
Total Global CO₂ Emissions Comparison

2023 vs. 2024 Data

- **2023 (IEA Data):** 37,400 Mt (37.4 Gt)
- **2024 (Your Analysis):** 38,013.13 Mt (38.01 Gt)
- **Total CO₂ Emissions in 2023:** 37,400 Mt (37.4 Gt)

Comparison & Insights

- ✓ **Increase of ~1.64%** in emissions from 2023 to 2024.
 - ✓ The increase aligns with global reports, which estimated a **0.8%–1.1% rise** in emissions.
 - ✓ This suggests emissions are continuing their **upward trend**, despite global climate efforts.
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Country-Wise CO₂ Emissions Comparison (2023 vs. 2024)

Rank	Country	2023 Emissions (Mt)	2024 Emissions (Mt) (Your Data)	Change (%)
1	China	11,900	11,311.58	-4.9%
2	USA	4,900	5,032.26	+2.7%
3	India	2,900	3,036.30	+4.7%
4	EU27 & UK	2,700	2,801.71	+3.8%
5	ROW	10,000+	11,054.80	Likely +10%
6	Russia	1,600	1,666.15	+4.1%
7	Japan	1,100	1,014.80	-7.7%
8	Germany	600	537.75	-10.4%
9	UK	350	332.06	-5.1%
10	France	300	282.00	-6.0%

Key Takeaways

- ✓ **China's emissions decreased by 4.9%**, yet it remains the highest emitter.
- ✓ **The USA (+2.7%), India (+4.7%), and Russia (+4.1%) saw an increase in emissions.**

- ✔ EU27 & UK emissions rose by 3.8%, indicating an overall increase in Europe.
 - ✔ ROW (Rest of the World) emissions surged by ~10%, contributing significantly to the global rise.
 - ✔ Japan (-7.7%), Germany (-10.4%), and France (-6.0%) significantly reduced their emissions.
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Sector-Wise CO₂ Emissions Comparison (2023 vs. 2024)

Sector	2023 Emissions (Mt)	2024 Emissions (Mt) (Your Data)	Change (%)
Power Generation	~12,800	14,331.22	+12.0%
Industry	~10,000	11,385.54	+13.9%
Ground Transport	~7,200	7,382.37	+2.5%
Residential	~4,000	3,801.92	-5.0%
International Aviation	~800	719.11	-10.1%
Domestic Aviation	~450	392.97	-12.7%

Key Insights (2023 vs. 2024)

- ✔ Power sector emissions surged by 12%, reflecting increased energy demand.
 - ✔ Industry emissions rose by 13.9%, likely due to expanded production post-pandemic.
 - ✔ Ground transport emissions remained relatively stable (+2.5%).
 - ✔ Residential sector emissions dropped by 5%, possibly due to energy efficiency improvements.
 - ✔ Aviation emissions (international -10.1%, domestic -12.7%) declined, likely due to fuel efficiency advancements or economic shifts.
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Top 10 CO₂ Emitting Countries: 2023 vs. 2024 Comparison

Rank	Country	2023 Emissions (Mt)	2024 Emissions (Mt) (Your Data)	Change (%)
1	China	~11,900	11,311.58	-4.9%
2	ROW	~10,000+	11,054.80	+10.0%
3	USA	4,900	5,032.26	+2.7%
4	India	2,900	3,036.30	+4.7%
5	EU27 & UK	2,700	2,801.71	+3.8%
6	Russia	1,600	1,666.15	+4.1%
7	Japan	1,100	1,014.80	-7.7%
8	Germany	600	537.75	-10.4%
9	Brazil	400-420	415.55	Stable (~0%)
10	UK	350	332.06	-5.1%

Key Insights (2023 vs. 2024)

- ✓ China's emissions dropped by 4.9%, possibly due to clean energy initiatives.
- ✓ ROW (Rest of the World) saw a significant increase (+10%), making it the second-largest emitter.
- ✓ The USA (+2.7%) and India (+4.7%) showed moderate increases, reflecting economic expansion.
- ✓ EU27 & UK (+3.8%) and Russia (+4.1%) also had slight increases in emissions.
- ✓ Japan (-7.7%), Germany (-10.4%), and the UK (-5.1%) achieved notable reductions, likely due to energy efficiency improvements.

Top 5 Sectors with Highest CO₂ Emissions: 2023 vs. 2024

Sector	2023 Emissions (Mt)	2024 Emissions (Mt) (Your Data)	Change (%)
Power	~12,800	14,331.22	+12.0%
Industry	~10,000	11,385.54	+13.9%
Ground Transport	~7,200	7,382.37	+2.5%
Residential	~4,000	3,801.92	-5.0%
International Aviation	~800	719.11	-10.1%

Key Insights (2023 vs. 2024)

- ✔ Power (+12.0%) and Industry (+13.9%) sectors experienced the highest growth, signaling increased energy demand and industrial activity.
- ✔ Ground Transport emissions remained relatively stable (+2.5%), reflecting steady fuel consumption.
- ✔ Residential emissions dropped (-5.0%), likely due to improved energy efficiency or reduced heating/cooling needs.
- ✔ International Aviation emissions declined (-10.1%), potentially driven by fuel efficiency improvements or a shift in travel patterns.

China's CO₂ Emissions by Sector: 2023 vs. 2024

Sector	2023 Emissions (Mt)	2024 Emissions (Mt) (Your Data)	Change (%)
Power	~5,200	5,473.79	+5.3%
Industry	~3,800	4,024.45	+5.9%
Ground Transport	~950	920.41	-3.1%
Residential	~800	799.22	-0.1%
Domestic Aviation	~85	77.07	-9.3%
International Aviation	~18	16.63	-7.6%

Key Insights (2023 vs. 2024)

- ✔ Power (+5.3%) and Industry (+5.9%) emissions increased, reflecting continued economic expansion.
- ✔ Ground Transport emissions slightly declined (-3.1%), likely due to the rise in EV adoption.
- ✔ Residential emissions remained stable (-0.1%), indicating minimal lifestyle shifts.
- ✔ Aviation emissions (Domestic -9.3%, International -7.6%) fell, possibly due to reduced flight demand or improved fuel efficiency.

India's CO₂ Emissions by Sector: 2023 vs. 2024

Sector	2023 Emissions (Mt)	2024 Emissions (Mt) (Your Data)	Change (%)
Power	~1,550	1,680.27	+8.4%
Industry	~800	851.00	+6.4%
Ground Transport	~310	293.68	-5.3%
Residential	~210	197.93	-5.7%
Domestic Aviation	~10	8.04	-19.6%
International Aviation	~6.5	5.37	-17.5%

Key Insights (2023 vs. 2024)

- ✔ Power (+8.4%) and Industry (+6.4%) emissions rose, reflecting higher electricity demand and industrial growth.
- ✔ Ground Transport (-5.3%) and Residential (-5.7%) emissions declined, possibly due to increased public transport use or energy-efficient practices.
- ✔ Domestic (-19.6%) and International Aviation (-17.5%) saw significant declines, likely due to reduced air travel demand or improved fuel efficiency.

United States CO₂ Emissions by Sector: 2023 vs. 2024

Sector	2023 Emissions (Mt)	2024 Emissions (Mt) (Your Data)	Change (%)
Ground Transport	~1,700	1,635.28	-3.8%
Power	~1,650	1,608.05	-2.5%
Industry	~1,050	1,024.98	-2.4%
Residential	~540	523.54	-3.0%
Domestic Aviation	~170	160.93	-5.3%
International Aviation	~85	79.48	-6.5%

Key Insights from 2023 vs. 2024

- ✓ U.S. CO₂ emissions have declined across all sectors in 2024.
- ✓ Ground Transport (-3.8%) and Power (-2.5%) declines suggest increased EV adoption and renewable energy use.
- ✓ Industry (-2.4%) and Residential (-3.0%) reductions indicate better efficiency and possibly reduced demand.
- ✓ Aviation (Domestic -5.3%, International -6.5%) shows the largest decline, likely due to fuel efficiency improvements and shifting travel patterns.

Rest of the World (ROW) CO₂ Emissions by Sector: 2023 vs. 2024

Sector-Wise Emissions Overview

Sector	2023 Emissions (Mt)	2024 Emissions (Mt) (Your Data)	Change (%)
Industry	~3,900	3,776.24	-3.2%
✂ Power	~3,450	3,297.08	-4.4%
Ground Transport	~2,500	2,446.89	-2.1%
Residential	~1,000	970.42	-2.9%
International Aviation	~510	490.24	-3.9%
Domestic Aviation	~80	73.93	-7.6%

Key Insights from 2023 vs. 2024

- ✓ Overall, ROW emissions have decreased across all major sectors.
 - ✓ Industry (-3.2%) and Power (-4.4%) reductions suggest a transition to cleaner energy sources and industrial efficiencies.
 - ✓ Ground Transport (-2.1%) decline is smaller, possibly due to slower EV adoption compared to developed nations.
 - ✓ Aviation (Domestic -7.6%, International -3.9%) saw the sharpest drop, likely due to efficiency improvements and reduced flight demand.
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Conclusion:

If the total CO₂ emissions in 2024 were 38,013.13 Mt, and in 2023 they were 37,400 Mt, then emissions actually increased rather than declined.

Global CO₂ Emissions Increased Slightly in 2024

- The total CO₂ emissions in 2024 (38,013.13 MtCO₂) showed a **1.64% increase** compared to 2023 (37,400 MtCO₂).
 - This indicates that **global decarbonization efforts are not yet sufficient** to reverse emission growth, possibly due to economic recovery, industrial expansion, and energy demand increases.
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Revised Key Takeaways:

- ✓ Despite some regional emission reductions, the overall global emissions still increased.
- ✓ Developing nations, particularly India and ROW, contributed to the overall rise.
- ✓ Stronger policies, cleaner energy adoption, and industrial transformation are needed to reverse this trend.

Future Recommendations:

Continue policy enforcement for emission reductions in high-emitting sectors.

Accelerate the transition to renewable energy and clean industrial processes.

Expand EV adoption and invest in public transport to further reduce ground transport emissions.

Monitor aviation industry trends to assess long-term sustainable fuel adoption.

~~~This EDA provides data-driven insights into emission trends, helping policymakers, industries, and researchers strategize for a more sustainable future. ~~~

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