

# Core inflation measurement in Norway

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# Monetary policy – operational target

- In 2001, the Central Bank got a monetary policy regulation
  - Annual consumer price inflation of approx. 2.5 per cent over time
- In general, the direct effects on consumer prices resulting from changes in
  - interest rates
  - **taxes**
  - **excise duties** and
  - **extraordinary, temporary disturbances shall not be taken into account**

# Extraordinary temporary disturbances?

- Back in 2001 extraordinary temporary disturbances were defined as
  - Price movements of **energy products** - highest st. dev.
    - ◆ Electricity
    - ◆ Liquid fuels
    - ◆ Heat energy
    - ◆ Fuels and lubricants
  - Other components up for discussion;
    - ◆ Fruits and vegetables
    - ◆ Clothing and footwear
- New methodology in recent years - high volatility
  - Passenger transport by air
  - Books

# Energy products in CPI

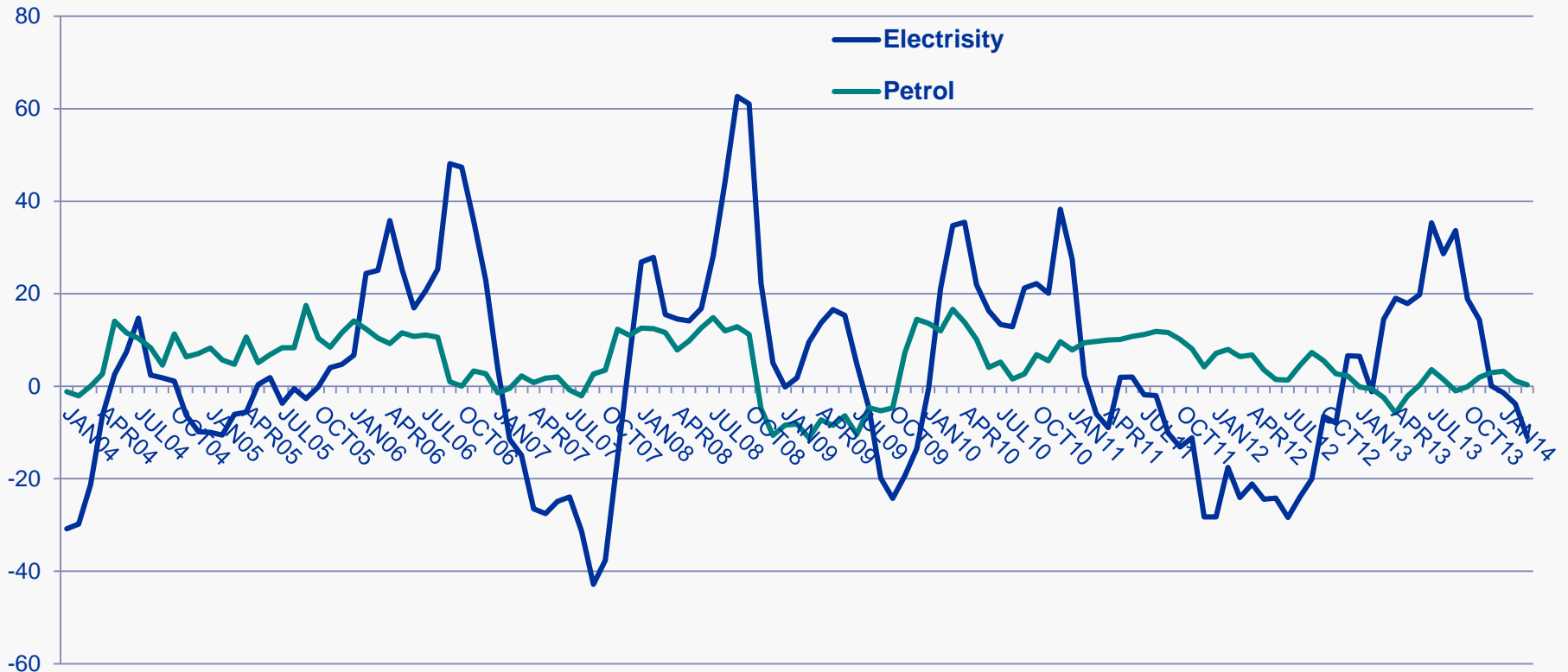
- Energy products constitute under 7 per cent of total consumption

	2014
Electricity, gas and other fuels	3.52 %
Fuels, lubricants, personal transport equipment	2.90 %
<b>Total weights of energy products</b>	<b>6.42 %</b>

# Energy products in CPI

- Energy products not so dominant, but strong fluctuations in short term

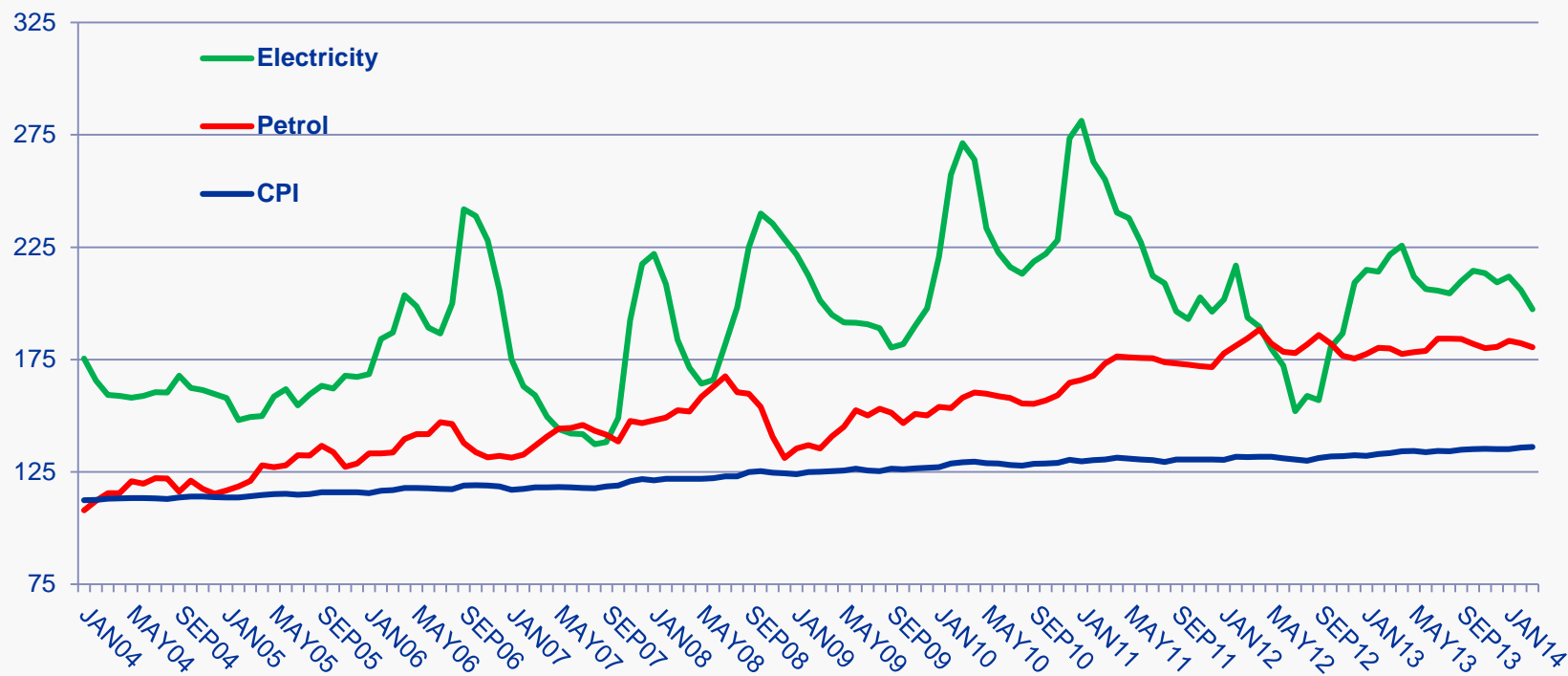
## 12-months change



# Energy products in CPI

- Energy products not so dominant, but higher price trend on long term

Index (1998=100)



# A set of official indicators

- CPI-ATE
  - CPI adjusted for tax changes and excluding energy products
- CPI-ATE seasonally adjusted
  - Using X12 ARIMA tool
- CPI-AT
  - CPI adjusted for tax changes
- CPI-AE
  - CPI excluding energy products
- CPI-AEL
  - CPI excluding electricity

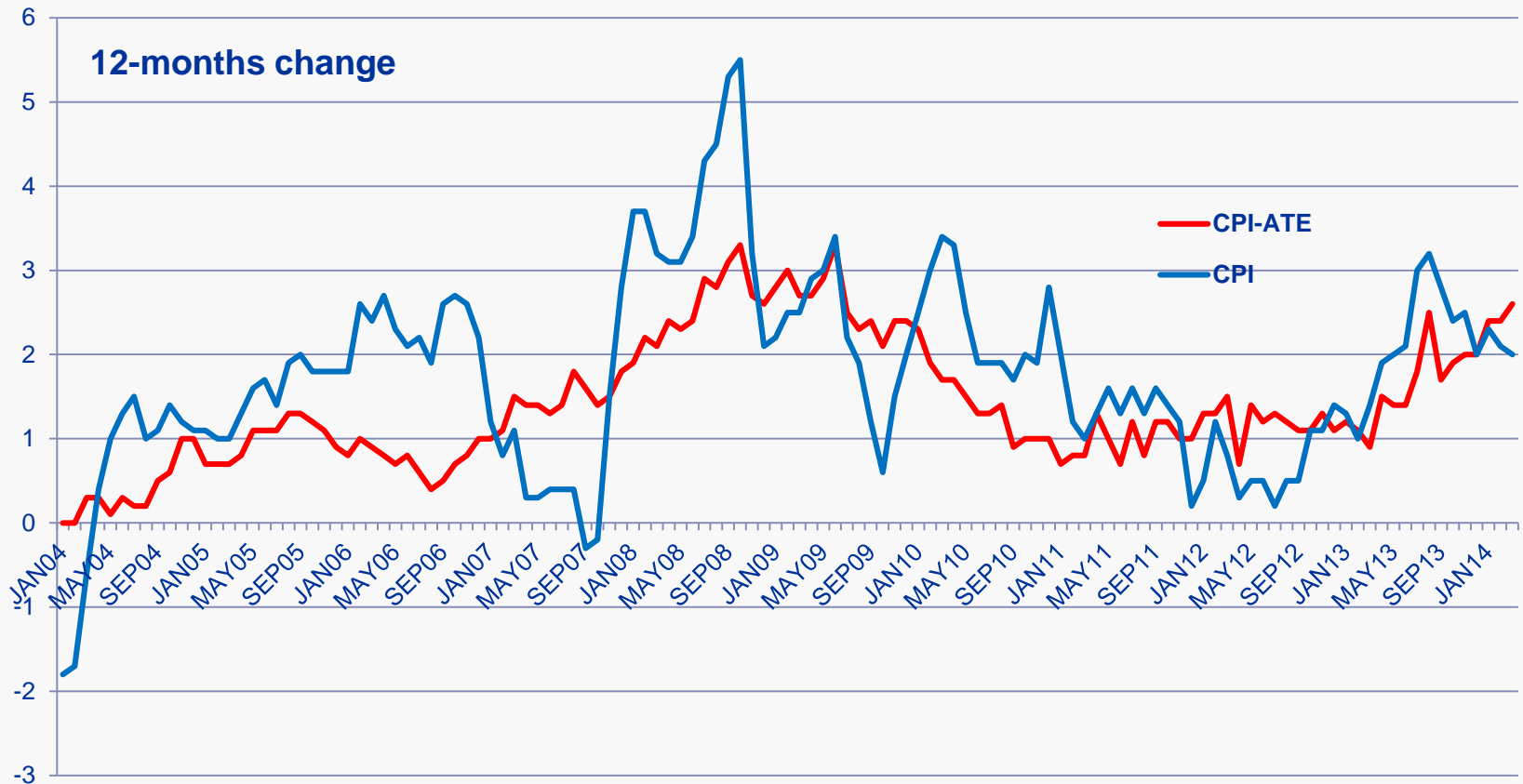


# Taxes and Duties

- Tax adjustments in the CPI-AT/CPI-ATE

Value added tax	Tax on mineral products
Tax on spirit, wine and beer	Tax on chocolate and sweets
Tax on tobacco	Tax on non-alcoholic beverages
Tax on sugar	Tax on petrol
Tax on air travel	Tax on diesel fuel
Tax on disposable beverage packing	Tax on electricity
Tax on motor vehicles	

# CPI adjusted for tax changes and excluding energy products



# HICP- Constant Taxes

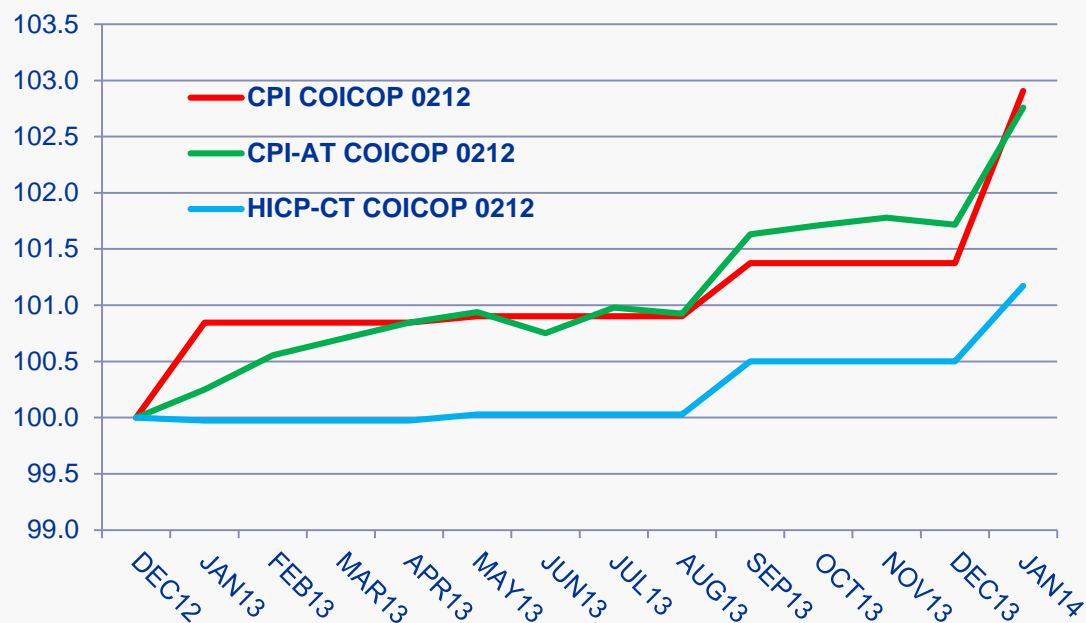
- **HICP-CT** and **CPI-AT** - similar methodology

$$CPI - AT_{t_0, t_n} = \sum_{i=1}^g \frac{p_{i, t_n} - (\tau_{i, t_n}) + \left( \tau_{i, t_0} * \frac{I_{i, t_n}}{I_{i, t_0}} \right)}{p_{i, t_0}}$$

- Adjustment of **nominal** tax changes in the HICP-CT
- Adjustment of **real** tax changes in the CPI-AT
  - Adjusting taxes per physical unit with the inflation
  - Drawback: index varies even though there are no actual tax changes
- Taxes treated consistently?
  - Different treatment of ad valorem taxes and taxes per physical unit

# Comparisons CPI-AT and HICP-CT

- What is the impact of the general inflation?



- Statistics Norway started calculating and transmitting to Eurostat HICP-CT in 2014
- How to present for users different measurements of what appears to be quite similar methodology?

# Other core inflation indicators in Statistics Norway

- 10 per cent trimmed mean
  - Ranking the CPI-AT components and their weights by the size of their price movement and the top and bottom distribution are removed
- 20 per cent trimmed mean
- Weighted median
  - The inflation rate for the item which is in the middle of the total distribution of price changes
  - Can vary from month to month
  - How to interpret?
- Extreme price movements are systematically removed
- Available for users (mostly financial analysts)
  - Not available on the Internet

# Comparison with other measurements of core inflation

