



Department
of Energy &
Climate Change

UK greenhouse gas emissions: 3rd quarter 2014 provisional figures

Statistical Release: Official statistics

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This document is also available from our website at <https://www.gov.uk/government/publications/quarterly-uk-emissions-estimates>

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Executive summary

Headline results for the year to quarter 3 2014

- Total greenhouse gas emissions have been provisionally estimated at 532.2 million tonnes carbon dioxide equivalent (MtCO₂e) over the four quarters to Q3 2014, a decrease of 8.5 MtCO₂e (1.6 per cent) compared to the year up to Q2 2014, when emissions were estimated to be 540.7 MtCO₂e.
- On a temperature adjusted basis, greenhouse gas emissions for the year to Q3 2014 have been provisionally estimated at 548.9 MtCO₂e. This is around 1.2 per cent lower than in the four quarters to Q2 2014, when emissions were estimated to be 555.5 MtCO₂e. Emissions measured on a temperature adjusted basis were higher than actual emissions. This reflects the fact that, on the whole, temperatures over the last four quarters were higher than the long term average.
- Actual and temperature adjusted emissions are both lower than in the year up to Q2 2014. This was due to a decrease in the amount of coal used for electricity generation. The decrease in coal was driven by the closure of some coal generation plants, and lower gas prices which led to an increase in gas used for generation, alongside increased renewables and a reduction in overall electricity generation when comparing Q3 2014 with Q3 2013.

Introduction

These estimates are Official Statistics, and were rebadged from Experimental Statistics in October 2014 following a review of the underlying methodology. More information about the review, and the underlying methodology, can be found in the accompanying [methodology document](#).

These statistics provide users with a first estimate of how emissions are changing in 2014, ahead of the annual provisional emissions statistics for 2014, which will be published on 26th March 2015. The final inventory figures for 2014 will be published in February 2016. This publication also provides an estimate of temperature adjusted emissions, which give an idea of overall trends in emissions without fluctuations due to changes in external temperature.

This publication will be of interest to those wanting an early indication of the broad trend of emissions, as well as others interested in greenhouse gas emissions in the UK. They give an early indication of emissions trends to those interested in whether we are on track to meet future targets. The statistics are estimates based on provisional inland energy consumption statistics for CO₂ emissions (around 80% of all greenhouse gas emissions), with other greenhouse gas emissions remaining constant for each quarter, reflecting the absence of quarterly data. As such they are not used directly to monitor progress against UK emissions targets. For information on UK emissions targets and progress towards them, see the [Final UK Greenhouse Gas inventory](#).

Quarterly emissions estimates are presented for the latest twelve month period ending at the end of the stated quarter. For example, emissions for the year to Quarter 3, 2014, represent an annual total comprising Quarter 3 2014, and the preceding 3 quarters, quarters 4, 2013 and Quarter 1 and 2, 2014. Presenting the data in this way has some advantages over presenting data for single quarters, since seasonal fluctuations are smoothed out and long term trends highlighted (see page 9 for more on methodology). Data on emissions in individual quarters are available in the data tables published alongside this publication.

Data for 2009-2012 are consistent with the annual emissions presented in the National Statistics publication 'Final UK Greenhouse Gas Emissions'. Data for 2013 and 2014 emissions are provisional and are calculated based on UK energy statistics.

Results

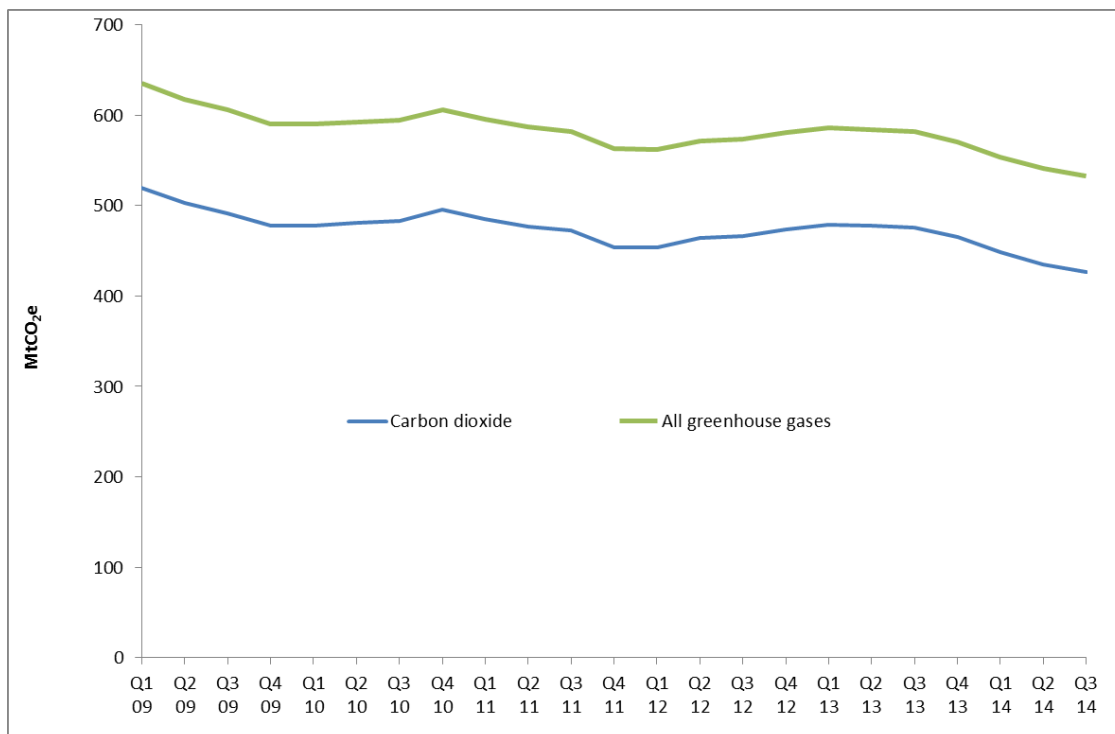
3rd quarter 2014 greenhouse gas emissions estimates

Table 1: Emissions of all greenhouse gases and carbon dioxide only (MtCO₂e)

	Year to Q2 2014	Year to Q3 2014	Change
Total GHG emissions	540.7	532.2	-1.6%
Temperature adjusted GHG emissions	555.5	548.9	-1.2%
Total CO ₂ emissions	435.1	426.6	-1.9%
Temperature adjusted CO ₂ emissions	449.9	443.3	-1.5%

1. CO₂ emissions figures are for the UK and Crown Dependencies; Greenhouse gas emissions figures also include some Overseas Territories.
2. Non-CO₂ emissions have not been temperature adjusted.
3. The figures labelled as “Q3 2014” cover the four quarters from Q4 2013 to Q3 2014 inclusive.

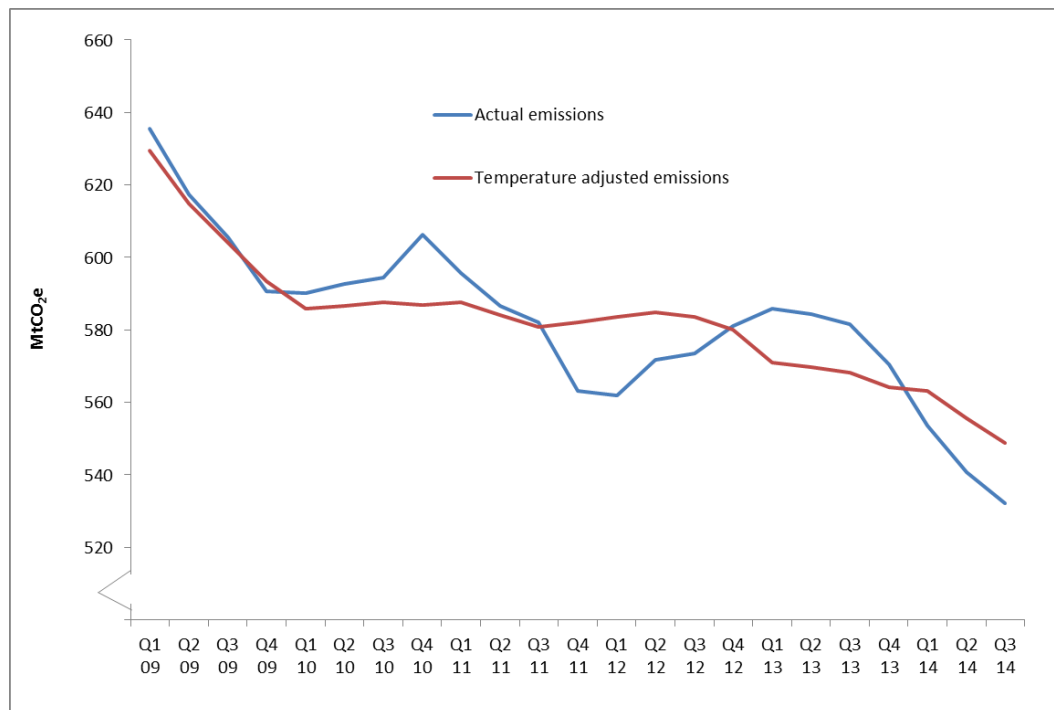
Figure 1: Actual emissions of all greenhouse gases and carbon dioxide, Year to Q1 2009 – Year to Q3 2014 (Mt CO₂e)



1. Figures are annual totals including the preceding 4 quarters
2. From Q1 2013 onwards, figures include provisional data

A temperature adjustment has been applied to the quarterly CO₂ emissions, in order to estimate what the overall trend of emissions would have been without the impact of external temperatures. Both the non-adjusted and the temperature adjusted emissions are shown in Figure 2 below.

Figure 2: Actual and temperature adjusted GHG emissions; Year to Q1 2009 Year to Q3 2014 (Mt CO₂e)



1. Figures are annual totals including the preceding 4 quarters
2. From year to Q1 2013 onwards, figures include provisional data

Both the non-adjusted and the temperature corrected series show a general decreasing trend since 2009, with non-adjusted emissions having decreased by 16 per cent and temperature adjusted emissions by 13 per cent in the year to Q3 2014, compared to the year to Q1 2009.

On a temperature adjusted basis, emissions remained relatively flat during the period between late 2010 and early 2012, while non-adjusted emissions were much more variable during this period, showing that much of the fluctuation can be attributed to change in energy use due to varying external temperatures. In particular, the 4th quarter of 2010 was 2.4 degrees lower than the long term average, while temperatures in Q4 2012 and Q1 2013 were 1.7 and 0.9 degrees higher. Both temperature adjusted and non-adjusted emissions have been falling during 2013 and 2014.

More information regarding the long term trends in emissions in each sector can be found in the [Final UK Greenhouse Gas Inventory](#) release.

Comparing the year up to Q3 2014 with the year up to Q2 2014, actual and temperature adjusted emissions are both lower.

This was mainly due to a decrease in the amount of coal used for electricity generation. The decrease in coal was driven by the closure of some coal generation plants, and lower gas prices which led to an increase in gas used for generation, alongside increased renewables and a reduction in overall electricity generation when comparing Q3 2014 with Q3 2013. See [Energy Trends](#) for further information about changes in the energy sector overall.

Carbon dioxide emissions by source sector – actual emissions

Table 2: Sources of carbon dioxide (CO₂) emissions, provisional sectoral breakdown, actual data (MtCO₂)

	Year to Q2 2014	Year to Q3 2014	Change (Mt)	Change (%)
Energy Supply	163.7	156.3	-7.3	-4.5%
Business	74.3	73.1	-1.2	-1.6%
Transport	116.6	117.0	0.4	0.3%
Public	9.5	9.5	0.0	0.0%
Residential	64.5	64.2	-0.3	-0.5%
Other	6.5	6.5	0.0	-0.1%
Total CO₂	435.1	426.6	-8.5	-1.9%

1. The figures labelled as “Q3 2014” cover the four quarters from Q4 2013 to Q3 2014 inclusive.

2. Figures for “Total CO₂” and “Change” may be different to the sum of those presented in the table due to rounding.

Carbon dioxide emissions decreased in most sectors, with the largest decrease in the energy supply sector (7.3 Mt or 4.5 per cent). Emissions in the business sector showed the next largest decrease (1.2 Mt or 1.6 per cent), emissions in other sectors changed relatively little.

Carbon dioxide emissions by source sector – temperature adjusted emissions

Table 3: Sources of carbon dioxide emissions, provisional sectoral breakdown – temperature adjusted data (MtCO₂)

	Year to Q2 2014	Year to Q3 2014	Change (Mt)	Change (%)
Energy Supply	168.1	161.3	-6.8	-4.0%
Business	76.5	75.6	-0.9	-1.2%
Transport	116.6	117.0	0.4	0.3%
Public	10.1	10.2	0.1	0.7%
Residential	72.1	72.7	0.6	0.8%
Other	6.5	6.5	0.0	-0.1%
Total CO₂	449.9	443.3	-6.7	-1.5%

1. The figures labelled as "Q3 2014" cover the four quarters from Q4 2013 to Q3 2014 inclusive.
2. Figures for "Total CO₂" and "Change" may be different to those presented in the table due to rounding.
3. Energy Supply, Business, Public and Residential are the only sectors that are temperature adjusted.

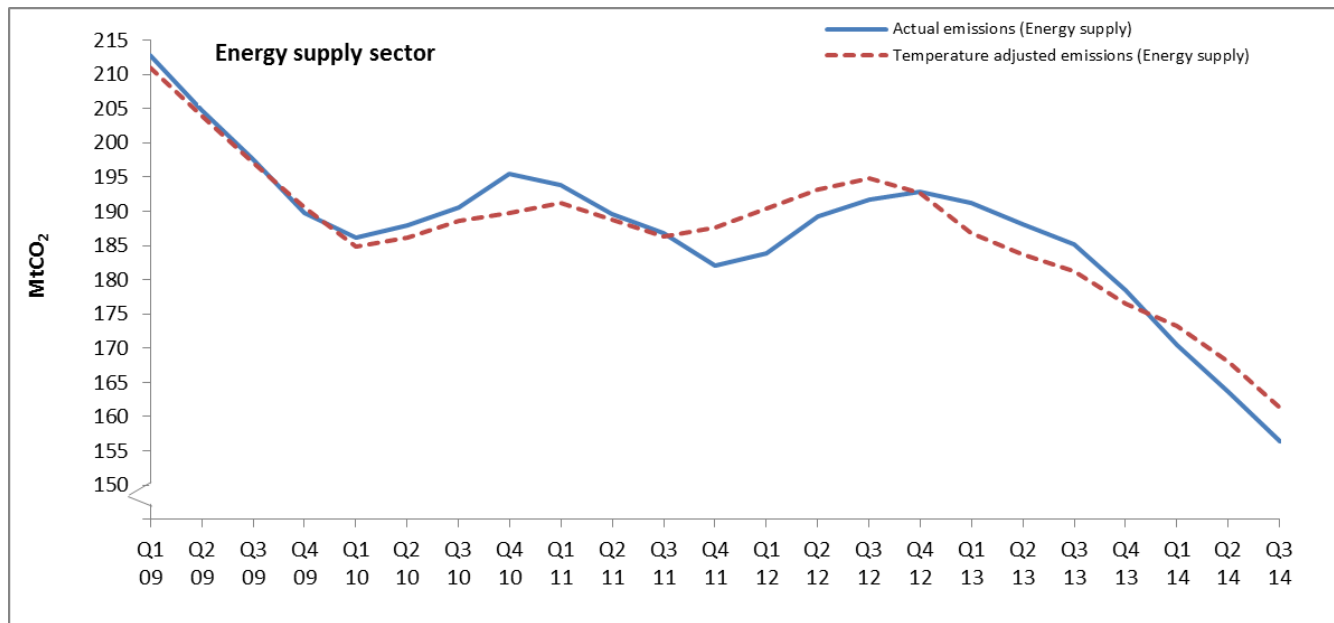
Again, carbon dioxide emissions decreased most in the energy supply sector (6.8 Mt or 4.0 per cent) with the next largest reduction in the business sector, which reduced by 0.9 Mt (1.2 per cent).

The sectors most influenced by temperature are residential and energy supply. With respect to the residential sector in particular, if temperatures increase there is a decrease in demand for space heating, resulting in a decrease in emissions. The reverse is true if temperatures decrease.

In the year to quarter 3 2014, when comparing tables 2 and 3 above, adjusting emissions for temperature increases emissions from the energy supply sector by 4.9 Mt (from 156.3 to 161.3 Mt), and from the residential sector by 8.5 Mt (from 64.2 to 72.7 Mt).

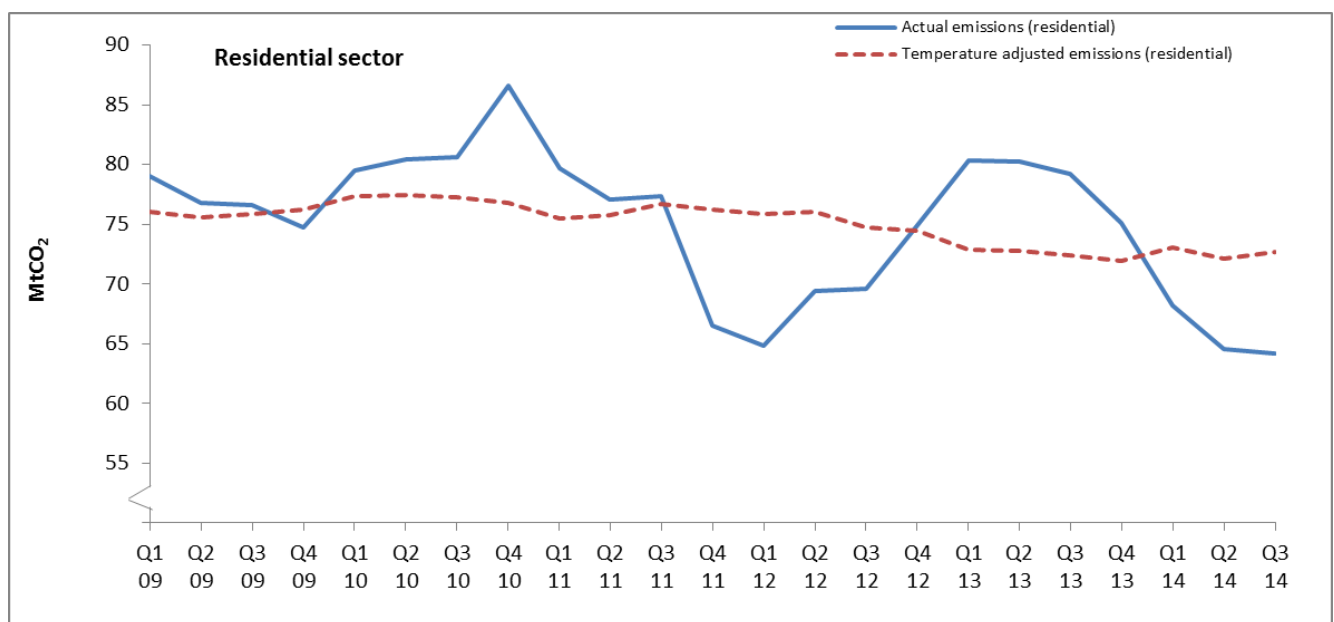
Figures 3 and 4 below shows the trend for these two sectors. As can be seen in the chart, temperature adjusted emissions from the energy supply sector show a similar trend to non-adjusted emissions. Temperature adjusted emissions in the energy supply sector have decreased by around 24 per cent compared to the year to Q1 2009, while non-adjusted emissions have decreased by around 27 per cent in the same period.

Figure 3: Energy supply emissions – actual and temperature adjusted data, Year to Q1 2009 – Year to Q2 2014 (MtCO₂)



In the residential sector, the difference between actual and temperature adjusted emissions is much more noticeable than in other sectors, reflecting the fact that this is the sector in which energy consumption and emissions are most sensitive to external temperatures. On a temperature adjusted basis, residential emissions have remained relatively flat between the year to Q1 2009 and the year to Q3 2014, while the trend for non-adjusted emissions is much more variable over the same time period.

Figure 4: Residential emissions – actual and temperature adjusted data, Year to Q1 2009 – Year to Q3 2014 (MtCO₂)



Additional information

Basis of the provisional quarterly emissions estimates

The estimates of carbon dioxide emissions have been produced based on provisional inland energy consumption statistics which are published in DECC's quarterly [Energy Trends](#) publication.

Carbon dioxide accounts for the majority of UK greenhouse gas emissions (82 per cent in 2012). However, in order to give an indication of what the latest provisional quarterly carbon dioxide emissions estimates imply for the total, we need to also produce an estimate of emissions of the remaining non-CO₂ gases. Because of the lack of availability of underlying quarterly data sources for activities related to non-CO₂ gases, emissions from these gases are assumed to be the same during each quarter, based on the latest available published annual estimates. They have not been temperature adjusted, only carbon dioxide emissions have been adjusted for temperature.

Quarterly totals

In order to remove the seasonality in the data so that a trend in emissions over time can be observed, quarterly emissions are reported as annual totals, covering the stated quarter, plus the preceding three quarters. When data becomes available for each new quarter, the estimates for the latest quarter are added to the total, while at the same time the estimates for the same quarter from the previous year are removed from the series. This procedure smooths out short-term fluctuations and highlights long term trends, and can be used to show the underlying trend each quarter.

Emissions estimates for each individual quarter are reported in the data tables accompanying this publication.

Quarterly emissions estimates – temperature adjustment

Carbon dioxide emissions are indirectly influenced by external temperatures. During the winter months, emissions are generally higher than in summer months, due to higher demand for fuel for space heating. During a particularly cold winter for example, it is likely that more fuel will be burnt for domestic or commercial use than during an average winter, and therefore emissions will be higher due to the additional fuel consumption.

Temperature adjusted quarterly emissions estimates therefore remove the effect of external temperatures. In a particularly cold winter quarter, for example, this will result in temperature adjusted emissions being lower than actual emissions, reflecting the lower fuel consumption which would have occurred if temperatures had been at average levels (based on the 30 year period 1981-2010). The temperature adjustment to emissions has been applied for the months from September to April inclusive; in any given calendar year, it will therefore be applied in the period from January to April, and then again from September to December. Temperature adjustment is determined by the average number of heating degree days in each quarter. This information can be found in [Energy Trends](#).

Further details of how quarterly emissions have been estimated and of the methodology underlying the temperature adjusted estimates can be found alongside this statistical release in a separate [Methodology summary](#).

Revisions to the quarterly provisional emissions estimates

It should be noted that the quarterly emissions time series may be revised each quarter to reflect any revisions made to either the underlying energy data or to the UK greenhouse gas inventory. Emissions from 2009-2012 are consistent with the UK greenhouse gas inventory from 1990-2012. Emissions estimates for 2013 and 2014 are provisional and are based on UK energy statistics. More information on the timing of revisions to the underlying data can be found in the [Methodology summary](#).

Future updates to quarterly provisional emissions estimates

Quarterly provisional estimates help us to understand the latest trend in emissions, and will provide an early indication of this trend ahead of the final annual figures being available from our greenhouse gas emissions inventory. We recommend that users look at this trend rather than any absolute figures for any particular quarter.

It is important to note that these figures are based on provisional energy data and are subject to change. The sectorial breakdown is given mainly for information, and is included in the publication for completeness, but sectorial estimates are more uncertain than the total.

These estimates are Official Statistics, having been rebadged from Experimental Statistics in October 2014 following the detailed review of the methodology.

Provisional annual emissions for 2014 will be published on 26th March 2015. The corresponding quarterly emissions statistics for the year up to Q4 2014 will be published on 14th April.

Further information and feedback

Further information on UK greenhouse gas emissions statistics, including Excel tables with additional data on UK emissions, can be found on the Gov.uk website at:

<https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/uk-greenhouse-gas-emissions>

Notes for Editors

1. The annual figures for 1990 to 2012 in this statistics release are from the National Atmospheric Emissions Inventory (NAEI). For further information on the UK Greenhouse Gas Inventory, see the [NAEI web site](#).
2. Detailed UK temperature data can be found on both the [Met Office website](#) and the [Energy Statistics section of the Gov.uk website](#).
3. The complete [Methodology summary](#) on quarterly and temperature corrected emissions can be found on the Gov.uk website.
4. The basket of greenhouse gases we report for the purposes of the Kyoto Protocol consists of carbon dioxide, methane, nitrous oxide, and the three F-gases: HFCs, PFCs and SF₆. From 2015 onwards nitrogen trifluoride (NF₃) will also be added.
5. Any enquiries about the Energy Trends report should be sent to energy.stats@decc.gsi.gov.uk.
6. Figures up to and including the year to Quarter 4 2012 are based on final inventory data. Figures from the year to Quarter 1 2013 onwards include provisional estimates.

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