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**Research Report**

## IMK Inflation Monitor: Inflation differentials between households considerably lower in May 2023

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# POLICY BRIEF

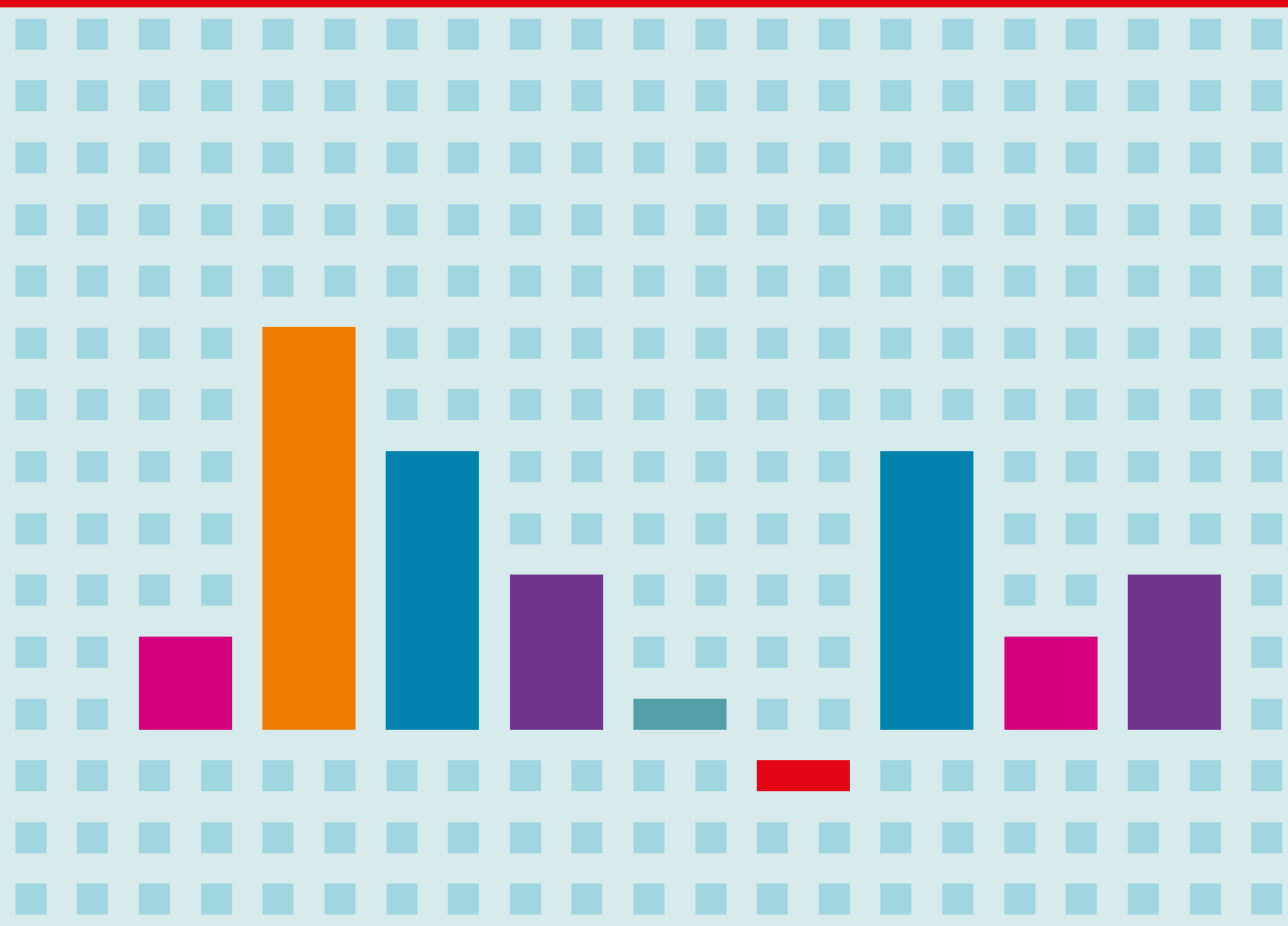
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## IMK INFLATION MONITOR

**Inflation differentials between households considerably lower in May 2023**

Sebastian Dullien, Silke Tober



# IMK INFLATION MONITOR

## Inflation differentials between households considerably lower in May 2023

Sebastian Dullien and Silke Tober<sup>1</sup>

### Summary

Germany's CPI inflation stood at 6.1% in May 2023 and was thus more than one percentage point lower than in April 2023 (7.2%). Food prices contributed slightly less to inflation, but at 2.1 percentage points still almost seven times as much as usual. The contribution of household energy was nine times higher than in more normal times, albeit with a lower weight in the consumer price index than food. Total energy prices increased by only 2.6% as fuel prices significantly fell over the past 12 months (-14.2%). Core inflation excluding energy, food, alcohol, and tobacco also declined and stood at 5.0% in May 2023 after 5.5% in April 2023.

Prices for household energy increased by 17.4% year on year, followed by food and non-alcoholic beverages (14.5%). As the share of food and household energy in consumption expenditure is strongly correlated with income, there are still noticeable differences between household-specific inflation rates.

In May 2023, the range of household-specific inflation rates was 1.5 percentage points. Low-income single adults, who benefited little from falling gasoline prices, had by far the highest inflation rate (6.9%), high-income single adults – as continuously since February 2022 – the lowest (5.4%). The difference in the combined burden of food and household-energy prices remains particularly pronounced. It amounted to 2.8 percentage points, with food and household energy contributing 4.7 percentage points to inflation for low-income single adults, compared to 1.9 percentage points for high-income single adults.

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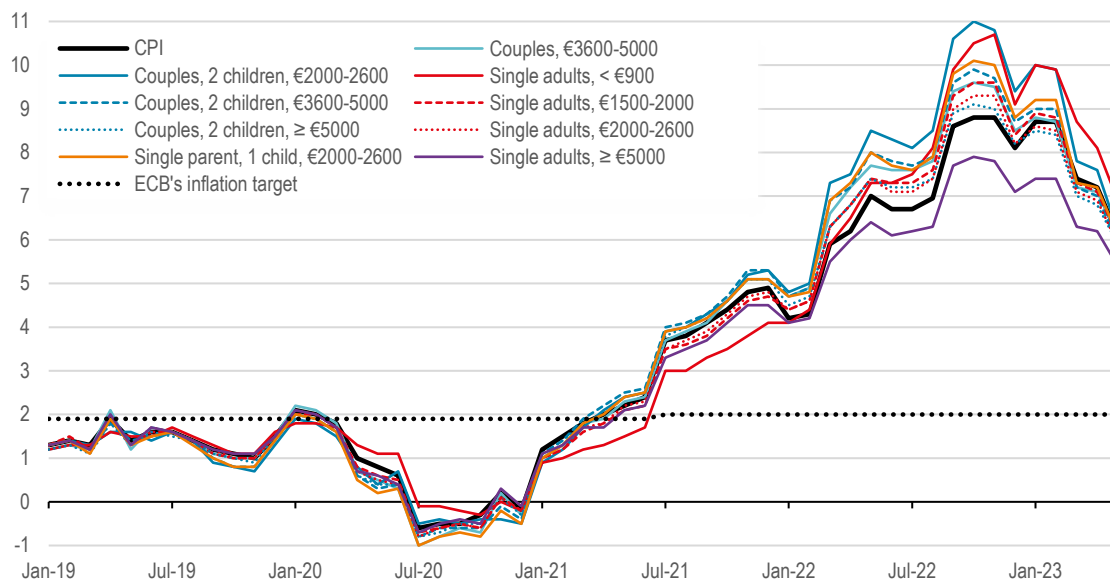
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## Household-specific inflation rates converge as inflation falls

At 6.1%, the Germany's CPI inflation was more than one percentage point lower in May 2023 than in the previous month (7.2%). Prices of food including beverages and tobacco contributed 2.1 percentage points to inflation, 0.3 percentage points less than in the previous month, and the contribution of energy (household energy and fuels) decreased as well. At 5.0%, core inflation, that excludes food and energy, was well below the March 2023 peak of 5.6%. Among the items in the core rate, prices of air travel (26.4%), package holidays (13.9%), campers and trailers (13.7%), personal care items (12.8%), and expenditures for pets rose particularly strongly, but restaurant and accommodation services (9.3%) also increased significantly. High price increases continued across all categories apart from post and telecommunications (0.5%).

**Figure 1: Household-Specific Inflation Rates and Inflation, January 2019 – May 2023**

Annual change in the household-specific consumer price indices, in %



Sources: Consumer price statistics and Survey of Income and Expenditure 2018, Federal Statistical Office; IMK calculations.



As shown in Tober (2022a-b), Dullien/Tober (2022a-i), Endres/Tober (2022), Dullien/Tober (2023a-d) and Tober (2023), the burden of inflation on different types of households, reflected in household-specific inflation rates, has varied considerably over the past 15 months. Figure 1 shows nine household-specific inflation rates and how they evolved since 2019. The strong divergence between the rates only materialized over the course of 2022, subsequent to the energy and food price shocks. Initially, low-income families were affected the most. Since March 2023, however, falling year-on-year fuel prices have lowered the inflation rate of low- and middle-income families most, so that low-income single adults have experienced the highest inflation rate during the past three months. At the beginning of 2023, when the gasoline price shock faded and food prices increased greatly, both low-income household groups shared the highest inflation rate of 10 % in January and 9.9% in February (Figures 1 and 3). The low share of motor fuels in consumption expenditure was also an important reason why the inflation rate of low-income single adults was

the lowest between February and December 2021. The last time all household-specific inflation rates were close to each other was in January 2021. At that time, prices for household energy fell (-1.3%) and even more so for fuels and lubricants (-2.9%), while food and non-alcoholic beverages increased by 1.8% and the overall consumer price index rose by 1.2%.

## Price shocks are gradually fading

The year-on-year increase in energy prices (household energy and motor fuels) in the German consumer price index was only 2.6% in May 2023; the peak was reached in September last year at 36.5%. Compared to April 2023, energy prices fell by 1.4%, with household energy prices falling by -0.6% and fuel prices by -2.6%. Despite the gas price brake,<sup>2</sup> the price of natural gas rose by 0.7%, while the prices of electricity and heating oil fell by 0.5% and 5.5% respectively. Year on year, natural gas prices increased by 40.3%, followed by electricity prices with 12.7%, while heating oil was 5.6% less expensive than a year earlier.<sup>3</sup> Fuel prices declined by 14.2% year on year and for the third month in a row.

Many food prices should also trend downwards in the coming months. Butter prices, which were 23.3% lower in May 2023 than in May 2022 and 4.2% lower than before the Ukraine war, are currently the exception. But sunflower oil also cost less than 12 months ago, pork was only 1.4% more expensive and dairy prices have at least fallen since April 2023. In May 2023, global food prices were 21% lower year on year, whereas the prices of dairy products and eggs, vegetables, and cereal products in German grocery stores were still 25.3%, 17.3% and 17.1% higher, respectively. Therefore, price reductions are likely in the near future, all the more so because energy costs are also coming down.

Figure 2 illustrates the pronounced calming on the international energy and commodity markets. The euro price of Brent crude oil in May 2023 was 35% lower than one year earlier, although still exceeding the 2019 level by 21%. International food prices, which have been falling steadily since their peak in March 2022, were 21% lower year on year, albeit still 31% higher than in 2019. Natural gas prices that increased most sharply in 2022, have now fallen the most. They were 64% lower in May 2023 than in May 2022, but still exceeded the 2019 level by 133%.

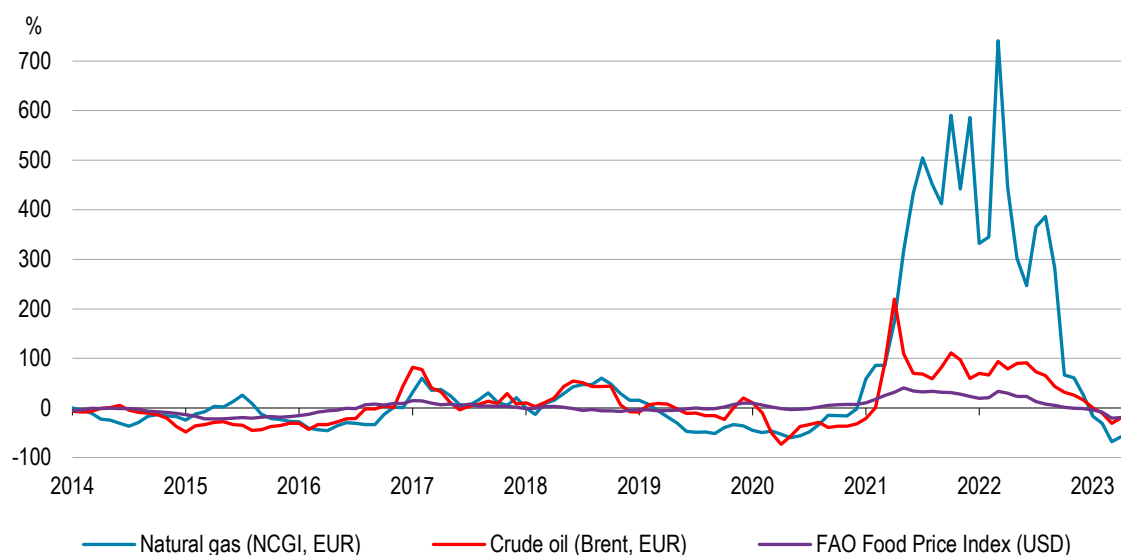
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<sup>2</sup> For private households, the gas price brake caps the price of natural gas at 12 ct/kWh for 80% of the amount consumed in the past as of January 2023.

<sup>3</sup> Including operating costs of communal central heating in apartment buildings. For households with individual heat meters, the annual price increase in May 2023 was 25.6% for natural gas and -30.5% for heating oil, with prices decreasing by 0.7% and 9.3% compared to April 2023, respectively.

**Figure 2: International Commodity Prices**

Annual percentages changes, in %, January 2014 – May 2023



Sources: European Central Bank; FAO; Macrobond; U.S. Energy Information Administration; IMK calculations.



## Food prices continue to dominate inflation differentials between household groups in May 2023

Since the beginning of 2022, the monthly IMK Inflation Monitor has used household-specific inflation rates to examine how the price shocks since mid-2021 have affected different household groups (Tober 2022a-b; Dullien/Tober 2022a-i; Endres/Tober 2022; Dullien/Tober 2023a-d; Tober 2023). Like the inflation rate of the Federal Statistical Office, the household-specific inflation rates are calculated as the annual percentage change in weighted consumer prices. However, whereas the household-specific inflation rates continue to be based on the 2018 Survey of income and consumption, as of this year, the Federal Statistical Office calculates the consumer price index on the basis of weights derived primarily from the national accounts (Federal Statistical Office, Dullien and Tober 2023b).

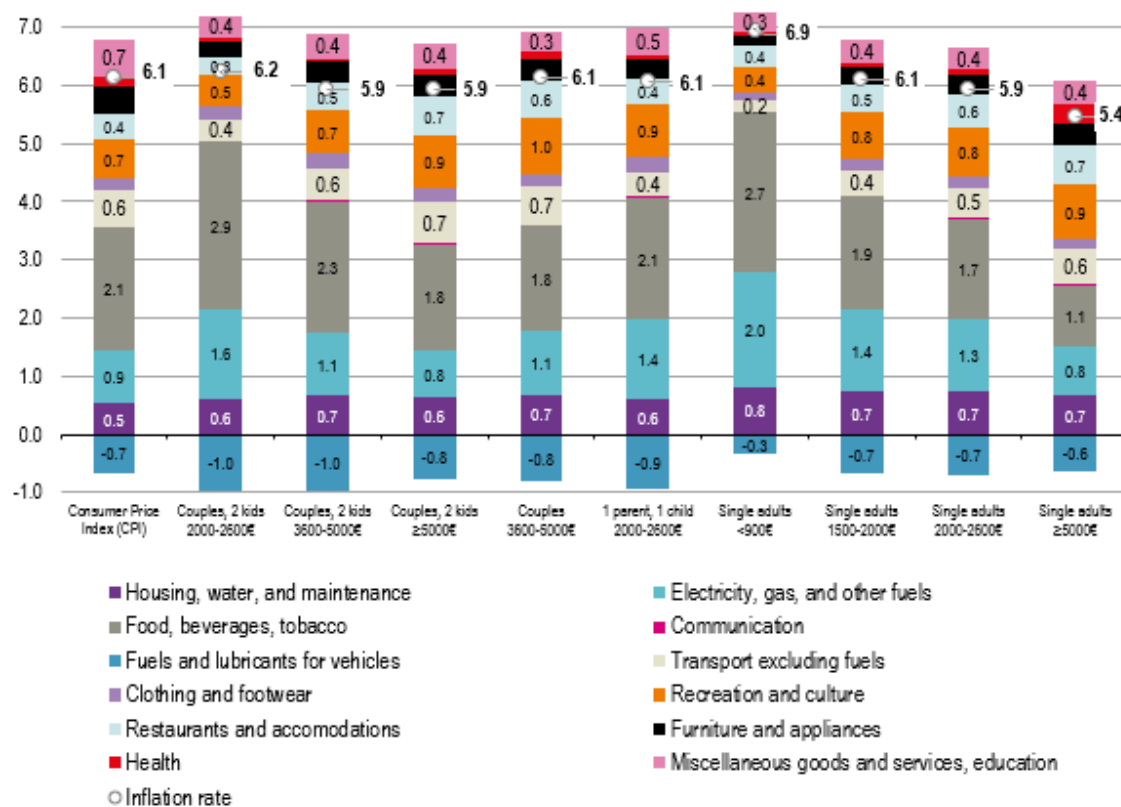
Figure 3 shows the household-specific inflation rates calculated on the basis of 30 expenditure items and the contributions of 12 summary items to the respective inflation rate of the nine representative household groups as well as for overall consumer price inflation.<sup>4</sup>

The highest inflation rate of 6.9% in May 2023 was recorded for low-income single adults. The lowest inflation rate of 5.4% was for single adults with a net income of more than €5,000, as has been the case since February 2022 (Figure 1). For low-income couples with two children, the inflation rate was 6.2% and for single parents with one child 6.1%, while for families with higher incomes it was 5.9%. Overall, the range of inflation rates, while still substantial at 1.5 percentage

<sup>4</sup> The 30 expenditure items are shown in Table 2 of the annex. The 12 subgroups deviate from the 12 CPI groups to highlight the dominant components during the current price-shock driven inflationary episode. Accordingly, household energy was extracted from division 4 (housing) and motor fuels and lubricants from division 7 (transport). With the aim of clarity, we combined divisions 1 and 2 into the subgroup food, beverages, tobacco, and added education (division 10) to division 12 (other goods and services) as it has a low CPI-weight of 0.9% and currently unremarkable price movements.

points, is less than half of the peak range in October 2022 (3.1 percentage points) and 0.4 percentage points lower than in April 2023.

**Figure 3: Household-Specific Inflation Rates and Item Contributions in May 2023<sup>1</sup>**  
in % and percentage points, respectively



<sup>1</sup> Several of the weights for „Couples with 2 kids (€2,000-2,600)“ are uncertain according to the Federal Statistical Office because very few households provided information.

The methodology for calculating household-specific inflation rates is described in (2022a).

Sources: Federal Statistical Office; IMK calculations.



Considering only the price increases in the expenditure categories "food, beverages, tobacco" and "household energy" yields even more pronounced differences between household groups. Low-income single adults recorded a combined inflation contribution of 4.7 percentage points in May 2023, compared to 1.9 percentage points in the case of high-income singles; low-income couples with two children a contribution of 4.4 percentage points compared to 3.3 percentage points in the case of the corresponding middle-income family (Table 1).<sup>5</sup>

Food, beverages, and tobacco contributed 2.1 percentage points to the household-specific inflation rate of low-income couple households with children, compared to 1.8 percentage points for high-income families and 1.1 percentage points for high-income single adults

<sup>5</sup> The weighting pattern of the German consumer price index reflects the average consumption of all private households in Germany. However, the weights of individual goods and services in consumption differ considerably between households, for example between a single adult household and a family with children or between people with high income and those with low income. The consumption pattern of individual household groups is calculated based on the 2018 Survey on Income and Expenditure (Tobler 2022a).

(Figure 3). Low-income single adults recorded an inflation contribution of 2.7 percentage points, as the share of food in their purchases is significantly higher than for high-income single adults. Compared to May 2022, prices of food and non-alcoholic beverages increased by 14.5% in May 2023 (April 2023: 16.8%), alcoholic beverages and tobacco by 9.2% (April 2023: 9.0%).

Household energy prices increased by 17.4% compared to May 2022 and contributed 0.9 percentage points to the increase in consumer prices. Figure 3 and Table 1 show that low-income single adults still experienced a 1.2 percentage point higher inflation contribution than high-income single adults in May 2023 (April 2023: 1.4 percentage points). Low-income couples with children also experienced an above-average burden (1.6 percentage points), while for rich couple families with two children, the inflation contribution of household energy was only 0.8 percentage points.

**Table 1: Selected Household-Specific Item Contributions to Inflation in May 2023**

<b>Item contribution in percentage points</b>	<b>Couples, 2 kids €2,000–2,600</b>	<b>Couples, 2 kids €3,600–5,000</b>	<b>Single adult &lt; €900</b>	<b>Single adult ≥ €5,000</b>
Food, beverages, tobacco	2.9	2.3	2.7	1.1
Housing, water, maintenance	0.6	0.7	0.8	0.7
Electricity, gas, and other fuels	1.6	1.1	2.0	0.8
Fuels and lubricants for vehicles	-1.0	-1.0	-0.3	-0.6
Transport excluding fuels	0.4	0.6	0.2	0.6
Recreation and culture	0.5	0.7	0.4	0.9
Restaurants and accommodations	0.3	0.5	0.4	0.7
Other consumption expenditures	0.9	1.1	0.7	1.3
<b>Inflation rate in %</b>	<b>6.2</b>	<b>5.9</b>	<b>6.9</b>	<b>5.4</b>

The item contributions may not add up to the inflation rate or other sums in the text due to rounding. For example, the inflation contributions of food and household energy add up to 4.4 percentage points for low-income families with two children and 3.3 percentage points for middle-income families.

Sources: Federal Statistical Office; IMK calculations.



With a price decline of 14.2% in May 2023, fuels and lubricants recorded a negative contribution to inflation of 0.7 percentage points. Low-income single adult households benefited the least, low- and middle-income families the most.

In May 2023, as in the months before, the item “housing, water, maintenance” had an inflation impact of 0.6 to 0.8 percentage points. Maintenance had a high price increase of 10.8% and weighs more in the consumption expenditure of high-income single adults, thereby compensating for the lower weight of net rent plus utilities (excluding energy) with a price increase of 2.3%.

The purchase of vehicles in the transport category hardly carries any weight in the purchases of low-income households and single parents. For high-income single adults and middle-income families of four, the inflation contribution was 0.3 percentage points – as in the overall consumer price index – whereas high-income couples with children and middle-income couples felt an above-average impact (0.4 percentage points). The increase in vehicles prices, while moderating to 6.3% in May 2023, remained high. Prices for new and second-hand cars climbed further on a monthly basis (0.4% and 1.0% respectively). In contrast, bicycle prices have been falling since February 2023 and, in May 2023, were 1.7% lower than in May 2022.

Overall, the inflation contribution of the category "transport excluding fuels" averaged 0.6 percentage points, which was almost 0.2 percentage points lower than in April 2023. This is primarily due to the 49-Euro-ticket for Germany-wide regional and local public transportation (Deutschland-ticket) introduced in May.

Package holidays, which fall into the category "recreation and culture", once again recorded a strong price increase in May 2023 (13.6%) and mostly impacted the household-specific inflation rates by 0.3 to 0.5 percentage points, with only the two low-income households showing a minimal effect.<sup>6</sup>

## **Energy and food prices as well as core inflation on a downward trend**

Although inflation at 6.1% was still very high in May 2023, it is now well below the inflation peak of 8.8% in October and November 2022. Inflation is not only falling due to base effects resulting from large price increases one year earlier, but also because prices for food, household energy, gasoline and diesel are declining on a monthly basis. Core inflation is also falling, albeit at a slower pace than overall inflation, just as it increased with a lag in response to the historic price shocks. The massive increase in energy prices came in several waves since mid-2021 and raised the costs of production and transportation of virtually all goods and services (Tober and Theobald 2023).

Given a high degree of competition, inflation should continue to fall in the coming months even without further interest rate hikes by the European Central Bank, with price declines to be expected in some cases. The decline in inflation will be reinforced by the resolution of remaining supply bottlenecks, lower energy prices and a reduction of excessive profit margins that have emerged in some sectors. This should compensate for the effect of the somewhat stronger wage increases, allowing inflation to closely approach the ECB's inflation target of 2% in the course of 2024, at the latest.

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<sup>6</sup> Due to the revision of the consumer price index at the beginning of 2023, price swings for package holidays have declined noticeably. The increase of 13.6% in May 2023 is the second highest within the revised period dating back to 2020. According to the previous consumer price index based on the year 2015, several rates in 2022 were significantly higher (17.1% in January, 14.4% in April and 16.7% in June). Destatis states that the coverage is now more accurate, in particular because transaction data are used rather than offered prices (Destatis 2023).

## Annex

Three of the household groups considered consist of two adults and two unmarried children under 18, one of a middle-income parent with one child, four are single adult households and one is a couple household in the median income bracket (Table A1). In 2018, the median household among couples with two children fell into the group with a net monthly income of €3,600-5,000. Among single adults, the median household had a net income of €1,500-2,000 (Federal Statistical Office 2020a).<sup>7</sup> These two median households are represented by household group 2 and household group 7, respectively. Household group 9 (single adult with a net income of more than €5,000) represents the upper bound of the income distribution, while the lower bound is represented by household group 6 (single adult with a net income of less than €900) and household group 1 (couple, 2 children, net household income of €2,000-2,600).

**Table A1: Selected Household Types in Different Net Income Brackets**

No.	Household type	Net income 2018 (€)
1	Couples with 2 children under the age of 18	2,000–2,600
2	Couples with 2 children under the age of 18	3,600–5,000*
3	Couples with 2 children under the age of 18	≥ 5,000
4	Couples	3,600–5,000*
5	Single parent with 1 child	2,000–2,600*
6	Single adult	500 < 900
7	Single adult	1,500–2,000*
8	Single adult	2,000–2,600
9	Single adult	≥ 5,000

\* Income bracket of the median of the respective household type.

Source: Federal Statistical Office, Survey of Income and Expenditure 2018.



<sup>7</sup> Calculated based on data in Federal Statistical Office (2020a, pp. 115, 138). The average income is higher at € 5,604 and € 2,142 euros, respectively (Federal Statistical Office 2020b, pp. 100, 124).

**Table A2: Household-Specific Expenditure Weights: Data Sources and Classification**

12 Subindices	CPI classification	Item in the Survey of Income and Expenditure
Food, beverages, tobacco	CC13-01	Food, non-alcoholic beverages
	CC13-02	Alcoholic beverages and tobacco products
Clothing and footwear	CC13-03	Clothing and footwear
Housing excluding energy	CC13-72 (4.1-2, 4.4)	Rents (actual and imputed), water, misc. services
	CC13-043	Maintenance
Electricity, gas, and other fuels	CC13-045	Electricity, gas, and other fuels
Furniture, appliances, equipment	CC13-05	Furniture, appliances, equipment
Health	CC13-06	Health
Transportation excluding fuels and lubricants	CC13-071	Purchase of vehicles
	CC13-0721	Spare parts and accessories for vehicles
	CC13-0723	Maintenance and repair of vehicles
	CC13-0724	Other services for vehicles
	CC13-073	Transport services
Fuels and lubricants for vehicles	CC13-0722	Fuels and lubricants for vehicles
Communication	CC13-08	Communication
Culture and recreation	CC13-091	Audio-visual, photographic and information processing equipment and accessories
	CC13-092	Other durables for recreation and culture
	CC13-093	Other goods and services for recreation and garden, pets
	CC13-094	Recreational and cultural services + repairs
	CC13-095	Print products, stationery and drawing materials
	CC13-096	Package holidays
Restaurants and accommodations	CC13-111	Restaurants
	CC13-112	Accommodations
Other goods and services, education	CC13-121	Personal care: services, appliances, products
	CC13-123	Other products for personal care
	CC13-124-127	Other services
	CC13-10	Education

Sources: Survey of Income and Expenditure 2018; Consumer Price Index, Classification according to individual consumption by purpose (COICOP 2-/3-/4-/5-/10-digit codes/special items), Federal Statistical Office; IMK compilation.



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