

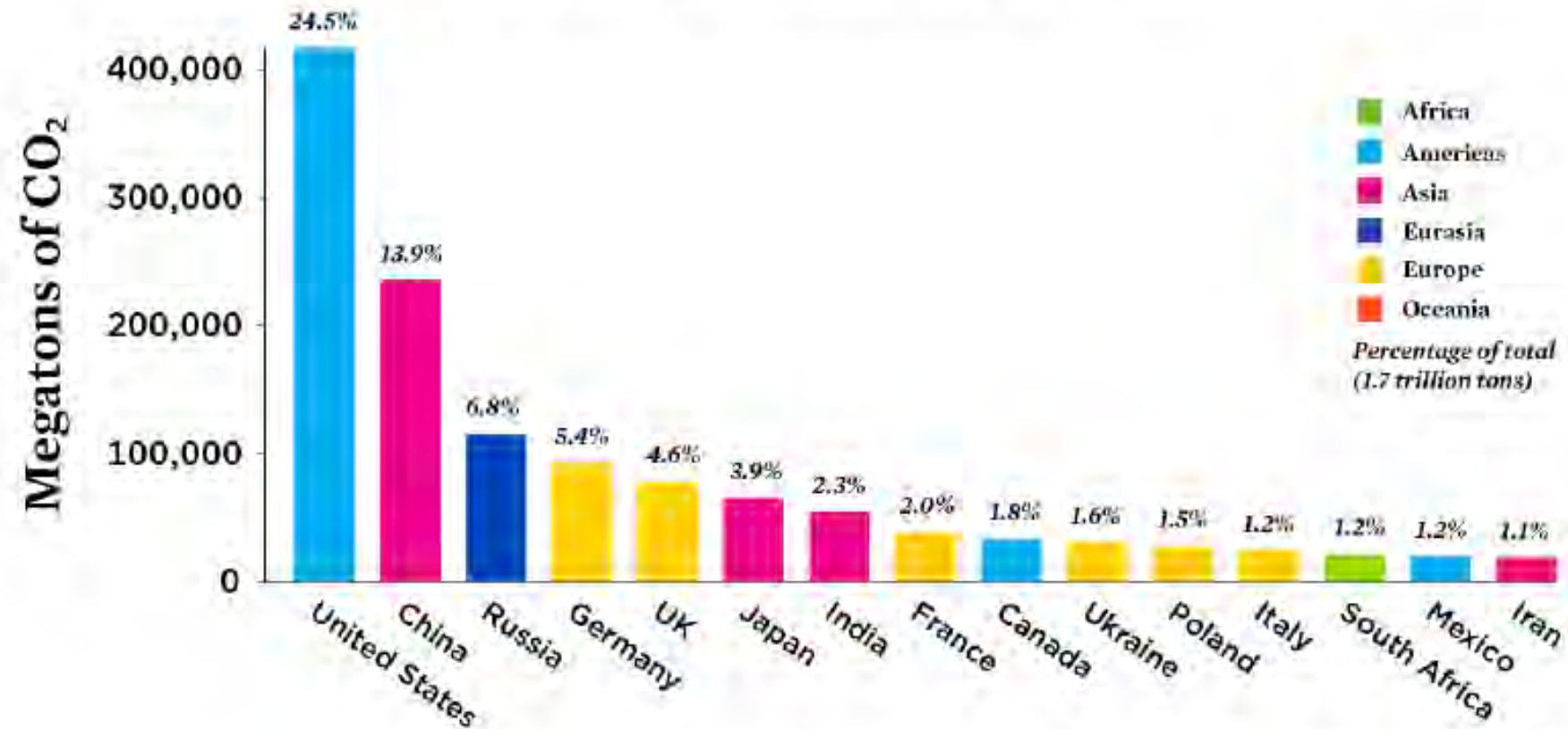
Asia and the Challenge of Net Zero

アジアとネットゼロへの挑戦

Miranda A. Schreurs
Technical University of Munich

最大の二酸化炭素排出国, 1750-2020

Top CO₂ Emitting Countries, 1750-2020
(from fossil fuels and cement)

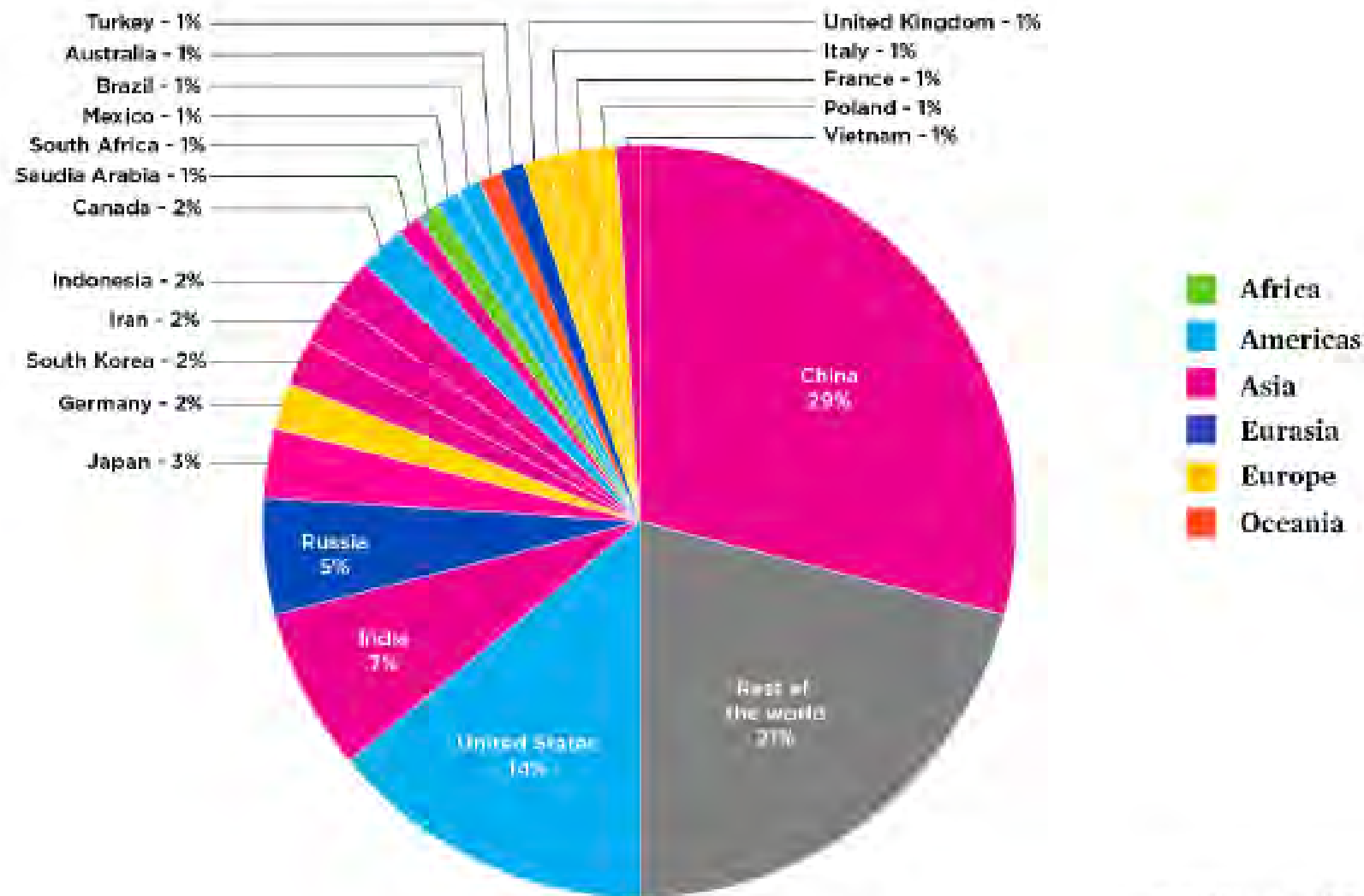


© 2021 Union of Concerned Scientists
Data: Global Carbon Project via Our World in Data

Top Annual CO₂ Emitting countries, 2019

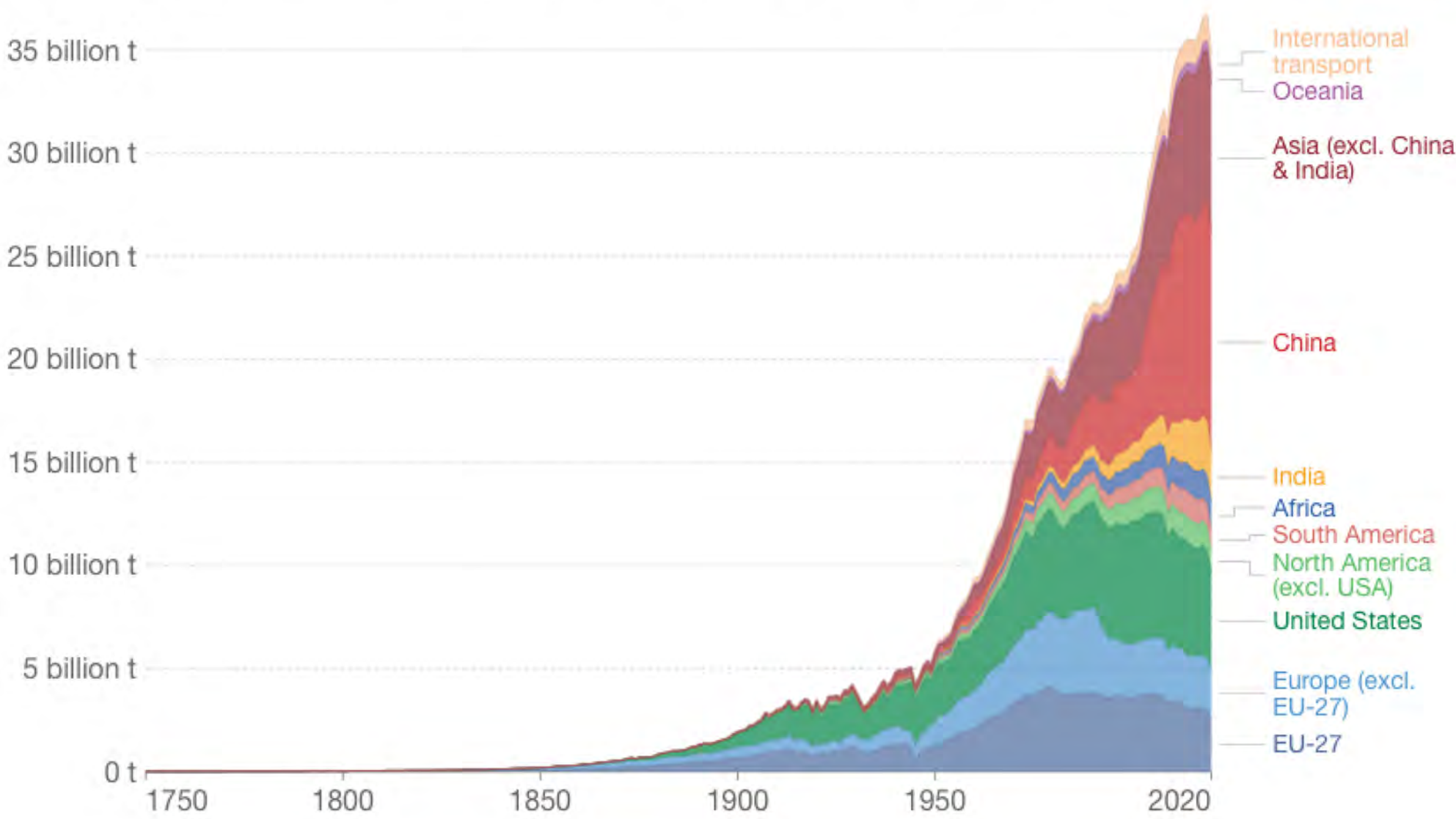
(from fossil fuels)

2019年の最大の
二酸化炭素排出国



Annual CO₂ emissions from fossil fuels, by world region

Our World
in Data

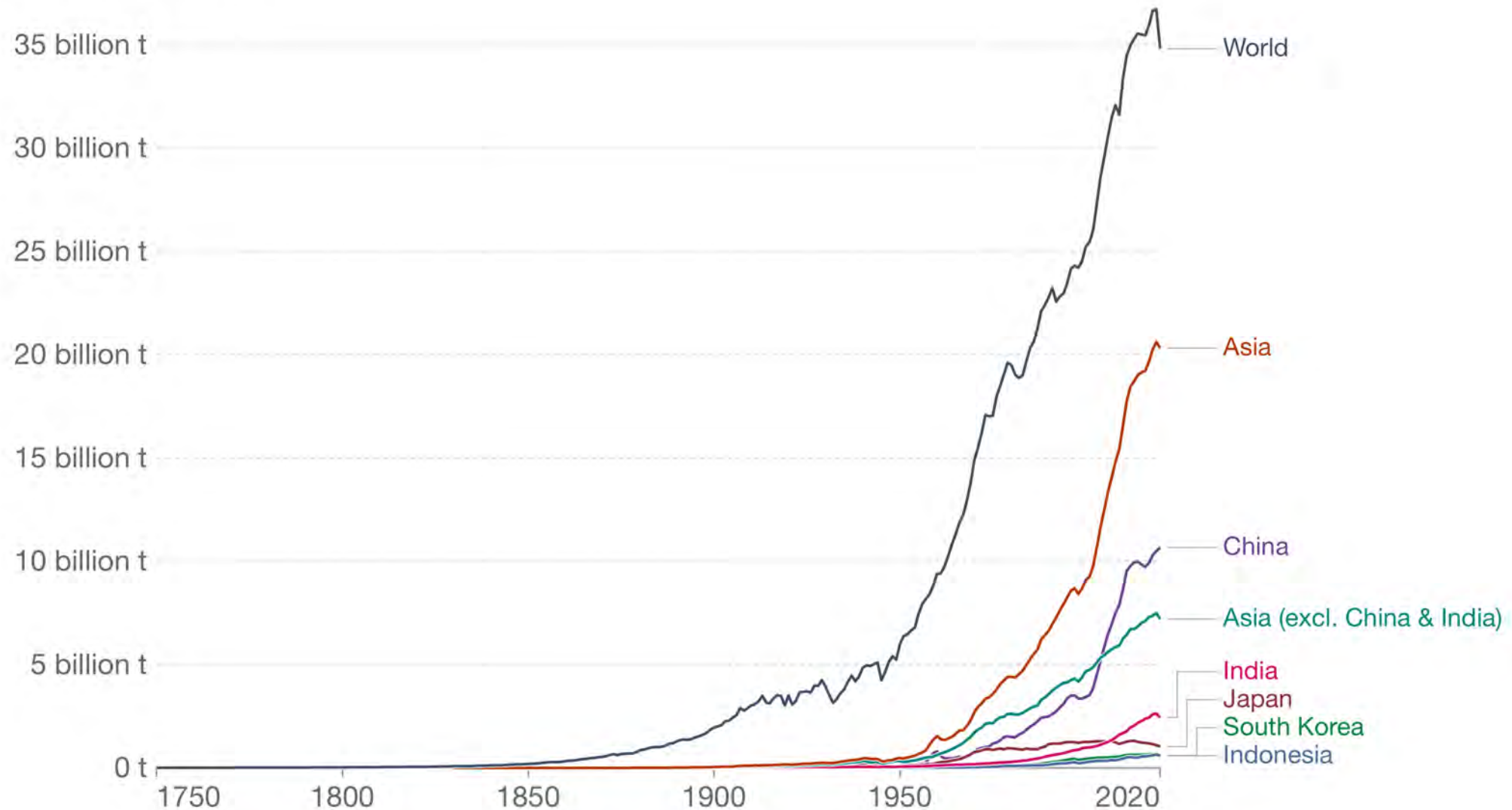


世界中の化石燃料からの年間二酸化炭素排出量

Source: Global Carbon Project
OurWorldInData.org/co2-and-other-greenhouse-gas-emissions • CC BY
Note: This measures CO₂ emissions from fossil fuels and cement production only – land use change is not included. 'Statistical differences' (included in the GCP dataset) are not included here.

Annual CO₂ emissions

Carbon dioxide (CO₂) emissions from the burning of fossil fuels for energy and cement production. Land use change is not included.



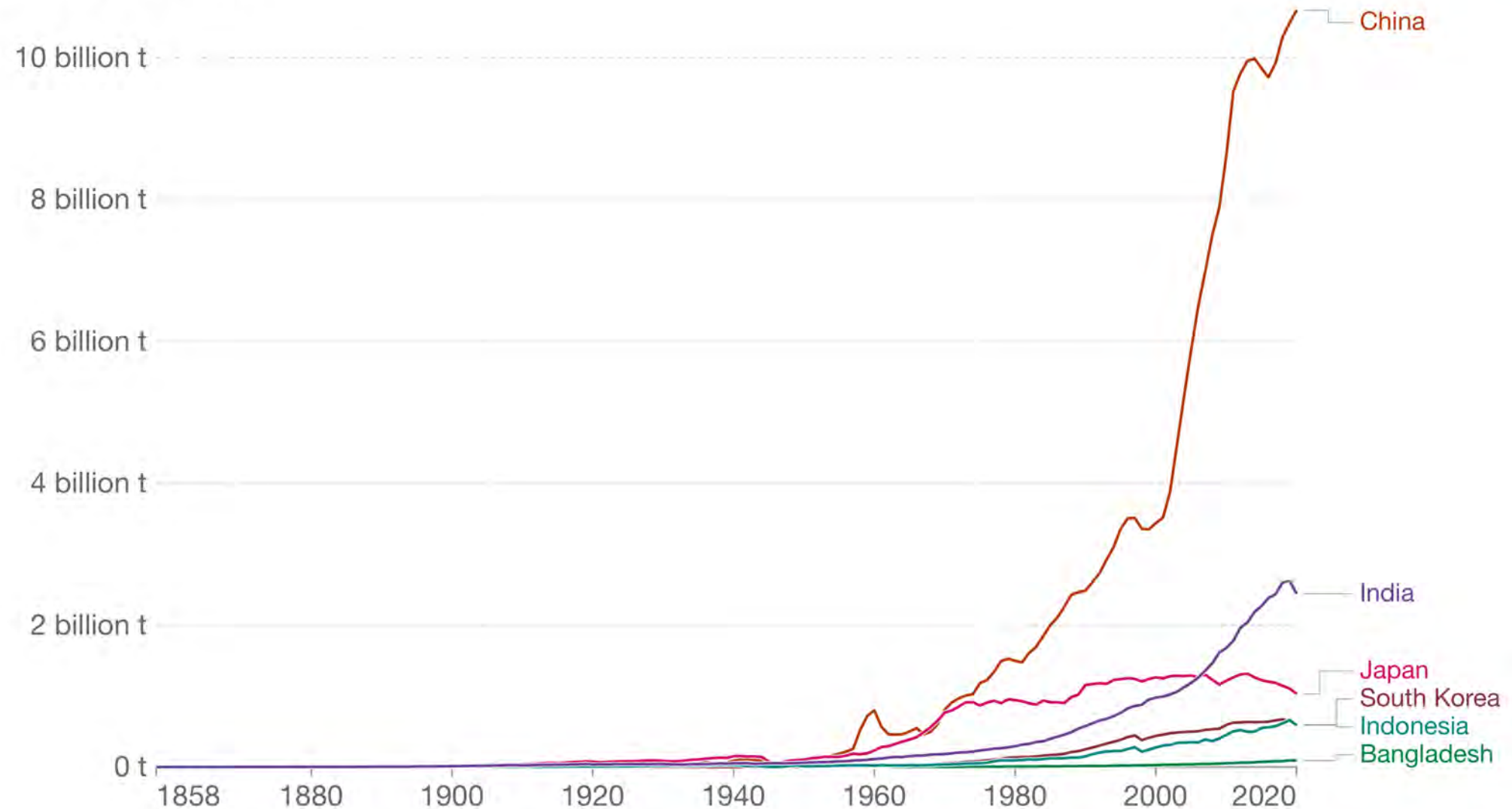
Source: Global Carbon Project

OurWorldInData.org/co2-and-other-greenhouse-gas-emissions/ • CC BY

Note: CO₂ emissions are measured on a production basis, meaning they do not adjust for emissions embedded in traded goods.

Annual CO₂ emissions

Carbon dioxide (CO₂) emissions from the burning of fossil fuels for energy and cement production. Land use change is not included.



Source: Global Carbon Project

OurWorldInData.org/co2-and-other-greenhouse-gas-emissions/ • CC BY

Note: CO₂ emissions are measured on a production basis, meaning they do not adjust for emissions embedded in traded goods.

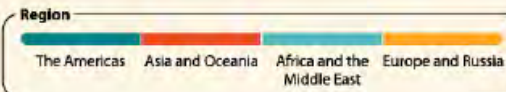
Carbon Emissions

PER-CAPITA BY COUNTRY

Measuring the total carbon emissions doesn't always paint the most accurate picture of a country's contribution, if their population isn't considered.

For example, even though China is the highest emitter of CO₂, the average American is responsible for producing 14.4 tonnes of CO₂ per person, compared to 7.1 tonnes for a Chinese citizen.

Here's a look at the biggest per-capita carbon emitters in the world:

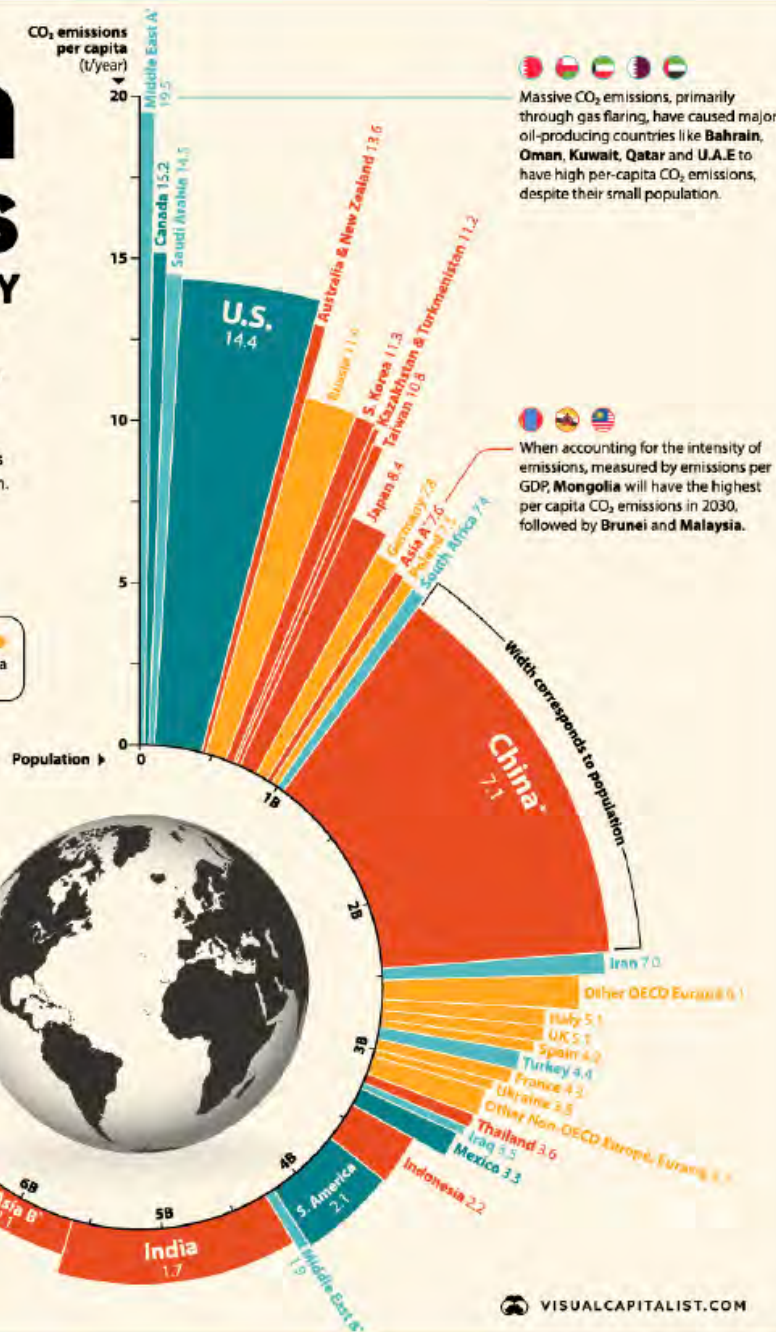


Unequal global distribution of wealth plays a factor in carbon emissions. Developed countries like **Qatar** emit 31t CO₂/yr, while that of developing countries in **Africa** can be as low as 0.7t CO₂/yr.

- *1 Middle East A
Bahrain, Oman, Kuwait, Qatar, United Arab Emirates
- *2 Middle East B
Israel, Jordan, Lebanon, Syria, Yemen
- *3 Asia A
Brunei, Malaysia, Mongolia, Singapore
- *4 Asia B
Asia without Asia A, China, India, Thailand, Taiwan, Indonesia, S. Korea or Japan
- *5 China
China, Hong Kong

The CO₂ emission values are based on estimates of the source chart. There may be negligible difference between the ones provided here and the source data.

SOURCE: AQAL GROUP, IEA (2021)



国別の一人当たりの
二酸化炭素排出量

USA. 14.4 tonnes/person

Japan 8.4

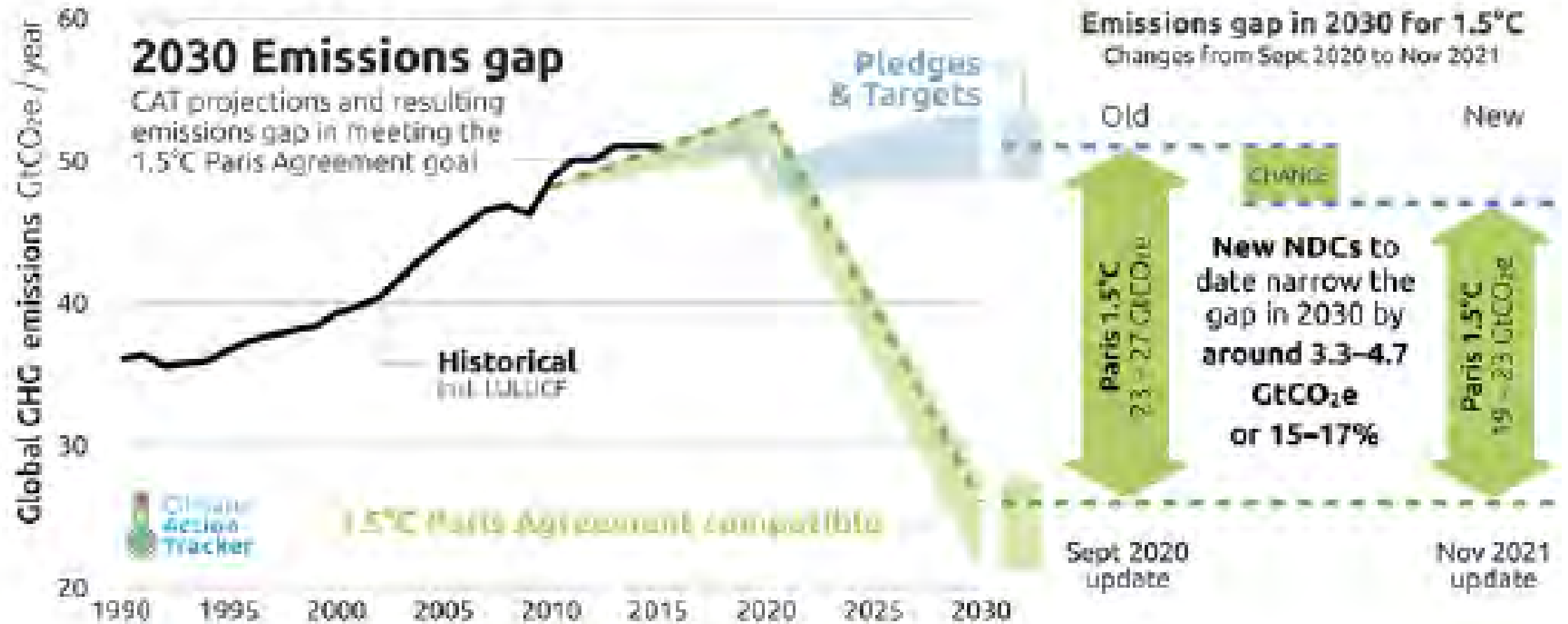
China 7.1

Thailand 3.6

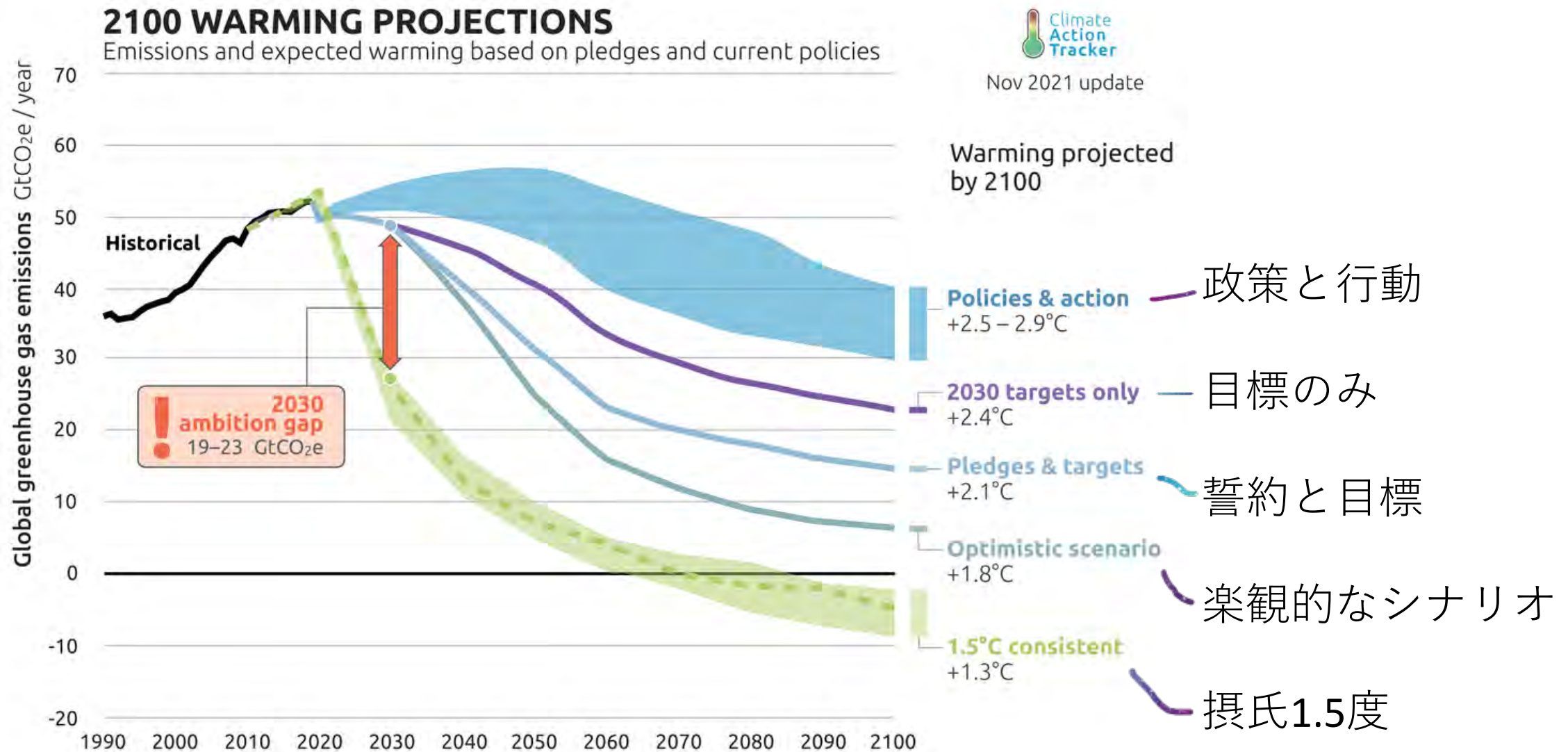
Indonesia 2.2

India 1.7

1.5°Cを達成するための2030年の排出ギャップ。2021年9月のNDCと2021年11月のNDCの比較. (NDC = 国が決定する貢献)

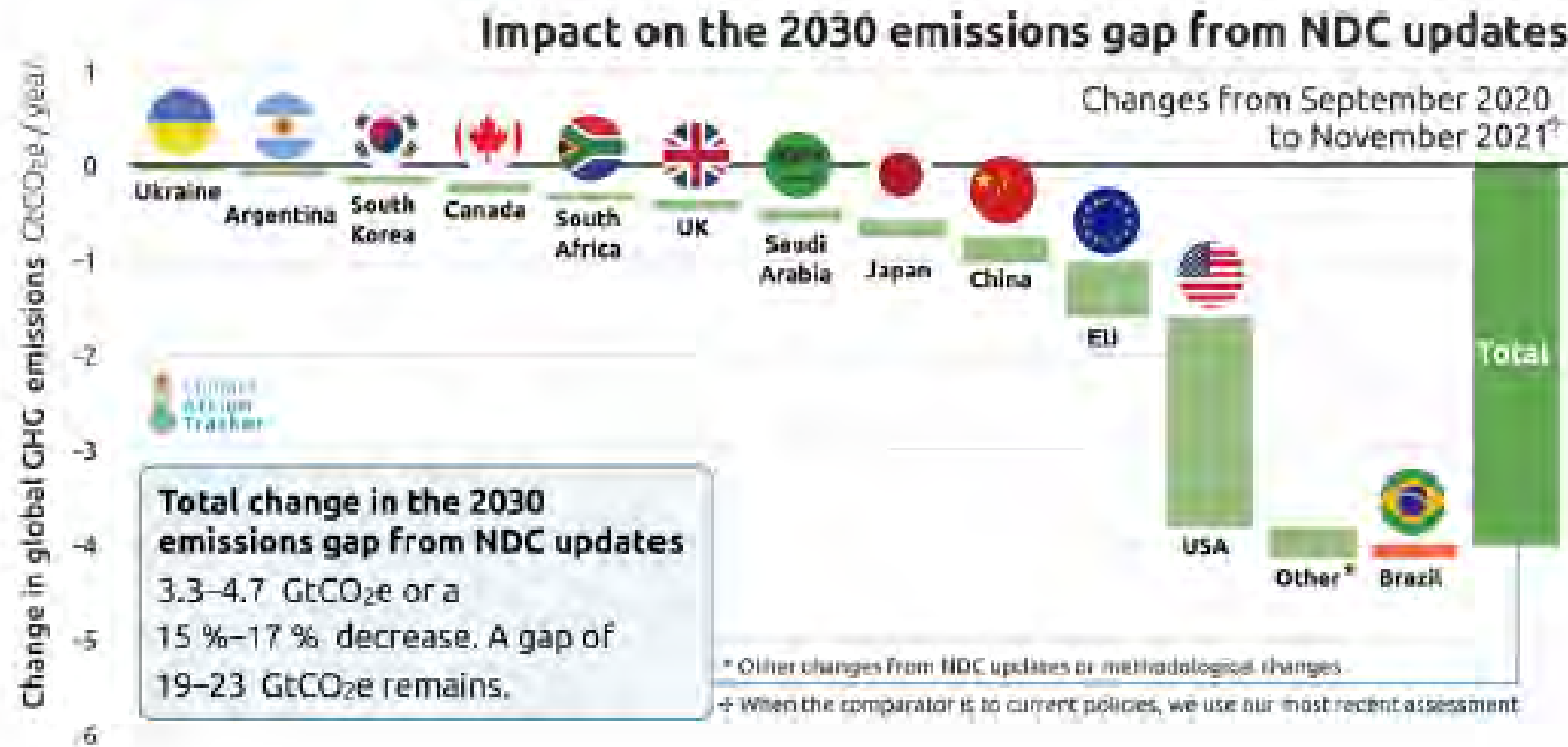


2100の温暖化予測



<https://climateactiontracker.org/global/temperatures/>

国が決定する貢献の更新による2030年の排出ギャップへの影響

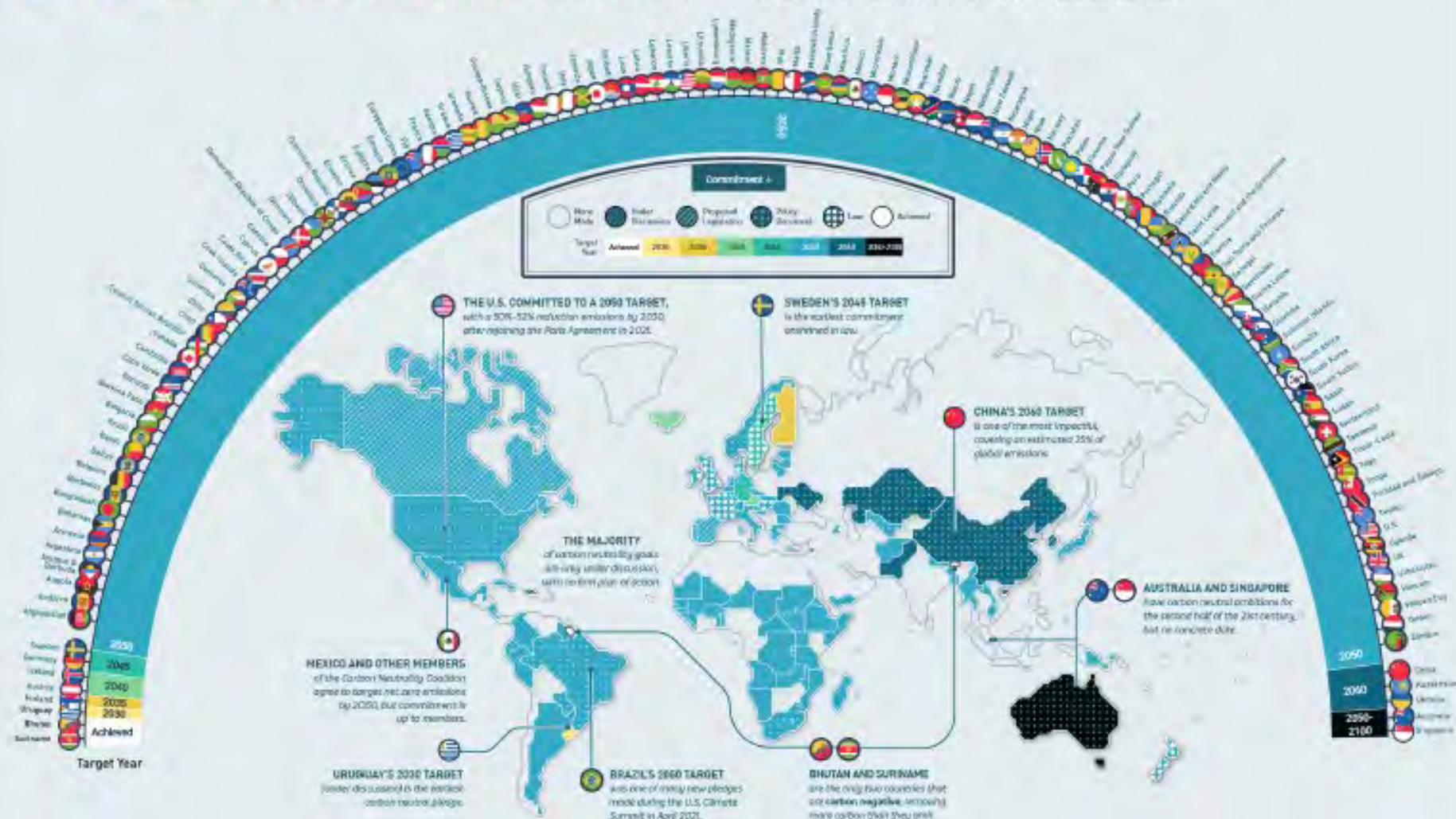




RACE TO NET ZERO

CARBON NEUTRAL GOALS BY COUNTRY

Which countries have made a carbon neutral pledge?
This map breaks down pledges by target year and level of commitment.



motivepower
ideas, implemented



VISUAL
CAPITALIST

SOURCES: Energy and Climate Intelligence Unit, Carbon Briefing, Reuters, Climate Action Tracker

Go back to:
VISUAL
CAPITALIST

NET ZERO EMISSIONS RACE



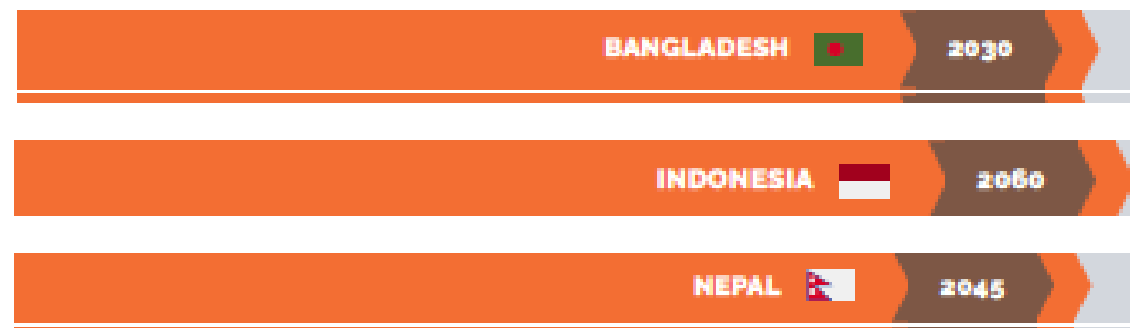
2022 SCORECARD



宣言/誓約

法定上の

ネットゼロへの競争



In discussion/ 議論中

公共政策文書で

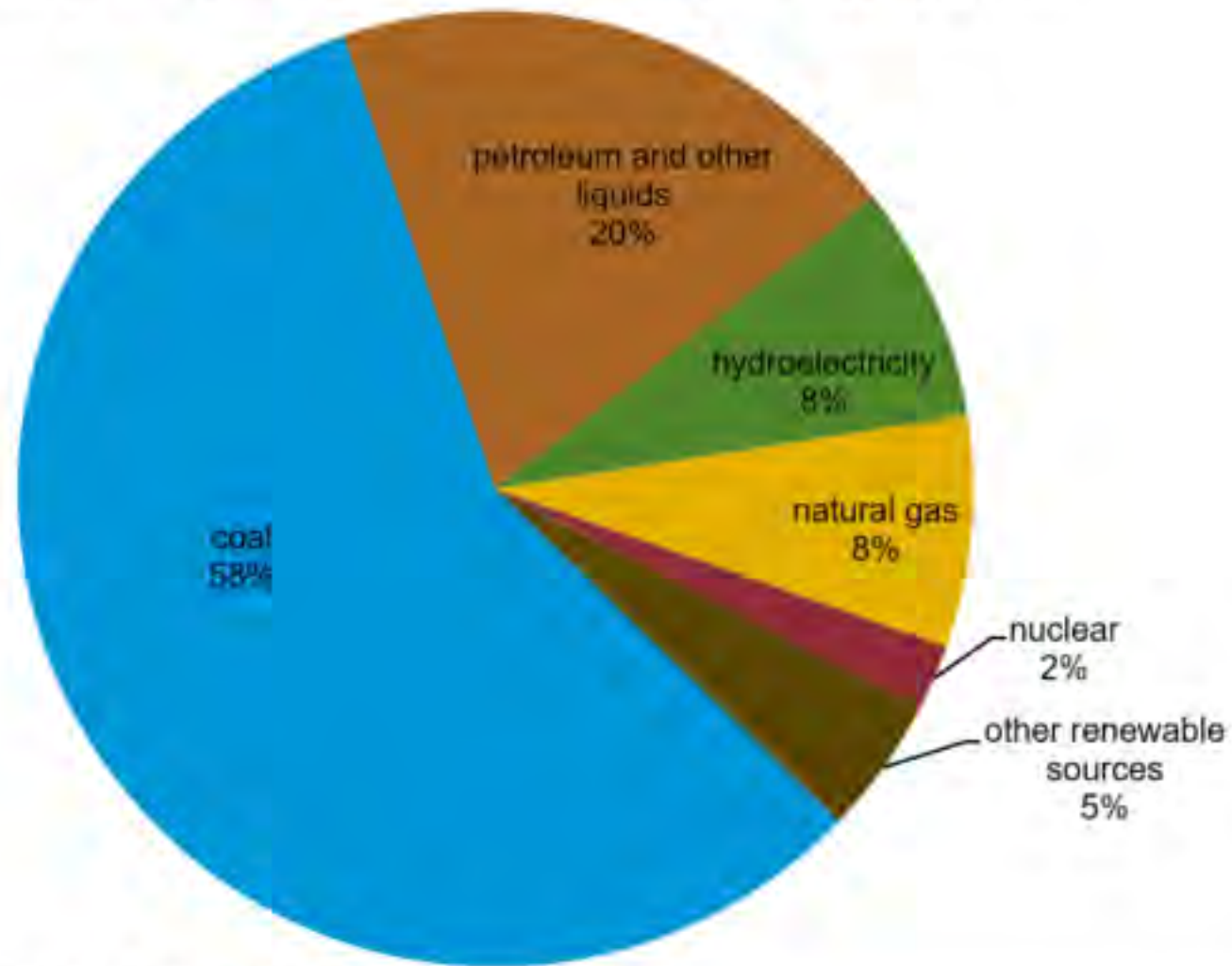
China's revised NDC targets (post-Glasgow):

中国の改訂された国が決定する貢献目標（グラスゴー後）：

- Peak carbon dioxide emissions “before 2030”
 - Lower carbon dioxide emissions per unit of GDP by “over 65%” in 2030 compared to 2005 levels
 - Share of non-fossil fuels in primary energy consumption to “around 25%” in 2030
 - Increase forest stock by around 6 billion cubic metres in 2030 from the 2005 level
 - Raise installed capacity of wind and solar power to at least 1.2 billion kilowatts by 2030.
-
- 「2030年以前」の二酸化炭素排出量のピーク
 - 2005年のレベルと比較して2030年にGDPの単位あたりの二酸化炭素排出量を「65%以上」削減
 - 一次エネルギー消費における非化石燃料の割合は、2030年には「約25%」になります
 - 2005年のレベルから2030年に約60億立方メートルの森林ストックを増やす
 - 風力および太陽光発電の設備容量を2030年までに少なくとも12億キロワットに引き上げます。

Figure 1. China total primary energy consumption by fuel type, 2019

燃料タイプ別の中国
の一次エネルギー
総消費量、2019年



Source: BP Statistical Review of World Energy 2020

Note: Total may not equal 100% because of independent rounding. Includes only commercial fuel sources and does not account for biomass used outside of power generation.

Powering the Belt and Road Initiative

China builds and invests in power plants and grid infrastructure worldwide

planned/under construction completed no. of projects: >1
Project value: > 100 million USD *at least: 350 MW **at least: 200 MW

FOSSIL-FUEL POWER PLANTS* RENEWABLE ENERGY POWER PLANTS** NUCLEAR POWER PLANTS GRID EXTENSION/DISTRIBUTION NETWORK EXPANSION TRANSMISSION LINE (PLANNED/UNDER CONSTRUCTION) TRANSMISSION LINE (COMPLETED) INVESTMENT IN GRID OPERATORS (COMPLETED)



中国が海外での石炭火力発電所の建設をやめることは重要なステップです。次に、国内での石炭依存の削減を開始する必要があります。これには、エネルギー効率の改善、より多くの再生可能エネルギー、水素燃料、CCSなどが必要になります。

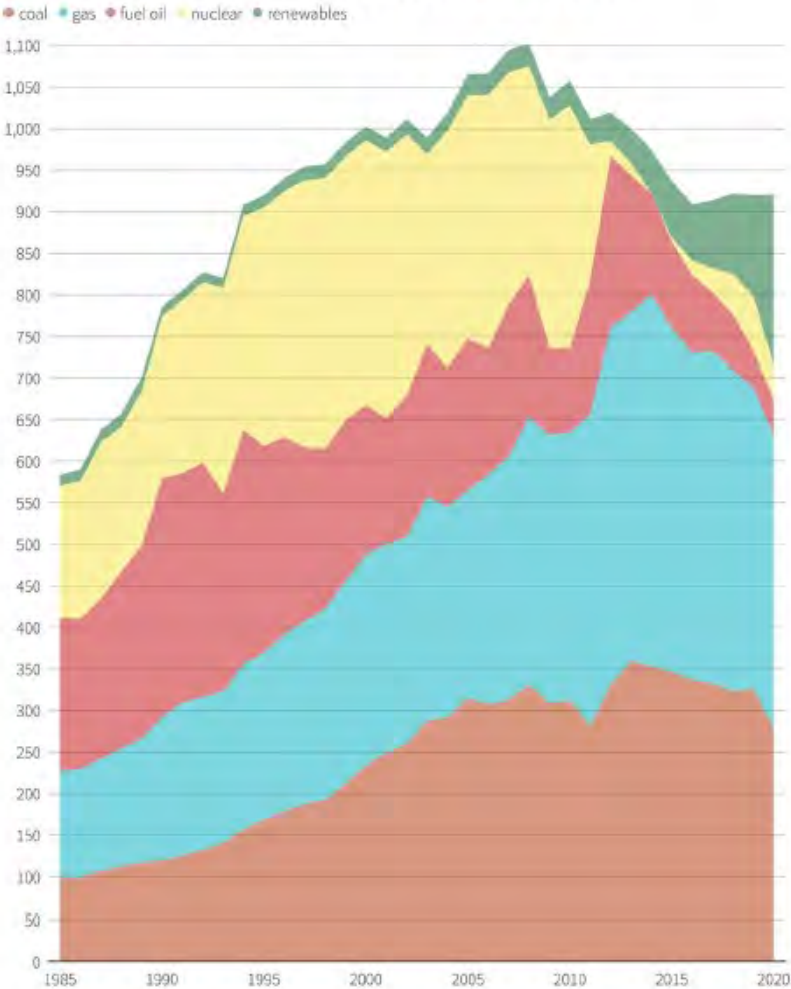
BBC

中国、海外での新たな石炭火力発電プロジェクト停止へ 習主席が国連総会で表明

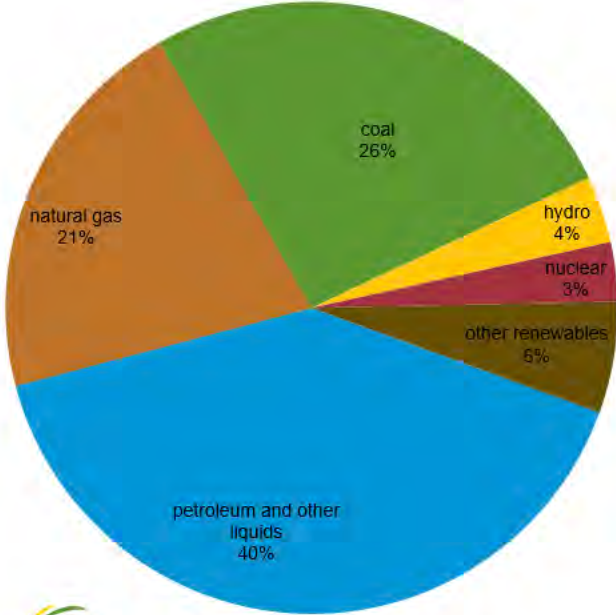
2021年9月22日

Japan's total energy consumption, 2019

Japan's electricity mix by source since 1985



Sources: BP Statistical Review, Renewable Energy Institute of Japan
Reuters Graphics



Source: BP Statistical Review of World Energy 2020



Japan won't sign COP26 statement on ending use of coal-fired plants
THE ASAHI SHIMBUN朝日新聞

November 5, 2021 at 14:59 JST

日本は石炭火力発電所の使用終了に関するCOP26声明に署名しない

気候に有害な補助金の撤廃とアジアの金融の緑化

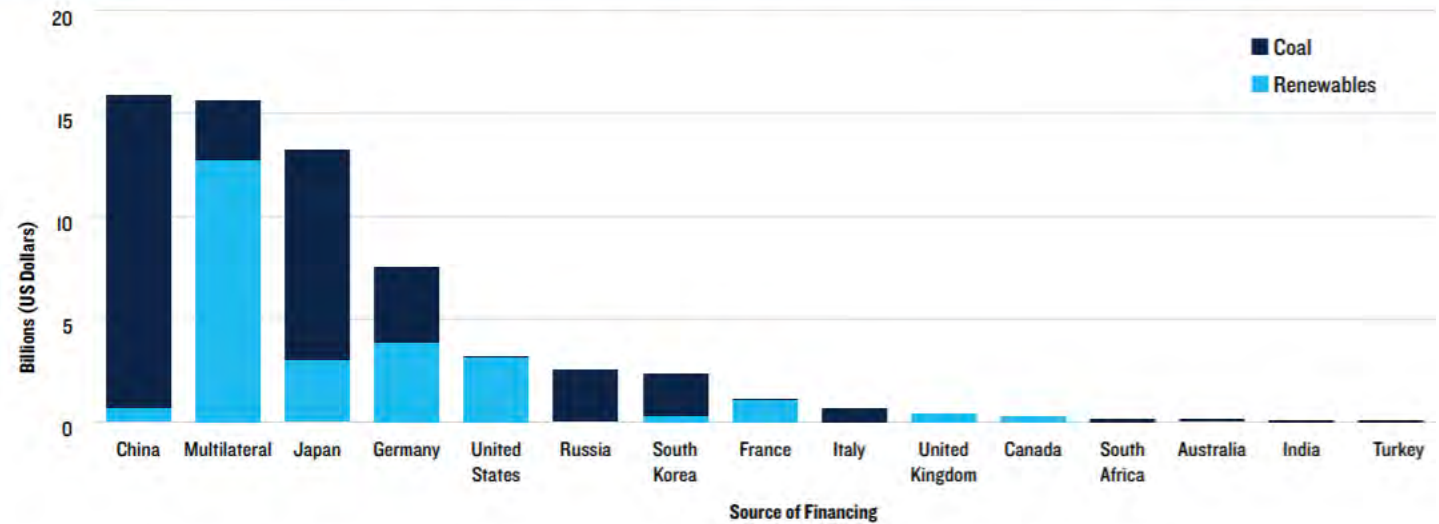


GREEN FINANCING IN ASIA AND THE PACIFIC

Five Approaches to Aligning the Financial System to Sustainable Development



FIGURE ESI: FINANCING BY G20 COUNTRIES FOR COAL AND RENEWABLE ENERGY PROJECTS ABROAD (2013–2016)

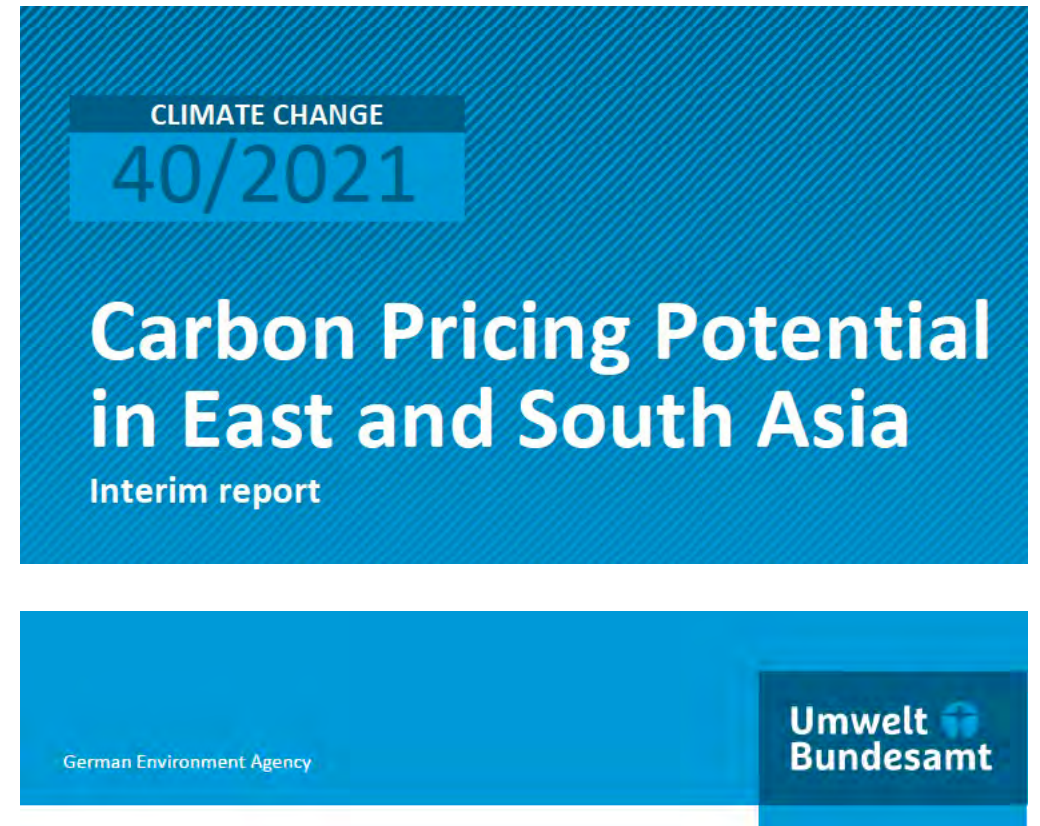


Source: NRDC Consolidated Coal and Renewable Energy Database 2017, based on data from various sources; since some of the public financial institutions involved do not fully disclose energy financing data, these figures could be underestimates; see Methodology section for further details.

Carbon pricing



Ren21. Renewables 2020. Global Status Report.



Renewable energy

年間投資/純容量の追加、
2019

Annual Investment / Net Capacity Additions / Production in 2019

Technologies ordered based on total capacity additions in 2019.

	1	2	3	4	5
Investment in renewable power and fuels capacity (not including hydropower over 50 MW)	China	United States	Japan	India	Chinese Taipei
 Solar PV capacity	China	United States	India	Japan	Vietnam
 Wind power capacity	China	United States	United Kingdom	India	Spain
 Hydropower capacity	Brazil	China	Lao PDR	Bhutan	Tajikistan
 Geothermal power capacity	Turkey	Indonesia	Kenya	Costa Rica	Japan
 Concentrating solar thermal power (CSP) capacity	Israel	China	South Africa	Kuwait	France
 Solar water heating capacity	China	Turkey	India	Brazil	United States
 Ethanol production	United States	Brazil	China	India	Canada
 Biodiesel production	Indonesia	United States	Brazil	Germany	France

Source: Ren21. Renewables 2020. Global Status Report.

Total Renewables Capacity/Generation end of 2019.

Total Capacity or Generation as of End-2019

Countries in **bold** indicate change from 2018.

	1	2	3	4	5
POWER					
Renewable power capacity (including hydropower)	China	United States	Brazil	India	Germany
Renewable power capacity (not including hydropower)	China	United States	Germany	India	Japan
Renewable power capacity <i>per capita</i> (not including hydropower) ¹	Iceland	Denmark	Sweden	Germany	Australia
 Bio-power capacity	China	United States	Brazil	India	Germany
 Geothermal power capacity	United States	Indonesia	Philippines	Turkey	New Zealand
 Hydropower capacity ²	China	Brazil	Canada	United States	Russian Federation
 Hydropower generation ²	China	Brazil	Canada	United States	Russian Federation
 Solar PV capacity	China	United States	Japan	Germany	India
 Concentrating solar thermal power (CSP) capacity	Spain	United States	Morocco	South Africa	China
 Wind power capacity	China	United States	Germany	India	Spain
HEAT					
 Solar water heating collector capacity ³	China	United States	Turkey	Germany	Brazil
 Solar water heating collector capacity <i>per capita</i>	Barbados	Cyprus	Israel	Austria	Greece
 Geothermal heat output ⁴	China	Turkey	Iceland	Japan	New Zealand

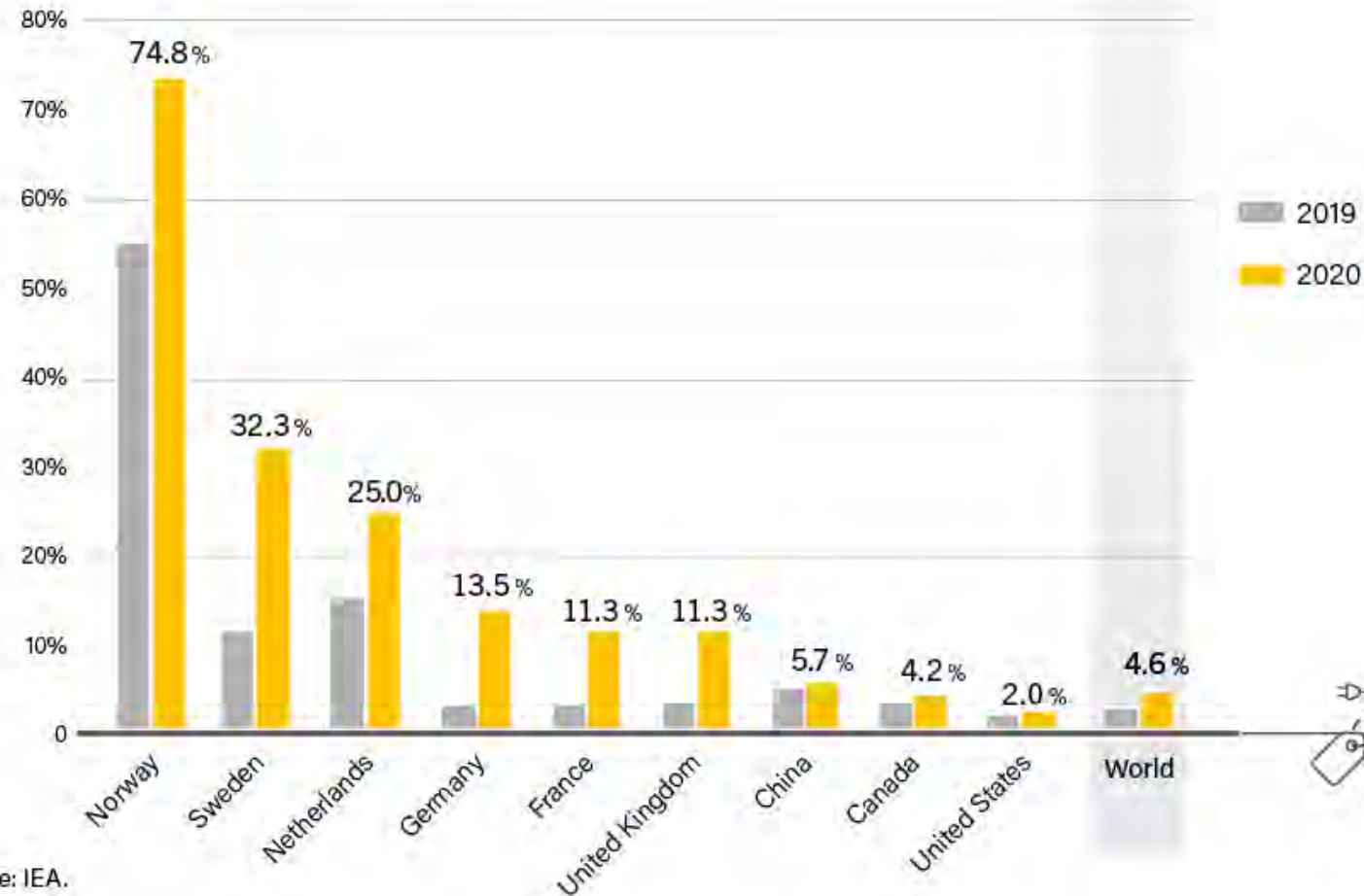
年間売上高における電気自動車の市場シェア



Market Share of Electric Cars in Annual Sales

Top Large Markets and World, 2020

Market Share



Source: IEA.

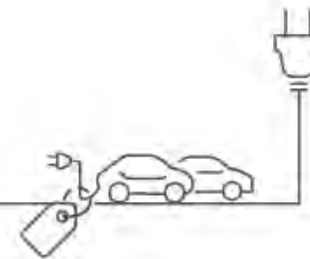
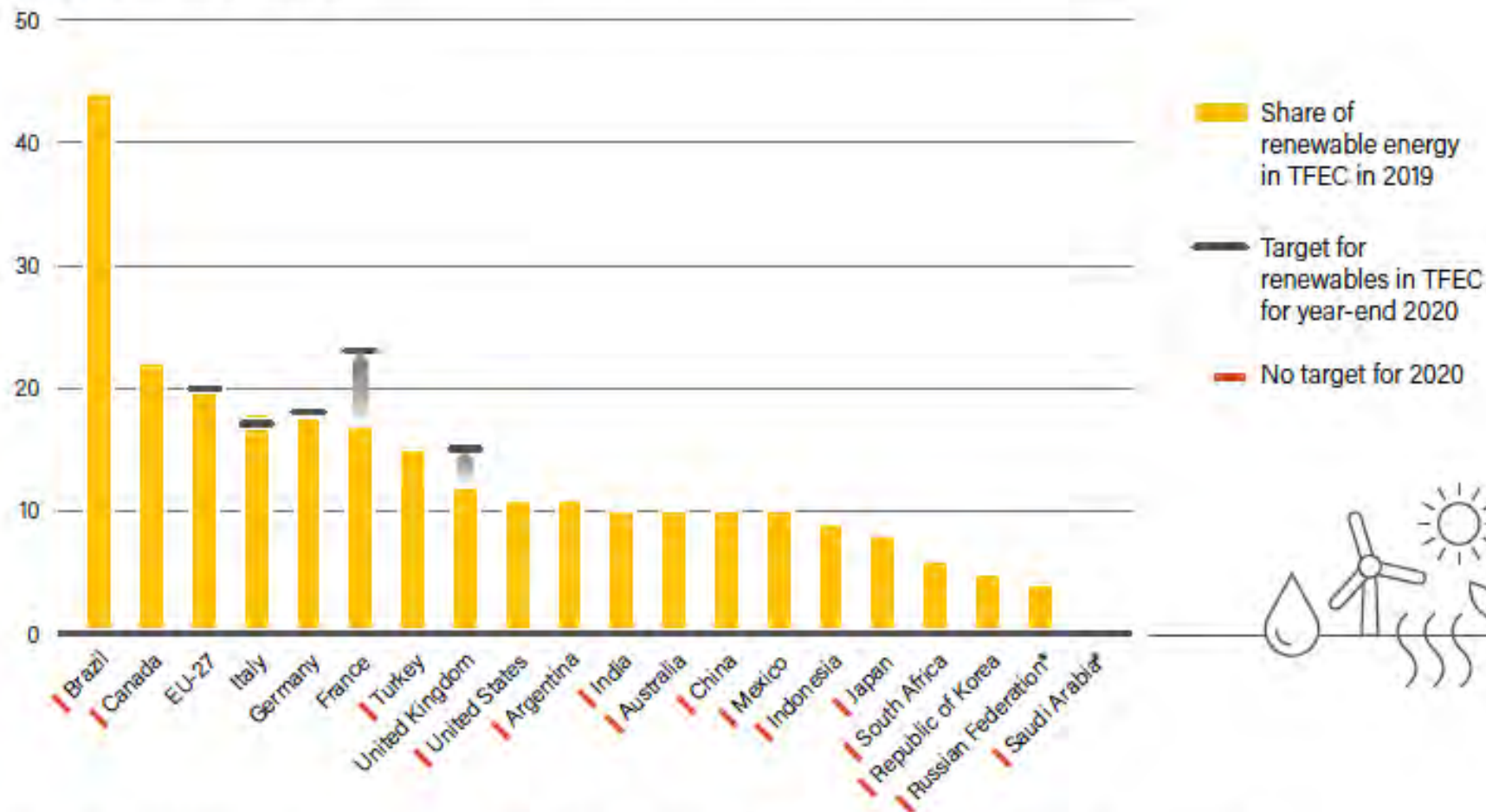




FIGURE 1.
Renewable Energy Shares and Targets, G20 Countries, 2019 and 2020

Share of renewables in TFEC (%)



Note: TFEC = Total final energy consumption. Data for Russian Federation and Saudi Arabia are for 2018 and 2017 respectively.

Source: See endnote 48 for this chapter.

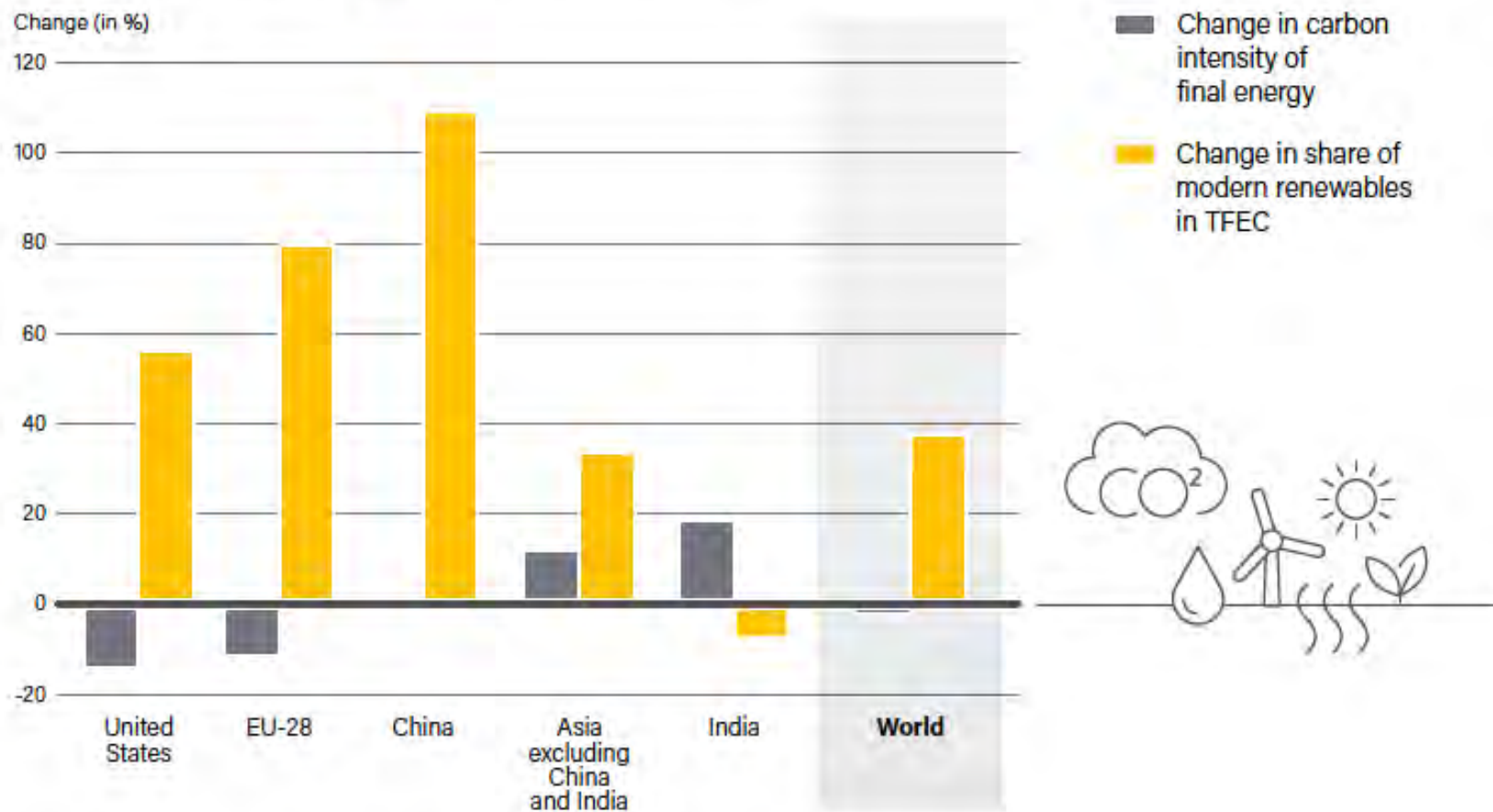
再生可能エ
ネルギーの
シェアと目
標、2019年
と2020年





FIGURE 58.

Change in Carbon Intensity of Final Energy Consumption and Share of Modern Renewables,
Selected Countries, 2008-2018



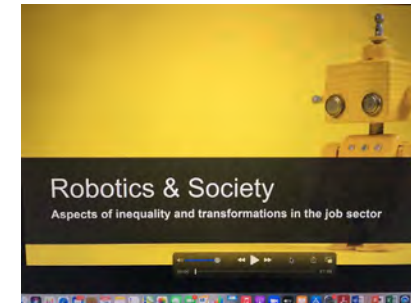
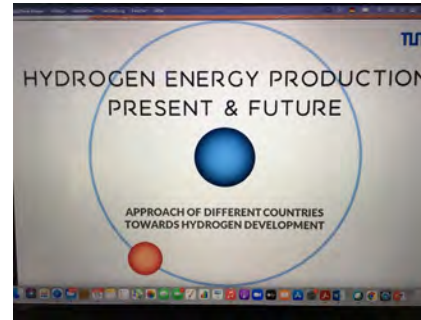
Source: Based on IEA data. See endnote 21 for this chapter.

最終エネルギー消費
量の炭素強度の変化
と現代の再生可能エ
ネルギーのシェア

India/インド

- 2070 net zero target
- Reducing the carbon intensity of the economy to 45% below 2005 level
- Increasing non-fossil capacity in power generation to 500GW.
- Achieving 50% of its energy requirement from renewable energy sources by 2030
- Reducing emissions by 1 billion tonnes by 2030.
- 2070ネットゼロターゲット。
- 経済の炭素強度を2005年の水準より45%低くする。
- 発電の非化石容量を500GWに増やす。
- 2030年までに再生可能エネルギー源からのエネルギー要件の50%を達成する。
- 2030年までに排出量を10億トン削減。

デジタル技術と人工知能で気候政策の目標に貢献する



kein Abseits! e.V.

Gloria Amoruso, Gründerin und Geschäftsleiterin,
nachgefragt



DAAD-Preisträgerin Sena
Yağmur Kütükde.

TUM Student Sustainability Projects During the Pandemic

- Podcast on Green Finance:

<https://www.youtube.com/watch?v=uOK1nwtPwx8>

- 100 Voices One Planet:

<https://www.youtube.com/channel/UCXkTT8TEpHLpzffJK-vFvmg>

