



HICP recommendations on the treatment of energy prices ⁽¹⁾

I. The Recommendations

Recommendation 1: The price indices for energy products should cover the full market.

That means including all geographical areas, new and existing contracts, fixed and variable price tariffs, social and commercial tariffs, regulated and free market, etc.

Recommendation 2: The variables used to define the elementary aggregates should be those for which the shares do not change during the year. Each elementary aggregate has a fixed annual weight. These weights are based on the shares of these elementary aggregates in household consumption expenditure. These shares should remain fixed during the calendar year.

Recommendation 3: The quantity of energy consumption defining each profile should be fixed during the year. As the aim of the HICP is to measure changes in prices, the changes in quantities should not affect the price index.

Recommendation 4: Other attributes should be used in the definition of individual products. The most commonly used attributes at this level are utility and network providers, the price type (quantity-dependent price and/or quantity-independent price), the price tariff (fixed or variable rate), and others. For example, prices are collected for each provider. At the individual product level, shares can change every month using the most appropriate data source on turnover available.

Recommendation 5: Migration rates are needed to reflect the changes in the product offers. Migration of consumers between contracts (migration rates) should be used to properly reflect in the index the movement of consumers.

Recommendation 6: A quality adjustment may be needed when the provider changes the characteristics of the contract. Changes in the quality of the service from the

⁽¹⁾ This recommendation was endorsed by the Directors of Macro-Economic Statistics via a written consultation in June 2024.

perspective of the consumer should be adjusted for to yield a measure of pure change in prices that is unaffected by quality change.

Recommendation 7: The annual bill (or monthly bill, defined as annual bill divided by 12) is recommended as price definition. The monthly bill and the annual bill for a consumer profile are, in general, obtained by multiplying the price per unit of the underlying good by an estimated average quantity consumed during the month or the year, respectively. This quantity is estimated based on information from the past, but the price per unit refers to the month when the transaction takes place. The price must reflect all taxes and subsidies ⁽²⁾ that impact the price per unit.

II. Explanatory text

1. Coverage

The price indices for energy products should cover the full market. That means including all geographical areas, new and existing contracts, fixed and variable price tariffs, social and commercial tariffs, regulated and free market, etc. The stratification of the market in individual products and elementary aggregates ⁽³⁾ should be such that all segments are covered. Changes in national regulation, market structure, or data source over time may require modifications to the stratification.

2. Defining the elementary aggregates

The variables used to define the elementary aggregates should be those for which the shares do not change during the year. Each elementary aggregate has a fixed annual weight. These weights are based on the shares of these elementary aggregates in household consumption expenditure. This implies that shifts between elementary aggregates due to changing consumption behaviour of households can only be reflected in the annual update of the sample and weights. The attributes to define elementary aggregates should therefore be carefully chosen.

As a minimum, consumption profiles ⁽⁴⁾ should be used to define elementary aggregates. The use of multiple consumption profiles is recommended, where the shares of each profile should remain fixed during the calendar year to avoid changes in the quantity of energy consumed by households affecting the price index. When providers, product offers, pricing, or taxation differ locally, the region should be used to define the elementary aggregate as well.

⁽²⁾ See for more detailed information on subsidies the methodological note '[Treatment of energy price compensation schemes in the HICP](#)'.

⁽³⁾ See [Commission Implementing Regulation \(EU\) 2020/1148](#), Article 2 (6) and (13).

⁽⁴⁾ Consumption profiles are defined by an estimated quantity or range of energy consumption.

3. The changes in quantities consumed throughout the year

The quantity of energy consumption defining each profile should be fixed during the year. With few exceptions, all energy products are available for consumption throughout the year, although the quantities consumed may vary substantially during a single year. If the monthly variation in quantities is considered in the index calculation, the result would no longer be a measure of 'pure' price change but would be affected by volume changes instead (see Annex 1). As the aim of the HICP is to measure changes in prices, the changes in quantities should not affect the price index.

4. Defining the individual products

Other attributes should be used in the definition of individual products. This practice allows the use of variable monthly shares of the attributes and migration rates where possible, reflecting substitution effects during the year. The most commonly used attributes at this level are utility and network providers, the price type (quantity-dependent price and/or quantity-independent price), the price tariff (fixed or variable rate), and others. For example, prices are collected for each provider. These prices are aggregated using shares based on the turnover of each provider. Consumers may change the provider during the year, so these shares can change monthly. If this attribute were used in the elementary aggregate, monthly changes could not be reflected because the fixed weight Laspeyres-type index is mandatory at this level. At the individual product level, shares can change every month using the most appropriate data source on turnover available.

5. Migration rates versus quality adjustments

Migration rates are needed to reflect the changes in the product offers. Assume that a consumer has a contract with a power level ⁽⁵⁾ of 3.5 kVA with a commitment period of 12 months. During this period, this type of contract disappears. At the time of contract renewal, the best available contract has 6.5 kVA. Migration of consumers between contracts (migration rates) should be used to properly reflect in the index the movement of consumers (see Annex 2).

A quality adjustment may be needed when the provider changes the characteristics of the contract. For example, a provider changes the power level on existing contracts from 3.5 kVA to 6.5 kVA. This is an increase in the quality of the service from the perspective of the consumer. The price should be adjusted to reflect this quality change. However, when consumers change to a different contract, then migration rates should be used (see above).

⁽⁵⁾ The power level, measured in kilovoltampere (kVA), measures the power a household's connection to the grid can sustain, or is allowed by contract to sustain. A higher rating could allow for the parallel use of many appliances or charging electric vehicles.

6. Price definition

The annual bill (or monthly bill, defined as annual bill divided by 12) is recommended as price definition. This price concept is not affected by monthly changes and seasonality of quantities and can account for taxes and subsidies (when imposed or given in part of the year) more easily.

The monthly bill and the annual bill for a consumer profile are, in general, obtained by multiplying the price per unit of the underlying good by an estimated average quantity consumed during the month or the year, respectively. This quantity is estimated based on information from the past, but the price per unit refers to the month when the transaction takes place. The price must reflect all taxes and subsidies ⁽⁶⁾ that impact the price per unit. The price that is followed should not be influenced by the time of the payment (e.g., monthly payments in advance). Finally, any price components that are independent of the level of consumption should be added to the annual or monthly bill.

⁽⁶⁾ See for more detailed information on subsidies the methodological note [‘Treatment of energy price compensation schemes in the HICP’](#).

Annex 1 Impact of monthly changing volumes

In the two examples below, a price index is calculated for the year t with reference to December of year t-1 according to two methods:

Method A: Monthly bill with constant consumption throughout the year given by the annual bill divided by 12.

Method B: Monthly bill with monthly varying consumption depending on the seasons 'Spring, summer, autumn, winter'.

Example 1. The annual consumption is 3480 kWh for both methods. The recorded tariff consists of a quantity-dependent (tariff price) and a quantity-independent price (basic fee) component.

The monthly consumption is first multiplied with the tariff price (in Cent/kWh), and the basic fee is added to this amount. This gives the final monthly bill, which is then converted back to the price per unit. The index with reference to the price reference period (December t-1) is derived from the price per unit.

Example 1: Calculations for one tariff with quantity-dependent and quantity-independent price component

Month		Dec(t-1)	Jan(t)	Feb(t)	Mar(t)	Apr(t)	May(t)	Jun(t)	Jul(t)	Aug(t)	Sep(t)	Oct(t)	Nov(t)	Dec(t)
Tariff	Cent/kWh	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Tariff basic fee	€/month	2	2	2	2	2	2	2	2	2	2	2	2	2
Method A														
Monthly consumption (kWh)		290	290	290	290	290	290	290	290	290	290	290	290	290
Sum per consumption		49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3
Plus basic fee, final bill		51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3
Price per unit		0.1769	0.1769	0.1769	0.1769	0.1769	0.1769	0.1769	0.1769	0.1769	0.1769	0.1769	0.1769	0.1769
Index (Dec(t-1)=100)		100	100	100	100	100	100	100	100	100	100	100	100	100
Method B														
Monthly consumption (kWh)		520	520	520	250	150	150	150	150	150	150	250	520	520
Sum per consumption		88.4	88.4	88.4	42.5	25.5	25.5	25.5	25.5	25.5	25.5	42.5	88.4	88.4
Plus basic fee, final bill		90.4	90.4	90.4	44.5	27.5	27.5	27.5	27.5	27.5	27.5	44.5	90.4	90.4
Price per unit		0.1738	0.1738	0.1738	0.1780	0.1833	0.1833	0.1833	0.1833	0.1833	0.1833	0.1780	0.1738	0.1738
Index (Dec(t-1)=100)		100	100	100	102	105	105	105	105	105	105	102	100	100

Example 2. The annual consumption for the low tariff is 2280 kWh and 1200 kWh for the high tariff (in total 3480 kWh). The two tariffs consist only of a quantity-dependent price component (tariff price).

The monthly consumption is first multiplied with the tariff price (in Cent/kWh) for the low and the high tariffs, respectively. A weighted price per unit is derived from these calculations. For method A, the tariff shares are held constant during the year, while they change monthly for method B.

Example 2: Calculations for two tariffs with only quantity-dependent price components

Month		Dec(t-1)	Jan(t)	Feb(t)	Mar(t)	Apr(t)	May(t)	Jun(t)	Jul(t)	Aug(t)	Sep(t)	Oct(t)	Nov(t)	Dec(t)
Low Tariff	Cent/kWh	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
High Tariff	Cent/kWh	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Method A														
Low Tariff	Monthly consumption (kWh)	190	190	190	190	190	190	190	190	190	190	190	190	190
High Tariff		100	100	100	100	100	100	100	100	100	100	100	100	100
Weighted price per unit		0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Index (Dec(t-1)=100)		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Method B														
Low Tariff	Monthly consumption (kWh)	190	190	190	190	190	190	190	190	190	190	190	190	190
High Tariff		140	130	110	90	80	80	80	80	80	80	90	110	130
Weighted price per unit		0.16	0.16	0.16	0.15	0.14	0.14	0.14	0.14	0.14	0.15	0.16	0.16	0.16
Index (Dec(t-1)=100)		100.0	98.4	94.7	90.6	88.3	88.3	88.3	88.3	88.3	90.6	94.7	98.4	100.0

Conclusion. The two examples show that the calculation methods A and B give different results for the price index. With monthly varying consumption (method B), the price index shows price movements during the year, even when there have not been any. The price index thus reflects volume shifts. Therefore, it is **not** recommended to compile the price index according to method B.

Annex 2 Example of the use of migration rate

Recalling the example in guideline 5 (Migration rates versus quality adjustments), assume that a consumer has a contract with a power level of 3.5 kVA with a commitment period of 12 months. During this period, this type of contract disappears. At the time of contract renewal, the best available contract has 6.5 kVA.

Not all consumers will move to the contract offering 6.5 kVA immediately because of the commitment period and will only change when the commitment period ends. Thus, one needs to estimate the monthly rate at which consumers migrate to the new contract, which is also denoted as 'migration rate'.

When no data are available to estimate the migration rate, one can assume that every month one twelfth of the consumers end the 12-month contract and move to the new contract. That results in a migration rate of $1/12 = 0.0833(3)$.

Table 1: Fixed $1/12 (=0.0833)$ migration rate

	Price for power-level 3.5 kVA	Price for power-level 6.5 kVA	Estimated Combined price
March	0.60		
April		0.70	$0.60 * (1-0.0833 * 1) + 0.70 * 0.0833 * 1 = 0.61$
May		0.70	$0.60 * (1-0.0833 * 2) + 0.70 * 0.0833 * 2 = 0.62$
June		0.70	$0.60 * (1-0.0833 * 3) + 0.70 * 0.0833 * 3 = 0.63$
July		0.70	$0.60 * (1-0.0833 * 4) + 0.70 * 0.0833 * 4 = 0.63$
August		0.70	$0.60 * (1-0.0833 * 5) + 0.70 * 0.0833 * 5 = 0.64$
September		0.70	$0.60 * (1-0.0833 * 6) + 0.70 * 0.0833 * 6 = 0.65$
October		0.70	$0.60 * (1-0.0833 * 7) + 0.70 * 0.0833 * 7 = 0.66$
November		0.70	$0.60 * (1-0.0833 * 8) + 0.70 * 0.0833 * 8 = 0.67$
December		0.70	$0.60 * (1-0.0833 * 9) + 0.70 * 0.0833 * 9 = 0.68$
January		0.70	$0.60 * (1-0.0833 * 10) + 0.70 * 0.0833 * 10 = 0.68$
February		0.70	$0.60 * (1-0.0833 * 11) + 0.70 * 0.0833 * 11 = 0.69$
March		0.70	$0.60 * (1-0.0833 * 12) + 0.70 * 0.0833 * 12 = 0.70$

Eventually more precise data may be available on the share of costumers ending their commitment period each month. Table 2 below show how to use monthly migration rates.

Table 2: Monthly variable migration rates

	Price for power-level 3.5 kVA	Price for power-level 6.5 kVA	Monthly Migration rate	Accumulated Migration rate	Estimated Combined price
March	0.60				
April		0.70	0.10	0.10	$0.60 * (1-0.10) + 0.70 * 0.10 = 0.61$
May		0.70	0.20	0.30	$0.60 * (1-0.30) + 0.70 * 0.30 = 0.63$
June		0.70	0.05	0.35	$0.60 * (1-0.35) + 0.70 * 0.35 = 0.64$
July		0.70	0.08	0.43	$0.60 * (1-0.43) + 0.70 * 0.43 = 0.64$
August		0.70	0.01	0.44	$0.60 * (1-0.44) + 0.70 * 0.44 = 0.64$
September		0.70	0.32	0.76	$0.60 * (1-0.76) + 0.70 * 0.76 = 0.68$
October		0.70	0.02	0.78	$0.60 * (1-0.78) + 0.70 * 0.78 = 0.68$
November		0.70	0.04	0.82	$0.60 * (1-0.82) + 0.70 * 0.82 = 0.68$
December		0.70	0.06	0.88	$0.60 * (1-0.88) + 0.70 * 0.88 = 0.69$
January		0.70	0.12	1.00	$0.60 * (1-1) + 0.70 * 1 = 0.70$