

EARTH INDEX 2023

TRACKING THE G20 RESPONSE
TO THE CLIMATE EMERGENCY





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THE CORPORATE KNIGHTS EARTH INDEX AND THE "SAY-DO" GAP

Member nations of the G20 are responsible for 75% of global greenhouse gas emissions; all but one have pledged to reduce net emissions to zero (the majority by 2050), and many have committed emission-reduction targets by 2030.⁽¹⁾ If all these pledges and targets were fulfilled, total greenhouse gas emissions in the G20 would decline to about 25 gigatonnes of carbon dioxide equivalent (Gt CO₂e) by 2030 from their 2021 level of 38.4 Gt CO₂e, and the world would have a good chance (66%) of keeping the global average temperature increase to 2°C.⁽²⁾

These stated commitments are compared with actual emissions from the G20 over the 2016 to 2021 period in Figure 1. That comparison reveals the crisis that has been generated by the failure of the G20 to align what they have said they will do and what they are actually doing. The world is currently on a pathway to a global average temperature increase of 2.8°C, with all the accelerated extreme weather, economic disruption, human suffering, and political instability that come with such dangerous disruption of the biosphere. Time is rapidly running out to close this "say-do" gap and step back from the brink.

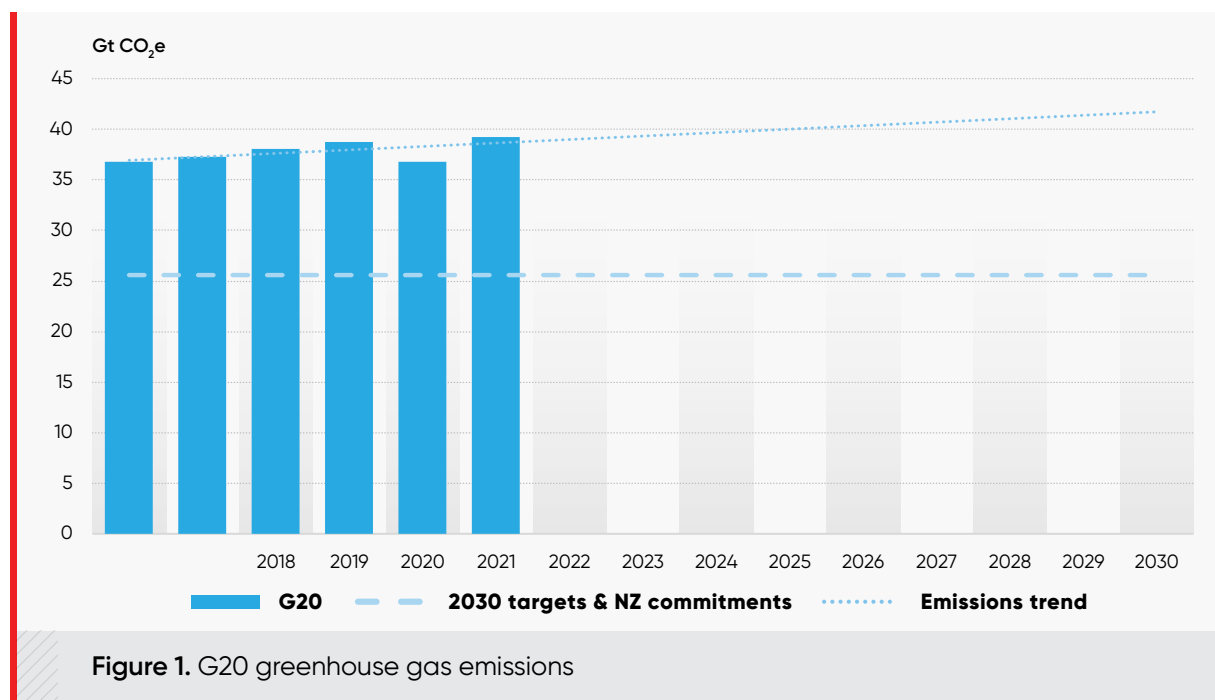


Figure 1. G20 greenhouse gas emissions

(1) Greenhouse gas emissions in this report are tabulated and analyzed exclusive of LUCAF (land-use change and forestry) impacts. Mexico is the one G20 nation that has yet to commit to a net zero target. Most G20 pledges are for the year 2050, except Germany (2045), Turkey (2053), China, Indonesia, Saudi Arabia, and the Russian Federation (all 2060), and India (2070).

(2) For a review of global greenhouse gas emissions, G20 pledges, and how they compare with what would be required to contain global warming to 2°C or 1.5°C, see United Nations Environment Programme, *Emissions Gap Report 2022: The Closing Window*, Nairobi, October 2022. www.unep.org/emissions-gap-report-2022.

Corporate Knights introduced the Earth Index in 2022 to compare actual reductions (or increases) in emissions in each of the G20 countries in 2019 with the annual rate of reduction required for countries to be on track to meet their net-zero pledges and 2030 emission targets. It showed that emissions declined in the high-income G20 countries but only at 44% of the rate needed to be on track for meeting emission targets in 2030. In the middle-income countries, including China and India, emissions continued to grow by almost as much as they would need to decline to be on track for hitting the declared targets.⁽³⁾

Then in 2020, the global pandemic disrupted patterns of fossil fuel production and consumption, the major source of greenhouse gas emissions. During the early weeks of the pandemic in 2020, fossil fuel combustion and related greenhouse gas emissions declined due to reduced travel, lower industrial activity, and shuttered businesses. Emissions may have dropped 25% by mid-April when they began to rebound,⁽⁴⁾ and as early as May, analysts were (correctly) predicting that the global annual reduction in emissions in 2020 would be in the range of 4% to 7.5%⁽⁵⁾ and that emissions would continue to rebound in 2021 unless there was a concerted effort to direct economic recovery investments toward low-carbon technologies and infrastructure.⁽⁶⁾⁽⁷⁾ In the event, only a small fraction of the G20 economic stimulus and pandemic recovery investment was directed to climate mitigation activity.⁽⁸⁾

The “pandemic dip” in greenhouse gas emissions in 2020 was deeper than any annual decline since the Second World War, but it was short-lived and of little consequence to the continuing buildup of greenhouse gases in the atmosphere. Even if it was repeated every year for the rest of the 2020s, it would not contain global warming; such is the magnitude of the challenge facing mankind. The challenge can still be met, but it will require closing the “say-do” gap between what we know and say needs to be done and the effort we have so far been able to muster. Meanwhile, the pre-pandemic pattern has returned, with emissions in the high-income countries declining but not by enough to hit the 2030 targets, and emissions in the middle-income countries continuing to grow. (See Figures 2 and 3.)

(3) The terms “high-income” and “middle-income” refer to the World Bank Atlas method, which classifies middle-income countries as those with gross national income (GNI) per capita between US\$1,046 and \$12,695 and high-income economies as those with GNI per capita of US\$12,696 or more. Regarding the G20 member states, the high-income group includes the United States, Canada, the United Kingdom, Japan, Australia, South Korea, and Saudi Arabia, in addition to Germany, France, Italy, and the EU. (Romania and Bulgaria are in the middle-income group as individual countries but are included here as part of the EU, in the high-income category.) The middle-income G20 members include Brazil, Russia, China, South Africa, Argentina, Mexico, Turkey, India, and Indonesia.

(4) Forster, P. M. et. al. “Current and future global climate impacts resulting from COVID-19,” *Nature Climate Change*, 10, 913–919 (August 2020). [nature.com/articles/s41558-020-0883-0](https://www.nature.com/articles/s41558-020-0883-0).

(5) Le Quéré, C. et. al. “Temporary reduction in daily global CO₂ emissions during the COVID-19 forced confinement,” *Nature Climate Change*, 10, 647–653 (May 2020). [nature.com/articles/s41558-020-0797-x](https://www.nature.com/articles/s41558-020-0797-x).

(6) OECD. “COVID-19 and the low-carbon transition: Impacts and possible policy responses,” June 26, 2020. [oecd.org/coronavirus/policy-responses/covid-19-and-the-low-carbon-transition-impacts-and-possible-policy-responses-749738fc/](https://www.oecd.org/coronavirus/policy-responses/covid-19-and-the-low-carbon-transition-impacts-and-possible-policy-responses-749738fc/).

(7) Jones, C. “How did COVID-19 lockdowns affect the climate?” Met Office, May 2021. [metoffice.gov.uk/research/news/2021/how-did-covid-19-lockdowns-affect-the-climate](https://www.metoffice.gov.uk/research/news/2021/how-did-covid-19-lockdowns-affect-the-climate)

(8) Nahm, J. M., Miller, S. M., & Urpelainen, J. “G20’s US\$14-trillion economic stimulus reneges on emissions pledges,” *Nature Climate Change*, March 2022. [nature.com/articles/d41586-022-00540-6](https://www.nature.com/articles/d41586-022-00540-6).

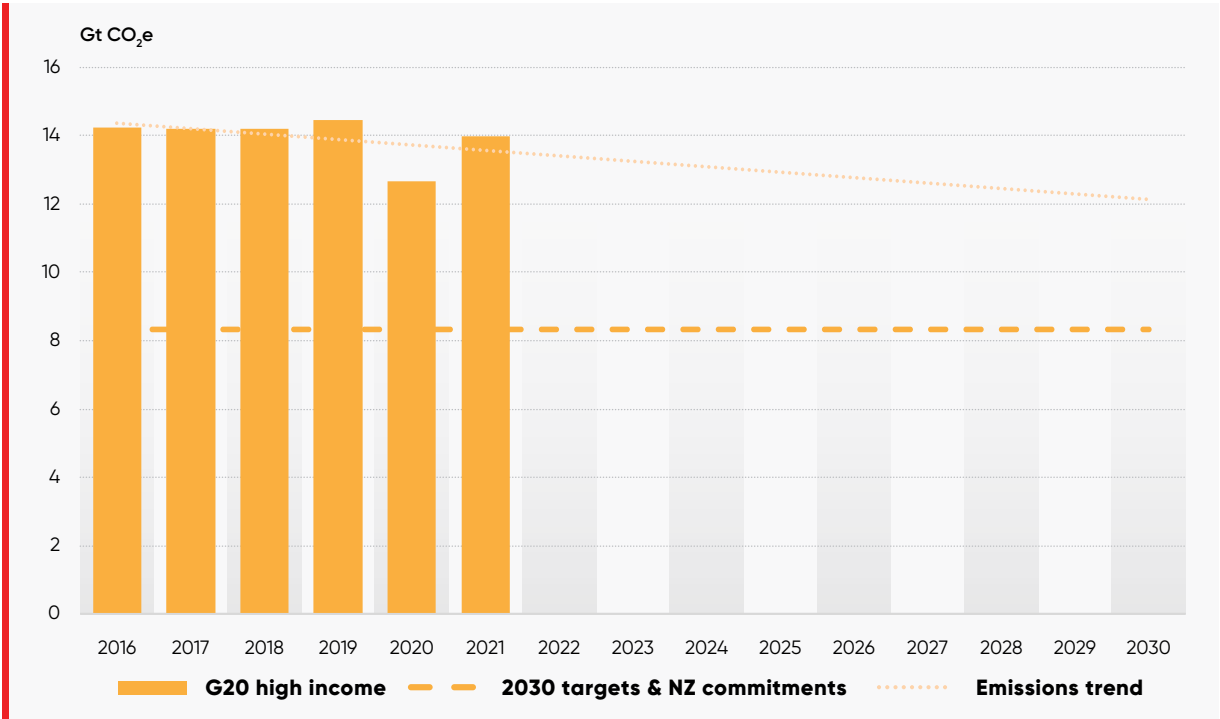


Figure 2. G20 high income countries greenhouse gas emissions

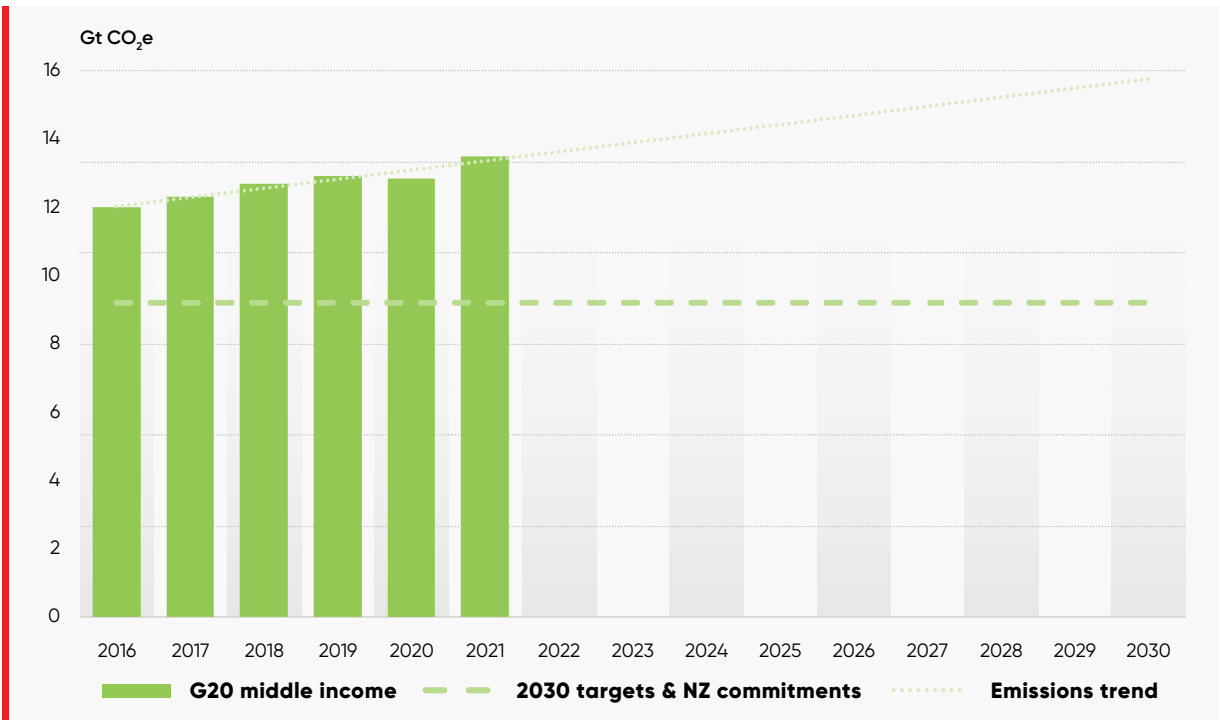


Figure 3. G20 middle income countries greenhouse gas emissions



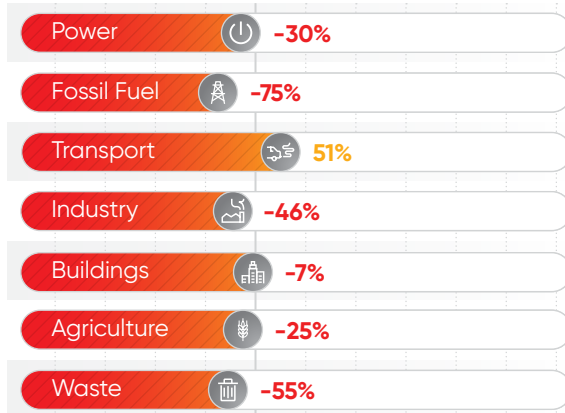
THE EARTH INDEX



-23%
Earth Index

Emissions in Mt CO₂e

Stated emission target	Varies
Emissions in Reference Years	34 118
Emissions in 2019	38 684
Emissions in 2021	39 251
Percent emission reductions achieved by 2021	-15.0%
Target emissions in 2030	25 581
Annual reduction needed to meet target from 2019	1 223
Emission reduction (increase) from 2019 to 2021	(567)
5 year emission reduction (increase), 2016-2021	(2 525)
Earth Index based on 2016-2021 trend	-63%



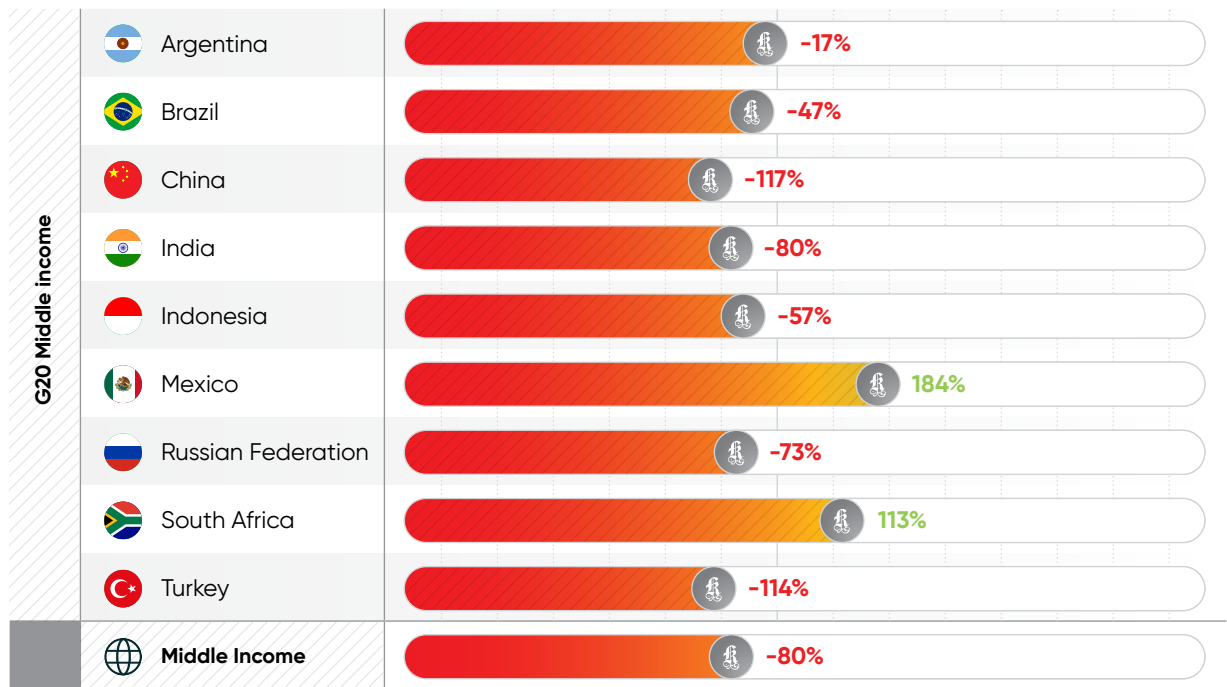
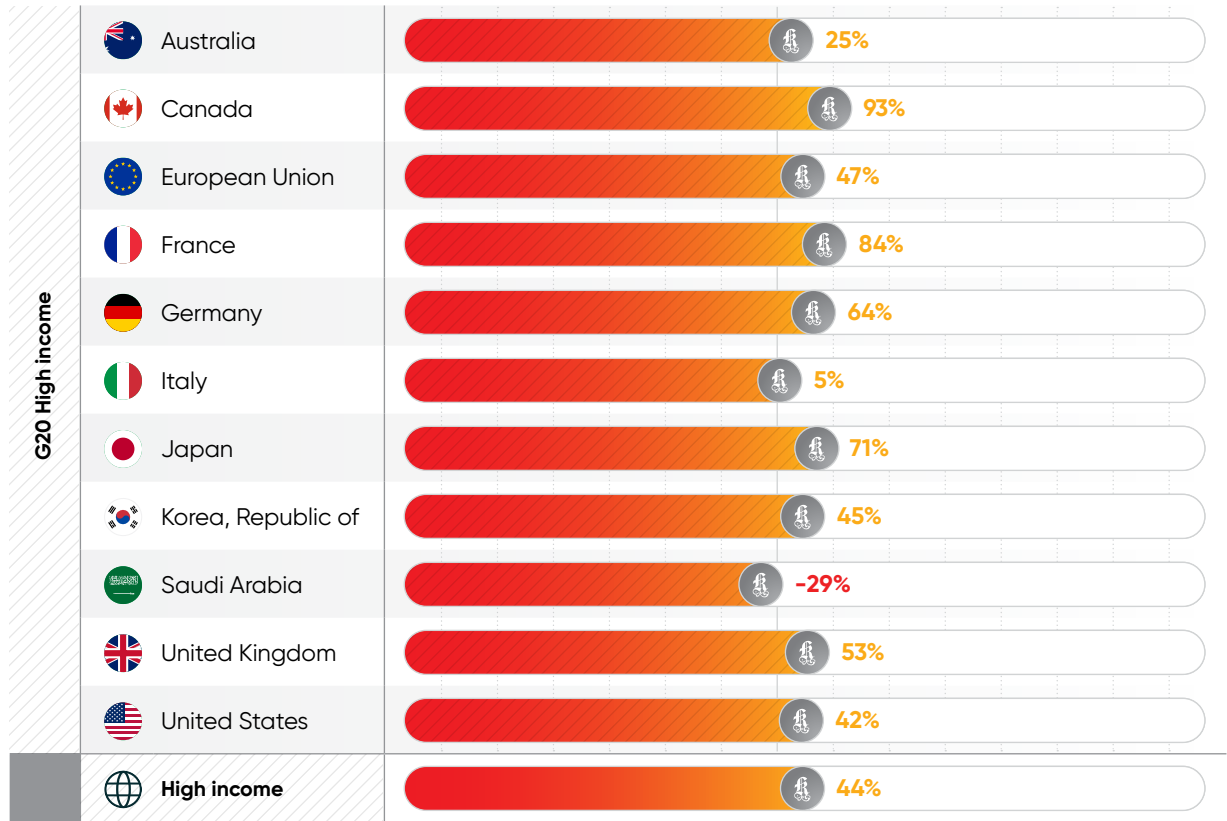
Emissions in Reference Years	10 188	3 057	4 792	7 704	2 840	4 194	1 343
Emissions in 2019	11 866	3 785	5 716	8 945	2 813	4 076	1 485
Emissions in 2021	12 076	3 968	5 510	9 185	2 825	4 150	1 537
Target emissions in 2030	8 075	2 484	3 538	6 098	1 802	2 612	973
Annual reduction needed to meet target from 2019	348	122	202	262	95	146	48
Actual emission reduction (increase) from 2019-2021	(105)	(92)	103	(120)	(6)	(37)	(26)

The Corporate Knights Earth Index compares the observed annual reduction in greenhouse gas emissions with the reduction required to stay on a linear pathway that aligns with the 2030 target or net-zero pledge. It is a deliberately simple indicator based on empirical observation and does not rely on modelling of future emissions. A description of the method is provided in Annex B. The Earth Index is normally calibrated annually, but the pandemic-induced “dip” in emissions in 2020 renders the annual emissions data for that year unsuitable for long-term analysis. For this reason, in this update the Earth Index scores capture the change in emissions over the two-year period 2020-2021. The Earth Index is calculated for each of the G20 members and includes separate sector scores for emissions from power, fossil fuel production, transport, industry, buildings, agriculture, and waste.

Over the 2019 to 2021 period, total emissions in the G20 increased by an amount equal to 23% of the amount they would have needed to decrease to be on track for meeting the consolidated 2030 target of the G20 members.

Table 2 lists the Earth Index scores for each of the G20 members, as well as the combined scores for the high-income and middle-income countries. Emissions in the high-income countries declined but only by 44% of what would have been required to align with the 2030 target pathway. In the middle-income countries, emissions grew 80% of the amount they would have needed to decrease to be aligned with the countries’ net-zero pledges. A complete set of Earth Index scorecards are included in Annex C, including sector breakdowns. Note that because Earth Index scores measure emissions performance relative to stated commitments, countries such as Mexico that have weak targets will have higher scores, all else being equal.

Table 2. 2021 Earth Index Scores





TRENDS AND OBSERVATIONS

Earth Index scores by sector are summarized in Table 4 and reveal both the continuation of the pre-pandemic trends and some lasting, sector-specific impacts from the pandemic.

- G20 greenhouse gas emissions were higher in 2021 than they were in 2019, resulting in a negative Earth Index score (-23%) and increasing the emission reduction rate needed for the rest of the decade to put the countries on track for hitting their targets. In the high-income countries emissions did decline, but only by half as much as needed to be on track for hitting their 2030 targets, and in the middle-income countries' emissions were up by about as much as they would have needed to decline to be on track for meeting stated targets.
- The difference between the high-income and middle-income countries is widespread across all sectors, with the high-income countries scoring consistently higher than the middle-income countries. Given that the 2030 emission-reduction targets are themselves generally more ambitious for the high-income countries than for the middle-income countries, the difference in the Earth Index scores understates the difference in both the magnitude and momentum of greenhouse gas emission reductions in the two country groups.
- Some high-income countries performed relatively well, with Canada achieving emissions reductions that were more than 90% of the levels needed to reach their targets (assuming they can maintain that pace for the rest of the decade). Countries with relatively ambitious targets for 2030 may have 2021 Earth Index scores that are close to 100%, but whether this can be maintained in the short term will depend on the successful acceleration of renewable electricity, electric vehicles, and decarbonization in industry and agriculture.
- For the G20 as a whole, the transport sector is the only sector where emissions were lower in 2021 than in 2019. The impact of the pandemic was greatest in this sector, especially in the high-income countries where the drop in both domestic air travel and personal vehicle travel resulted in the largest drops in emissions. The pandemic may have triggered permanent, systemic changes in personal mobility patterns, at least in the high-income countries (Figure 4 where the Earth Index score reached 66%).

Table 4. Sector trends by country group

	G20	G7	High income	Middle income	EU	BRICS	Legend
Power	-30% ↑	48% →	61% →	-94% ↑	112% ↓	-113% ↑	↓ Emission reductions on pace that would exceed the 2030 target
Fossil Fuel	-75% ↑	50% →	37% →	-159% ↑	81% →	-106% ↑	→ Emission reductions but at a pace that is insufficient to meet the 2030 target
Industry	-46% ↑	43% →	23% →	-88% ↑	-9% ↑	-97% ↑	↑ Emissions increasing, not on track to meet 2030 targets
Transport	51% →	64% →	66% →	19% →	86% →	-28% ↑	
Buildings	-7% ↑	61% →	44% →	-94% ↑	-4% ↑	-114% ↑	
Agriculture	-25% ↑	39% →	13% →	-46% ↑	-4% ↑	-57% ↑	
Waste	-55% ↑	-32% ↑	-33% ↑	-65% ↑	40% →	-68% ↑	
Total	-23% ↑	50% →	44% →	-80% ↑	47% →	-92% ↑	

- The next-highest sector score is for the fossil fuel industry, and this result is closely tied to the drop in transportation fuel consumption in aviation, shipping, and road transportation. The prospect of a permanent impact of the pandemic in this sector, on the level and pattern of global fossil fuel production and trade, has been overshadowed by the impact of the war in Ukraine through 2022, but there may yet be a permanent impact of the pandemic-induced changes in mobility (Figures 5 and 6).
- Power sector emissions decreased in the high-income countries and increased in the middle-income countries. In 2021, coal emissions stood at an all-time high in the power sector due to the record high price of natural gas. Of the global increased emissions in the power sector, almost all is accounted for by coal use in China. Oil demands remained below pre-pandemic levels, signalling long-term reduced global demand in oil for use outside the transport sector.
- Emissions from waste management and agricultural processes had the lowest Earth Index scores in the high-income countries. The pandemic appeared to have little impact on emissions from these sectors, and government mitigation policies have not yet been very effective in these sectors. It is particularly urgent to improve performance in these two sectors because they are large emitters of methane, and methane reductions are essential to easing the pressure on the climate in the next critical decade.

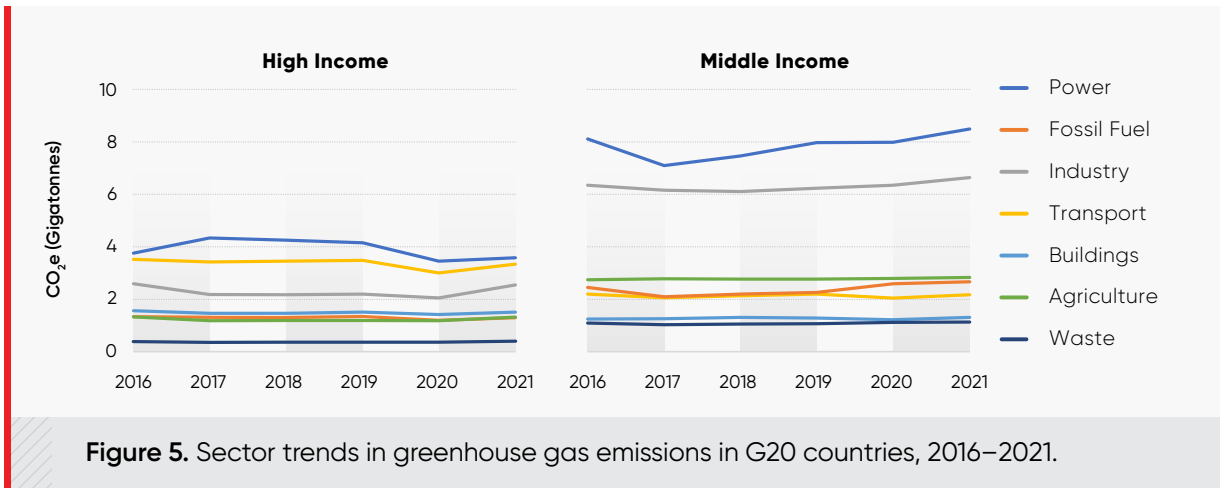


Figure 5. Sector trends in greenhouse gas emissions in G20 countries, 2016–2021.

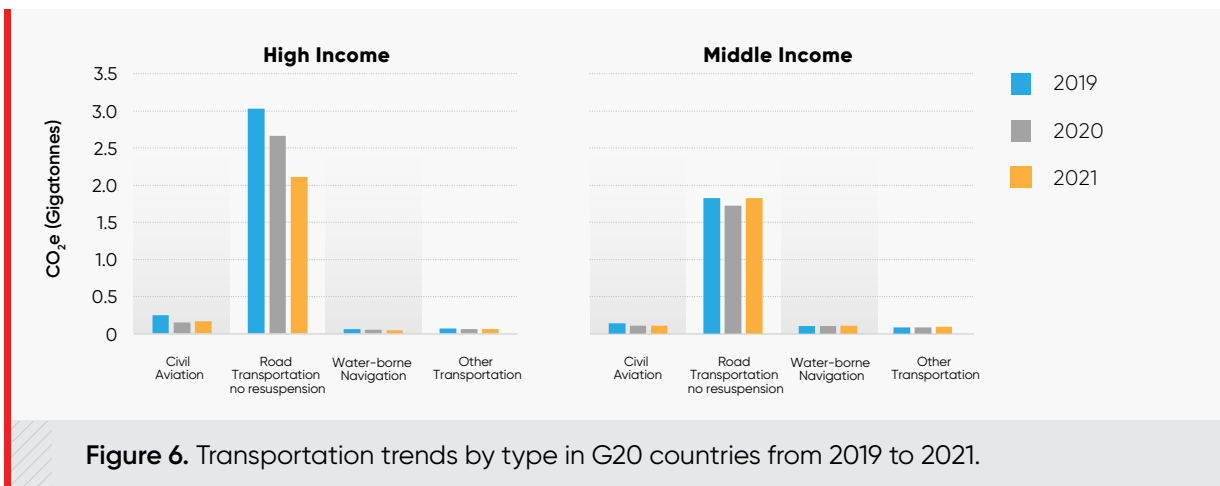
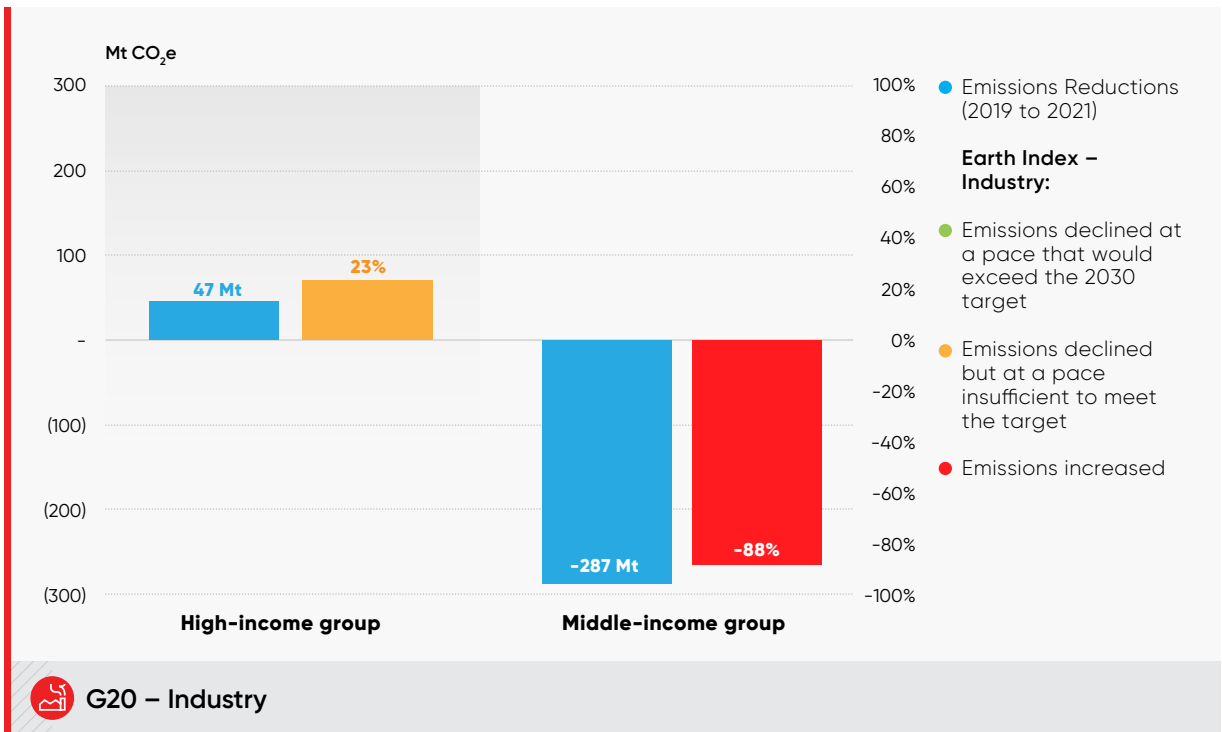
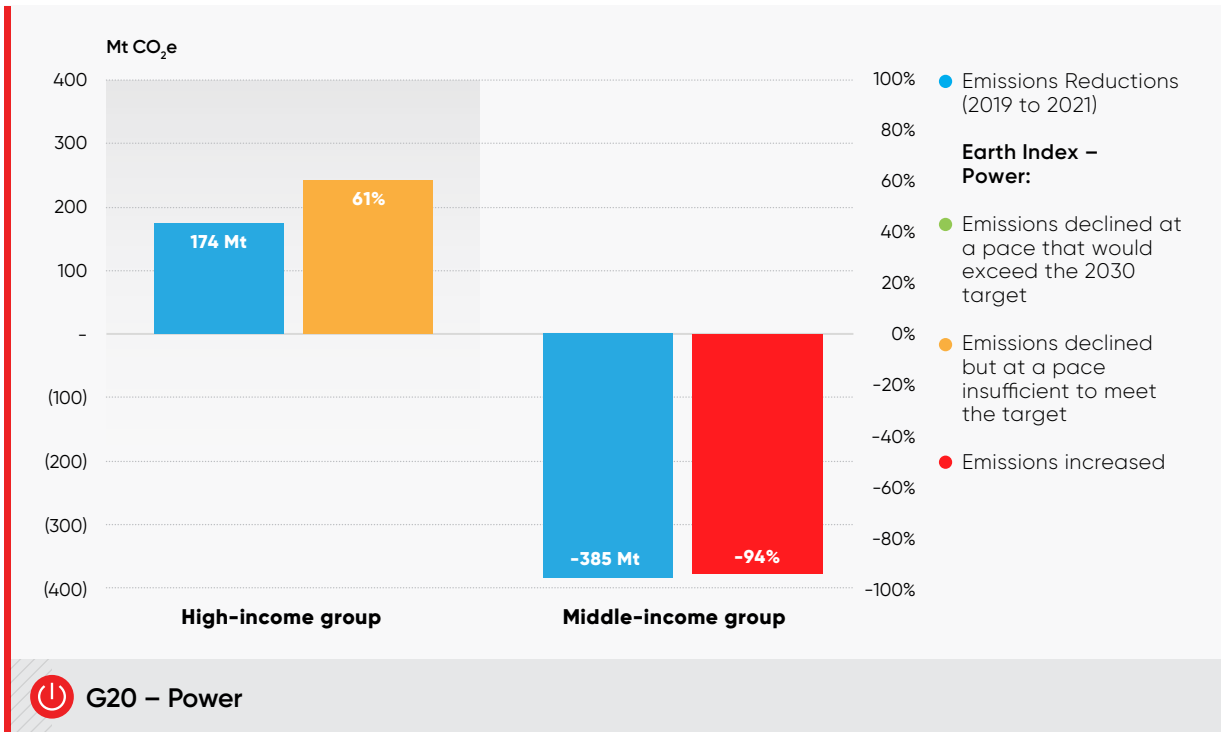
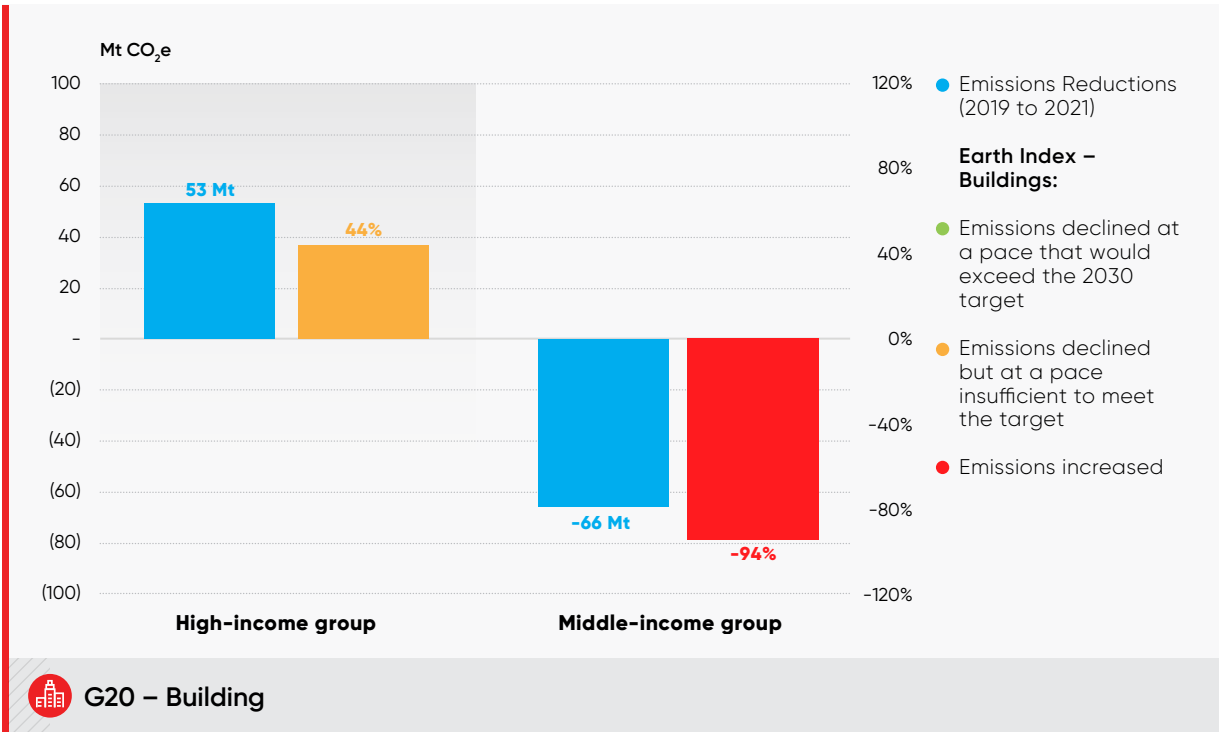
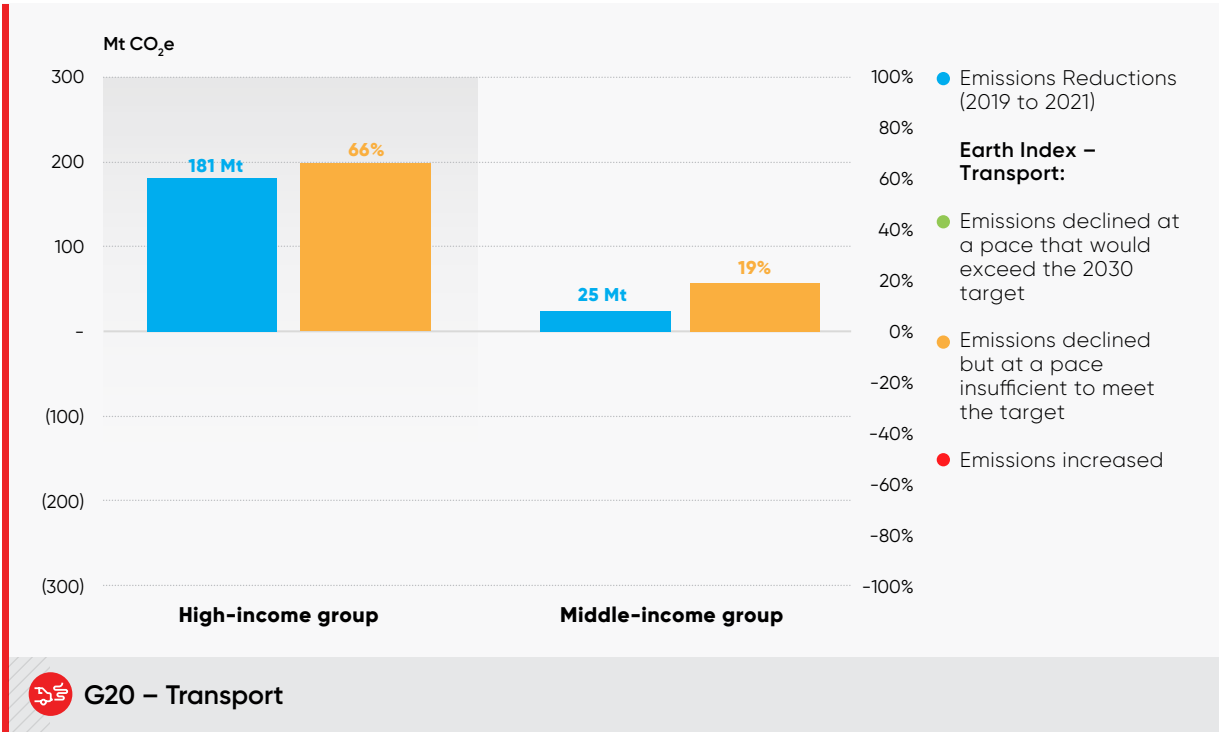


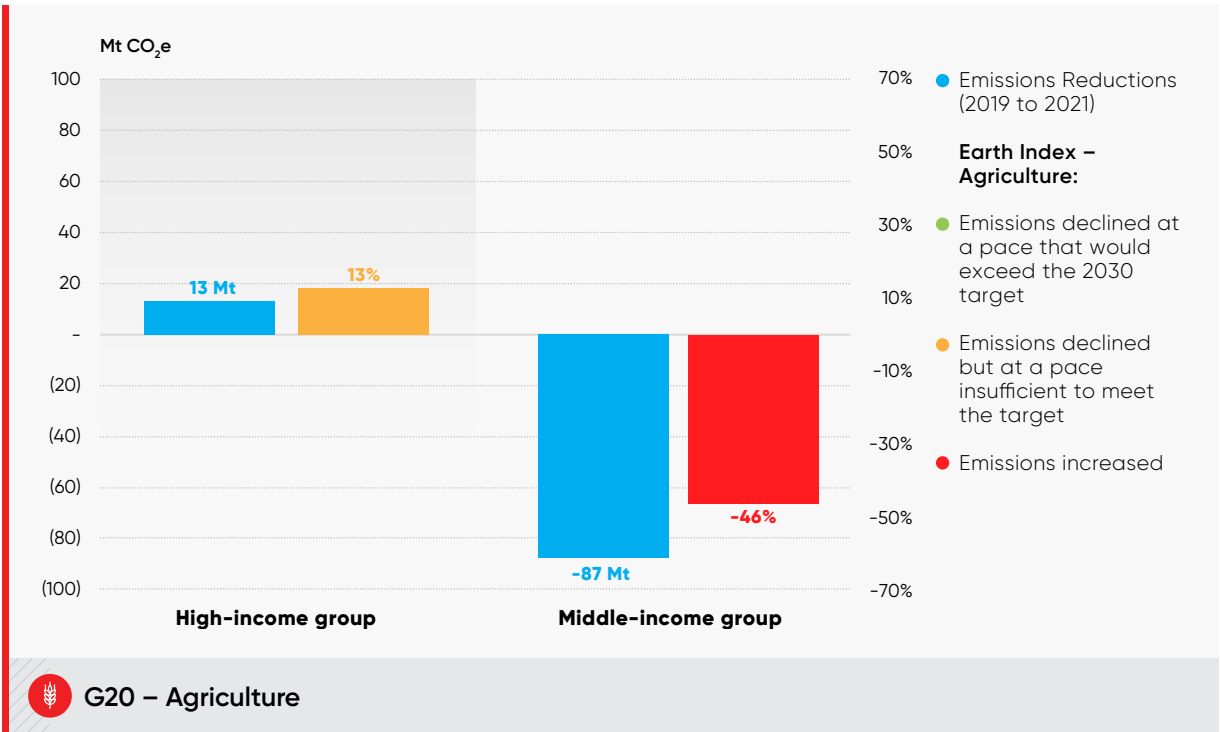
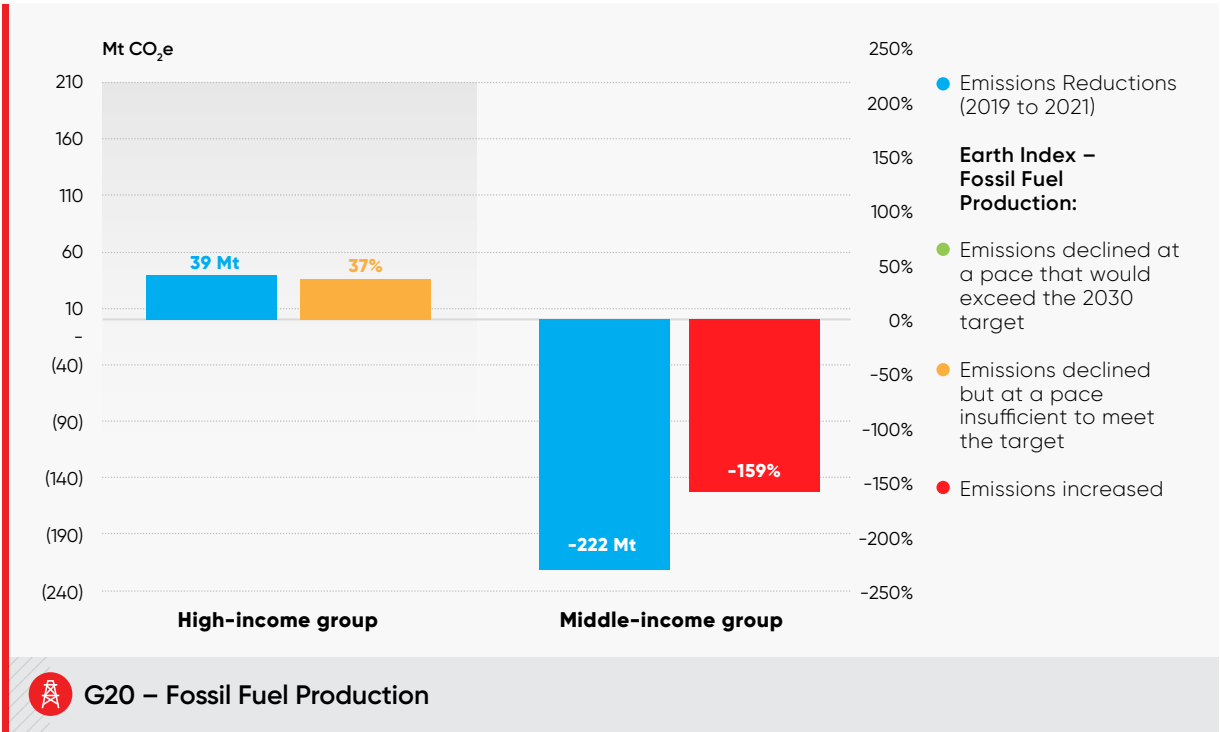
Figure 6. Transportation trends by type in G20 countries from 2019 to 2021.

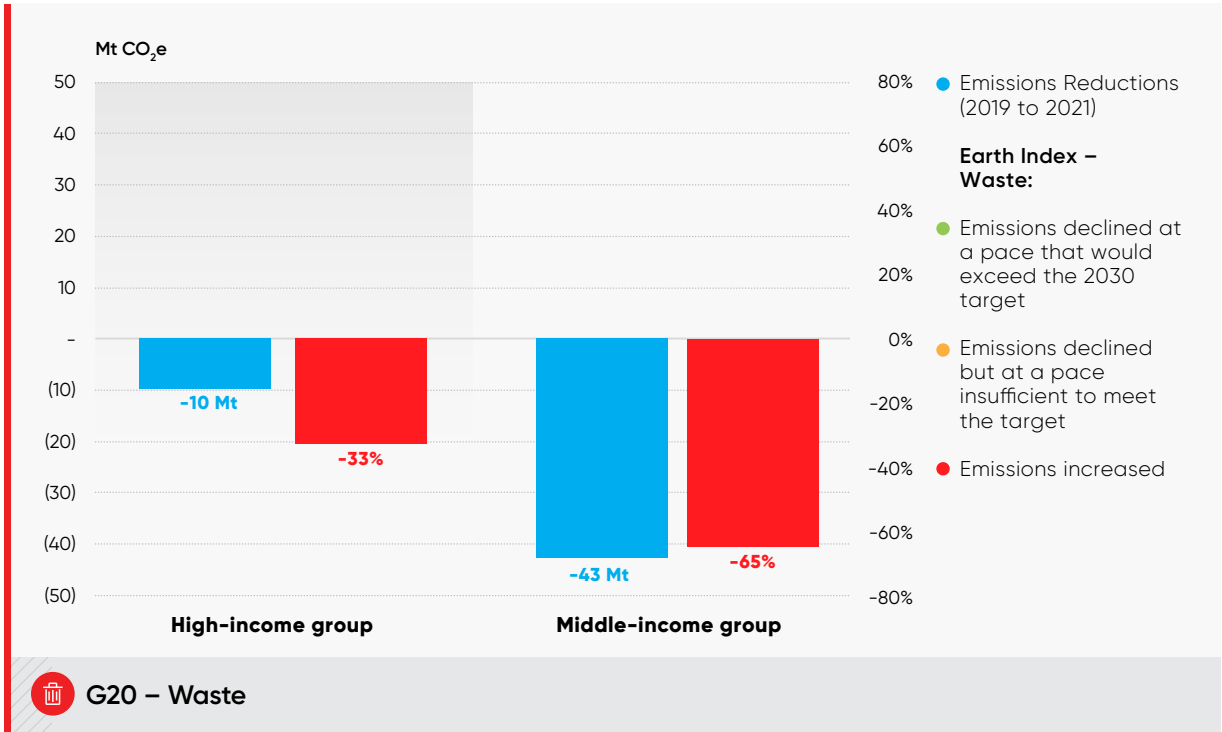


ANNEX A. SECTOR PROFILES











ANNEX B. EARTH INDEX METHOD

OBJECTIVE

The Earth Index tracks the progress of countries toward meeting their greenhouse gas (GHG) emissions targets.

SCOPE

The Earth Index covers the 19 countries plus the European Union (EU) that together constitute the G20. The countries are assessed in two groups: United Nations Framework Convention on Climate Change (UNFCCC) [Annex I and non-Annex I](#) countries.

For Annex I countries, the full range of GHG emissions in UNFCCC inventories are included as published in April 2023, with the exception of Japan and Russian Federation. For the non-Annex I countries, Japan and Russia, the three principal GHGs are included: carbon dioxide, methane, and nitrous oxide from the Emissions Database for Global Atmospheric Research (EDGAR) version 7.0 dataset. Changes in GHG emissions and absorption due to land use, land-use change, and forestry (LULUCF) are not included in the Earth Index at this time.

The Earth Index is based on annual emissions data up to and including the most recent year for which comprehensive emissions inventory is available for all G20 countries.

DATA SOURCES

The method used to calculate Earth Index is identical for all countries in the G20, but there are differences in data sources and sector definitions between countries included in Annex I of the UNFCCC and the non-Annex I countries.

- For Annex I countries, Earth Index uses data from the [UNFCCC inventories](#) filed by countries.
- For non-Annex I countries, Earth Index uses data from the European Commission [Emissions Database for Global Atmospheric Research \(EDGAR\)](#).

Stated commitments are based on the most recent targets identified in filings with the UNFCCC and other national commitments. In the case of EU members, the more ambitious of the a) national target or b) EU target (55% reduction by 2030 relative to 1990) is taken. National targets are converted using a linear scale to actual levels of GHG emissions in the target year (usually 2030) to facilitate the Earth Index method described below.

GHG emissions are also disaggregated by seven economic sectors: agriculture, buildings, fossil fuels, industry, power, transport, and waste. While the sector names are the same or nearly identical for all countries in the Earth Index, there are differences between Annex I and non-Annex I countries in the detailed definition of the sectors. These differences result from the higher level of aggregation published in the EDGAR database as compared to the more disaggregated presentation by the Intergovernmental Panel on Climate Change (IPCC) sector codes in the UNFCCC inventories.

CALCULATION METHOD

The main Earth Index for countries is the emissions reduction achieved in the most recent year according to reported data, divided by the annual emissions reduction required to meet the country's stated target. This update covers the two-year period 2020/2021, and so the emission reduction is averaged over the 2020/2021 period:

$$\text{EARTH INDEX (\%)} = \left(\frac{(\text{Emissions 2019} - \text{Emissions 2021}) / 2}{(\text{Emissions 2019} - \text{Emissions target})} \right) \frac{1}{2030 - 2019}$$

For example, a country with a target of reducing GHG emissions by 45% below 1990 levels by 2030 and that emitted 1,000 megatonnes (Mt) in 1990 therefore has a 2030 emissions target of 550 Mt. If that country emitted 900 Mt in 2019 and 880 Mt in 2021, its Earth Index result for 2021 would be 31%, indicating that the progress made over the 2020/2021 period was 31% of the annual progress required to meet its 2030 target:

$$\text{EARTH INDEX} = \left(\frac{(900 - 880) / 2}{(900 - 550)} \right) \frac{10}{31.8} = 31\%$$

To calculate target GHG emission levels and annual required emission reductions at the sector level, the target 2030 emissions level (for countries with 2030 targets) for each sector is the sector's most recent reported annual emissions multiplied by the percent reduction in total national emissions needed to meet the 2030 target. For example, if a country with an emissions target of 1,000 Mt in 2030 has emissions of 1,600 Mt in 2019, then it must reduce its emissions by 37.5% to meet its 2030 target. Sector emission-reduction targets in this example would therefore be set equal to 37.5% of 2020 emissions for each sector.








For countries that have committed to net-zero emissions but not to an interim 2030 target, the annual emissions reduction required to reach the target is calculated for both the country and sector level by dividing the latest year for which emissions data is available by (n - latest year), where "n" is the year by which the country has committed to achieving net-zero emissions.

OUTPUT

Each year, eight Earth Index scores are calculated for each country; one for total emissions and one for each of the seven economic sectors. These are published in scorecard format (see Annex C) that will facilitate at-a-glance comparisons between countries and economic sectors within countries.

Note: a negative score results when GHG emissions increase, and a score greater than 100% results when emission reductions are greater than required to stay on track for meeting the national target

EARTH INDEX SECTOR DEFINITIONS FOR ANNEX 1 COUNTRIES

EARTH INDEX Sector	IPCC Code
 Power	1.A.1.a Public Electricity and Heat Production
 Fossil Fuel	1.A.1.b Petroleum Refining
	1.A.1.c Manufacture of Solid Fuels and Other Energy Industries
	1.A.3.e.i Pipeline Transport
	1.B Fugitive Emissions from Fuels
 Industry	1.A.2 Manufacturing Industries and Construction
	1.A.5 Other (not specified elsewhere)
	2.A Mineral Industry
	2.B Chemical Industry
	2.C Metal Industry
	2.D Non-Energy Products from Fuels and Solvent Use
	2.E Electronics Industry
	2.F.1.c Industrial Refrigeration
	2.F.2 Foam Blowing Agents
	2.F.4 Aerosols
	2.F.5 Solvents
	2.F.6 Other Applications
	2.G Other Product Manufacture and Use
	2.H Other
 Transport	1.A.3 Transport
	EXCEPT 1.A.3.e.i Pipeline Transport
	2.F.1.d Transport Refrigeration
	2.F.1.e Mobile Air-conditioning
 Buildings	1.A.4.a Commercial/Institutional
	1.A.4.b Residential
	2.F.1.a Commercial Refrigeration
	2.F.1.b Domestic Refrigeration
	2.F.1.f Stationary Air-conditioning
	2.F.3 Fire Protection
 Agriculture	3. Agriculture
	1.A.4.c Agriculture/Forestry/Fishing
 Waste	5. Waste

Sector definitions for non-Annex I countries available on request. Please email research@corporateknights.com



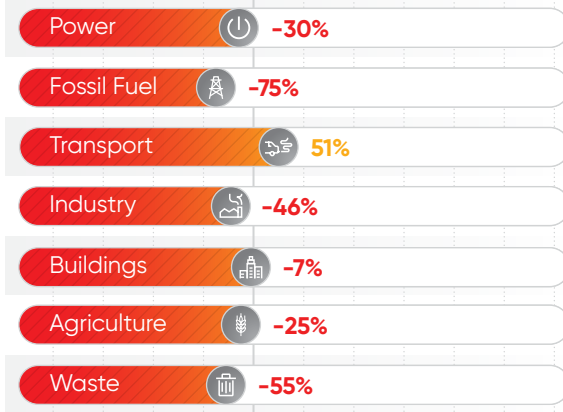
Annex C. Earth Index Scorecards



-23%
Earth Index

Emissions in Mt CO₂e

Stated emission target	Varies
Emissions in Reference Years	34 118
Emissions in 2019	38 684
Emissions in 2021	39 251
Percent emission reductions achieved by 2021	-15.0%
Target emissions in 2030	25 581
Annual reduction needed to meet target from 2019	1 223
Emission reduction (increase) from 2019 to 2021	(567)
5 year emission reduction (increase), 2016-2021	(2 525)
Earth Index based on 2016-2021 trend	-63%



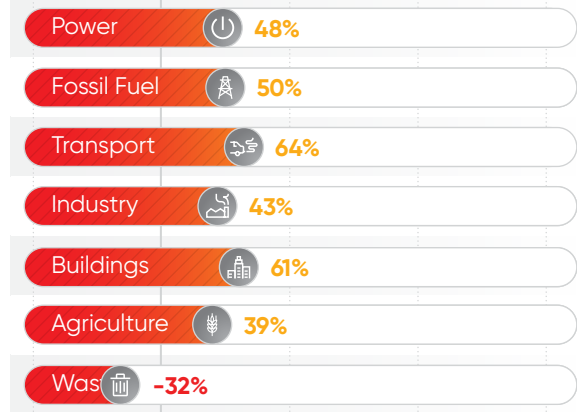
	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Years	10 188	3 057	4 792	7 704	2 840	4 194	1 343
Emissions in 2019	11 866	3 785	5 716	8 945	2 813	4 076	1 485
Emissions in 2021	12 076	3 968	5 510	9 185	2 825	4 150	1 537
Target emissions in 2030	8 075	2 484	3 538	6 098	1 802	2 612	973
Annual reduction needed to meet target from 2019	348	122	202	262	95	146	48
Actual emission reduction (increase) from 2019-2021	(105)	(92)	103	(120)	(6)	(37)	(26)



50%
Earth Index

Emissions in Mt CO₂e

Stated emission target, percent below 2012 by 2030	21%
Emissions in Reference Years	12 674
Emissions in 2019	10 613
Emissions in 2021	10 180
Percent emission reductions achieved by 2021	19.7%
Target emissions in 2030	5 872
Annual reduction needed to meet target from 2019	431
Emission reduction (increase) from 2019 to 2021	434
5 year emission reduction (increase), 2016-2021	(656)
Earth Index based on 2016-2021 trend	-50%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Years	3 880	1 008	2 827	2 365	1 289	954	351
Emissions in 2019	2 587	942	2 740	1 865	1 261	959	259
Emissions in 2021	2 487	904	2 596	1 800	1 198	929	266
Target emissions in 2030	1 447	518	1 508	1 036	695	526	142
Annual reduction needed to meet target from 2019	104	39	112	75	51	39	11
Actual emission reduction (increase) from 2019-2021	50	19	72	32	32	15	(3)

The 2021 Earth Index is obtained by dividing the average annual emissions reduction over the two-year 2020-2021 period by the annual emissions reductions required to meet the stated target. Any result less than 100% indicates insufficient progress to meet the stated target, and when emissions are growing rather than declining, a negative score is obtained. The data for the analysis are from the inventories filed with the UNFCCC in April 2023 for Annex I countries, with the exception of Japan and Russia. For all other non-Annex I

countries, Japan and Russia, the data for analysis are from the JRC EDGAR database version 7.0 published in 2022. The Earth Index sectors are defined by groups of IPCC codes. For countries that have committed to net-zero emissions but not to an interim 2030 target, the implied target for 2030 is identified by interpolating from the emissions level in 2019. Details available in the Earth Index Methodology document. This scorecard was generated on April 19, 2023.



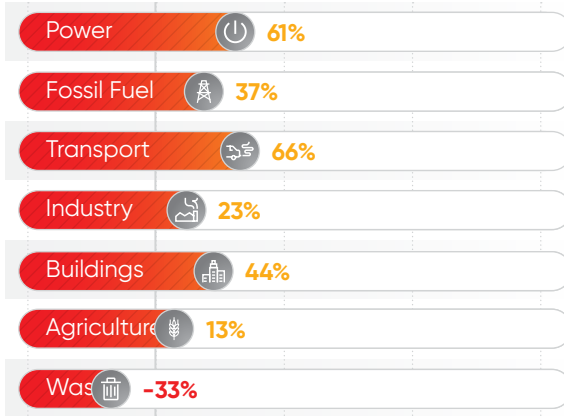
Annex C. Earth Index Scorecards

G20 High Income

44%
Earth Index

Emissions in Mt CO₂e

Stated emission target	Varies
Emissions in Reference Years	17 172
Emissions in 2019	14 487
Emissions in 2021	13 989
Percent emission reductions achieved by 2021	18.5%
Target emissions in 2030	8 329
Annual reduction needed to meet target from 2019	560
Emission reduction (increase) from 2019 to 2021	498
5 year emission reduction (increase), 2016-2021	254
Earth Index based on 2016-2021 trend	12%



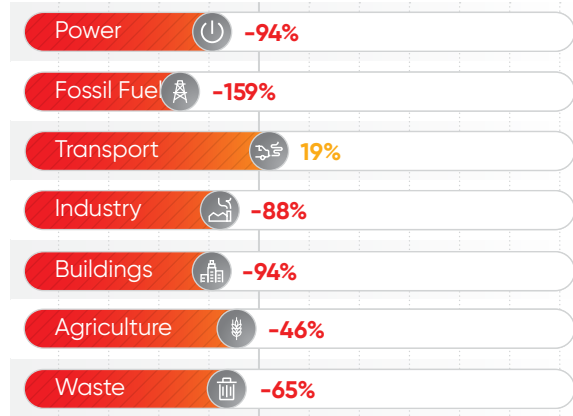
	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Years	5 387	1 416	3 431	3 352	1 639	1 420	527
Emissions in 2019	3 757	1 336	3 519	2 593	1 564	1 330	389
Emissions in 2021	3 583	1 297	3 338	2 546	1 510	1 317	399
Target emissions in 2030	2 176	760	2 008	1 501	900	760	224
Annual reduction needed to meet target from 2019	144	52	137	99	60	52	15
Actual emission reduction (increase) from 2019-2021	87	19	91	23	27	7	(5)

G20 Middle Income

-80%
Earth Index

Emissions in Mt CO₂e

Stated emission target	Varies
Emissions in Reference Years	16 946
Emissions in 2019	24 197
Emissions in 2021	25 262
Percent emission reductions achieved by 2021	-49.1%
Target emissions in 2030	17 252
Annual reduction needed to meet target from 2019	663
Emission reduction (increase) from 2019 to 2021	(1 065)
5 year emission reduction (increase), 2016-2021	(2 779)
Earth Index based on 2016-2021 trend	-149%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Years	4 801	1 641	1 361	4 353	1 201	2 774	815
Emissions in 2019	8 109	2 449	2 197	6 352	1 249	2 746	1 096
Emissions in 2021	8 494	2 671	2 172	6 639	1 315	2 833	1 138
Target emissions in 2030	5 899	1 723	1 530	4 597	902	1 852	748
Annual reduction needed to meet target from 2019	204	70	65	162	35	94	33
Actual emission reduction (increase) from 2019-2021	(192)	(111)	12	(143)	(33)	(44)	(21)

The 2021 Earth Index is obtained by dividing the average annual emissions reduction over the two-year 2020-2021 period by the annual emissions reductions required to meet the stated target. Any result less than 100% indicates insufficient progress to meet the stated target, and when emissions are growing rather than declining, a negative score is obtained. The data for the analysis are from the inventories filed with the UNFCCC in April 2023 for Annex I countries, with the exception of Japan and Russia. For all other non-Annex I

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Annex C. Earth Index Scorecards

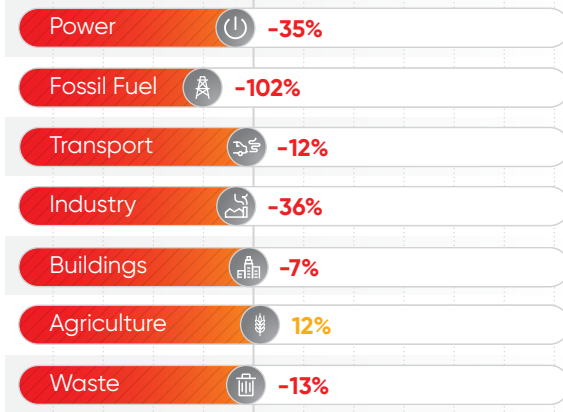


ARGENTINA

-17%
Earth Index

Emissions in Mt CO₂e

Emission target, net zero by 2050	100%
Emissions in 2005	365
Emissions in 2019	365
Emissions in 2021	376
Percent emission reductions achieved by 2021	-3.1%
As a percent of the target	-3.1%
Target emissions in 2030	349
Annual reduction needed to meet target from 2019	33
Emission reduction (increase) from 2019 to 2021	(11)
5 year emission reduction (increase), 2016-2021	0.2
Earth Index based on 2016-2021 trend	2%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	40	42	48	32	39	148	15
Emissions in 2019	40	42	48	32	39	148	15
Emissions in 2021	43	50	49	34	39	145	16
Target emissions in 2030	38	40	46	31	37	141	15
Annual reduction needed to meet target from 2019	4	4	4	3	4	13	1
Actual emission reduction (increase) from 2019-2021	(1)	(4)	(1)	(1)	(0.2)	2	(0.2)

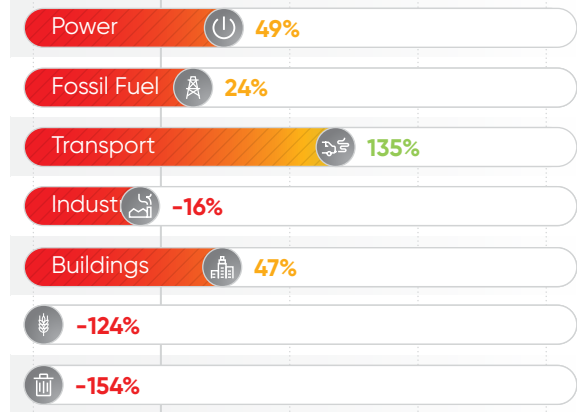


AUSTRALIA

25%
Earth Index

Emissions in Mt CO₂e

Stated emission target, percent below 2005 by 2030	43%
Emissions in 2005	525
Emissions in 2019	547
Emissions in 2021	536
Percent emission reductions achieved by 2021	-2.0%
As a percent of the target	-4.8%
Target emissions in 2030	299
Annual reduction needed to meet target from 2019	22
Emission reduction (increase) from 2019 to 2021	11
5 year emission reduction (increase), 2016-2021	27
Earth Index based on 2016-2021 trend	29%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	197	60	82	69	16	86	14
Emissions in 2019	179	87	101	65	26	76	12
Emissions in 2021	172	86	90	66	25	84	13
Target emissions in 2030	98	48	55	36	14	42	6
Annual reduction needed to meet target from 2019	7	4	4	3	1	3	0.5
Actual emission reduction (increase) from 2019-2021	4	1	6	(0.4)	1	(4)	(0.7)

The 2021 Earth Index is obtained by dividing the average annual emissions reduction over the two-year 2020-2021 period by the annual emissions reductions required to meet the stated target. Any result less than 100% indicates insufficient progress to meet the stated target, and when emissions are growing rather than declining, a negative score is obtained. The data for the analysis are from the inventories filed with the UNFCCC in April 2023 for Annex I countries, with the exception of Japan and Russia. For all other non-Annex I

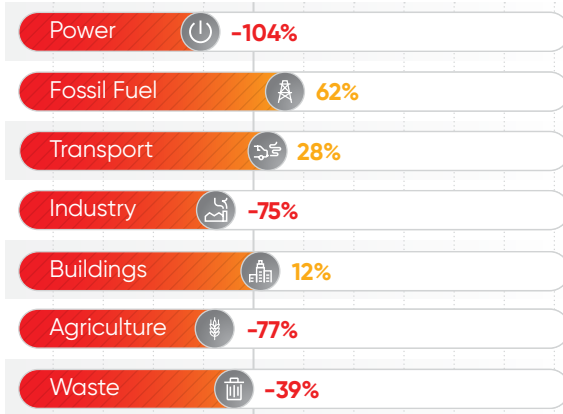
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-47%
Earth Index

Emissions in Mt CO₂e

Stated emission target, percent below 2005 by 2030	50%
Emissions in 2005	1 006
Emissions in 2019	1 211
Emissions in 2021	1 272
Percent emission reductions achieved by 2021	-26.4%
As a percent of the target	-52.8%
Target emissions in 2030	503
Annual reduction needed to meet target from 2019	64
Emission reduction (increase) from 2019 to 2021	(60)
5 year emission reduction (increase), 2016-2021	(57)
Earth Index based on 2016-2021 trend	-23%



Annex C. Earth Index Scorecards

Emissions in Reference Year	35	48	140	127	36	505	114
Emissions in 2019	65	60	197	129	42	572	147
Emissions in 2021	73	56	191	139	41	619	153
Target emissions in 2030	27	25	82	53	17	237	61
Annual reduction needed to meet target from 2019	3	3	10	7	2	30	8
Actual emission reduction (increase) from 2019-2021	(4)	2	3	(5)	0.3	(23)	(3)

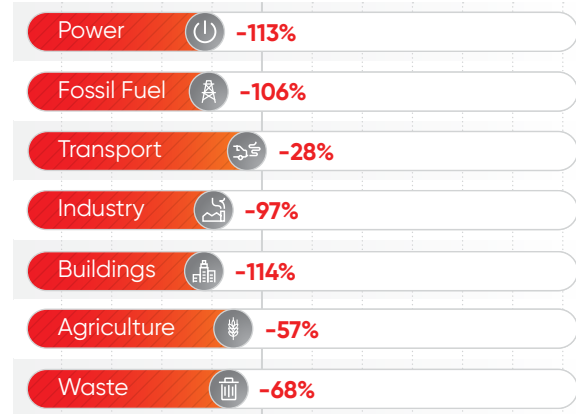
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-92%
Earth Index

Emissions in Mt CO₂e

Emission target, percent below 2018 by 2030	40%
Emissions in 2005	14 594
Emissions in 2019	21 441
Emissions in 2021	22 444
Percent emission reductions achieved by 2021	-53.8%
As a percent of the target	-134.5%
Target emissions in 2030	15 425
Annual reduction needed to meet target from 2019	547
Emission reduction (increase) from 2019 to 2021	(1 003)
5 year emission reduction (increase), 2016-2021	(2 512)
Earth Index based on 2016-2021 trend	-156%



Emissions in Reference Year	4 378	1 345	1 017	3 877	1 033	2 305	638
Emissions in 2019	7 569	2 070	1 762	5 827	1 083	2 244	886
Emissions in 2021	7 981	2 182	1 789	6 105	1 145	2 321	921
Target emissions in 2030	5 554	1 491	1 237	4 257	782	1 495	610
Annual reduction needed to meet target from 2019	183	53	48	143	27	68	25
Actual emission reduction (increase) from 2019-2021	(206)	(56)	(13)	(139)	(31)	(39)	(17)

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Annex C. Earth Index Scorecards

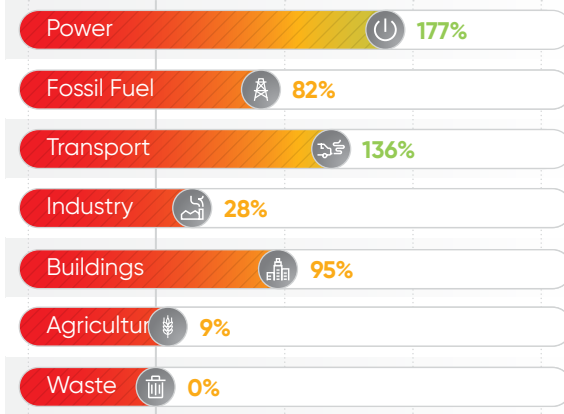


CANADA

93%
Earth Index

Emissions in Mt CO₂e

Stated emission target, percent below 2005 by 2030	45%
Emissions in 2005	732
Emissions in 2019	724
Emissions in 2021	670
Percent emission reductions achieved by 2021	8.4%
As a percent of the target	18.7%
Target emissions in 2030	402
Annual reduction needed to meet target from 2019	29
Emission reduction (increase) from 2019 to 2021	54
5 year emission reduction (increase), 2016-2021	43
Earth Index based on 2016-2021 trend	39%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	125	163	182	106	77	56	22
Emissions in 2019	70	193	206	95	83	58	21
Emissions in 2021	60	180	183	92	77	57	21
Target emissions in 2030	39	107	114	53	46	32	12
Annual reduction needed to meet target from 2019	3	8	8	4	3	2	1
Actual emission reduction (increase) from 2019-2021	5	6	11	1	3.2	0.2	-

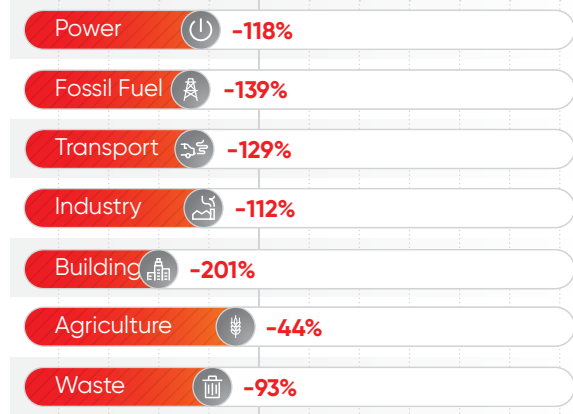


CHINA

-117%
Earth Index

Emissions in Mt CO₂e

Emission target, net zero by 2060	100%
Emissions in 2005	8 057
Emissions in 2019	13 770
Emissions in 2021	14 557
Percent emission reductions achieved by 2021	-80.7%
As a percent of the target	-80.7%
Target emissions in 2030	10 076
Annual reduction needed to meet target from 2019	336
Emission reduction (increase) from 2019 to 2021	(787)
5 year emission reduction (increase), 2016-2021	(1 777)
Earth Index based on 2016-2021 trend	-184%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	2 388	713	408	2 856	509	899	283
Emissions in 2019	5 272	1 323	929	4 395	600	825	425
Emissions in 2021	5 576	1 413	988	4 635	659	843	445
Target emissions in 2030	3 858	968	680	3 216	439	604	311
Annual reduction needed to meet target from 2019	129	32	23	107	15	20	10
Actual emission reduction (increase) from 2019-2021	(152)	(45)	(29)	(120)	(29)	(9)	(10)

The 2021 Earth Index is obtained by dividing the average annual emissions reduction over the two-year 2020-2021 period by the annual emissions reductions required to meet the stated target. Any result less than 100% indicates insufficient progress to meet the stated target, and when emissions are growing rather than declining, a negative score is obtained. The data for the analysis are from the inventories filed with the UNFCCC in April 2023 for Annex I countries, with the exception of Japan and Russia. For all other non-Annex I

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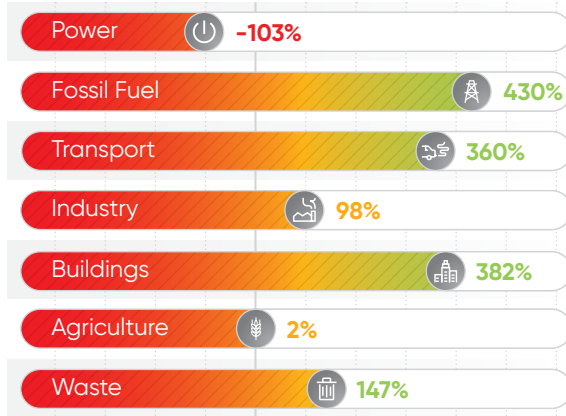


DENMARK

182%
Earth Index

Emissions in Mt CO₂e

Stated emission target: 70% below 1990 level by 2030	70%
Emissions in 1990	70
Emissions in 2019	44
Emissions in 2021	40
Percent emission reductions achieved by 2021	42.8%
As a percent of the target	61.2%
Target emissions in 2030	21
Annual reduction needed to meet target from 2019	2
Emission reduction (increase) from 2019 to 2021	4
5 year emission reduction (increase), 2016-2021	10
Earth Index based on 2016-2021 trend	96%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	25	2	10	8	9	13	2
Emissions in 2019	7	3	12	6	4	10	1
Emissions in 2021	7	2	10	5	3	10	1
Target emissions in 2030	3	1	6	3	2	5	1
Annual reduction needed to meet target from 2019	0.3	0.1	1	1	0.2	0.5	0.1
Actual emission reduction (increase) from 2019-2021	(0.3)	0.6	2	1	0.7	0.01	0.1

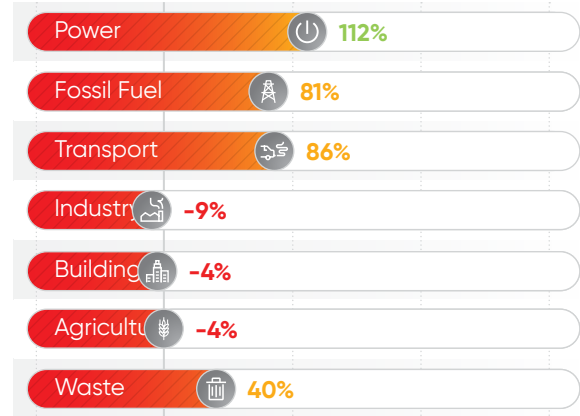
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EUROPEAN UNION

47%
Earth Index

Emissions in Mt CO₂e

Stated emission target, percent below 1990 level by 2030	55%
Emissions in 1990, kt CO ₂ e	4 861
Emissions in 2019	3 588
Emissions in 2021	3 468
Percent emission reductions achieved by 2021	28.6%
As a percent of the target	52.1%
Target emissions in 2030	2 187
Annual reduction needed to meet target from 2019	127
Emission reduction (increase) from 2019 to 2021	120
5 year emission reduction (increase), 2016-2021	343
Earth Index based on 2016-2021 trend	59%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	1 236	379	669	1 196	628	569	184
Emissions in 2019	752	226	841	705	501	450	112
Emissions in 2021	692	213	790	710	503	452	109
Target emissions in 2030	458	138	513	430	306	274	69
Annual reduction needed to meet target from 2019	27	8	30	25	18	16	4
Actual emission reduction (increase) from 2019-2021	30	7	26	(2)	(1)	(0.6)	2

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Annex C. Earth Index Scorecards

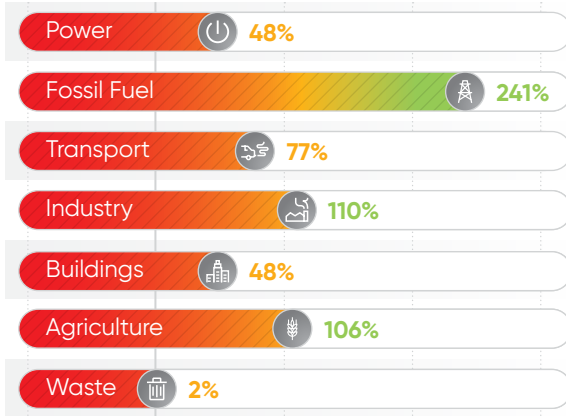


FRANCE

84%
Earth Index

Emissions in Mt CO₂e

Stated emission target: 55% below 1990 level by 2030 (EU)	55%
Emissions in 1990, kt CO ₂ e	547
Emissions in 2019	441
Emissions in 2021	412
Percent emission reductions achieved by 2021	24.8%
As a percent of the target	45.0%
Target emissions in 2030	246
Annual reduction needed to meet target from 2019	18
Emission reduction (increase) from 2019 to 2021	30
5 year emission reduction (increase), 2016-2021	55
Earth Index based on 2016-2021 trend	70%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	50	28	123	150	86	93	17
Emissions in 2019	33	13	135	88	70	84	18
Emissions in 2021	32	11	127	80	67	76	18
Target emissions in 2030	19	7	75	49	39	47	10
Annual reduction needed to meet target from 2019	1	1	5	4	3	3	1
Actual emission reduction (increase) from 2019-2021	1	1	4	4	1	4	0.01

The 2021 Earth Index is obtained by dividing the average annual emissions reduction over the two-year 2020-2021 period by the annual emissions reductions required to meet the stated target. Any result less than 100% indicates insufficient progress to meet the stated target, and when emissions are growing rather than declining, a negative score is obtained. The data for the analysis are from the inventories filed with the UNFCCC in April 2023 for Annex I countries, with the exception of Japan and Russia. For all other non-Annex I

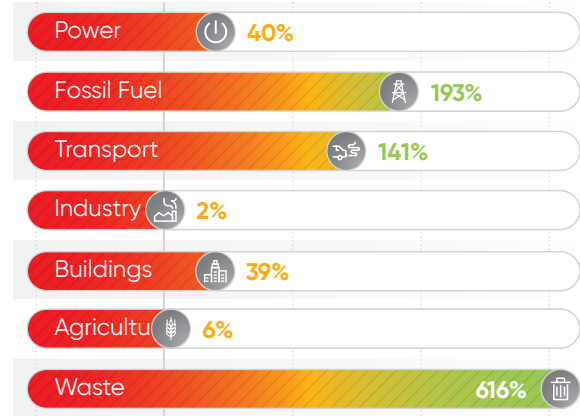


GERMANY

64%
Earth Index

Emissions in Mt CO₂e

Emission target, percent below 1990 level by 2030	65%
Emissions in 1990, kt CO ₂ e	1242
Emissions in 2019	800
Emissions in 2021	757
Percent emission reductions achieved by 2021	39.0%
As a percent of the target	60.1%
Target emissions in 2030	435
Annual reduction needed to meet target from 2019	33
Emission reduction (increase) from 2019 to 2021	43
5 year emission reduction (increase), 2016-2021	144
Earth Index based on 2016-2021 trend	87%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	341	125	163	296	198	81	38
Emissions in 2019	219	40	168	177	124	63	9
Emissions in 2021	212	34	148	177	120	63	4
Target emissions in 2030	119	22	91	96	67	34	5
Annual reduction needed to meet target from 2019	9	2	7	7	5	3	0.4
Actual emission reduction (increase) from 2019-2021	4	3	10	0.1	2	0.2	2

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Annex C. Earth Index Scorecards

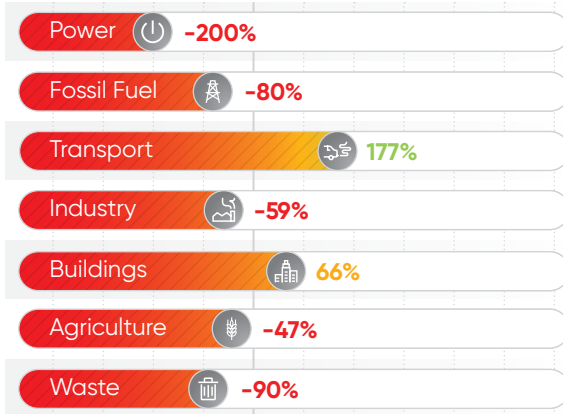


INDIA

-80%
Earth Index

Emissions in Mt CO₂e

Emission target, net zero by 2070	100%
Emissions in 2005	2 031
Emissions in 2019	3 509
Emissions in 2021	3 619
Percent emission reductions achieved by 2021	-78.2%
As a percent of the target	-78.2%
Target emissions in 2030	2 752
Annual reduction needed to meet target from 2019	69
Emission reduction (increase) from 2019 to 2021	(110)
5 year emission reduction (increase), 2016-2021	(404)
Earth Index based on 2016-2021 trend	-245%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	565	108	120	353	107	629	150
Emissions in 2019	1 181	138	317	804	161	713	194
Emissions in 2021	1 274	143	295	823	157	726	201
Target emissions in 2030	927	108	249	631	127	559	152
Annual reduction needed to meet target from 2019	23	3	6	16	3	14	4
Actual emission reduction (increase) from 2019-2021	(46)	(2)	11	(9)	2	(7)	(3)

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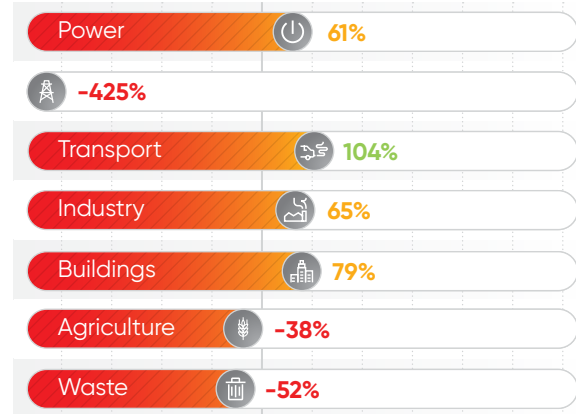


INDONESIA

-57%
Earth Index

Emissions in Mt CO₂e

Emission target, percent below 2010 by 2030	29%
Emissions in 2005	755
Emissions in 2019	1 079
Emissions in 2021	1 137
Percent emission reductions achieved by 2021	-50.5%
As a percent of the target	-174.2%
Target emissions in 2030	514
Annual reduction needed to meet target from 2019	51
Emission reduction (increase) from 2019 to 2021	(58)
5 year emission reduction (increase), 2016-2021	(263)
Earth Index based on 2016-2021 trend	-205%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	120	132	91	163	26	167	56
Emissions in 2019	226	225	152	201	28	177	70
Emissions in 2021	213	316	137	188	26	183	74
Target emissions in 2030	108	107	72	96	13	84	33
Annual reduction needed to meet target from 2019	11	11	7	10	1	8	3
Actual emission reduction (increase) from 2019-2021	7	(46)	8	6	1	(3)	(2)

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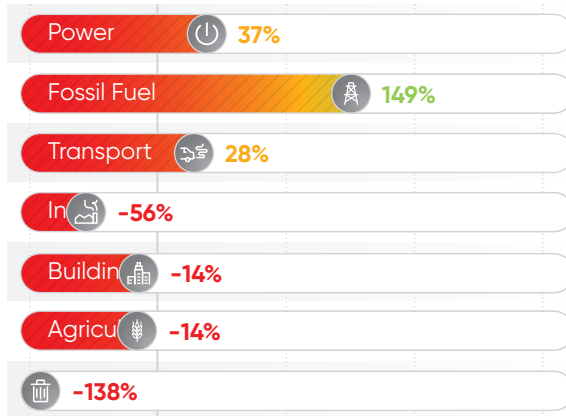
Annex C. Earth Index Scorecards

ITALY

5%
Earth Index

Emissions in Mt CO₂e

Emission target, percent below 1990 level by 2030	60%
Emissions in 1990, kt CO ₂ e	520
Emissions in 2019	418
Emissions in 2021	416
Percent emission reductions achieved by 2021	199%
As a percent of the target	33.2%
Target emissions in 2030	208
Annual reduction needed to meet target from 2019	19
Emission reduction (increase) from 2019 to 2021	2
5 year emission reduction (increase), 2016-2021	23
Earth Index based on 2016-2021 trend	28%



Emissions in Reference Year	109	42	102	134	70	46	17
Emissions in 2019	67	32	106	69	87	39	18
Emissions in 2021	65	28	103	72	88	40	20
Target emissions in 2030	33	16	53	34	43	19	9
Annual reduction needed to meet target from 2019	3	1	5	3	4	2	1
Actual emission reduction (increase) from 2019-2021	1	2	1	(2)	(1)	(0.3)	(1)

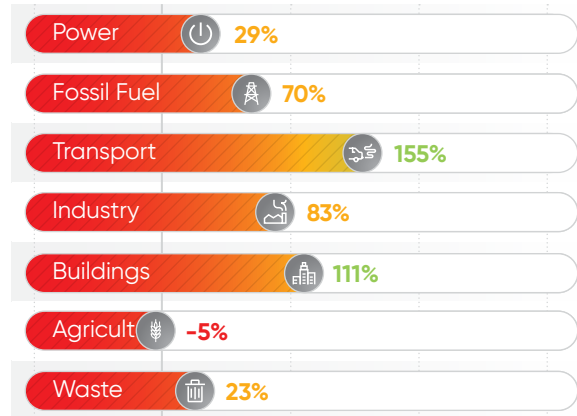
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JAPAN

71%
Earth Index

Emissions in Mt CO₂e

Emission target, percent of 2013 level by 2030	46%
Emissions in 2013	1402
Emissions in 2019	1209
Emissions in 2021	1151
Percent emission reductions achieved by 2021	179%
As a percent of the target	38.9%
Target emissions in 2030	757
Annual reduction needed to meet target from 2019	41
Emission reduction (increase) from 2019 to 2021	58
5 year emission reduction (increase), 2016-2021	148
Earth Index based on 2016-2021 trend	77%



Emissions in Reference Year	619	65	221	293	141	49	15
Emissions in 2019	509	55	204	262	121	46	14
Emissions in 2021	499	52	182	247	112	46	13
Target emissions in 2030	318	34	128	164	76	29	9
Annual reduction needed to meet target from 2019	17	2	7	9	4	2	0.5
Actual emission reduction (increase) from 2019-2021	5	1	11	7	5	(0.1)	0.1

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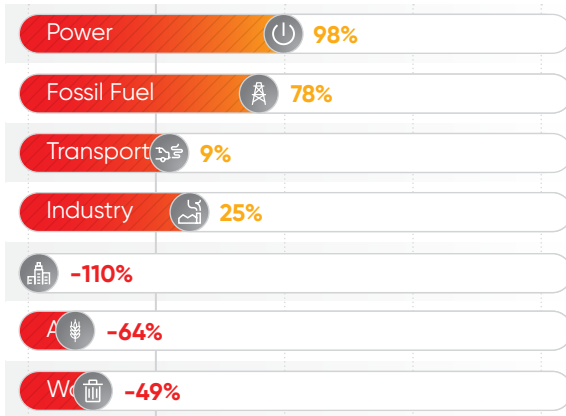


KOREA, REPUBLIC OF

45%
Earth Index

Emissions in Mt CO₂e

Emission target, percent below 2018 by 2030	40%
Emissions in 2005	728
Emissions in 2019	705
Emissions in 2021	683
Percent emission reductions achieved by 2021	6.2%
As a percent of the target	15.6%
Target emissions in 2030	437
Annual reduction needed to meet target from 2019	24
Emission reduction (increase) from 2019 to 2021	22
5 year emission reduction (increase), 2016-2021	32
Earth Index based on 2016-2021 trend	32%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	336	58	104	130	55	23	23
Emissions in 2019	320	59	108	120	52	23	23
Emissions in 2021	298	55	108	118	56	24	24
Target emissions in 2030	199	36	67	74	32	14	14
Annual reduction needed to meet target from 2019	11	2	4	4	2	1	1
Actual emission reduction (increase) from 2019-2021	11	2	0.3	1	(2)	(1)	(0.4)

The 2021 Earth Index is obtained by dividing the average annual emissions reduction over the two-year 2020-2021 period by the annual emissions reductions required to meet the stated target. Any result less than 100% indicates insufficient progress to meet the stated target, and when emissions are growing rather than declining, a negative score is obtained. The data for the analysis are from the inventories filed with the UNFCCC in April 2023 for Annex I countries, with the exception of Japan and Russia. For all other non-Annex I

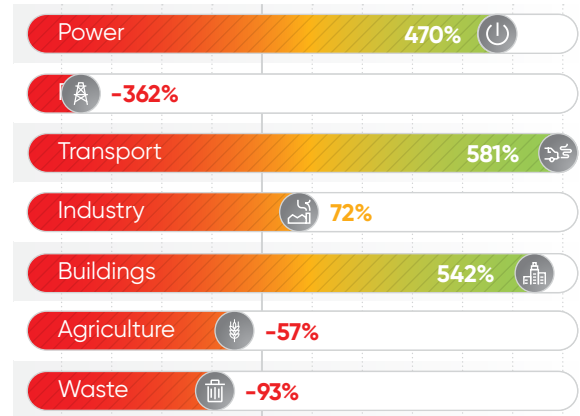


MEXICO

184%
Earth Index

Emissions in Mt CO₂e

Emission target, percent below 2013 by 2030	22%
Emissions in 2005	765
Emissions in 2019	744
Emissions in 2021	695
Percent emission reductions achieved by 2021	9.2%
As a percent of the target	41.8%
Target emissions in 2030	597
Annual reduction needed to meet target from 2019	13
Emission reduction (increase) from 2019 to 2021	49
5 year emission reduction (increase), 2016-2021	76
Earth Index based on 2016-2021 trend	122%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	145	100	153	168	33	104	62
Emissions in 2019	137	83	150	164	31	110	69
Emissions in 2021	114	94	118	160	25	113	71
Target emissions in 2030	110	67	120	131	25	89	55
Annual reduction needed to meet target from 2019	2	1	3	3	1	2	1.2
Actual emission reduction (increase) from 2019-2021	12	(5)	16	2	3	(1)	(1)

countries, Japan and Russia, the data for analysis are from the JRC EDGAR database version 7.0 published in 2022. The Earth Index sectors are defined by groups of IPCC codes. For countries that have committed to net-zero emissions but not to an interim 2030 target, the implied target for 2030 is identified by interpolating from the emissions level in 2019. Details available in the Earth Index Methodology document. This scorecard was generated on April 19, 2023.

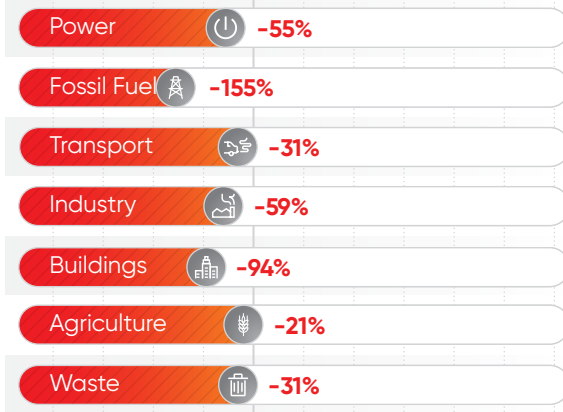


RUSSIAN FEDERATION

-73%
Earth Index

Emissions in Mt CO₂e

Stated emission target: net zero by 2060	100%
Emissions in 2005	2 975
Emissions in 2019	2 384
Emissions in 2021	2 472
Percent emission reductions achieved by 2021	16.9%
As a percent of the target	16.9%
Target emissions in 2030	1 729
Annual reduction needed to meet target from 2019	60
Emission reduction (increase) from 2019 to 2021	(87)
5 year emission reduction (increase), 2016-2021	(303)
Earth Index based on 2016-2021 trend	-193%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	1 179	360	305	469	354	236	73
Emissions in 2019	818	441	260	433	238	98	97
Emissions in 2021	841	475	264	446	249	99	98
Target emissions in 2030	593	320	189	314	172	71	70
Annual reduction needed to meet target from 2019	20	11	7	11	6	2	2
Actual emission reduction (increase) from 2019-2021	(11)	(17)	(2)	(6)	(6)	(1)	(1)

The 2021 Earth Index is obtained by dividing the average annual emissions reduction over the two-year 2020-2021 period by the annual emissions reductions required to meet the stated target. Any result less than 100% indicates insufficient progress to meet the stated target, and when emissions are growing rather than declining, a negative score is obtained. The data for the analysis are from the inventories filed with the UNFCCC in April 2023 for Annex I countries, with the exception of Japan and Russia. For all other non-Annex I

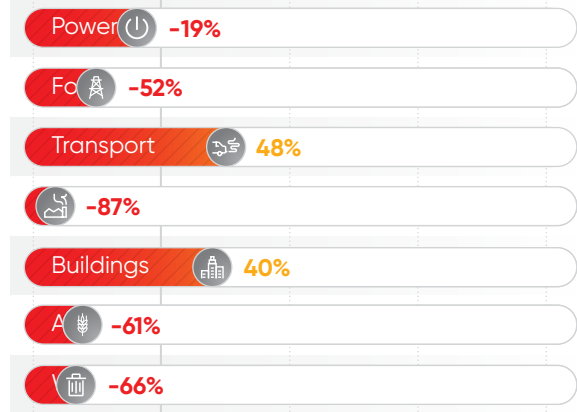


SAUDI ARABIA

-29%
Earth Index

Emissions in Mt CO₂e

Emission target, percent below 2019 level by 2030	39%
Emissions in 2005	693
Emissions in 2019	693
Emissions in 2021	708
Percent emission reductions achieved by 2021	-2.1%
As a percent of the target	-5.3%
Target emissions in 2030	423
Annual reduction needed to meet target from 2019	25
Emission reduction (increase) from 2019 to 2021	(14)
5 year emission reduction (increase), 2016-2021	16
Earth Index based on 2016-2021 trend	15%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	238	106	138	171	5	7	28
Emissions in 2019	238	106	138	171	5	7	28
Emissions in 2021	241	110	134	181	5	7	29
Target emissions in 2030	145	65	84	104	3	4	17
Annual reduction needed to meet target from 2019	8	4	5	6	0.2	0.2	1
Actual emission reduction (increase) from 2019-2021	(1.6)	(2)	2	(5)	0.1	(0.2)	(0.7)

countries, Japan and Russia, the data for analysis are from the JRC EDGAR database version 7.0 published in 2022. The Earth Index sectors are defined by groups of IPCC codes. For countries that have committed to net-zero emissions but not to an interim 2030 target, the implied target for 2030 is identified by interpolating from the emissions level in 2019. Details available in the Earth Index Methodology document. This scorecard was generated on April 19, 2023.

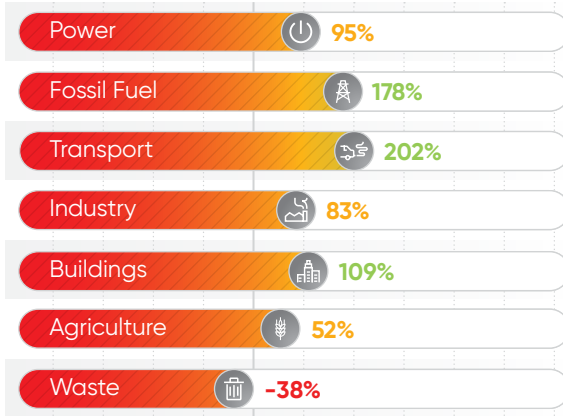


SOUTH AFRICA

113%
Earth Index

Emissions in Mt CO₂e

Emission target, net zero by 2050	100%
Emissions in 2005	526
Emissions in 2019	566
Emissions in 2021	525
Percent emission reductions achieved by 2021	0.2%
As a percent of the target	0.2%
Target emissions in 2030	365
Annual reduction needed to meet target from 2019	18
Emission reduction (increase) from 2019 to 2021	41
5 year emission reduction (increase), 2016-2021	29
Earth Index based on 2016-2021 trend	43%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	211	116	44	72	26	36	19
Emissions in 2019	232	108	58	66	42	36	24
Emissions in 2021	218	95	51	62	40	35	24
Target emissions in 2030	150	70	38	43	27	23	15
Annual reduction needed to meet target from 2019	7	3	2	2	1	1	1
Actual emission reduction (increase) from 2019-2021	7	6	4	2	1	1	(0.3)

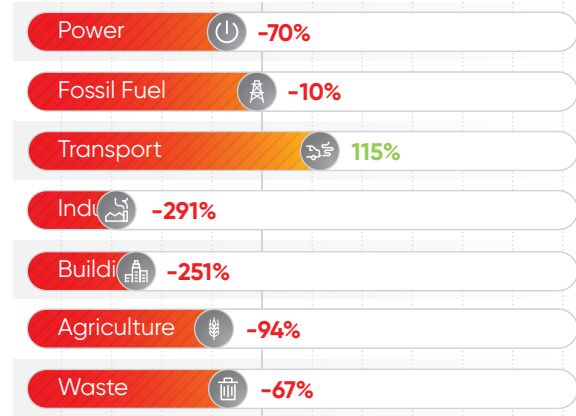
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TURKEY

-114%
Earth Index

Emissions in Mt CO₂e

Stated emission target, percent below 2012 by 2030	21%
Emissions in 2012, kt CO ₂ e	466
Emissions in 2019	569
Emissions in 2021	610
Percent emission reductions achieved by 2021	-31.0%
As a percent of the target	-147.8%
Target emissions in 2030	368
Annual reduction needed to meet target from 2019	18
Emission reduction (increase) from 2019 to 2021	(42)
5 year emission reduction (increase), 2016-2021	(79)
Earth Index based on 2016-2021 trend	-136%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	117	21	52	112	70	50	44
Emissions in 2019	137	28	84	128	69	67	55
Emissions in 2021	143	28	78	152	80	71	57
Target emissions in 2030	89	18	55	83	44	43	36
Annual reduction needed to meet target from 2019	4	1	3	4	2	2	2
Actual emission reduction (increase) from 2019-2021	(3)	(0.1)	3	(12)	(6)	(2)	(1)

countries, Japan and Russia, the data for analysis are from the JRC EDGAR database version 7.0 published in 2022. The Earth Index sectors are defined by groups of IPCC codes. For countries that have committed to net-zero emissions but not to an interim 2030 target, the implied target for 2030 is identified by interpolating from the emissions level in 2019. Details available in the Earth Index Methodology document. This scorecard was generated on April 19, 2023.

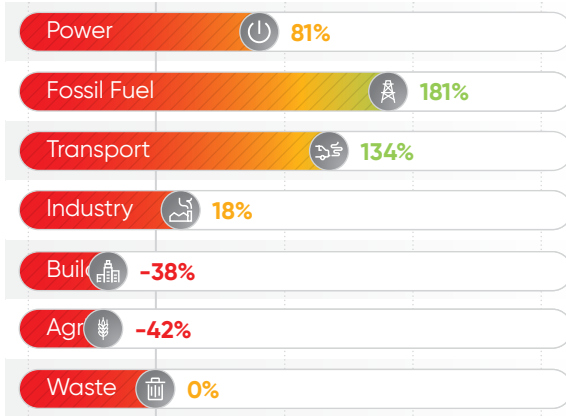


UNITED KINGDOM

53%
Earth Index

Emissions in Mt CO₂e

Emission target, percent below 1990 level by 2030	68%
Emissions in 1990, kt CO ₂ e	797
Emissions in 2019	448
Emissions in 2021	430
Percent emission reductions achieved by 2021	46.1%
As a percent of the target	67.8%
Target emissions in 2030	255
Annual reduction needed to meet target from 2019	18
Emission reduction (increase) from 2019 to 2021	19
5 year emission reduction (increase), 2016-2021	40
Earth Index based on 2016-2021 trend	52%



Annex C. Earth Index Scorecards

	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	205	75	122	168	106	55	65
Emissions in 2019	60	37	124	70	90	47	19
Emissions in 2021	56	32	111	69	93	49	19
Target emissions in 2030	34	21	70	40	51	27	11
Annual reduction needed to meet target from 2019	2	1	5	3	4	2	0.7
Actual emission reduction (increase) from 2019-2021	1.9	3	6	1	(1)	(0.8)	0.003

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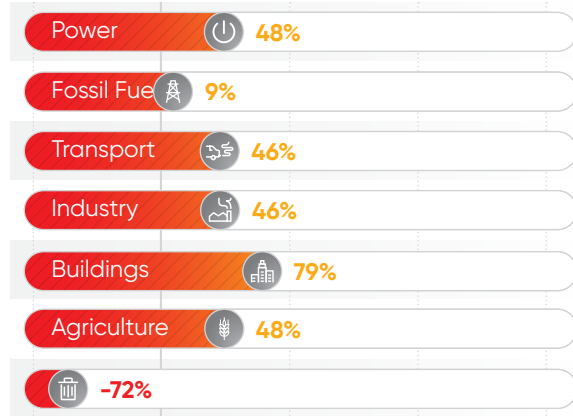


UNITED STATES

42%
Earth Index

Emissions in Mt CO₂e

Stated emission target, percent below 2005 by 2030	52%
Emissions in 2005	7 435
Emissions in 2019	6 572
Emissions in 2021	6 344
Percent emission reductions achieved by 2021	14.7%
As a percent of the target	28.2%
Target emissions in 2030	3 569
Annual reduction needed to meet target from 2019	273
Emission reduction (increase) from 2019 to 2021	228
5 year emission reduction (increase), 2016-2021	(396)
Earth Index based on 2016-2021 trend	-47%



	Power	Fossil Fuel	Transport	Industry	Buildings	Agriculture	Waste
Emissions in Reference Year	2 431	510	1 913	1 220	612	574	176
Emissions in 2019	1 628	573	1 797	1 105	685	623	160
Emissions in 2021	1 564	569	1 741	1 063	640	598	169
Target emissions in 2030	884	311	976	600	372	338	87
Annual reduction needed to meet target from 2019	68	24	75	46	28	26	7
Actual emission reduction (increase) from 2019-2021	32	2	28	21	22	12	(5)

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