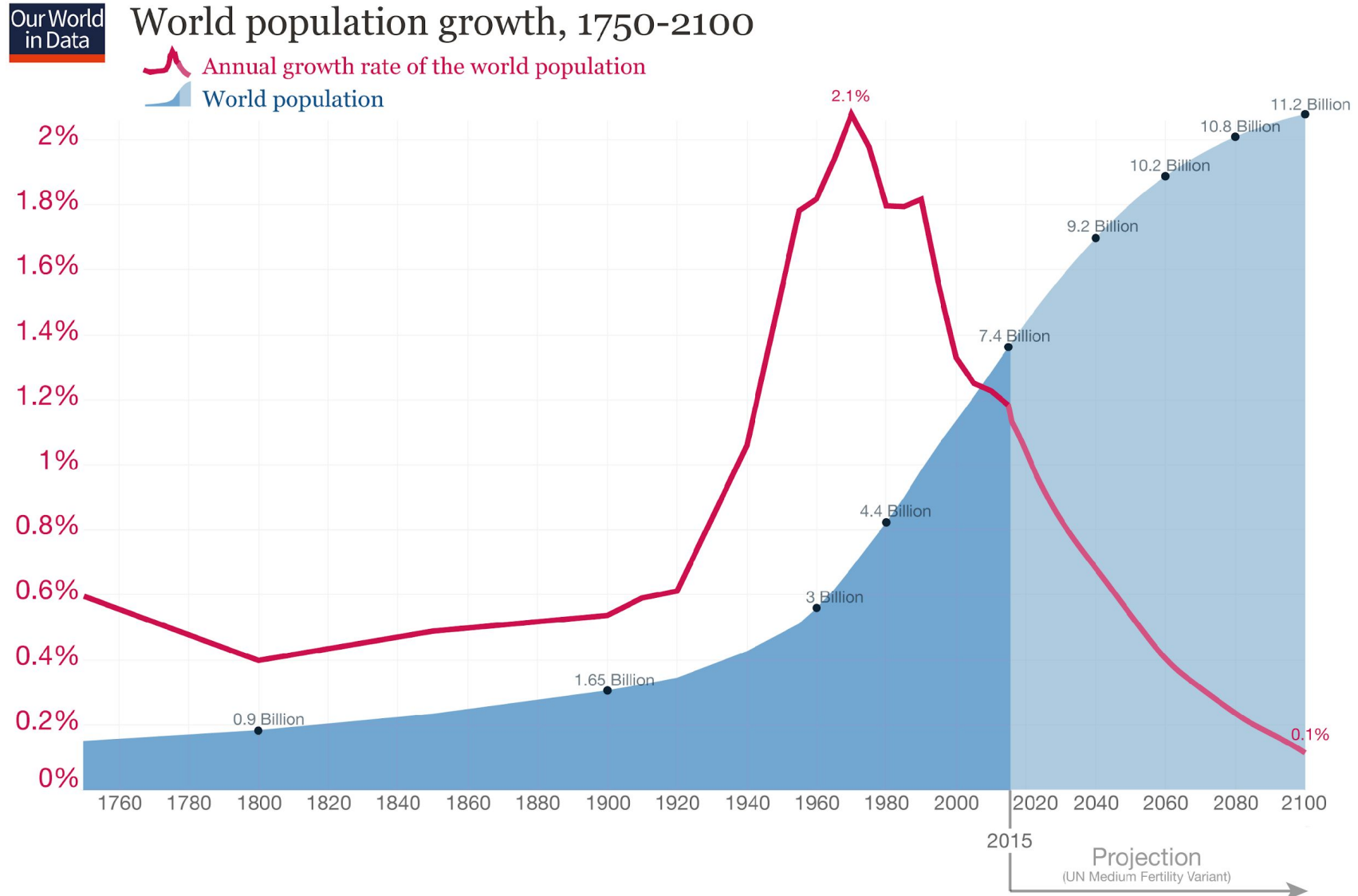


# Daily new confirmed COVID-19 deaths, Dec 14, 2020

Shown is the rolling 7-day average. Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.



# The Malthusian Specter



Data sources: Up to 2015 OurWorldInData series based on UN and HYDE. Projections for 2015 to 2100: UN Population Division (2015) – Medium Variant. The data visualization is taken from [OurWorldInData.org](https://ourworldindata.org). There you find the raw data and more visualizations on this topic.

Licensed under CC-BY-SA by the author Max Roser.

## Three Anti-Technology Temptations

- Apocalypse
- Return to simplicity
- “De-Growth” (sharp cut in living standards)

# The Sustainable Development Possibility

*Poverty:* Ended

*Inequality:* Economic Rights for All

Health, education, social protection, nutrition, leisure, environmental security

*Environment:* Sustainable

Warming peaks at below 1.5° C

Restoration of Biodiversity

Circular Economy

Precaution against Zoonotic Outbreaks

*Global Peace:*

UN multilateralism, nuclear disarmament, and peace maintenance

# The SDGs on the Pathway to 2050

## SUSTAINABLE DEVELOPMENT GOALS



# The Core Strategy for Sustainable Development

- (1) Education for all
- (2) Health services for all
- (3) Mass deployment of renewable energy and circular economy
- (4) Shift to sustainable healthy diets and farming practices
- (5) Digital, electric, and service-based cities
- (6) Digital inclusion for all (services, governance, privacy)

Supported by *SD Governance + Development Finance*



# Six key transformations for the SDG



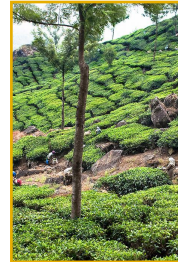
I. Education, Inclusion,  
Jobs, Growth



II. Health and  
Wellbeing



III. Clean Energy and  
Industry



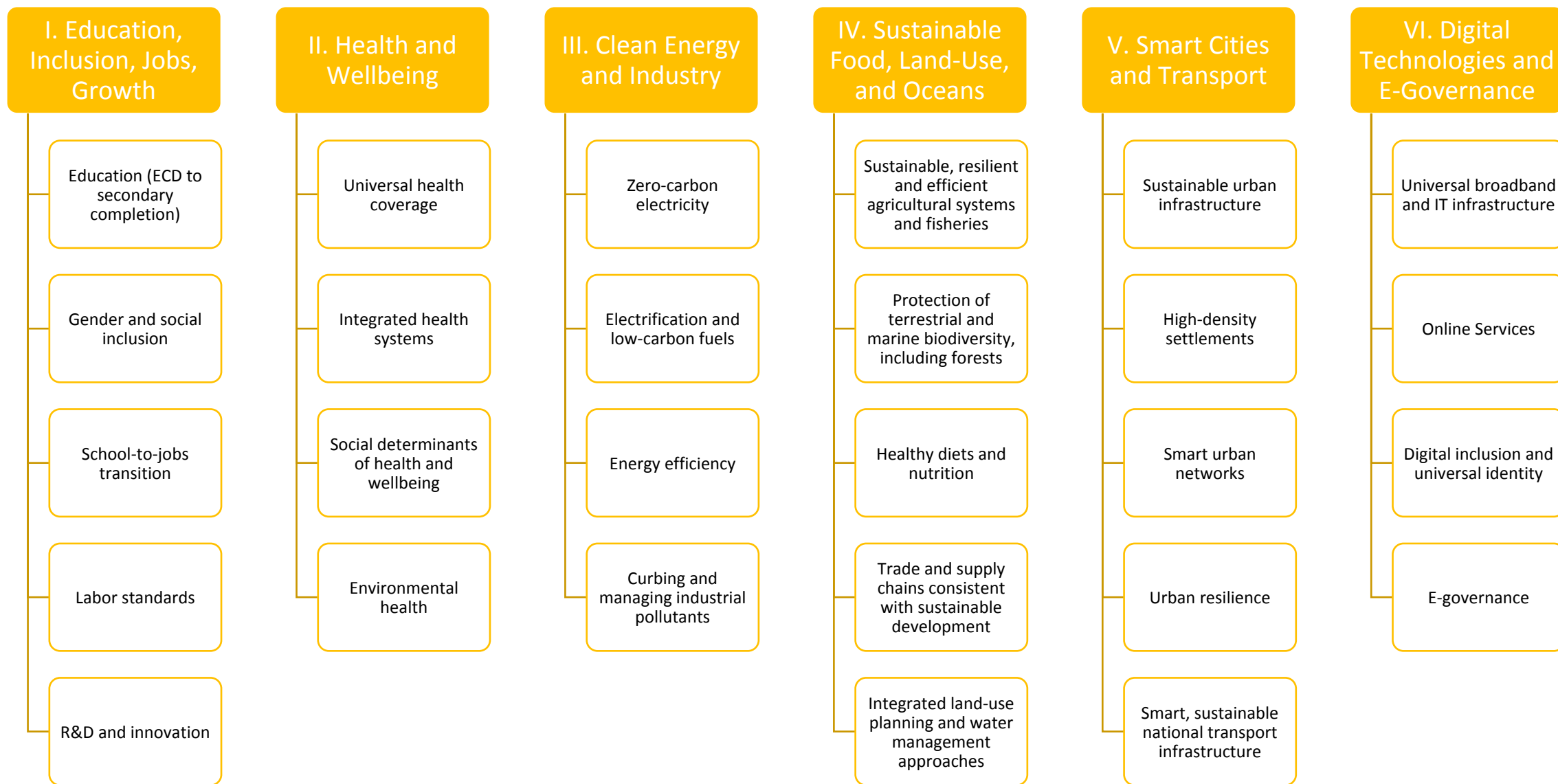
IV. Sustainable Food,  
Land-Use, and Oceans



V. Smart Cities and  
Transport



VI. Digital Technologies  
and E-Governance



# THE EUROPEAN GREEN DEAL



# Main policies of the Korean New Deal

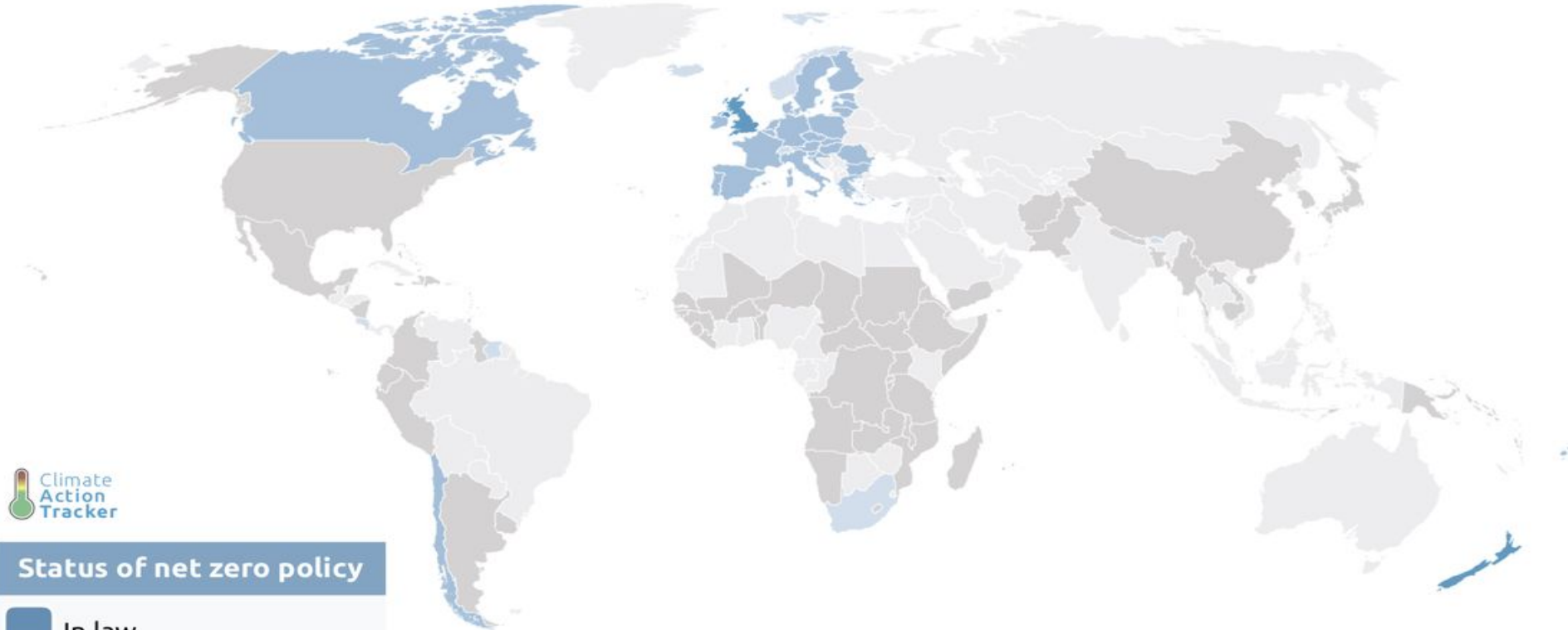




# NET ZERO POLICY GLOBAL MAP

November 2020

Canada	USA	EU	Japan
Canada tabled net zero target legislation in November 2020	'Biden Plan' by President-elect proposing net zero target for 2050	Commission tabled net zero target legislation in March 2020	Prime minister Suga announced that Japan will aim for net zero GHG emissions by 2050



## Status of net zero policy

- In law
- Proposed Legislation
- In Policy Document
- Target Under Discussion
- No discussion

## South Africa

Vision statement for net zero carbon emissions by 2050 in submitted LTS

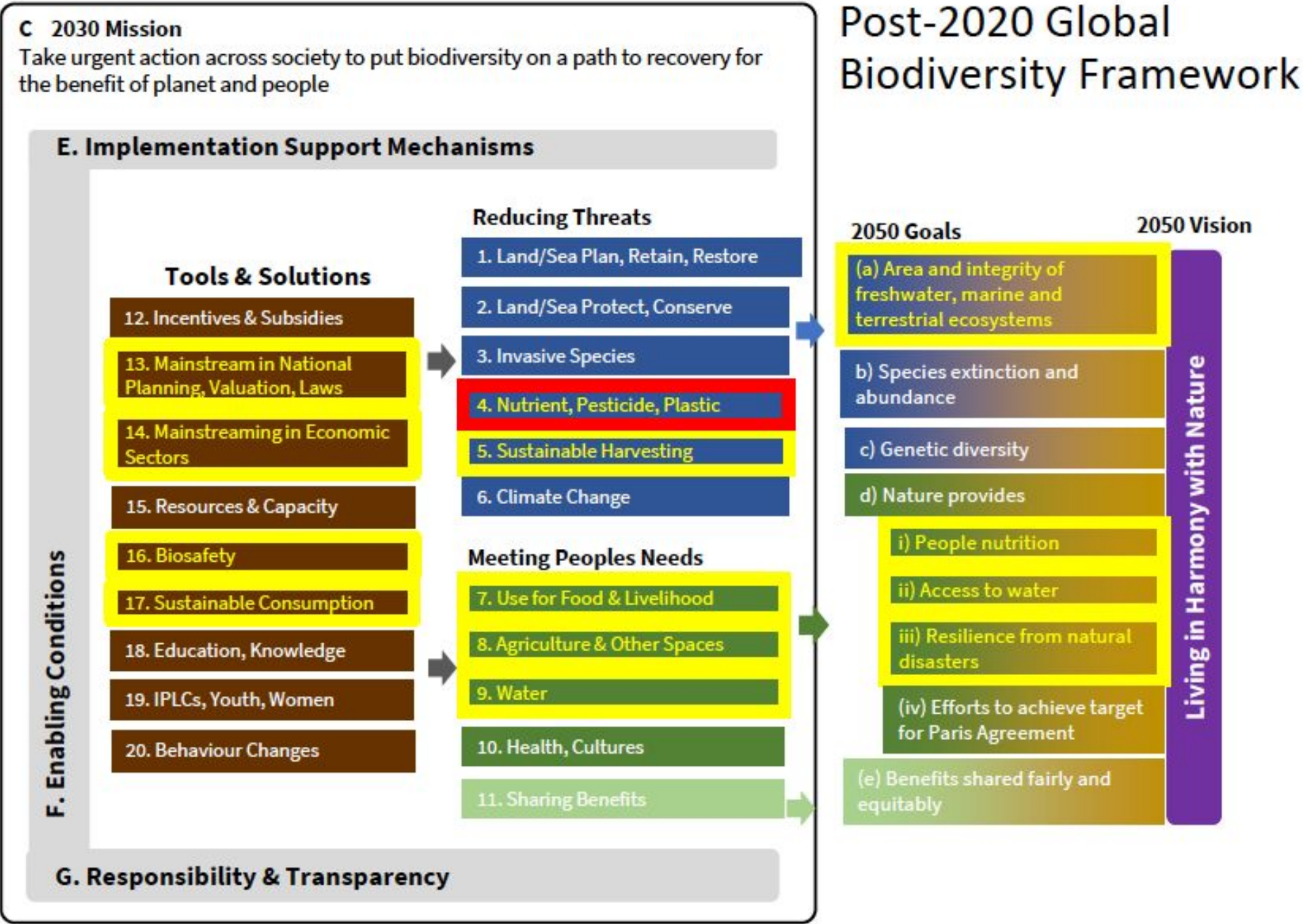
## China

Announcement of 'carbon neutrality' before 2060 by President Xi Jinping at UN General Assembly

## South Korea

In a policy speech President Moon Jae-in announced that South Korea will reach carbon neutrality by 2050

# Goals of COP 15 of the Convention On Biological Diversity







**United  
Nations**



**Food Systems Summit 2021**

**Action Track 1: Ensure access to safe and nutritious food for all**

**Action Track 2: Shift to sustainable consumption patterns**

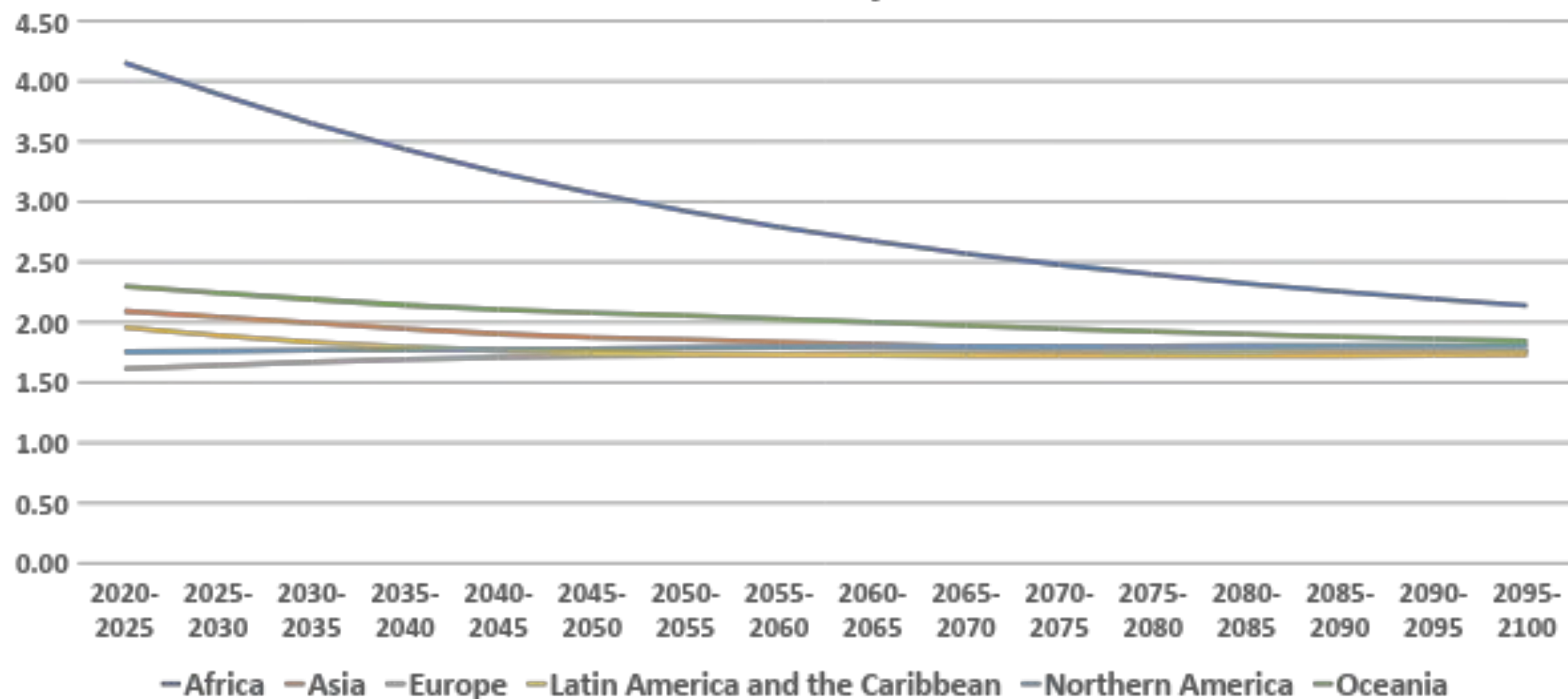
**Action Track 3: Boost nature-positive production**

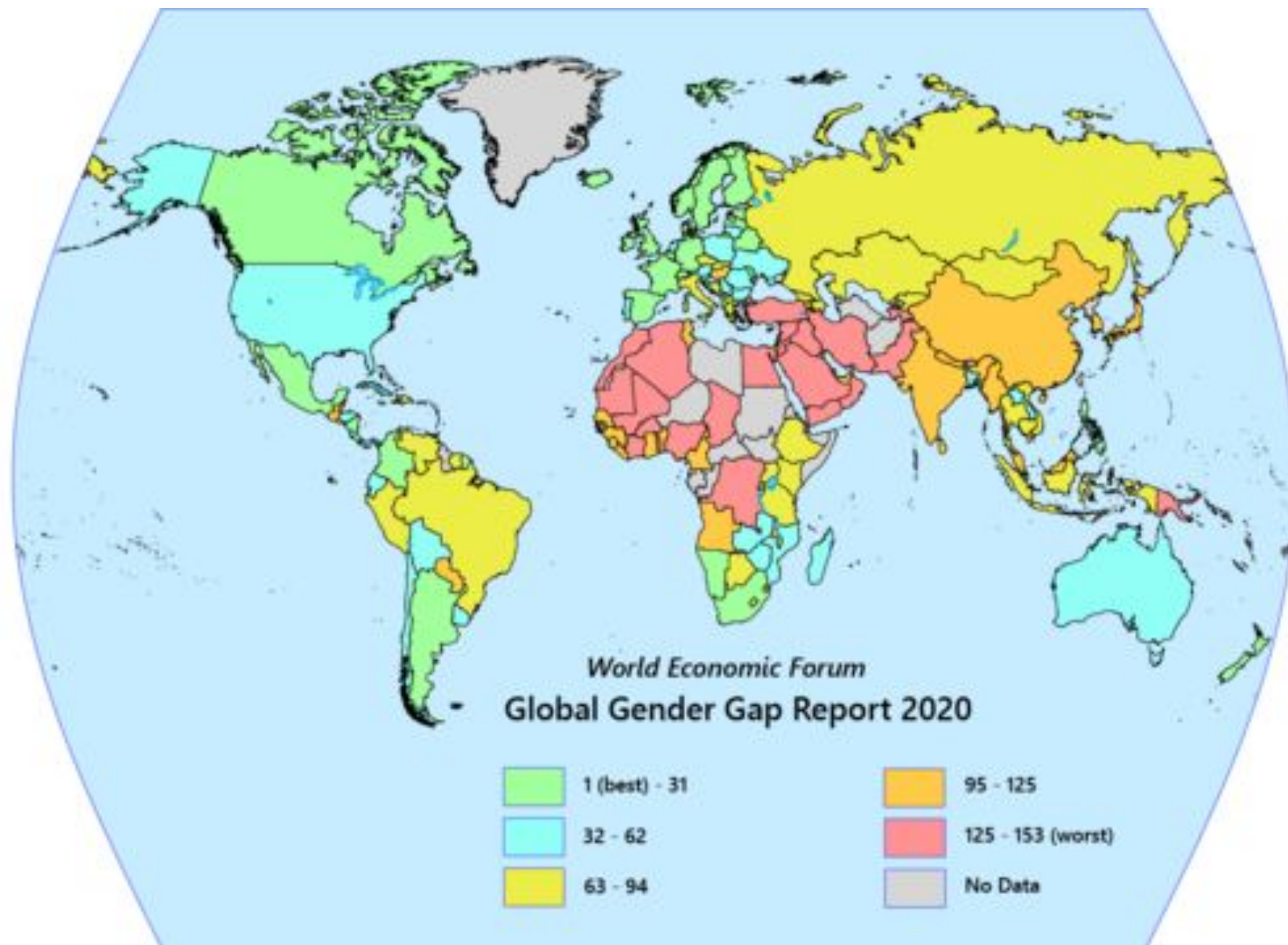
**Action Track 4: Advance equitable livelihoods**

**Action Track 5: Build resilience to vulnerabilities, shocks and stress**

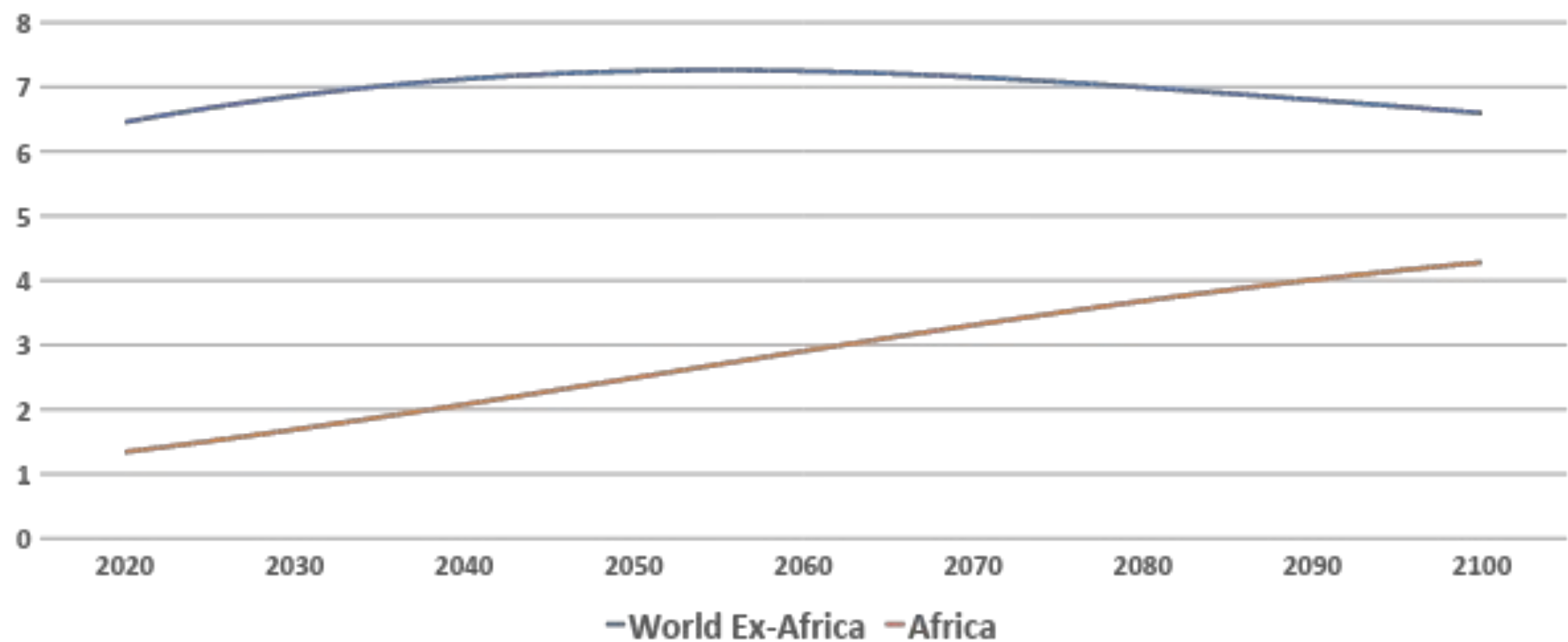
# Banishing the Malthusian Specter

## Total Fertility Rate by Region Medium Fertility Variant

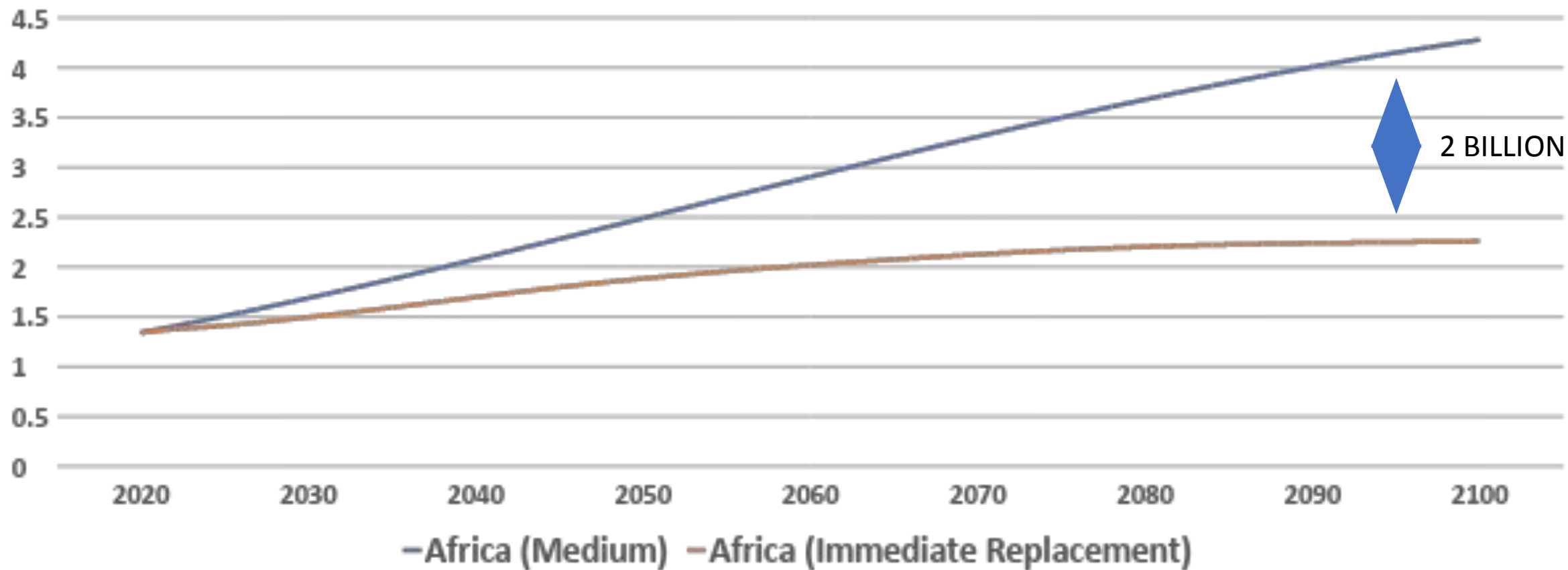




## UN Population Scenario Medium Fertility Variant

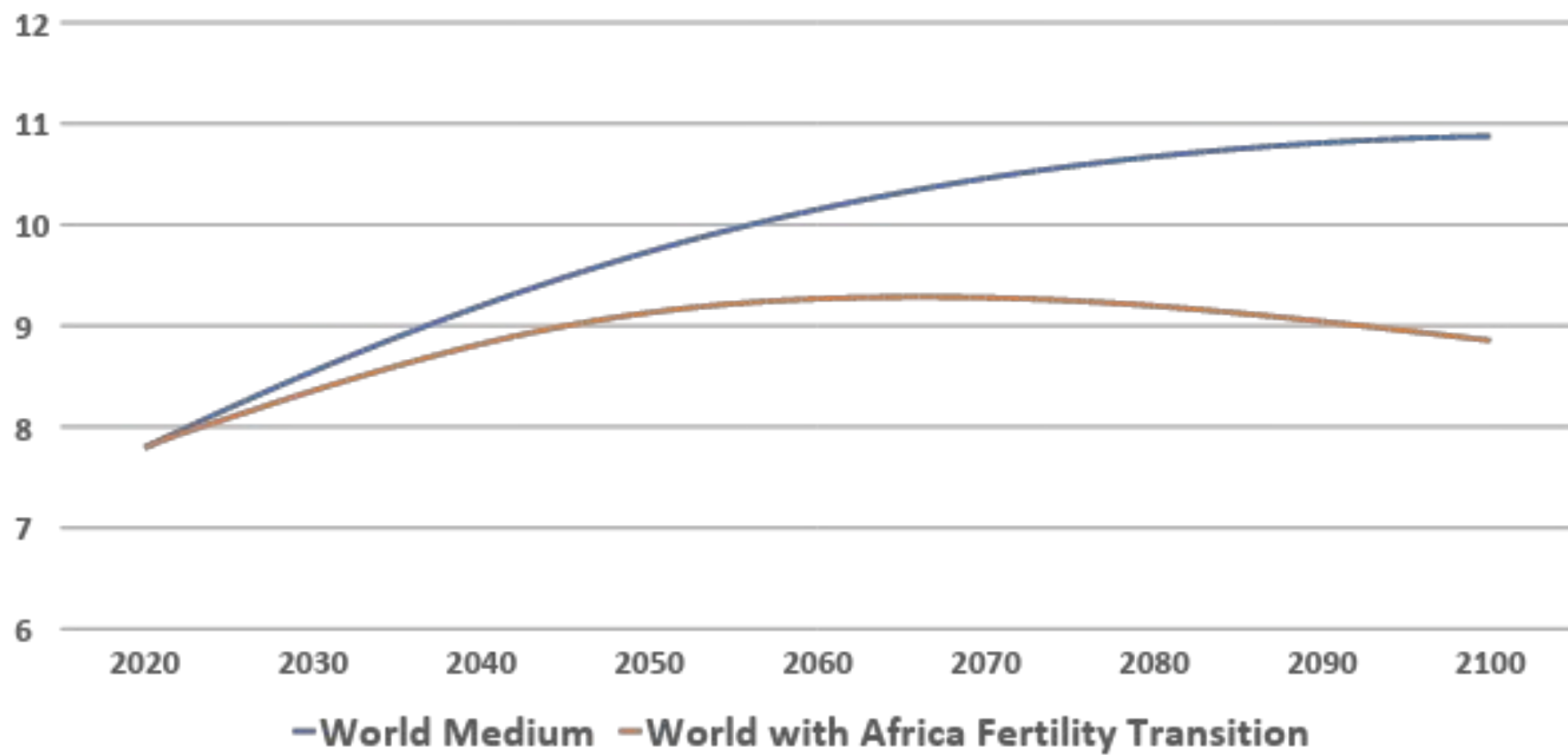


## Africa Population Medium Fertility versus Replacement Rate Scenarios

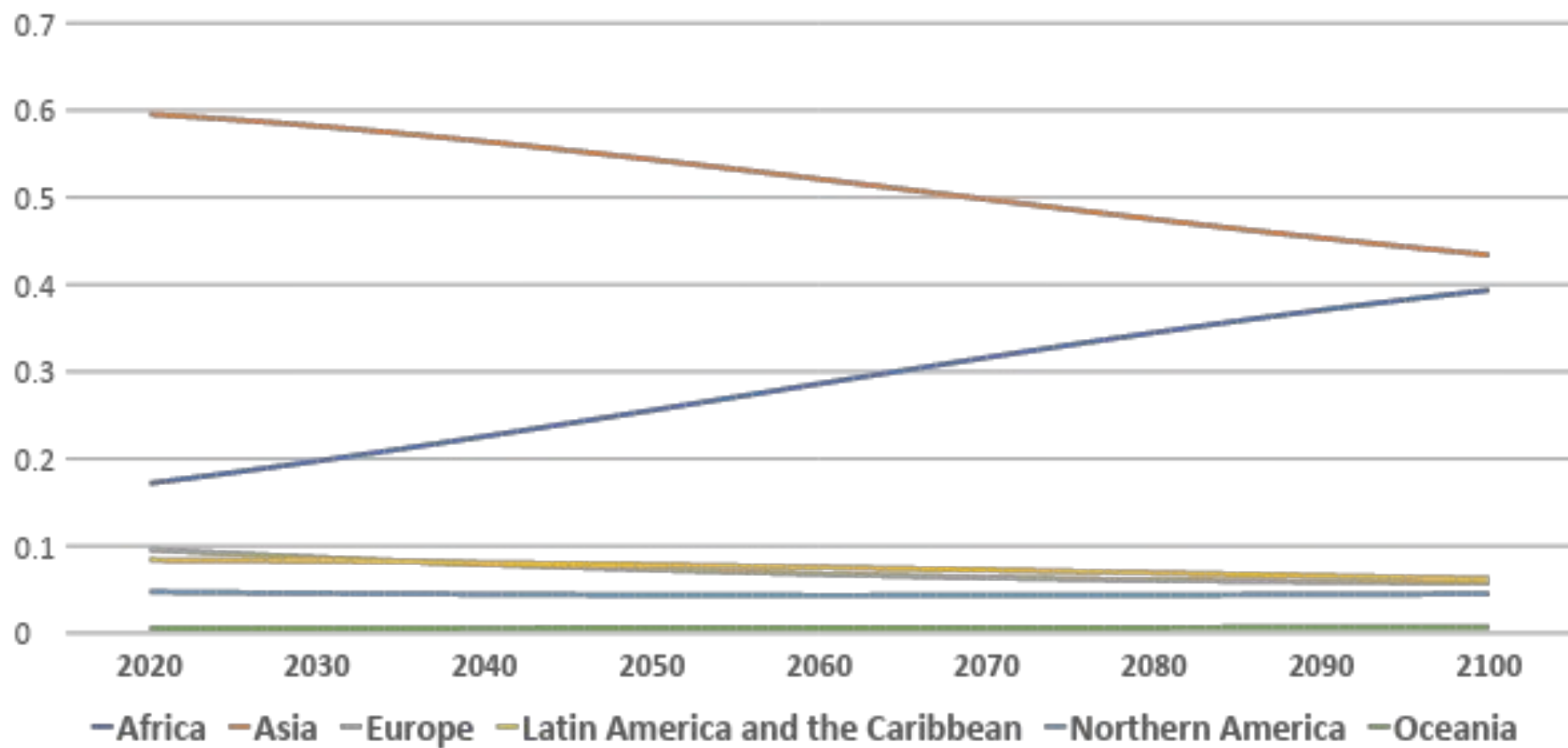




## World Population Medium versus Replacement Scenarios

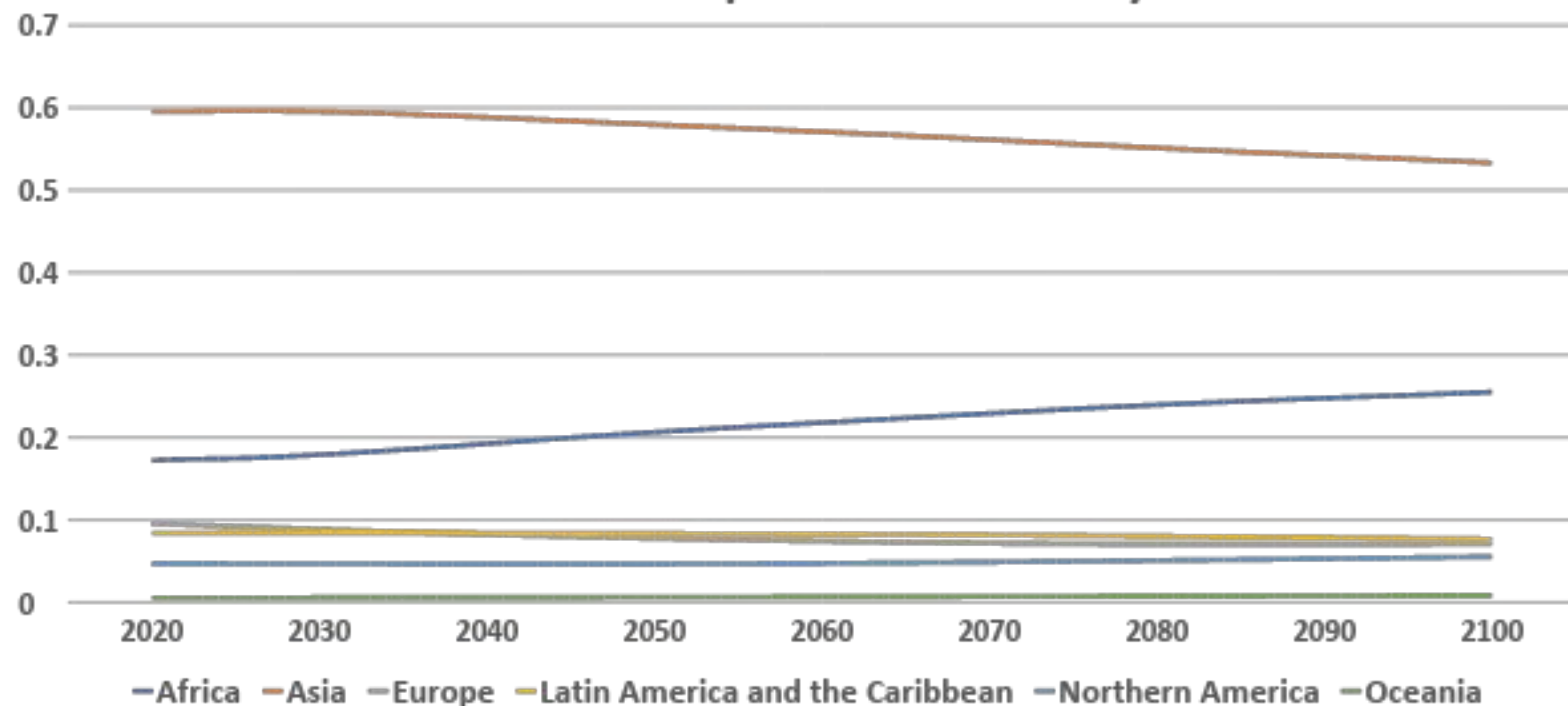


## Population Share by Continent Medium Fertility Variant



## Population Shares by Continent

### Medium Variant + Replacement Fertility in Africa



Region	Land (Km2)	Land Share	Population Share 2100
World ex Antarctica	104,279,000	100.0%	100.0%
Asia	44,579,000	42.7%	53.3%
Africa	30,065,000	28.8%	25.5%
North America	24,256,000	23.3%	5.5%
South America	17,819,000	17.1%	7.7%
Europe	9,938,000	9.5%	7.1%
Australia (plus Oceania)	7,687,000	7.4%	0.8%

# The Great Transformation

# Pillars of Deep Transformation

- Goal-Based Development
- Technology Pathways
- Policy Support
- Financial Programming
- Corporate Alignment
- Regional Integration
- Geopolitical Cooperation
- Ethics of Sustainable Development



# Goal-Based Development

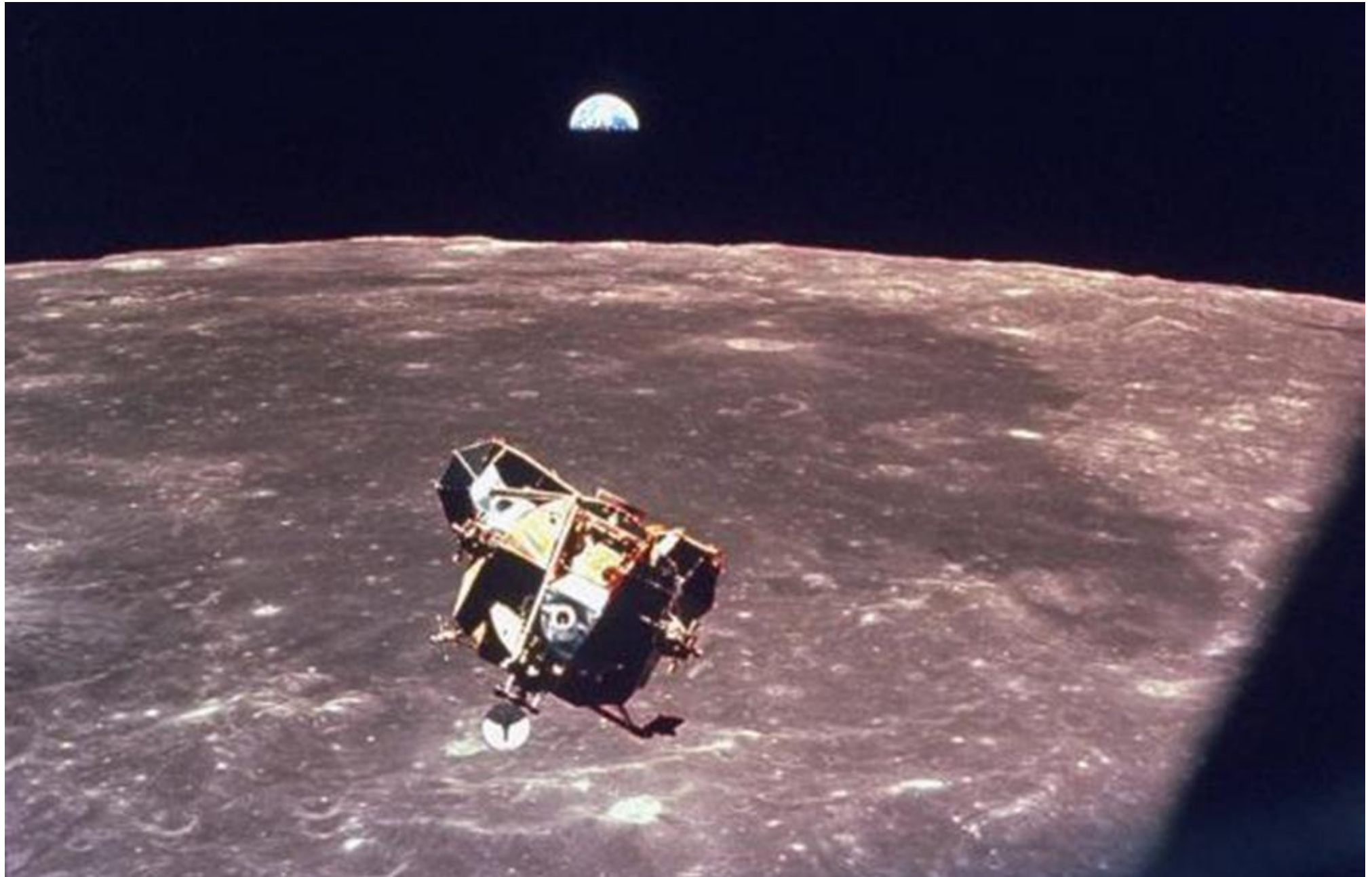


“Peace need not be impracticable, and war need not be inevitable. By defining our goal more clearly, by making it seem more manageable and less remote, we can help all people to see it, to draw hope from it, and to move irresistibly towards it.”

John F. Kennedy

American University Commencement Address

June 10, 1963



I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to the earth. No single space project in this period will be more impressive to mankind, or more important for the long-range exploration of space; and none will be so difficult or expensive to accomplish.

John F. Kennedy  
May 25, 1961

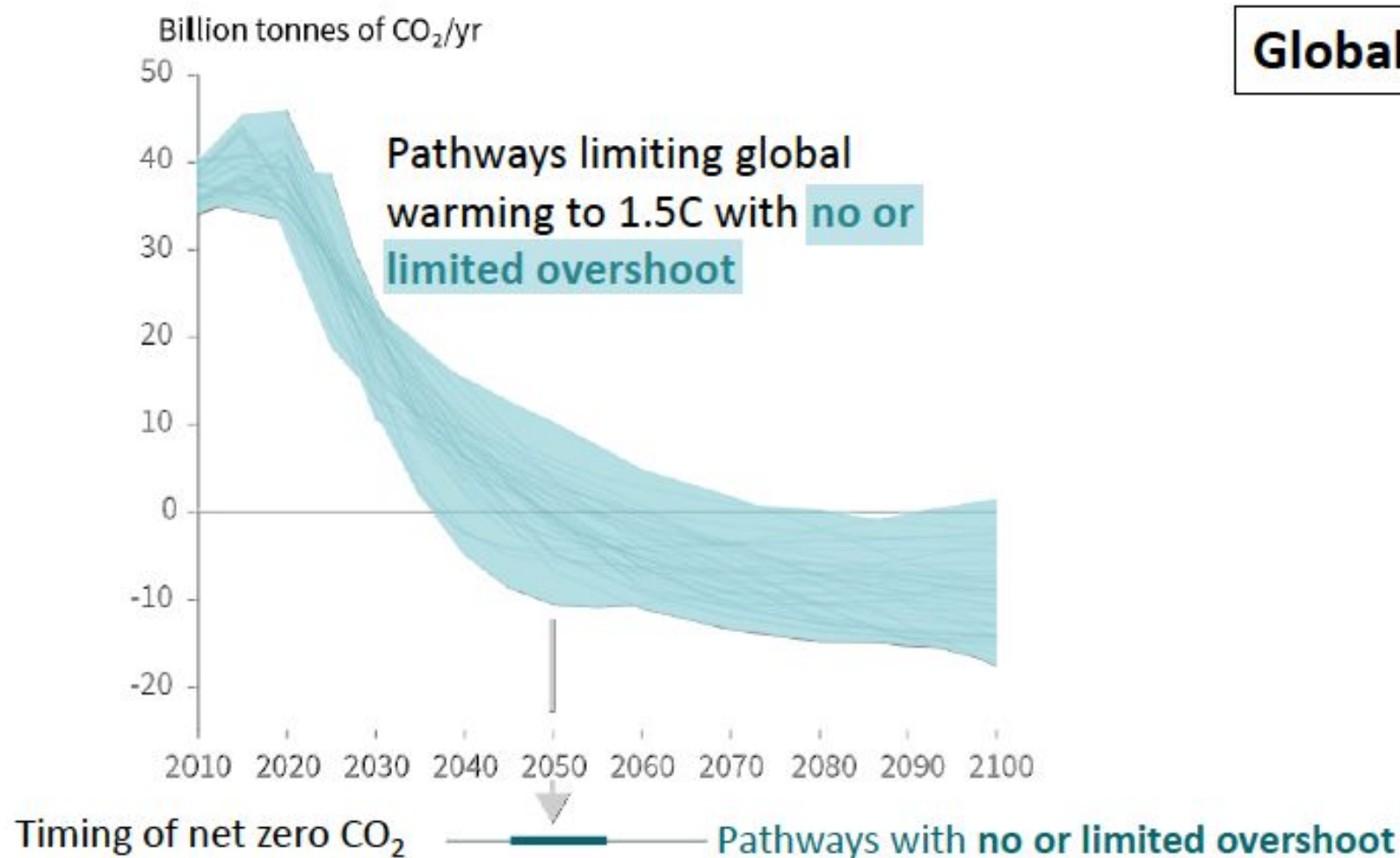
We choose to go to the Moon in this decade and do the other things, not because they are easy, but because they are hard; because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one we intend to win, and the others, too.

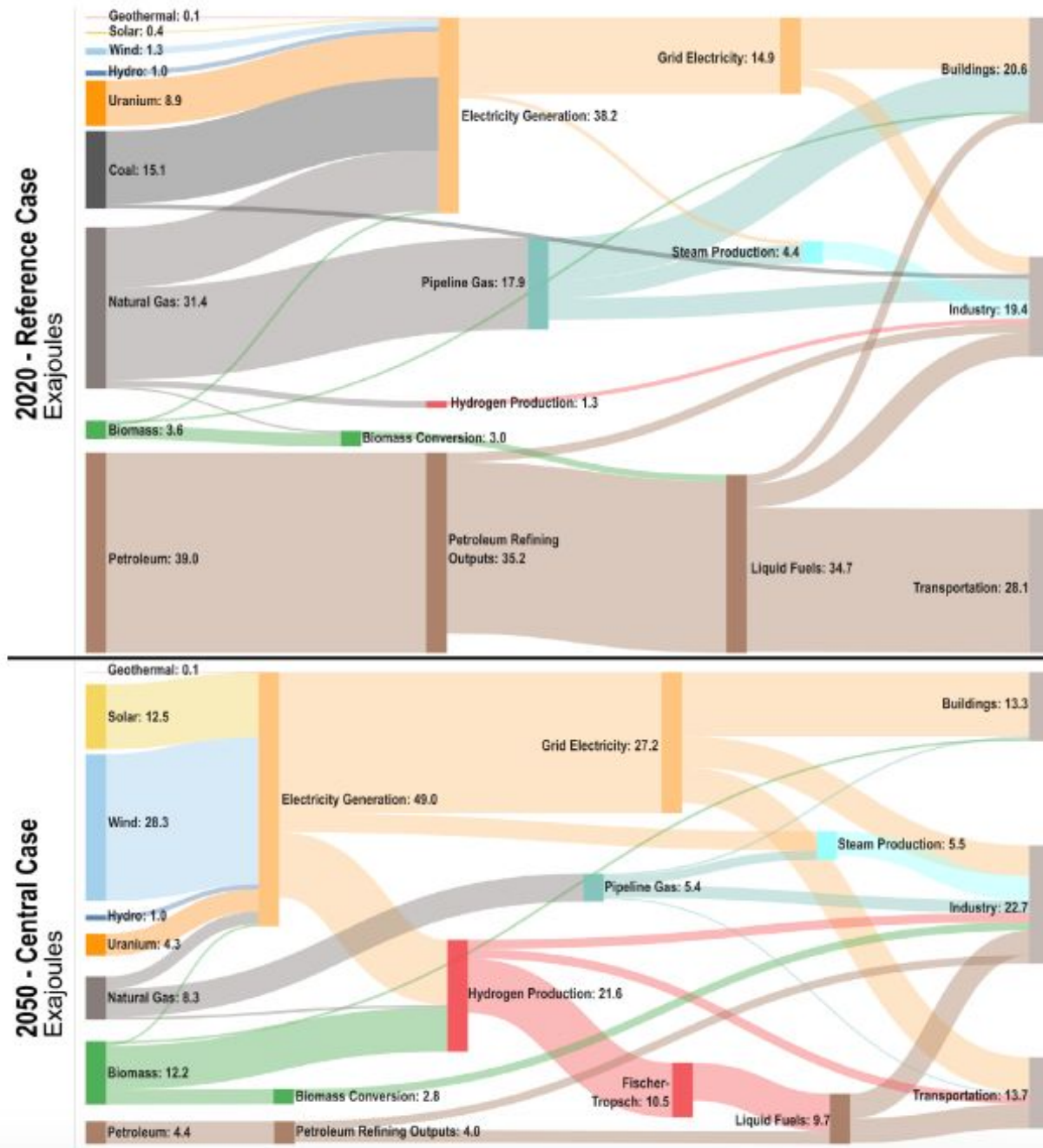
John F. Kennedy  
September 12, 1962



# Technology Pathways

# SPM3a | Global emissions pathway characteristics





## Decarbonization Pathways:

Zero-Carbon Power

Electric Transport

Electric Heating

Synthetic Fuels (e.g. H<sub>2</sub>)

Energy Efficiency

# Cutting Food Waste, Boosting Farm Productivity, Shifting from Meat

			Greenhouse-gas emissions (Gt CO <sub>2</sub> -eq/yr)	Cropland use (M km <sup>2</sup> )	Water use (M km <sup>3</sup> )	Nitrogen application (Tg)	Phosphorus application (Tg)	OPTM biodiversity loss (E/MSY)	MAN biodiversity loss (E/MSY)	OPTN biodiversity loss (E/MSY)	NAT biodiversity loss (E/MSY)
Food production boundary			5.0 (4.7-5.4)	13 (11.0-15.0)	2.5 (1.0-4.0)	90 (65.0-140.0)	8 (6.0-16.0)	10 (1-80)	10 (1-80)	10 (1-80)	10 (1-80)
Baseline in 2010			5.2	12.6	1.8	131.8	17.9	100	100	100	100
Production (2050)	Waste (2050)	Diet (2050)	..	..	..	..	..	..	..	..	..
(1)											
BAU	full waste	BAU	9.8	21.1	3.0	199.5	27.5	2	36	153	1067
BAU	full waste	reference	5.0	21.1	3.0	191.4	25.5	2	45	120	1309
BAU	full waste	pescatarian	3.2	20.6	3.0	189.7	25.3	2	46	118	1313
BAU	full waste	vegetarian	3.2	20.8	3.1	186.9	24.7	2	48	122	1374
BAU	full waste	vegan	2.1	20.7	3.3	184.1	24.4	2	50	128	1431
PROD+	halve waste	BAU	8.1	11.3	1.9	128.2	14.2	0	7	38	196
PROD+	halve waste	reference	4.0	11.0	1.9	121.3	13.1	0	10	28	290
PROD+	halve waste	pescatarian	2.4	10.6	1.9	118.8	12.9	0	10	27	298
PROD+	halve waste	vegetarian	2.4	10.7	1.9	117.6	12.6	0	11	29	330
PROD+	halve waste	vegan	1.5	10.5	2.0	113.9	12.1	0	12	33	366

# **Sustainable Cities at 2050**

Work and leisure from home

E-services (government, health, education, finance, entertainment)

E-commerce

End of peak (rush-hour) commuting

Carsharing rather than car owning

Small, autonomous e-vehicles

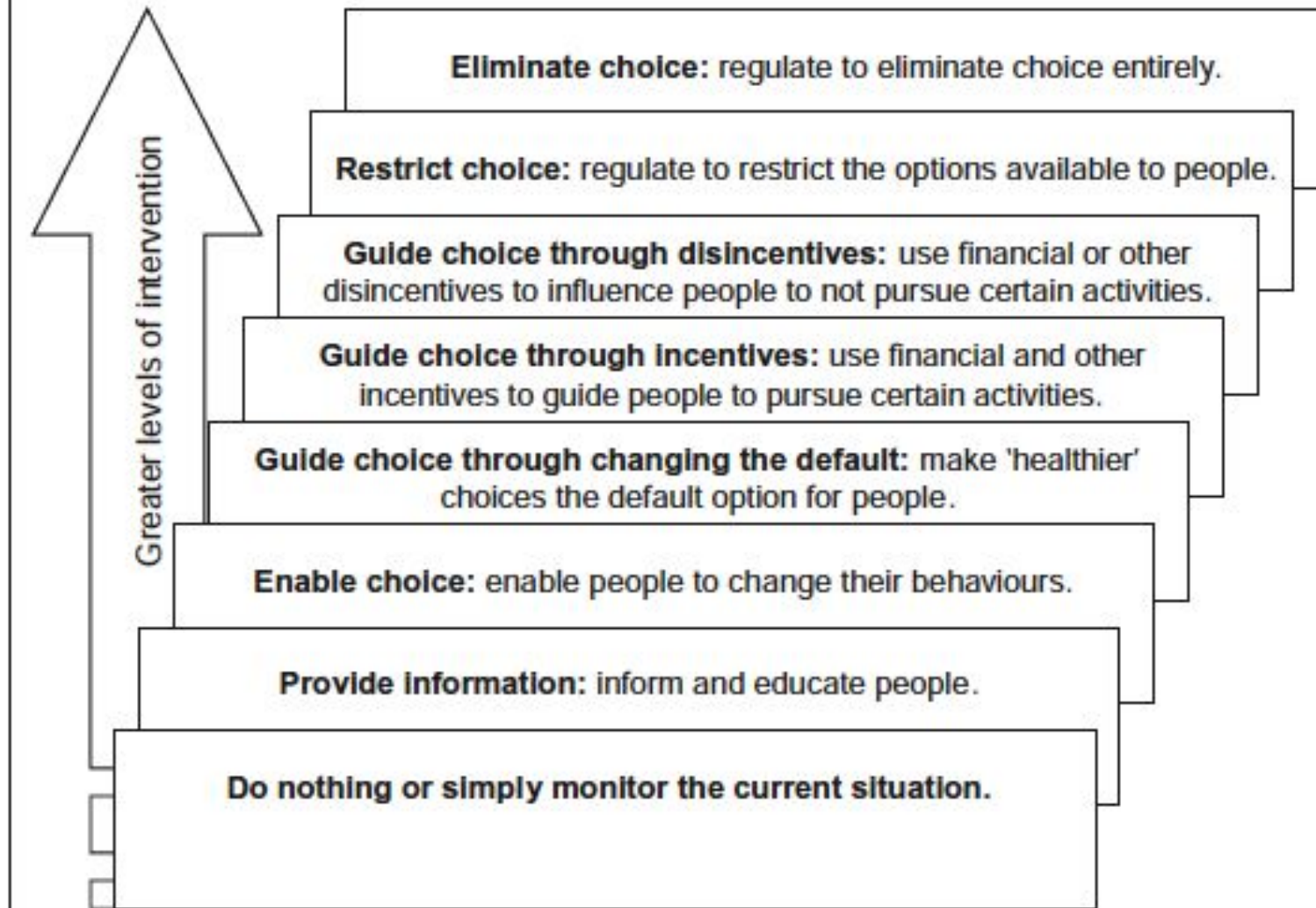
Streets reclaimed for walking, biking, green space

Policy Support



# The Nuffield Policy Ladder

Figure 2.1: A ladder of interventions



# Financial Programming

## Budgetary Financing

Social services (Health, education)

## Blended Financing

Infrastructure (Renewable Energy, Power Grid, Road/Rail, Water/Sanitation, Housing, Fiber )

## Market Financing

E-commerce, personal mobility

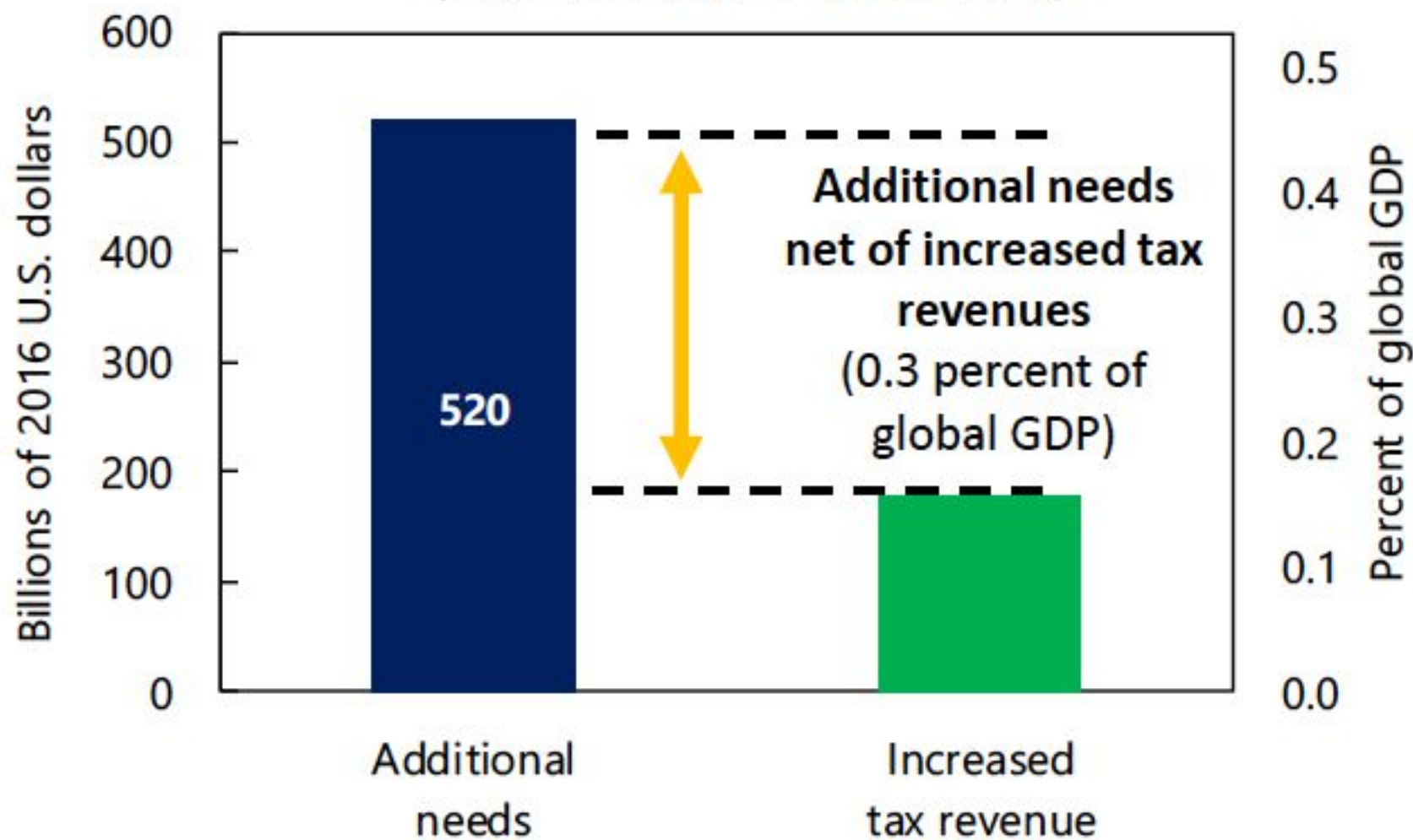
Inter-Generational Budget Accounting &  
Fiscal Gap Analysis

Debt carrying capacity of developing-country public  
sectors

The SDG Financing Gap

## LIDCs: Additional Spending Needs and Increased Tax Revenues in 2030

(Billions of 2016 U.S. dollars)



Source: IMF staff calculations.

# Corporate Alignment



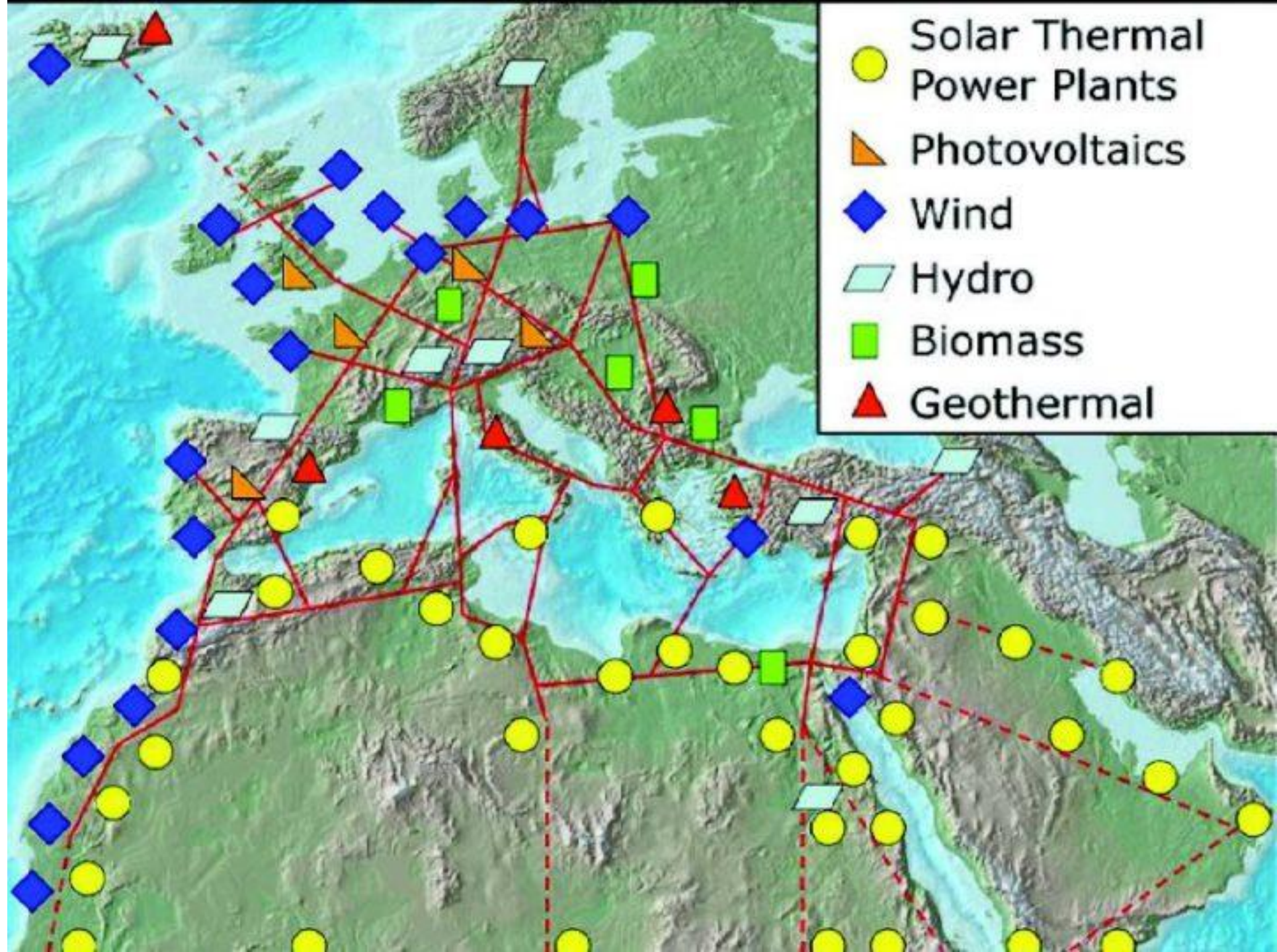
## **New Corporate Accountability Standards**

Accountability and risk disclosure for products,  
production processes, environmental risks

Accountability for global value chain performance

Transparency regarding governance, taxation, lobbying, etc.

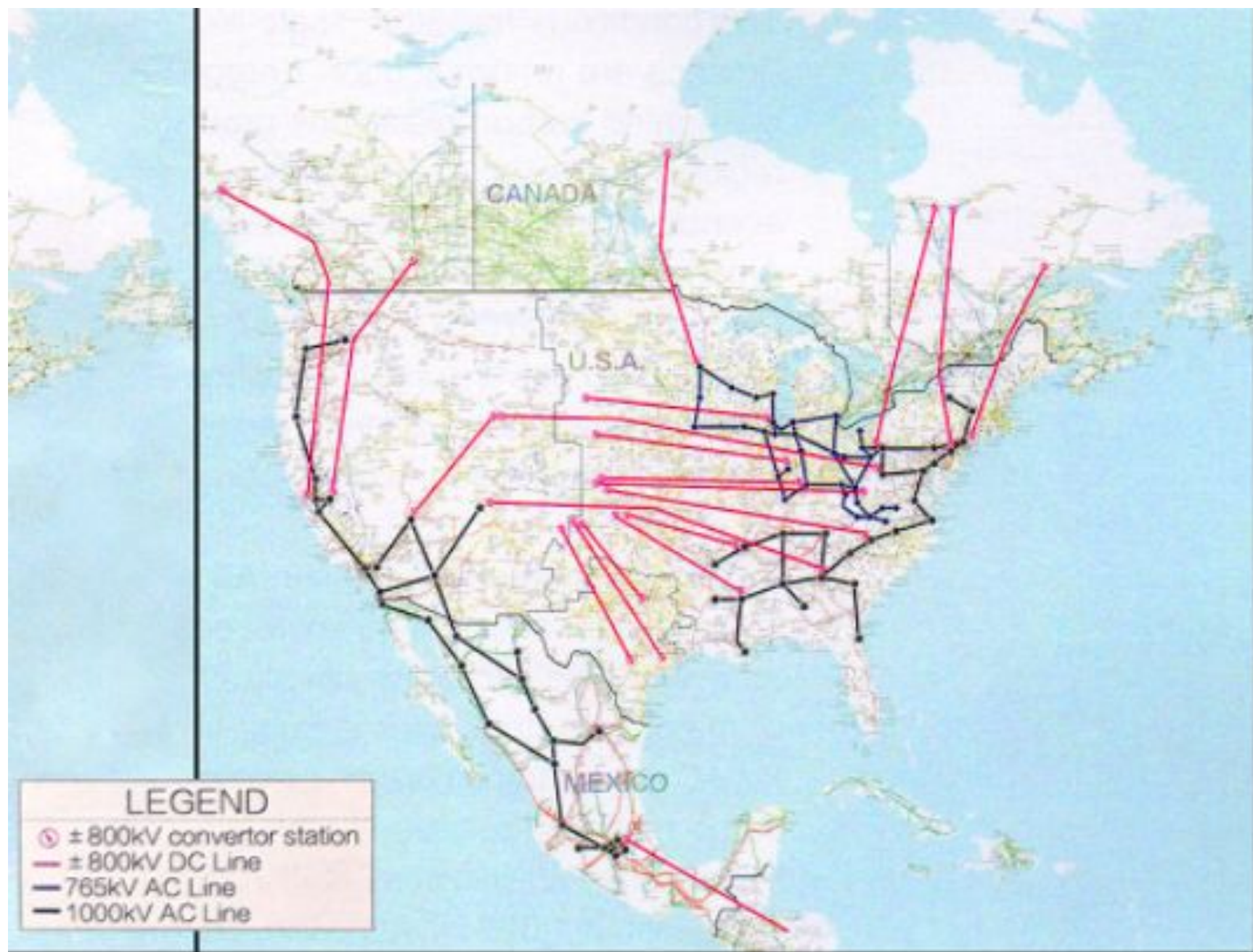
# Regional Integration



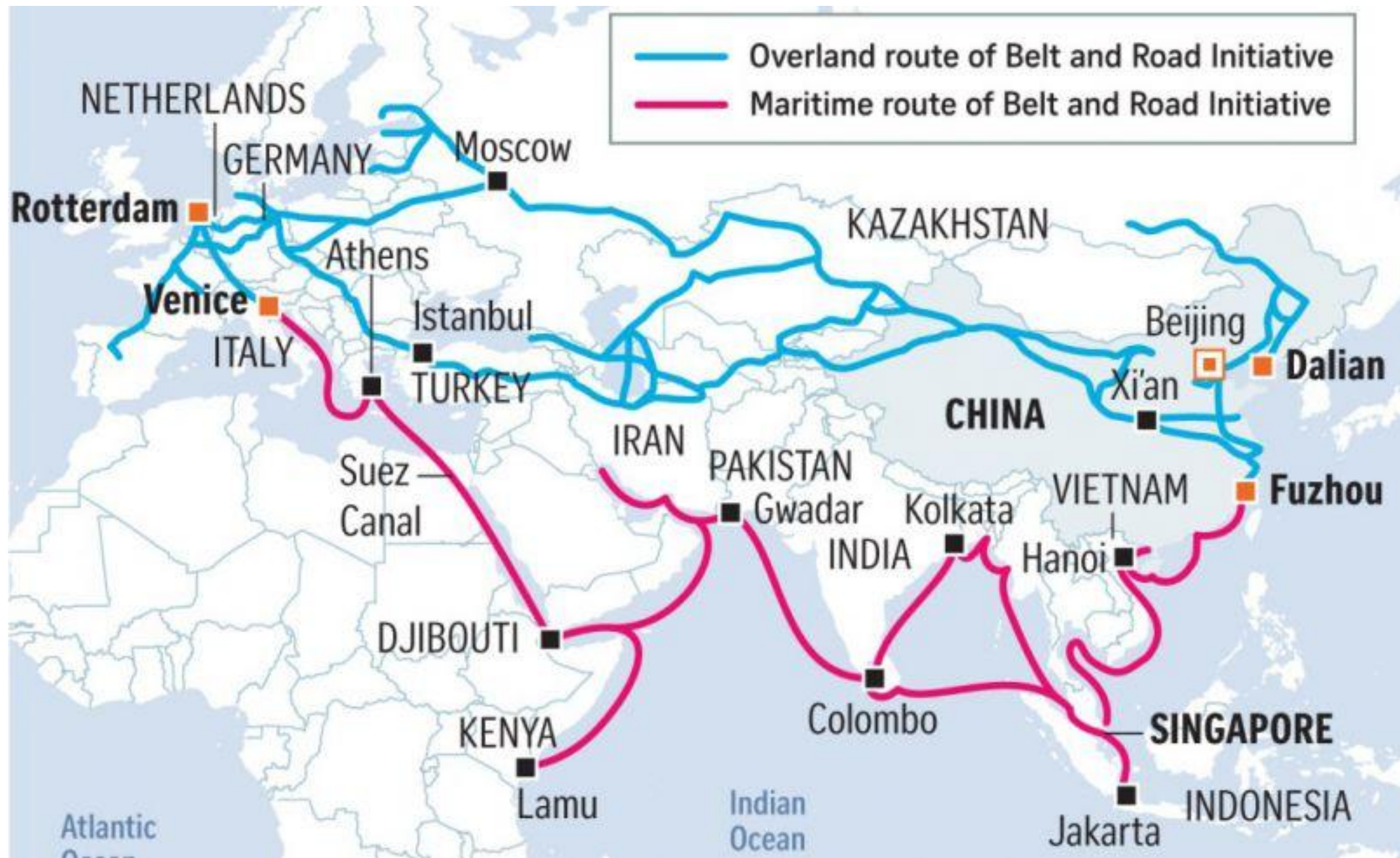




Global Energy Interconnection  
Development and Cooperation Organization  
全球能源互联网发展合作组织



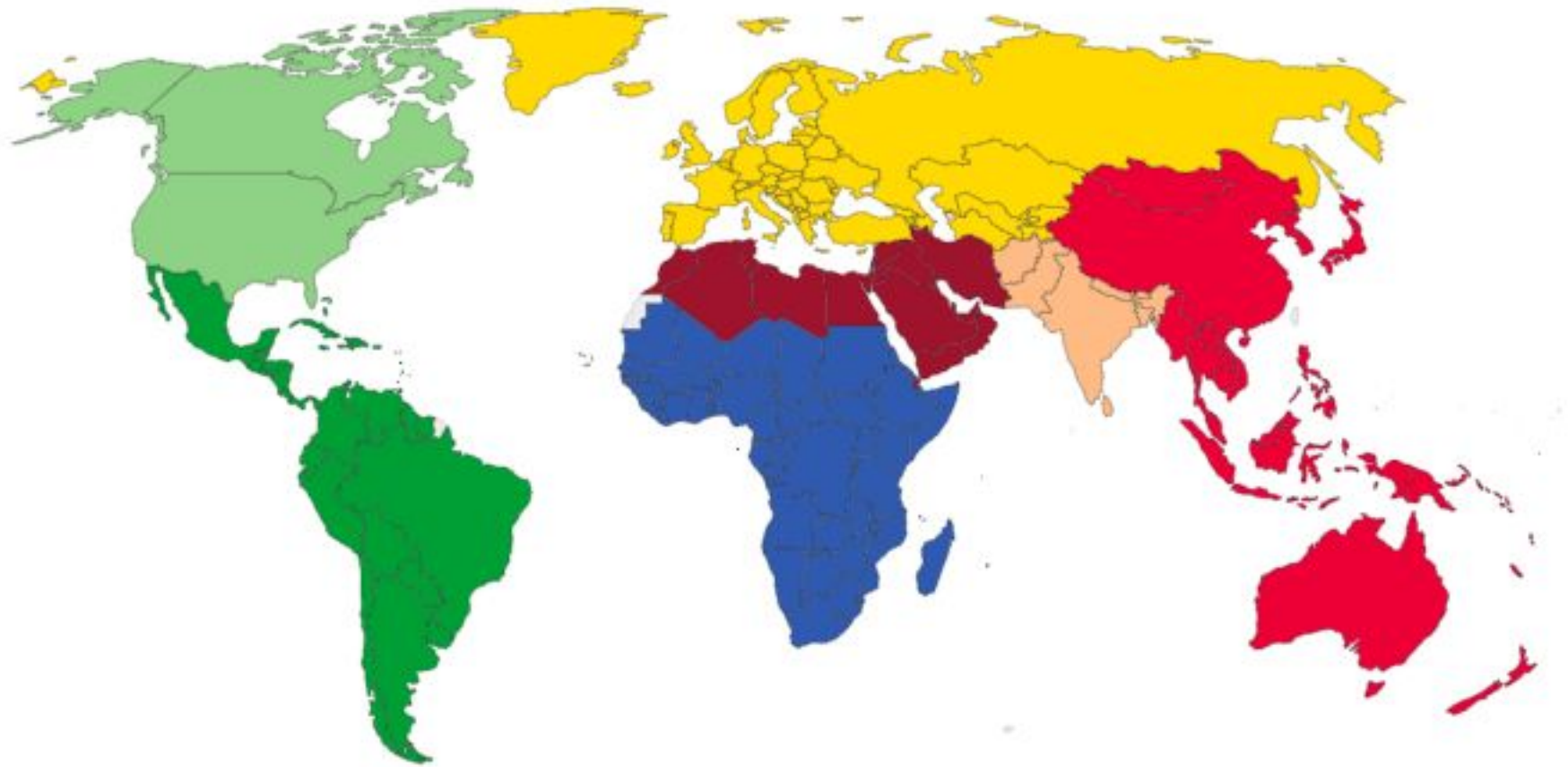






# World regions according to the World Bank

World



# Geopolitical Cooperation

# **The Culture and Ethics of Sustainable Development**

Human Rights and Responsibilities (75<sup>th</sup> Anniversary of the UDHR)

*Perpetual Peace* (1795) and the 150 years later: the UN Charter (1945)

*Science and Faith* in Human Progress (Pontifical Academy of Sciences)

Mission 4.7 Education for Sustainable Development and Global  
Citizenship

Global University Networks: SDSN

*Eudaimonia*: The Human *Telos*

## ***2021 Global Agenda***

Paris Climate Agreement + 5 (COP 26, Glasgow)

Convention on Biological Diversity (COP 15, Kunming)

World Food Systems Summit (UN, NYC)

World Oceans Summit (Lisbon)