SDG Goal 9 Industry, innovation and infrastructure

SDG Target 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

SDG Indicator 9.4.1 CO2 emission per unit of value added

1. Name of time series	
CO_2 emissions per real GDP	
Compliant with global metadata: yes	Global Metadata

2. Definition of time series
The time series shows the CO_2 intensity of the total economy. By indicating how much CO_2 is emitted (needed) to produce one unit of gross domestic product (GDP), the carbon intensity is a proxy for clean technology production and the developmental state of an industry. The time series does not include emissions from land use, land-use change and forestry.
3. Comparison with global metadata (as of 13/03/2018)
GDP used in the calculation of the time series is given in terms of Euro and not in terms of US dollar as requested in the global metadata.

4. Data description	
The data on CO_2 are taken from the National Inventory Report submitted under the United Nations Framework Convention on Climate Change 2009 by the German Environment Agency (UBA). The data on GDP are calculated by the Federal Statistical Office's National Accounts as a secondary statistic. GDP is adjusted based on a price base changing every five years(constant prices). After several revisions due to new data input, final results are available four years after the first preliminary release.	
5. Calculation method	
CO_2 emissions per real GDP $= \frac{\text{Total } CO_2 \text{ emissions [g]}}{\text{Price adjusted GDP [Euro]}}$	
6. Unit of measure	g/EUR

7. Timeliness	8. Frequency
CO_2: t + 17 months GDP: t + 15 days	Annual
9. Last regular revision	10. Revised period
2014	2010-2014

11. Accessibility of source data
Table on trend summary – Green House Gas (GHG) Inventory UBA (only available in German): “Berichte und Daten” - “Trendtabellen Treibhausgase 1990-20XX” https://www.umweltbundesamt.de/themen/klima-energie/treibhausgas-emissionen National accounts - Gross value added, gross domestic product – GENESIS online, table 81000-0001 https://www-genesis.destatis.de/genesis//online?operation=table&code=81000-0001&bypass=true&language=en
12. Metadata on source data
Submission under the United Nations Framework Convention on Climate Change and the Kyoto Protocol 2020, Chapter 1 https://www.umweltbundesamt.de/publikationen/submission-under-the-united-nations-framework-5 Quality report "Economy", National Accounts https://www.destatis.de/EN/Methods/Quality/QualityReports/_node.html

SDG Goal 9 Industry, innovation and infrastructure

SDG Target 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

SDG Indicator 9.4.1 CO2 emission per unit of value added

13. Name of time series	
CO_2 emissions per gross value added (price adjusted) in manufacturing industries	
Compliant with global metadata: yes	Global Metadata

14. Definition of time series
The time series shows the CO_2 intensity of the manufacturing sector. By indicating how much CO_2 is emitted (needed) to produce one unit of gross value added, this carbon intensity is a proxy for clean technology production and the developmental state of an industry.
15. Comparison with global metadata (as of 13/03/2018)
Gross value added used in the calculation of the time series is given in terms of Euro and not in terms of US dollar as requested in the global metadata.

16. Data description
The data on CO_2 emissions and value added of manufacturing sector have been calculated by the Federal Statistical Office of Germany as secondary statistics. The emissions are based on the national energy balance by the Working Group on Energy Balances (AGEB). Gross value added of manufacturing sector is calculated at constant 2010 price. For price adjustment, the nominal value of 2010 is taken as basis year. This value is then multiplied by the prices of 2010 adjusted index for gross value added of the reference year. After several revisions of the indexes due to new data input, final results are available 4 years after the first preliminary release.
17. Calculation method
CO_2 emissions per gross value added in manufacturing industries (prive adjusted) $= \frac{CO_2 \text{ emissions in manufacturing sector [g]}}{\text{Price adjusted gross value added in manufacturing sector [Euro]}}$

18. Unit of measure	g/EUR

19. Timeliness	20. Frequency
CO_2: t + 17 months Value added: t + 14 months	Annual
21. Last regular revision	22. Revised period
Not available	Not available

23. Accessibility of source data
Air emissions: Germany, years, type of air emission, homogeneous branches – GENESIS online 85111-0001 https://www-genesis.destatis.de/genesis//online?operation=table&code=85111-0001&bypass=true&language=en Gross value added: Persons employed, turnover, output and value added of enterprises in manufacturing – GENESIS online, table 42251-0001 https://www-genesis.destatis.de/genesis//online/data?operation=table&code=42251-0001&bypass=true&language=en Index of gross value added: National accounts - Gross value added (nominal/price-adjusted) – GENESIS online, table 81000-0103 https://www-genesis.destatis.de/genesis//online/data?operation=table&code=81000-0103&bypass=true&language=en
24. Metadata on source data
Emissions (only available in German): “Methode der Luftemissionsrechnung“ https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Umwelt/UGR/energiefluesse-emissionen/Publikationen/Downloads/methode-luftemissionsrechnung-5851317199004.pdf Industry and manufacturing industry (only available in German): “Branchen und Unternehmen – Industrie, Verarbeitendes Gewerbe” https://www.destatis.de/DE/Methoden/Qualitaet/Qualitaetsberichte/Industrie-Verarbeitendes-Gewerbe/einfuehrung.html