Asia and the Challenge of Net Zero
アジアとネットゼロへの挑戦

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Technical University of Munich
Top CO₂ Emitting Countries, 1750-2020
(from fossil fuels and cement)
Top Annual CO₂ Emitting countries, 2019
(from fossil fuels)

China - 29%
Rest of the world - 21%
United States - 13%
India - 6%
Russia - 5%
Indonesia - 2%
Iran - 2%
South Korea - 2%
Germany - 2%
Japan - 3%
Turkey - 1%
Australia - 1%
Brazil - 1%
Mexico - 1%
South Africa - 1%
Saudia Arabia - 1%
Canada - 2%
United Kingdom - 1%
Italy - 1%
France - 1%
Poland - 1%
Vietnam - 1%

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Data: IEA Atlas of Energy
Annual CO₂ emissions from fossil fuels, by world region

Source: Global Carbon Project

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

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

https://www.visualcapitalist.com/visualizing-global-per-capita-co2-emissions/
1.5℃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

2100 WARMING PROJECTIONS
Emissions and expected warming based on pledges and current policies

政策と行動
目標のみ
誓約と目標
楽観的なシナリオ
摂氏1.5度

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

NET ZERO EMISSIONS RACE

2022 SCORECARD

AUSTRALIA 2050
THAILAND 2050
MALAYSIA 2050
VIETNAM 2050
SOUTH AFRICA 2050
UNITED ARAB EMIRATES 2050
KAZAKHSTAN 2050
ISRAEL 2050
ESTONIA 2050
ANDORRA 2050
RUSSIAN FEDERATION 2060
SAUDI ARABIA 2060
NIGERIA 2060
BAHRAIN 2060
INDIA 2070

GERMANY 2045
SWEDEN 2045
PORTUGAL 2045
JAPAN 2050
FRANCE 2050
UNITED KINGDOM 2050
SOUTH KOREA 2050
CANADA 2050
SPAIN 2050
IRELAND 2050
DENMARK 2050
HUNGARY 2050
NEW ZEALAND 2050
EUROPEAN UNION 2050

宣言/誓約

法定上の
公共政策文書で

In discussion/ 議論中
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

- Coal: 58%
- Petroleum and other liquids: 20%
- Hydroelectricity: 8%
- Natural gas: 8%
- Nuclear: 2%
- Other renewable sources: 5%

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.
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。
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
Carbon pricing

Renewable energy

Annual Investment / Net Capacity Additions / Production in 2019
Technologies ordered based on total capacity additions in 2019.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Investment in renewable power and fuels capacity (not including hydropower over 50 MW)</strong></td>
<td><strong>China</strong></td>
<td><strong>United States</strong></td>
<td><strong>Japan</strong></td>
<td><strong>India</strong></td>
</tr>
<tr>
<td><strong>Solar PV capacity</strong></td>
<td><strong>China</strong></td>
<td><strong>United States</strong></td>
<td><strong>India</strong></td>
<td><strong>Japan</strong></td>
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<tr>
<td><strong>Wind power capacity</strong></td>
<td><strong>China</strong></td>
<td><strong>United States</strong></td>
<td><strong>United Kingdom</strong></td>
<td><strong>India</strong></td>
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<tr>
<td><strong>Hydropower capacity</strong></td>
<td><strong>Brazil</strong></td>
<td><strong>China</strong></td>
<td><strong>Lao PDR</strong></td>
<td><strong>Bhutan</strong></td>
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<tr>
<td><strong>Geothermal power capacity</strong></td>
<td><strong>Turkey</strong></td>
<td><strong>Indonesia</strong></td>
<td><strong>Kenya</strong></td>
<td><strong>Costa Rica</strong></td>
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<tr>
<td><strong>Concentrating solar thermal power (CSP) capacity</strong></td>
<td><strong>Israel</strong></td>
<td><strong>China</strong></td>
<td><strong>South Africa</strong></td>
<td><strong>Kuwait</strong></td>
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<td><strong>Solar water heating capacity</strong></td>
<td><strong>China</strong></td>
<td><strong>Turkey</strong></td>
<td><strong>India</strong></td>
<td><strong>Brazil</strong></td>
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<td><strong>Ethanol production</strong></td>
<td><strong>United States</strong></td>
<td><strong>Brazil</strong></td>
<td><strong>China</strong></td>
<td><strong>India</strong></td>
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<tr>
<td><strong>Biodiesel production</strong></td>
<td><strong>Indonesia</strong></td>
<td><strong>United States</strong></td>
<td><strong>Brazil</strong></td>
<td><strong>Germany</strong></td>
</tr>
</tbody>
</table>

Total Renewables Capacity/Generation end of 2019.

<table>
<thead>
<tr>
<th>Power</th>
<th>1</th>
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<th>4</th>
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<td>China</td>
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<td>Brazil</td>
<td>India</td>
<td>Germany</td>
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<tr>
<td>(including hydropower)</td>
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<tr>
<td>Renewable power capacity</td>
<td>China</td>
<td>United States</td>
<td>Germany</td>
<td>India</td>
<td>Japan</td>
</tr>
<tr>
<td>(not including hydropower)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renewable power capacity per</td>
<td>Iceland</td>
<td>Denmark</td>
<td>Sweden</td>
<td>Germany</td>
<td>Australia</td>
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<tr>
<td>capita (not including hydropower)</td>
<td></td>
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<td>Bio-power capacity</td>
<td>China</td>
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<td>Germany</td>
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<td>Philippines</td>
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<td>Canada</td>
<td>United States</td>
<td>Russian Federation</td>
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<tr>
<td>Hydropower generation</td>
<td>China</td>
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<td>Canada</td>
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<td>Russian Federation</td>
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<td>China</td>
<td>United States</td>
<td>Japan</td>
<td>Germany</td>
<td>India</td>
</tr>
<tr>
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<td>United States</td>
<td>Morocco</td>
<td>South Africa</td>
<td>China</td>
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<tr>
<td>power (CSP) capacity</td>
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<td></td>
</tr>
<tr>
<td>Wind power capacity</td>
<td>China</td>
<td>United States</td>
<td>Germany</td>
<td>India</td>
<td>Spain</td>
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<table>
<thead>
<tr>
<th>Heat</th>
<th>1</th>
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<th>3</th>
<th>4</th>
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</tr>
</thead>
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<tr>
<td>Solar water heating collector</td>
<td>China</td>
<td>United States</td>
<td>Turkey</td>
<td>Germany</td>
<td>Brazil</td>
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<tr>
<td>capacity</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Solar water heating collector</td>
<td>Barbados</td>
<td>Cyprus</td>
<td>Israel</td>
<td>Austria</td>
<td>Greece</td>
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<td>Geothermal heat output</td>
<td>China</td>
<td>Turkey</td>
<td>Iceland</td>
<td>Japan</td>
<td>New Zealand</td>
</tr>
</tbody>
</table>

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

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.

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