

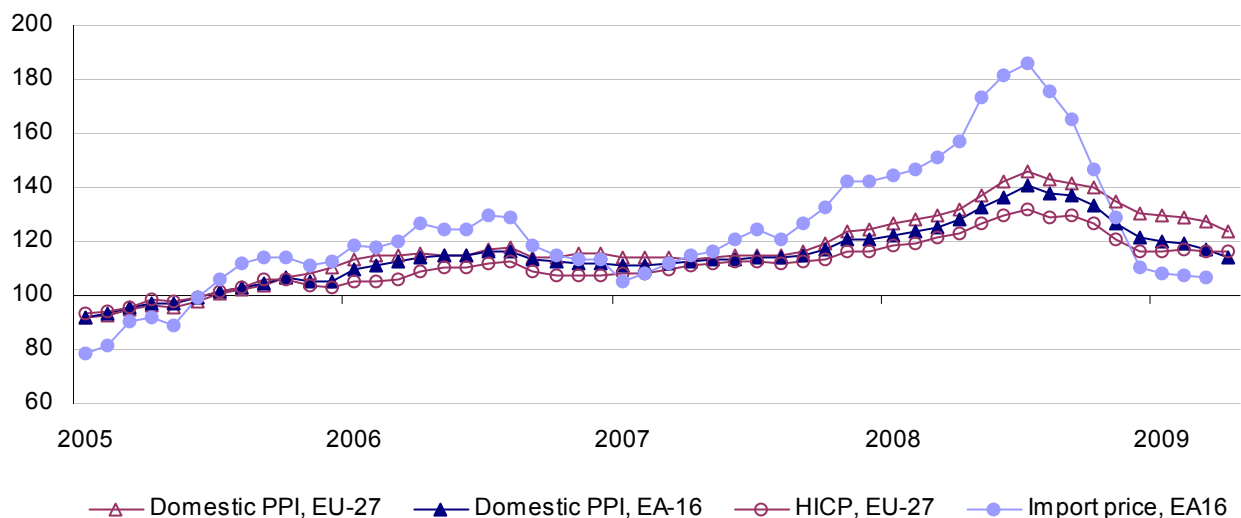
Latest development of energy output prices and consumer energy prices driven by oil prices

This publication looks at a variety of price indices related to energy activities and energy products. These indices range from the output prices of primary activities covering the removal of raw materials from the ground (extraction, mining and quarrying of energy producing products), through various intermediate stages, to their final purchase by consumers (for example, gas and electricity for domestic use). The publication shows how prices have developed over the last four years, at different stages of this chain which links extraction to consumption. It should be noted that the EU is heavily reliant on imports of energy products, hence the interest in import prices, and that prices of energy products are, to a large degree, determined by global markets.

Changes in the import price index and the producer price index (PPI) might be expected to be reflected subsequently in changes in the corresponding products in the harmonized index for consumer prices (HICP). As can be seen in Figure 1, which focuses just on energy related activities and energy products, the developments are similar, but the large changes in 2008 in the import price index are less visible when it comes to domestic output prices and consumer prices of energy products.

The import price index reflects the development of prices domestic euro area residents have to pay when purchasing energy goods from the non-domestic market. The PPI reflects the developments over time in the prices received by domestic producers on the domestic market. In contrast, the HICP concerns purchases by consumers of all energy products, regardless of where they have been produced. As such, the HICP includes prices of imported goods, as well as domestically produced ones.

Figure 1: selected price indices for energy (2005=100)



Source: Eurostat (STS, HICP)

There are several reasons for the indices displaying different movements, including, for example, the influence of taxes on consumer prices, changes in margins of distributors, or costs of logistics. The different treatment of taxes is important, as these constitute a significant part of the final price paid by consumers for energy products. The PPI excludes VAT as well as other taxes on products, whereas the HICP includes both of these. Changes in VAT or other taxes on products may lead to the HICP and PPI diverging.

Another difference between the indices is the share of the different energy activities or products in overall energy prices (Table 1). Imports of energy products are dominated by crude petroleum (almost 50 % of total energy imports in the EA-16); while the second most important product is coke and refined petroleum (29 %). The main component of the domestic PPI is the electricity activity with 59.4 % (of total turnover in the EU-27) followed by the activity of refined petroleum (30.3 %). Across consumer prices, the household consumption of energy products is largely split between the consumption of fuels ⁽¹⁾ (50 %) and the consumption of electricity and gas (40 %).

Table 1: share of the different energy related activities and products in total energy prices

	Import prices (EA-16)
Coal & lignite	3.6%
Crude petroleum & natural gas	64.1%
Crude petroleum	49.5%
Coke & refined petroleum	14.6%
Refined petroleum	29.0%
Elec., gas, steam & air con.	3.3%
	Domestic PPI (EU-27)
Coal & lignite	1.0%
Crude petroleum & natural gas	5.7%
Crude petroleum	5.4%
Coke & refined petroleum	30.6%
Refined petroleum	30.3%
Elec., gas, steam & air con.	59.4%
	HICP (EU-27)
Electricity	24%
Gas	16%
Liquid fuels	7%
Solid fuels	2%
Heat energy	7%
Fuels & lubr. for pers. transport	43%
ENERGY	100%
Fuels	50%

Source: Eurostat (STS, HICP)

⁽¹⁾ Includes liquid fuels and fuels and lubricants for personal transport equipment.

The STS Regulation requires import prices indices only for euro area Member States. Import prices are based on the Classification of Products by Activity (CPA), while the domestic PPI is based on the classification of activities (NACE).

Prices in energy related activities and products fluctuate more than for other industries or products

An analysis of the EU-27's PPI and EA-16's import price indices for energy and for all other industrial activities or products (see Figure 2) indicates very different developments over the past few years. The PPI for energy grew much more strongly than for other industrial activities through until the middle of 2006 after which it fell back slightly towards the end of 2006 while a continued increase was recorded for other industrial activities. From the beginning of 2007 the PPI for energy again grew at a much more rapid pace than for other industrial activities, peaking in July 2008 before falling back sharply, while the PPI for other industrial activities continued its more modest increase for two more months before it started to decline in October 2008.

A very similar situation was observed for the EA-16's import price index, with the index for energy showing even greater volatility than the equivalent PPI: by the end of December 2008 the index had returned to the same level it had been in the middle of 2005, despite having been 68 % higher just five months earlier.

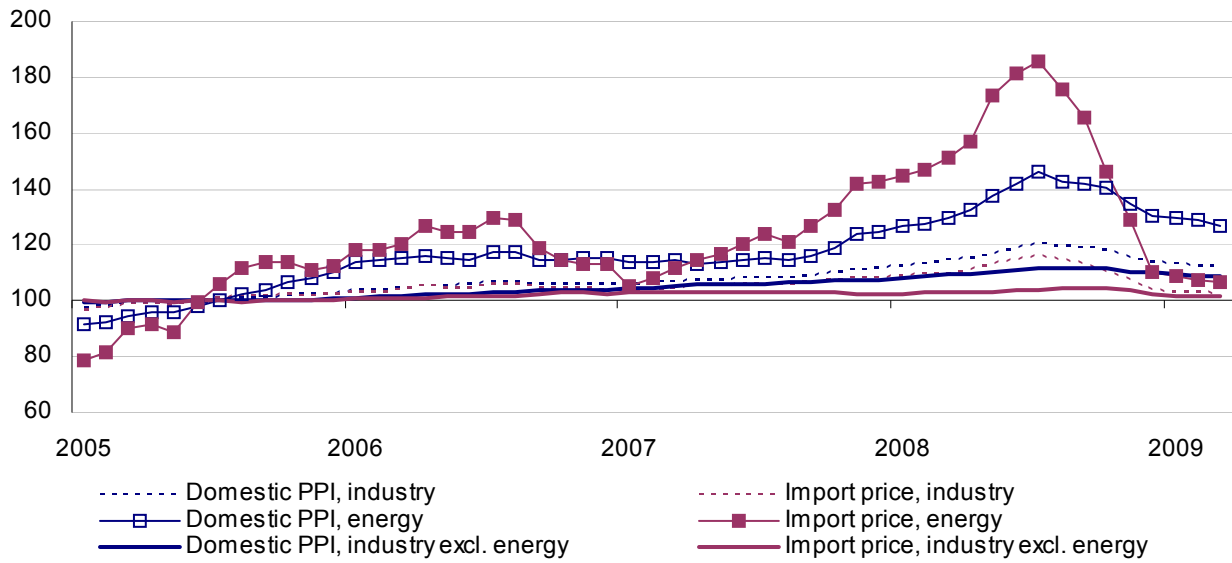
Energy output prices influenced by the price of crude oil

A great deal of the volatility observed for the PPI for energy related activities can be traced to the extraction of crude petroleum and gas, as well as the refining of petroleum and manufacture of coke: the very similar developments of these two indices show how the price of crude oil impacts on the output price of its related downstream processing activity (see Figure 3).

Energy related activities can be grouped into three types: extraction, for example of coal, crude petroleum and natural gas; processing, including the production of coke and refined petroleum products; generation and distribution of network fuels, notably electricity and gas.

In contrast to the extraction of crude petroleum and gas, the PPI for the mining of coal (and lignite) was relatively stable for most of the period analysed. However, the beginning of 2008 marked a change in the development of this index, with a large jump in January 2008, followed by a sustained increase in the index through to the end of the time series.

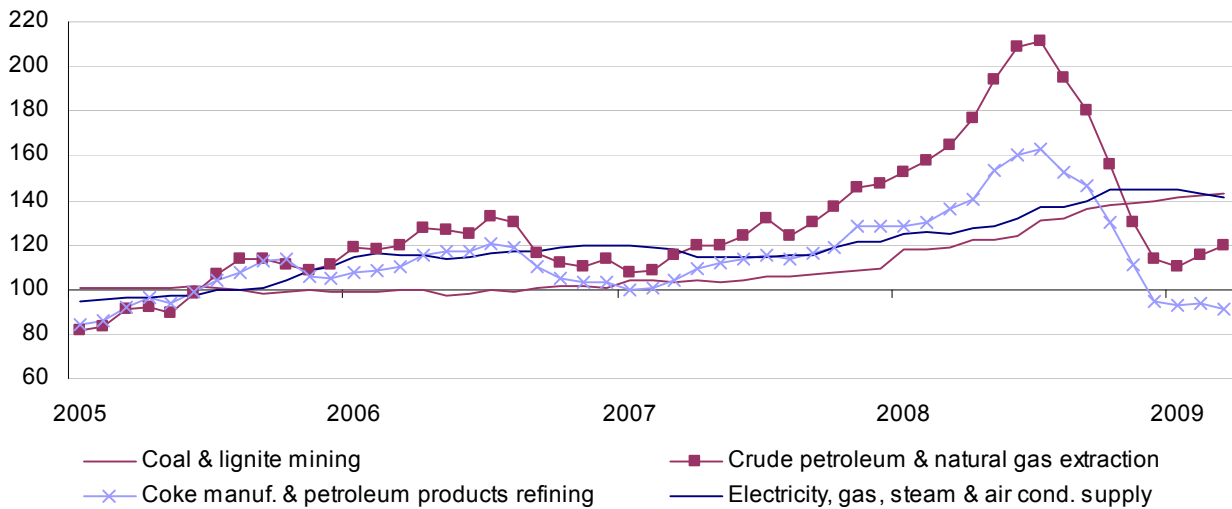
Figure 2: PPI and import price indices, energy and non-energy related activities/products (2005=100) (1)



(1) Domestic PPI, EU-27; import price index, EA-16.

Source: Eurostat (STS)

Figure 3: domestic PPI, energy related activities, EU-27 (2005=100)



Source: Eurostat (STS)

The final stage in the energy related activities includes (among other activities) the generation of electricity, relying on coal, gas and oil alongside generation from non-fossil fuels such as hydroelectric and nuclear power. The PPI for electricity, gas (which also includes steam and air

conditioning supply) was much less volatile than for upstream activities, and its development reflected a combination of the different developments for the mining of coal and the extraction of crude petroleum and gas.

Focusing on the year 2008, the first half year was characterised by a sharp increase in energy prices up to July 2008 followed by an equally sharp downwards price development in the second half of the year. Out of the components that make up energy activities, the main contributor to price developments was the extraction of crude petroleum. While energy output prices increased by a monthly average of 2.4 % over the first six months of 2008, the refined petroleum output price contributed 1.2% of this increase (see Table 2) followed by the production of electricity and gas (0.8 %). When it came to the downturn in output price developments in the second half of 2008, average energy prices decreased by 1.9 % per month, almost all of which could be attributed to the decrease for refined petroleum output prices, while output prices of electricity and gas rose by 0.4 %.

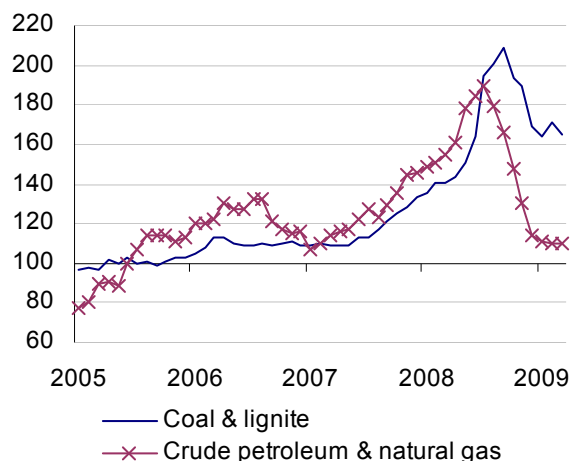
Table 2: PPI energy prices and components (average monthly price development)

	Jan-Jul 2008	Jul-Jan 2009
Total	2.40%	-1.90%
Coal & lignite	0.02%	0.01%
Crude petroleum & natural gas	0.32%	-0.42%
Coke & refined petroleum prod.	1.20%	-1.89%
Electricity, gas, steam & air con.	0.80%	0.40%

Source: Eurostat (STS)

As the EU as a whole is heavily dependent on imports for its energy consumption, the import price index is important for the intermediate processing stage and for the downstream generation and distribution stage. Figure 4 shows how the import price index for upstream extraction activities developed in the euro area. The development of the import price index for crude petroleum and gas was very similar to that of the PPI for the same activity, reflecting the global nature and importance of international prices for the output of this activity. However, the import price index for coal was very different to the equivalent PPI and reflected more closely the import price index for crude petroleum and gas. The import price of coal was soaring until September 2008 perhaps reflecting tensions in global oil prices and strong demand, but the effects of the economic crisis reduced the demand for coal from downstream activities (e.g. the steel industry).

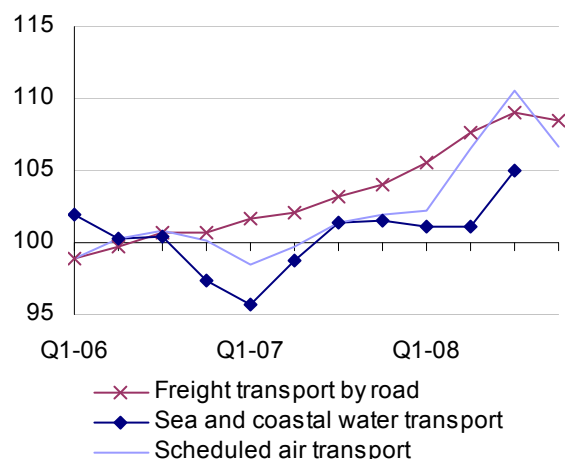
Figure 4: import price index, selected energy products, EA-16 (2005=100)



Source: Eurostat (STS)

Another stage that may be identified in the use of energy related products is the use of fuel by transport service providers – for both freight and passenger transport. PPIs for services are a relatively new data set (here presented in terms of the NACE Rev. 1.1 classification and with a base year of 2006). Figure 5 shows that EU-27 producer prices for road freight, sea transport and scheduled air transport tended to rise from the start of 2007 through to a peak in the third quarter of 2008, before falling back in the final quarter of 2008.

Figure 5: PPI, selected transport services, EU-27 (2006=100)



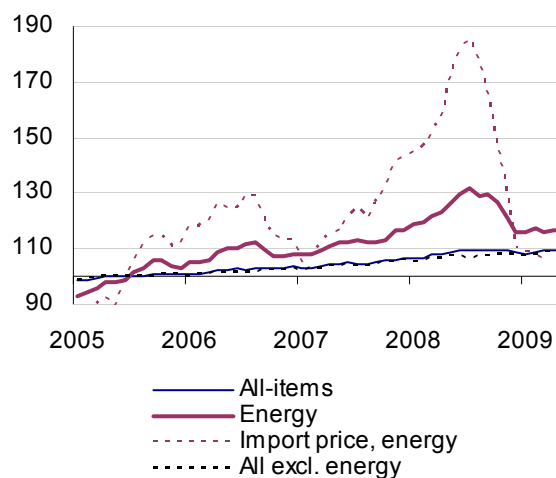
Source: Eurostat (STS)

The HICP for energy has in the last few months dropped back close to, but above, its level from the middle of 2006, whereas the import price index has dropped some way below this. Figure 6 confirms that over the last few years the HICP for energy developed quite differently from the HICP for non-energy items.

An analysis of all three types of indices studied in this publication is shown in Figure 7 which presents the standard deviation of price indices. This shows the volatility of these price indices. The measure used is based on the monthly (quarterly) index values during the years from 2005 (2006) to 2008 (2006 is for services PPIs).

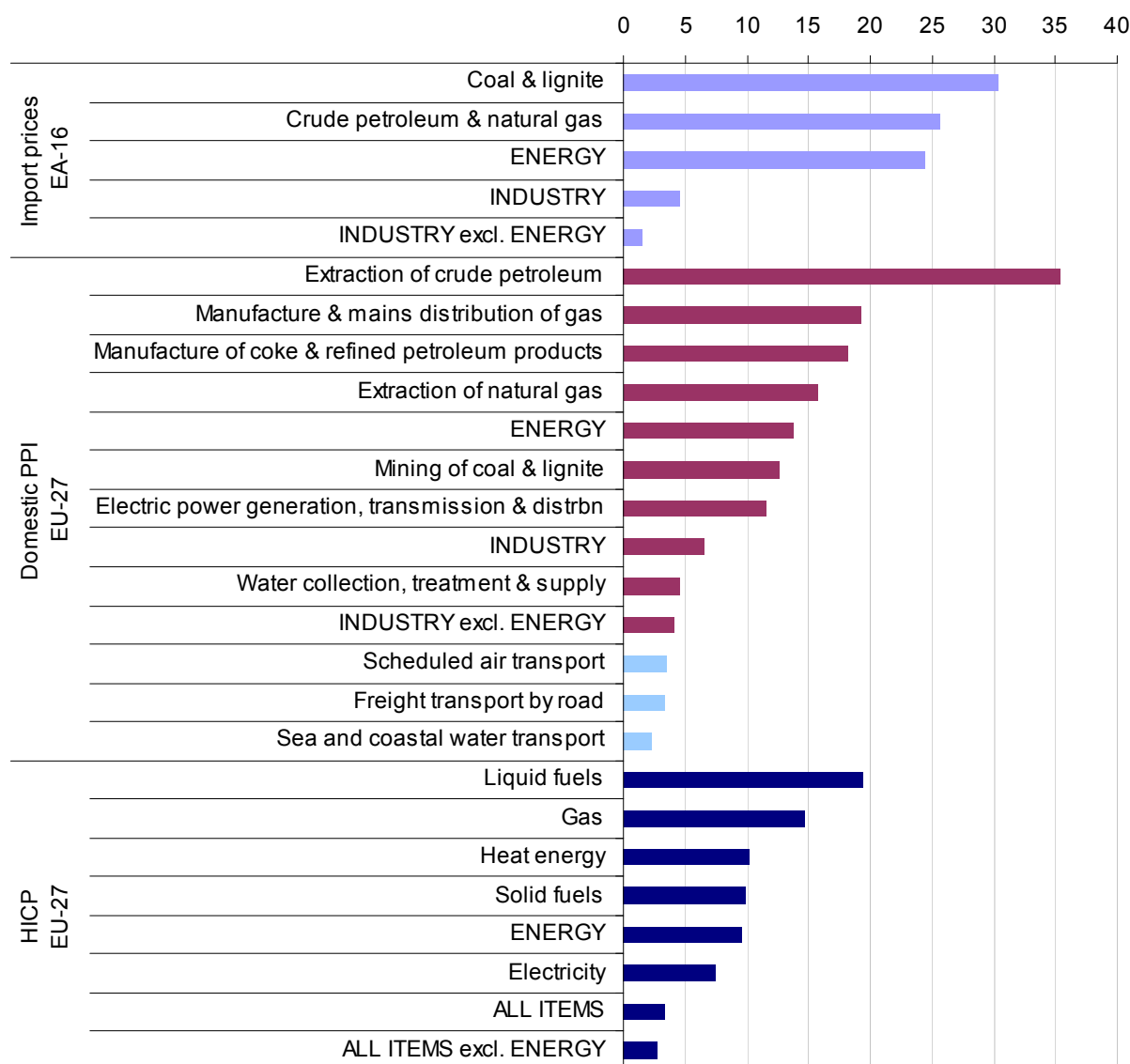
For PPIs the activities related to the extraction and processing of petroleum or to the extraction and distribution of gas were the most volatile. The PPI for the mining of coal was the least volatile of the PPIs for extraction activities. The impact of these different price indices for fuels on users depends on the type of fuel used and the relative share of fuel when compared with other inputs.

Figure 6: HICP (EU-27) and import price index (EA-16), energy and non-energy related products (2005=100)



Source: Eurostat (HICP)

Figure 7: standard deviation of price indices



Source: Eurostat (STS, HICP)

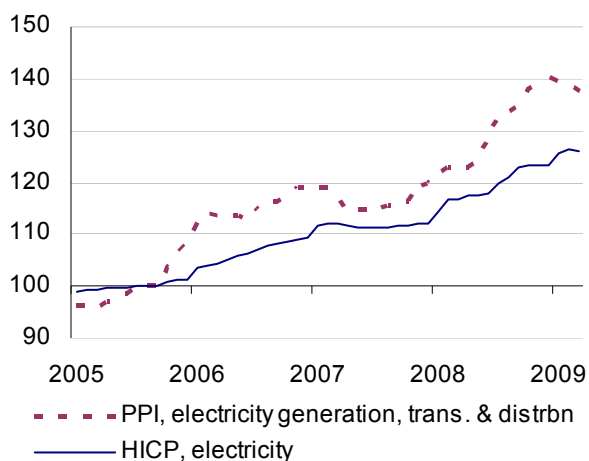
The volatility of the PPI for electricity generation, transmission and distribution was below the average for the PPI of all energy related activities. A similar situation was observed for the HICP, with the index for electricity less volatile than the overall index for energy. Although fewer import price indices are available, it is worth noting that the import price index for coal was much more volatile than the equivalent PPI. Services PPIs were also generally much less volatile than upstream energy activities.

Figures 8 to 10 provide a direct comparison of price indices between 2005 and the end of the first quarter of 2009 for some energy related activities and products. For electricity, the PPI for generation, transmission and distribution moved more than the equivalent HICP, suggesting greater price volatility in earlier generation and transmission stages than for the final distribution stage, or greater volatility for customers other than households. For gas, the PPIs and the HICP show similar developments, but often with a time lag between the series. Price movements in the PPI for

the extraction of gas are generally more volatile than the indices for the other two series. When considerable and sustained movements occur in the PPI for gas extraction then these are naturally followed shortly afterwards by movements in the PPI for gas manufacture and mains distribution, and then after a further lag by movements in the HICP. For example, in 2006 prices generally rose. Thereafter, the gas extraction PPI fell rapidly from the start of 2007, that for gas manufacture and mains distribution from February 2007 and the HICP from April 2007. In a similar vein, after rapid price growth in 2008 for all three indices, first of all the PPI for gas extraction fell at the start of 2009, then the PPI for gas manufacture and mains distribution, while there was only a slight reduction in the HICP.

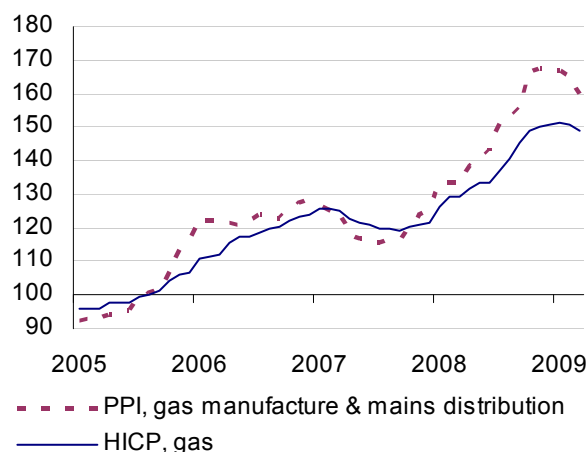
The two PPIs and the HICP concerning petroleum products all display very similar developments over time, but with varying degrees of movement. The biggest changes in prices were recorded for the first stage, namely the extraction of petroleum products.

Figure 8: Electricity, EU-27 (2005=100)



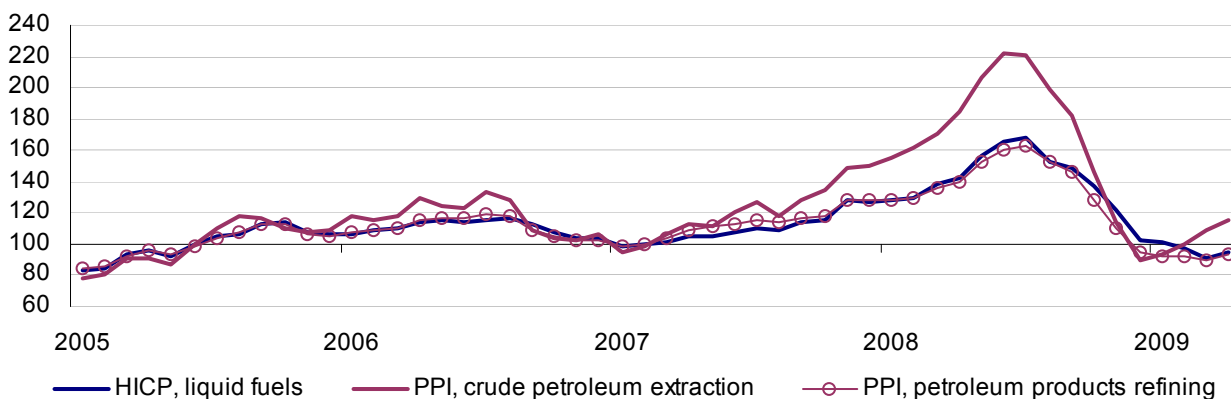
Source: Eurostat (STS, HICP)

Figure 9: Gas, EU-27 (2005=100)



Source: Eurostat (STS, HICP)

Figure 10: Petroleum and liquid fuels, EU-27 (2005=100)



Source: Eurostat (STS, HICP)

METHODOLOGICAL NOTES

Legal basis

The principal legal basis for short-term statistics is Council Regulation No 1165/98 of 19 May 1998 ⁽²⁾ concerning short-term statistics. The variable 'import prices' was introduced by an amendment to this Regulation in 2005.

Harmonized indices of consumer prices are required under Article 121 of the Treaty of Amsterdam (109j of the Treaty on European Union).

Definition of indicators

Import price indices measure the transaction price development of imported goods purchased from non-domestic areas by domestic residents. All related services are initially excluded from the scope. These price indices should track the price movements of comparable items over time. It is essential that all price-determining characteristics of the products are taken into account, including quantity of units sold, transport provided, rebates, service conditions, guarantee conditions, origin and destination. The specification must be such that in subsequent reference periods, the observation unit is able uniquely to identify the product and to provide the appropriate price per unit.

The price is the c.i.f. (cost, insurance, and freight) price at the border excluding all duties and taxes on the goods and services to be shouldered by the observation unit. The price should be an actual transaction price, and not a list price, therefore discounts should be deducted from the price. The price index compilation should take into account and adjust for quality changes in products. Imports are recorded when the ownership of the goods is transferred (i.e. when the parties record transaction in their books or account).

The **producer (or output) price index** for an economic activity measures the average price development of all goods and related services resulting from an activity. It is essential that all price-determining characteristics are taken into account, including quantity sold, transport provided, rebates, service conditions, guarantee conditions and destination. The appropriate price is the basic price that excludes VAT and similar deductible taxes directly linked to turnover as well as all duties and taxes on the goods and services invoiced by the unit, whereas subsidies on products received by the producer, if there are any, should be added. The producer price index should take into account quality changes in products or services.

The appropriate price measure is the transaction price reflecting the revenue received by the producer for products actually sold to customers.

Harmonized indices of consumer prices are harmonised inflation figures designed for international comparison of consumer price inflation. These consumer price indices are compiled according to the classification of individual consumption by purpose (COICOP). The weights are based on the share of household final monetary consumption expenditure.

Geographical coverage

The Member States' data are supplied by national statistical institutes; the indices for the EU and the euro area are compiled by Eurostat.

The data for the European Union and the euro area presented in this publication are based on a consistent composition: for the EU data are presented for the 27 countries that (at the time of writing) are EU Member States, while for the euro area data are presented for the 16 countries currently participating in the euro.

Base years

All indices (except SPPIs) presented in this publication are presented with 2005=100. The SPPIs are presented with the base year 2006=100.

Abbreviations

COICOP	classification of individual consumption by purpose
EA	euro area
EU	European Union
HICP	harmonized index of consumer prices
NACE	statistical classification of economic activities in the European Community
PPI	producer price index
SPPI	services producer price index
STS	short-term statistics
VAT	value added tax

More information:

liselott.oezman@ec.europa.eu
isabelle.remond-tiedrez@ec.europa.eu

⁽²⁾ Official Journal No L 162, of 5 June 1998.

Further information

Data: [Eurostat Website: http://ec.europa.eu/eurostat](http://ec.europa.eu/eurostat)

Data on "Short-term business statistics ":
http://epp.eurostat.ec.europa.eu/portal/page/portal/short_term_business_statistics/data/database

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