

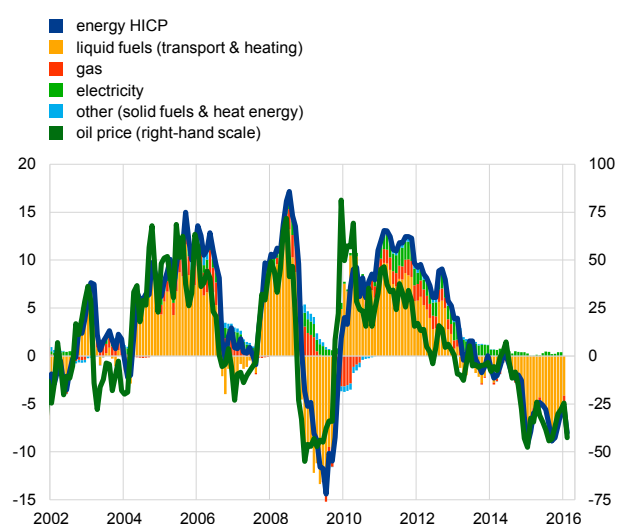
## Box 6

# Oil prices and euro area consumer energy prices

**The major negative impact that energy prices are currently having on headline HICP inflation primarily reflects the effect of changes in the price of oil in euro** (see Chart A). However, while fairly close, there is no strict one-to-one relationship between movements in the price of crude oil and overall consumer energy prices. In particular, the co-movement varies in terms of intensity and timing across the

**Chart A**  
Oil prices and HICP energy components

(annual percentage changes; percentage point contributions)



Sources: Eurostat, Bloomberg, BIS and ECB calculations.  
Note: Latest observations refer to February 2016 (flash estimate for HICP; no breakdown available).

main energy components.<sup>1</sup> Against the backdrop of the recent sharp falls in oil prices, this box reviews some pertinent factors that can influence the co-movement in terms of the degree of automaticity, magnitude and timing between oil prices and euro area consumer energy prices. Given that these factors can be different across energy price sub-components, they are assessed separately for liquid fuels, gas and electricity.

**Movements in consumer prices for liquid fuels reflect a direct, complete and quick pass-through of crude oil prices.** This pass-through can typically be measured in terms of a few weeks.<sup>2</sup> In the very short term, refining and distribution costs and margins tend to slightly buffer movements in crude oil prices, but evolve in a more stable and independent fashion over longer horizons. For example, petrol, refining and distribution costs and margins have increased slightly since the second half of 2015, but these movements have been swamped by the very large movements in crude oil prices (see Chart B). Indirect taxes account for a significant portion of the final consumer price of liquid fuels. Excise taxes are fixed in terms of euro cent

per litre and have no co-movement with oil prices. Value added taxes are levied as a percentage of the price, including excise taxes, and thus co-move with crude oil prices. All in all, the decline in euro area consumer liquid fuel prices by approximately 25% since July 2014 reflects the more or less complete pass-through of the large (more than 60%) decline in crude oil prices in euro terms.<sup>3</sup>

<sup>1</sup> See the 2010 Structural Issues Report entitled "Energy markets and the euro area macroeconomy" (also published as *ECB Occasional Paper Series*, No 113). See in particular Section 3.2, entitled "Direct first-round effects".

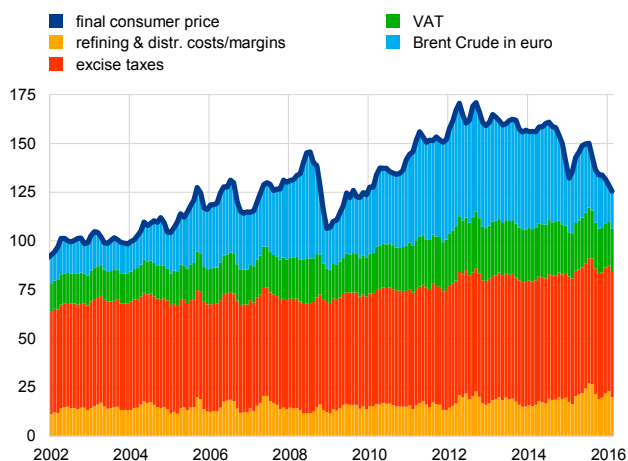
<sup>2</sup> On average across the euro area, approximately 75% is passed through within three weeks and more than 90% within five weeks. See Meyler, A., "The pass through of oil prices into euro area consumer liquid fuel prices in an environment of high and volatile oil prices", *Energy Economics*, Vol. 31, Issue 6, November 2009, pp. 867-881.

<sup>3</sup> The large share of excise taxes implies that the elasticity of consumer prices with respect to oil prices (i.e. the percentage change in the consumer price in response to a given percentage change in the oil price) is relatively low/high at low/high levels of oil prices.

## Chart B

### Breakdown of consumer petrol prices

(euro cents per litre)



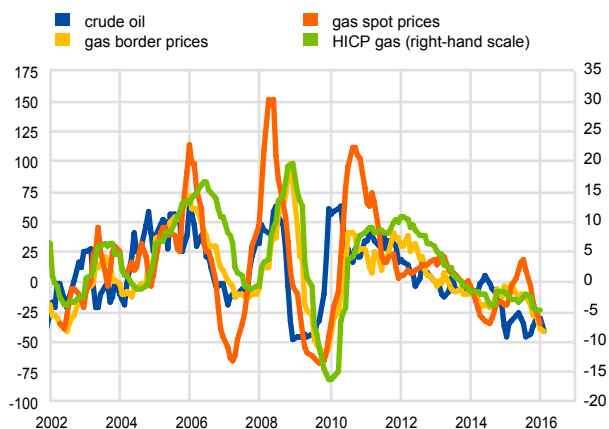
Sources: BIS, Bloomberg, European Commission Oil Bulletin and ECB calculations.

with liquid fuel prices.<sup>6</sup> Movements in wholesale gas prices are generally passed through with a short lag of three to six months. The lag in pass-through also means that the distribution costs and margins initially tend to fall when wholesale prices are rising and vice versa, but to revert thereafter. Since July 2014 euro area wholesale gas prices have declined by 33% and consumer gas prices by approximately 5%.<sup>7</sup>

## Chart C

### Crude oil, wholesale gas and consumer gas prices

(annual percentage changes)



Sources: Eurostat, Bloomberg, BIS, Haver Analytics and ECB calculations.

### Consumer gas prices are largely driven by wholesale gas prices, which do not necessarily co-move with oil prices.

Traditionally in Europe, wholesale gas prices, in particular contracted gas border prices, were linked by long-term contracts to oil prices with a lag of approximately three to six months. However, as spot markets have developed in Europe, this link has become less prevalent, implying a potential weakening of the link between developments in consumer gas prices and crude oil prices. The share of oil-linked wholesale gas pricing decreased from 80% to 30% between 2005 and 2014.<sup>4</sup> Despite this de-linking, wholesale gas prices have fallen in tandem with crude oil prices in recent years (see Chart C). However, this is more a reflection of the supply-demand balance for gas in Europe than an automatic link with oil price movements.<sup>5</sup> Gas network and distribution costs and margins, as well as taxes, drive a wedge between the wholesale and consumer prices for gas, as is the case

with liquid fuel prices.<sup>6</sup> Movements in wholesale gas prices are generally passed through with a short lag of three to six months. The lag in pass-through also means that the distribution costs and margins initially tend to fall when wholesale prices are rising and vice versa, but to revert thereafter. Since July 2014 euro area wholesale gas prices have declined by 33% and consumer gas prices by approximately 5%.<sup>7</sup>

### Consumer electricity prices have little direct linkage to developments in oil prices, reflecting the many different ways that electricity is produced.

The main methods for generating electricity in the euro area are the use of fossil fuels, such as gas or coal/lignite; the exploitation of renewable energy sources, such as hydro, solar or wind; and nuclear fission. Oil is rarely used to generate electricity; however, owing to the co-movement of gas with oil, there has been some correlation with electricity prices, but this is much weaker and with a longer lag than for liquid fuels or for gas – see Chart D. Furthermore, it is primarily seen in countries where gas accounts for a relatively large

<sup>4</sup> See the International Gas Union's *Wholesale Gas Price Survey – 2015 Edition*. See also European Commission, *Quarterly Report on European Gas Markets*, Volume 8, Issue 3; third quarter of 2015.

<sup>5</sup> Owing to the costs of shipping gas (requiring liquefaction and regasification facilities), opportunities for international arbitrage (e.g. with US gas) are relatively limited and only profitable when price differentials are quite large.

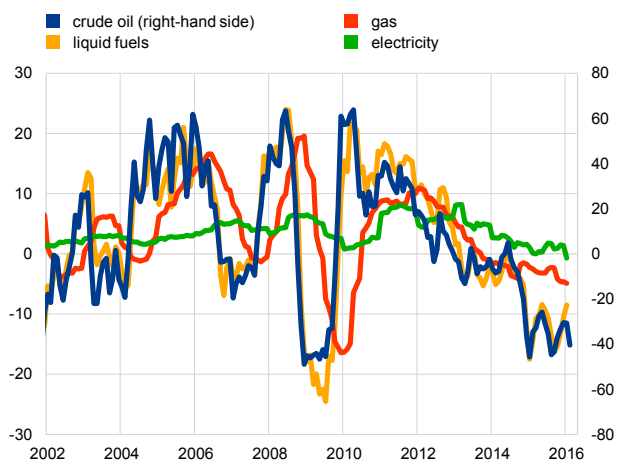
<sup>6</sup> On average in 2014 and 2015, wholesale gas prices accounted for approximately 40% of the consumer gas prices, distribution costs and margins made up around 33%, and taxes and levies just over 25%, according to ECB staff calculations derived from Eurostat and Haver Analytics data.

<sup>7</sup> Consumer gas prices have declined across all euro area countries, albeit with some differences in magnitude, in part reflecting country-specific regulatory changes.

## Chart D

### Crude oil prices and consumer energy price components

(annual percentage changes)



Sources: Eurostat, Bloomberg, BIS and ECB calculations.

Note: Latest observations refer to February 2016 (crude oil) and January 2016 (HICP energy components).

portion of the electricity generated. Across the euro area on average, in 2014 (the latest year for which data are available from Eurostat), almost 40% of the electricity price for consumers was accounted for by energy and supply costs, around 25% by network costs and the remainder – approximately 33% – by taxes and levies. Since July 2014 consumer electricity prices in the euro area have increased (by approximately 1%), but decreased marginally in annual terms at the beginning of 2016.

**Overall, the current negative inflation in consumer energy prices reflects the impact of oil price declines, primarily via consumer liquid fuel prices.**

Consumer prices for liquid (transport and heating) fuels – which comprise approximately half of the energy component – have the most direct, strongest and quickest link with oil prices. Consumer prices for gas and, in particular, for electricity tend to have a less direct and weaker link, and respond with a longer lag.

Based on oil, gas and electricity prices, as well as on

market futures, consumer energy prices – not only for liquid fuels but also for gas – are likely to continue to have a negative impact on inflation in 2016, whilst consumer electricity prices are likely to remain subdued.