Co-funded by the Horizon 2020 programme
of the European Union

ODYSSEE-MURE

First meeting of the project *"ODYSSEE-MURE, Monitoring EU Energy Efficiency First Principle and Policy Implementation"*
16-18 December 2019, Berlin, Germany

WP2 : Main efficiency trends in the EU

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Enerdata intelligence + consulting

Outline

- Energy consumption trends
- Energy efficiency trends
- Drivers of consumption variation
- Energy intensity and structural changes

Energy consumption trends

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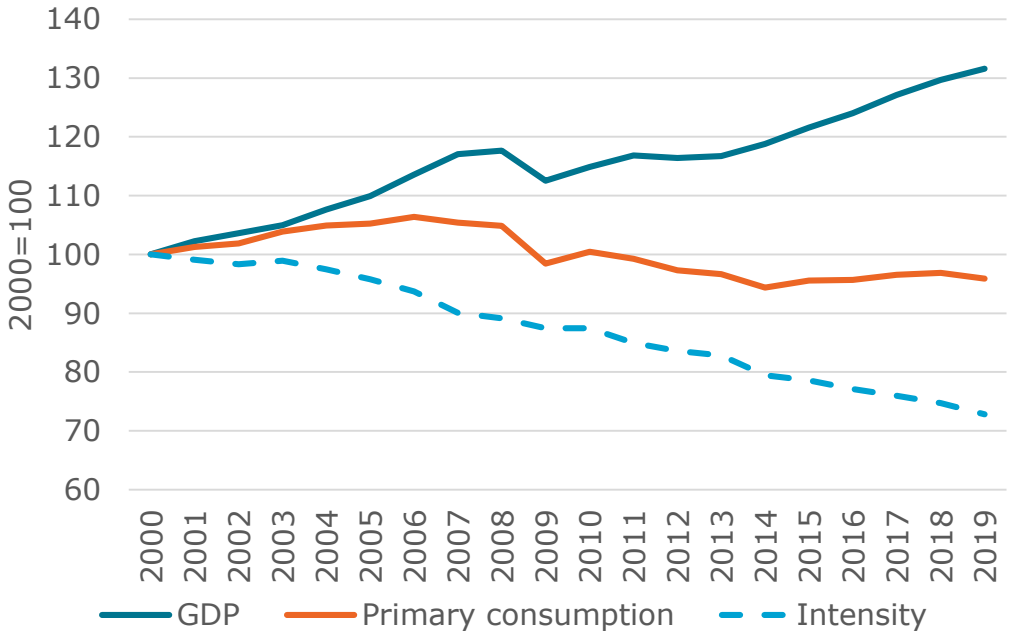
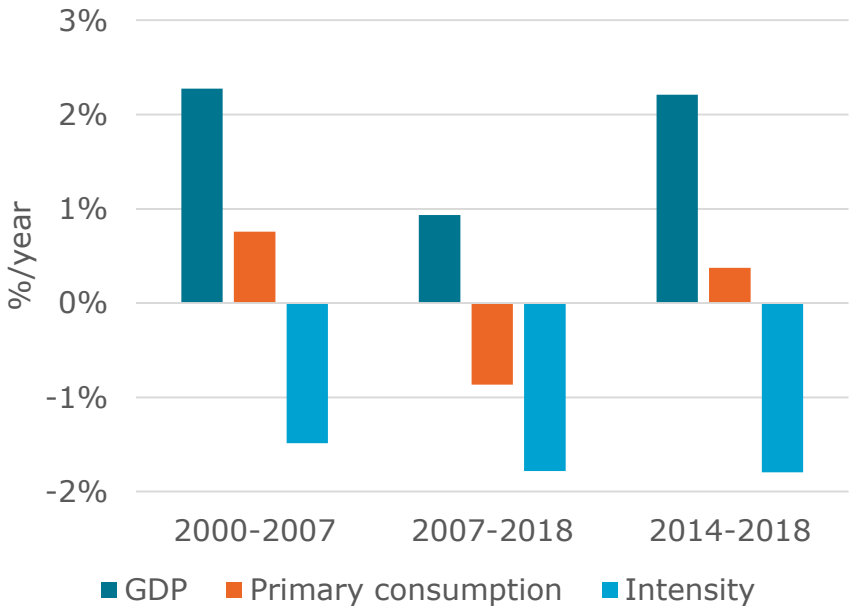
- Slight progression of the primary consumption since 2014 (0.4%/yr), about 6 times slower than GDP, after a decrease of 1.6%/yr between 2007 and 2014 (consumption at normal climate).
- Regular and rapid decrease of the primary energy intensity since 2007 (~1.8%/year), slightly faster than over 2000-2007 (+0,2 pts)

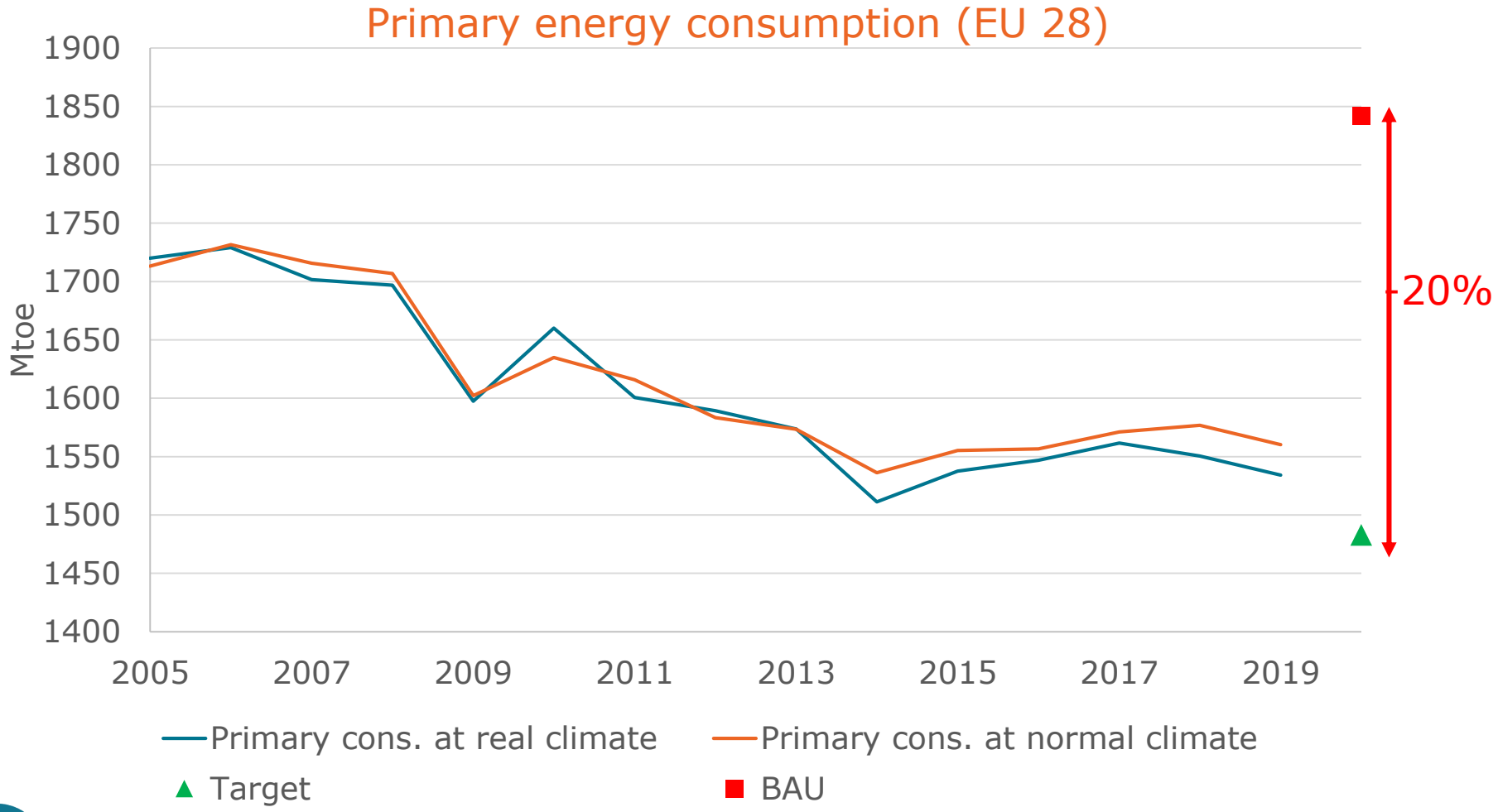
Primary energy consumption and intensity vs GDP (EU 28)





Consumption and intensity at normal climate, Source: ODYSSEE
2019 estimate based on Enerdata's Monthly data

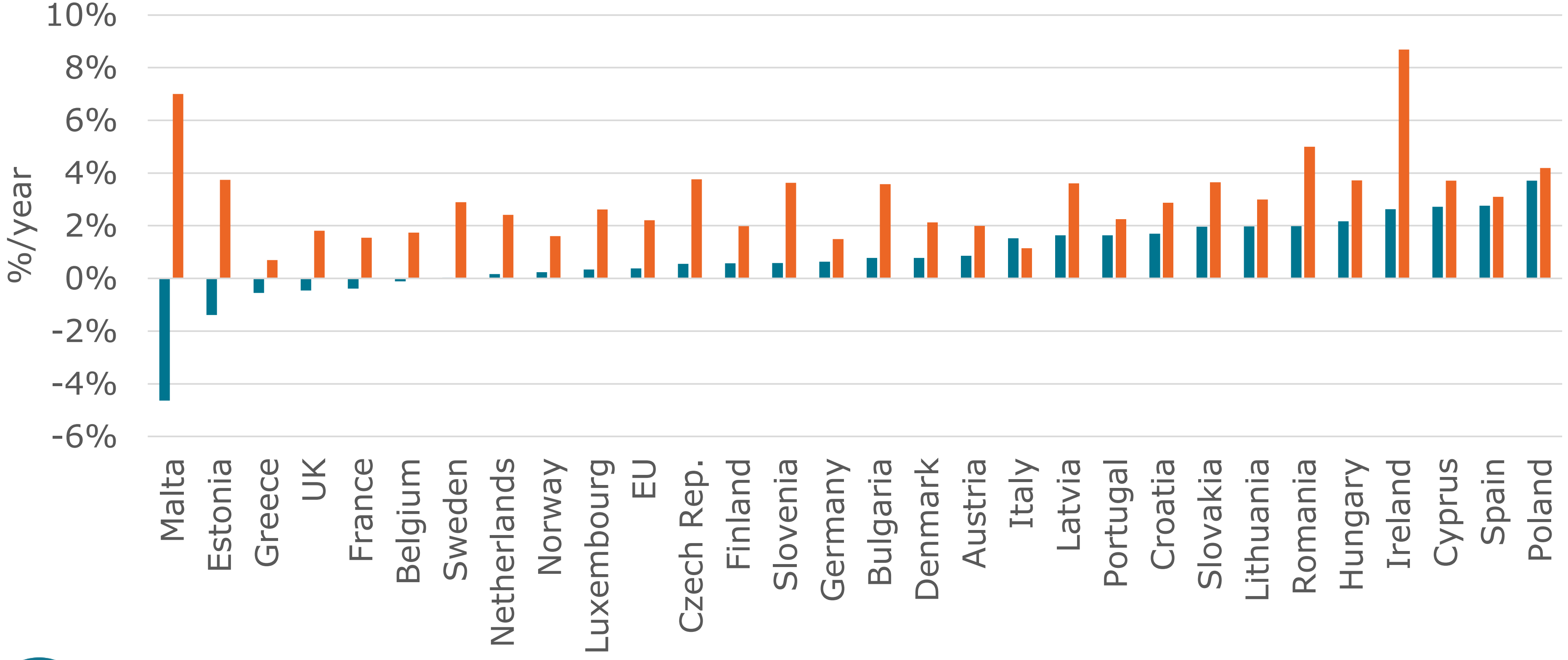
- In 2019, EU primary energy consumption should be 3% above the 2020 efficiency target, according to preliminary estimates (4.5% higher in 2018).
- The consumption at real climate decreases faster than the consumption with climate corrections because of the recent warmer winters



Source: Eurostat until 2017, Enerdata for 2018 and 2019 (2019 estimate based on Enerdata's Monthly data)

- Since 2014, decreasing primary consumption in 5 countries and low consumption growth below the 0,4%/year observed for the EU in 4 other countries despite the economic recovery.
- Everywhere the consumption is progressing much slower than the GDP, implying a decreasing energy intensity, especially significant in Ireland, the Czech Rep, Romania, Slovenia, and Bulgaria (> or = to 3%/yr).

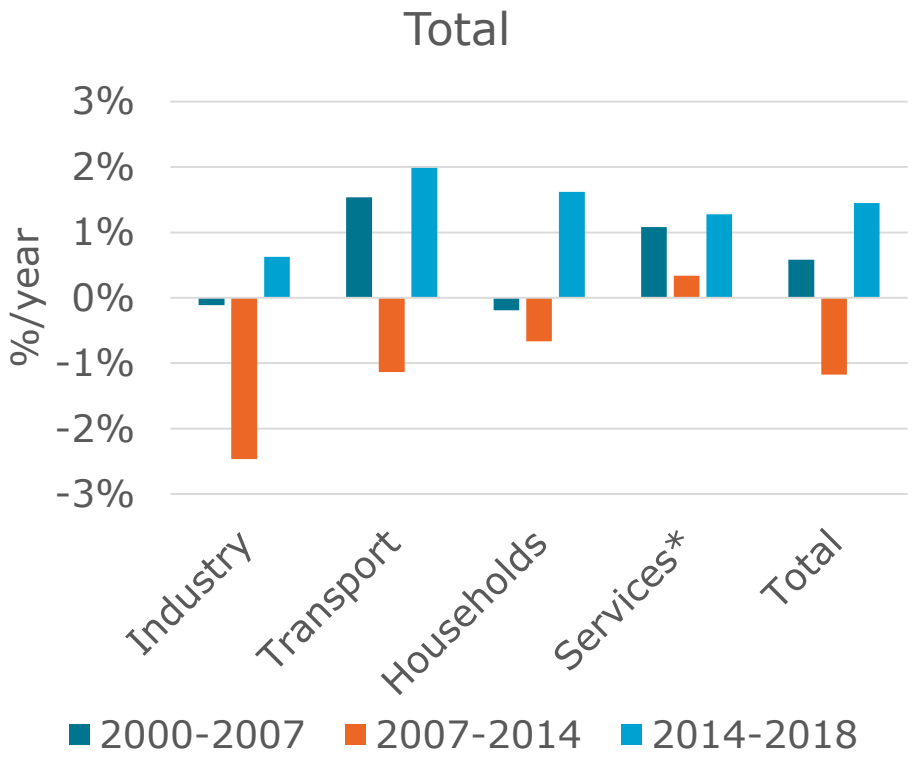
Variation of primary energy consumption* and GDP over 2014-2018

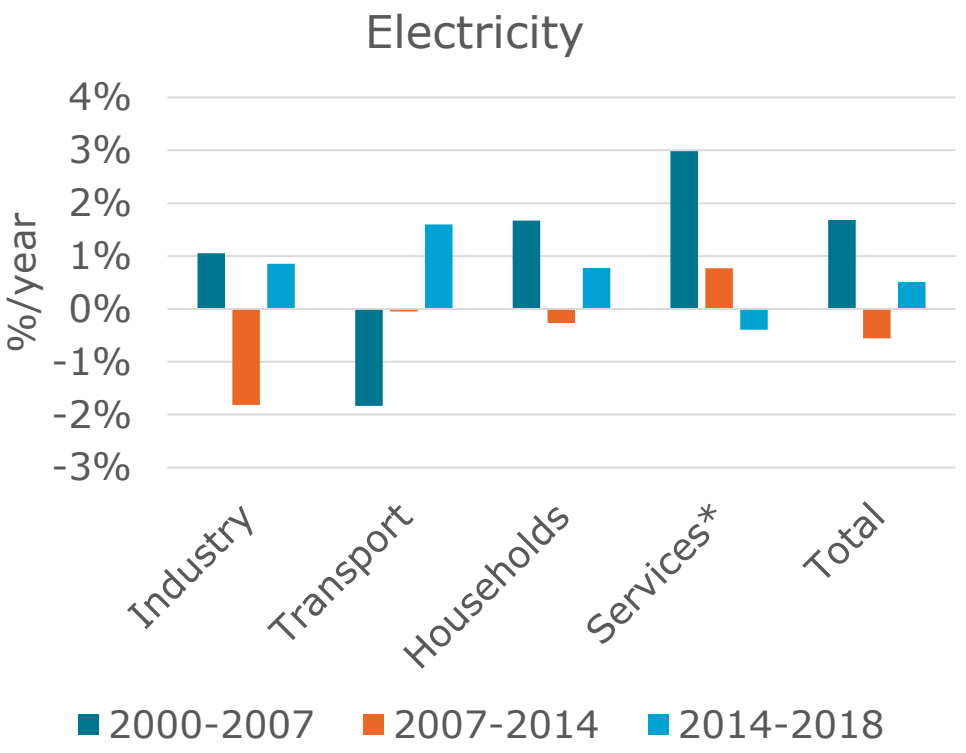


Enerdata

*At normal climate

- Final consumption grows again since 2014 with the economic growth rebound: +1.4%/year for total and a lower progression for electricity, especially in buildings (0.5%/yr).
- The final intensity decrease has been divided by 2 since 2014 : from 1.4%/year over 2007-2014 to 0.7%/year since then.
- Transport is the most dynamic sector since 2014.





Households and services at normal climate based on Eurostat data at real climate up to 2017 and Enerdata's Annual data for 2018.
Services include non-specified

Energy efficiency trends : preliminary results

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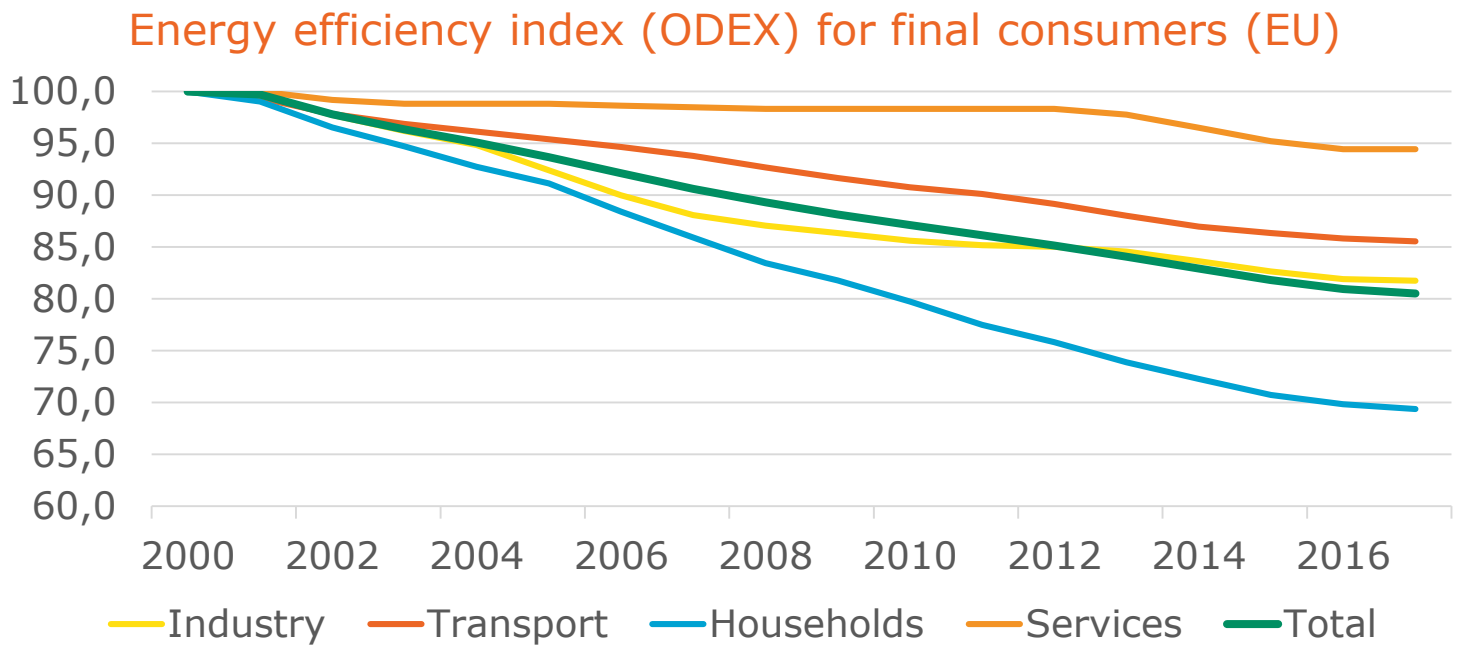
- Energy efficiency of final consumers improved by 1.3%/year between 2000 and 2017 (1.4%/yr before 2007 and 1.1%/year since 2010).
- Larger gains for households (2%/yr since 2000) with a net slow down since 2014 (1.4 %/yr against 2.3%/yr before).
- Rate of improvement divided by more than 2 in industry, since 2007 (0.7%/yr compared to 1.8%/yr before).
- Regular but limited improvement in transport (0.9%/year): greater for cars than for trucks with also a net slowdown (0.5%/yr since 2015 against 1%/yr before).

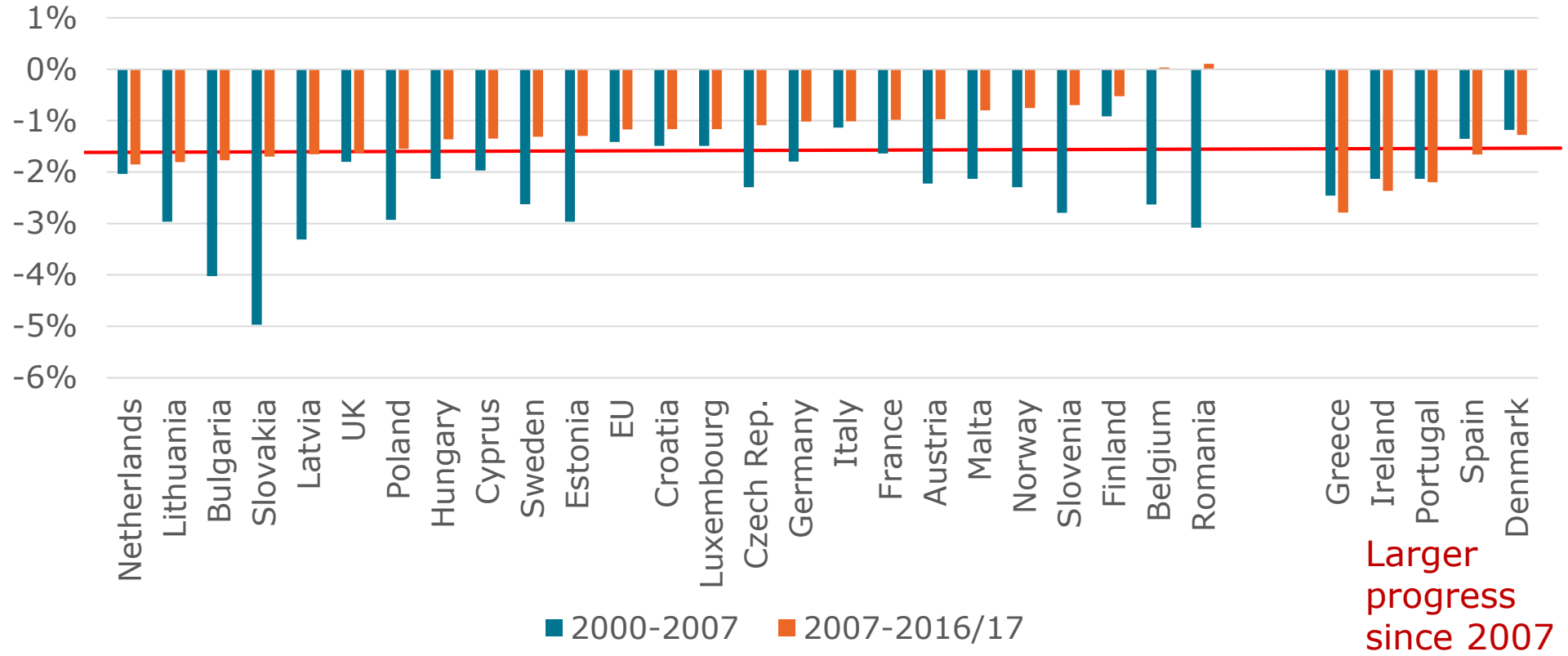


Source: ODYSSEE

ODEX=80.5 in 2017 ➔ 19.5% energy efficiency improvement or 1.3%/yr

- Energy efficiency improvement above 1.5%/year* since 2007 in 11 countries.
- Only 4 countries have accelerated their rate of energy efficiency improvement since 2007.

Energy efficiency improvements of final consumers by country*



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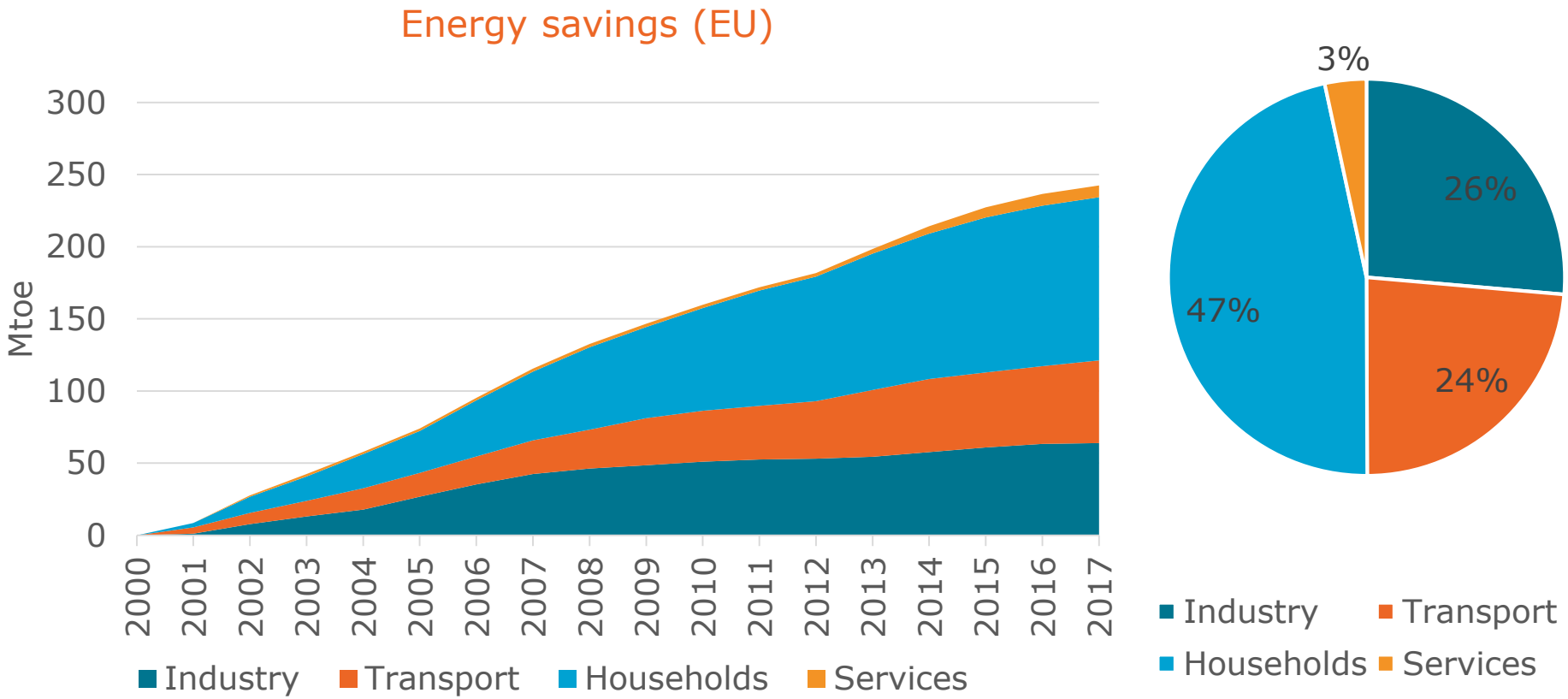
As a comparison with Article 7 target of EED
***As measured with the energy efficiency index ODEX.*

- Around 243 Mtoe energy savings in 2017 compared to 2000 (i.e. 21% of final energy consumption).
- Without these savings the final energy consumption would have been 21% higher in 2017.
- Most of these savings come from households (47%), 26% from industry, 24% from transport and 3% from services.



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Drivers of consumption variation 2010-2017

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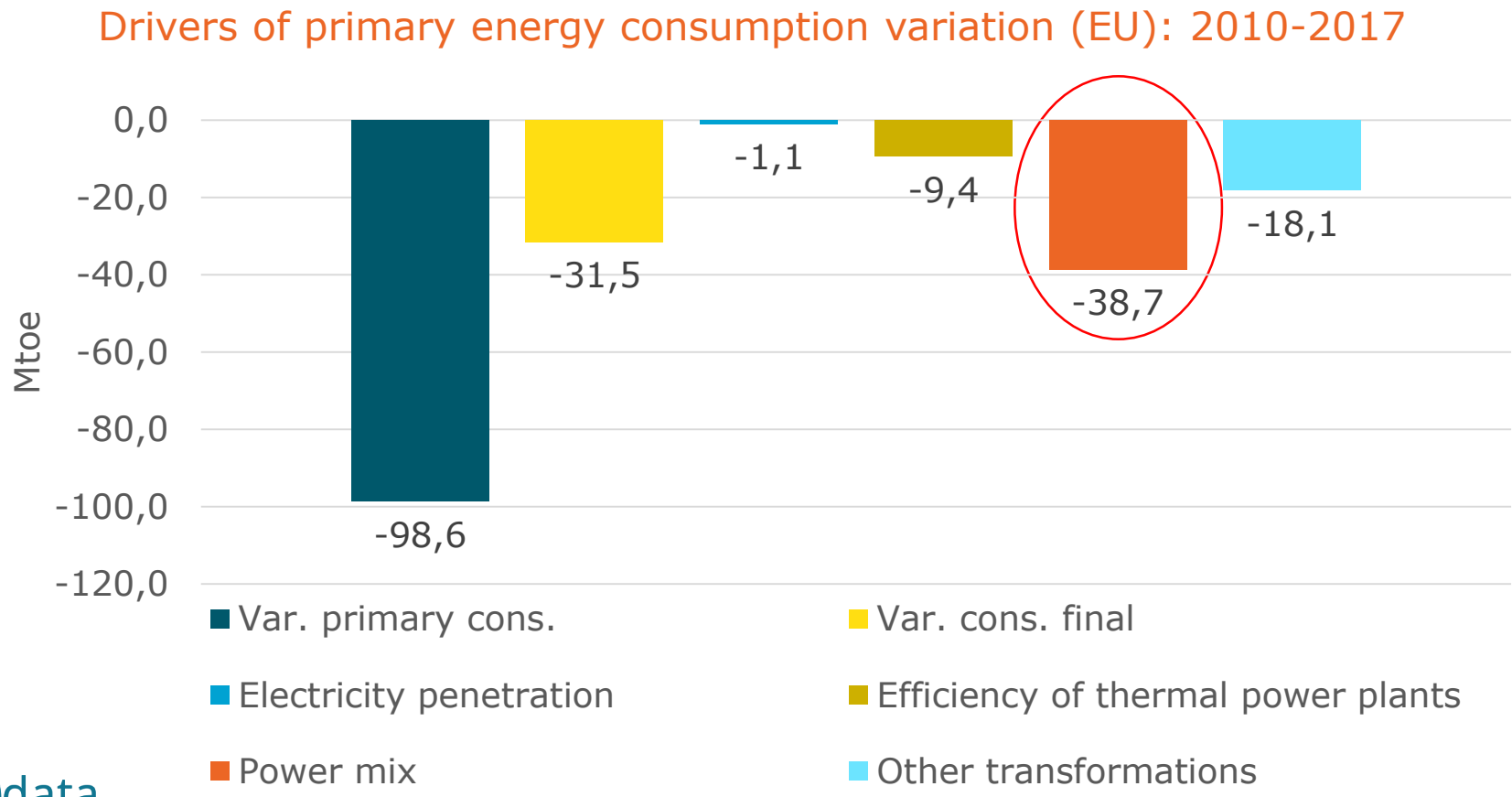
▪The primary consumption decreased faster than the final consumption between 2010 and 2017.

▪This is mainly due to the change in the power mix (higher share of renewables, lower share of nuclear), that explains 40% of the reduction in primary consumption .



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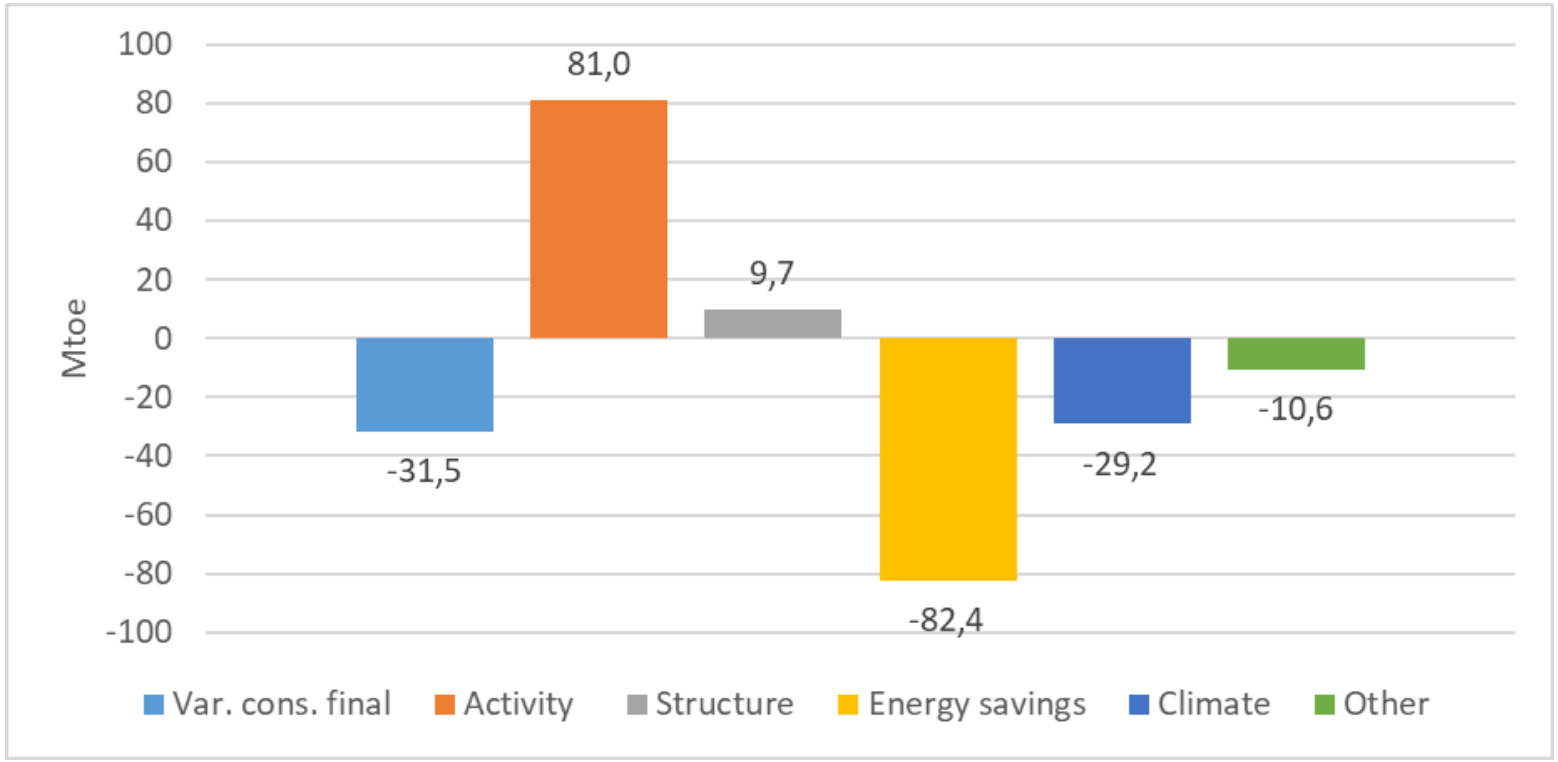
- Between 2010 and 2017, the activity effect contributed to raise the final consumption by 81 Mtoe.
- To a lesser extent, structural changes in industry and modal shift in transport also contributed to increase the consumption (+10 Mtoe).
- Energy savings totally offset the activity effect.
- The warmer climate in 2017 had a significant impact (-29 Mtoe) and is equivalent to the consumption reduction.

Drivers of final energy consumption variation (EU): 2010-2017



Activity effect : mainly economic growth, plus demography and lifestyle changes (appliance ownership and larger dwellings).

Energy intensity and energy efficiency trends

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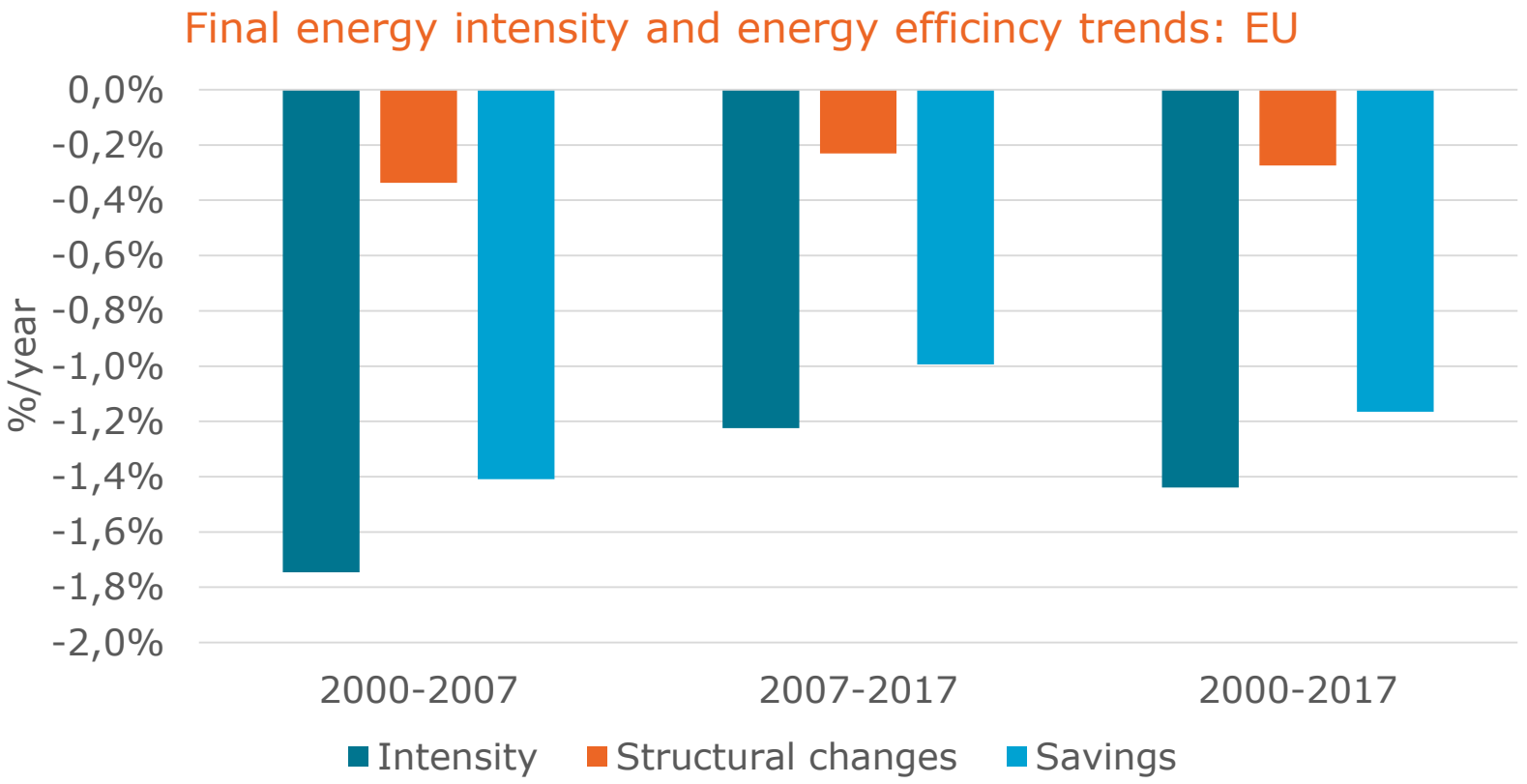
Energy efficiency explains most of the intensity decrease (around 80%)… but not all; the remaining being explained by different types of structural changes



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Conclusions

- The primary consumption target for 2020 should be reached, taking into account the present trends.

- Since 2010, the increasing share of renewables explains around 40% of the decrease in primary energy consumption reduction, while only 32% is coming from final consumers.

- Energy efficiency improvement has been much slower since 2014/2015 in all sectors, generally by a factor 2 in industry and transport. The progression is the strongest for households because of the multiple regulations implemented at EU and measures at national level .

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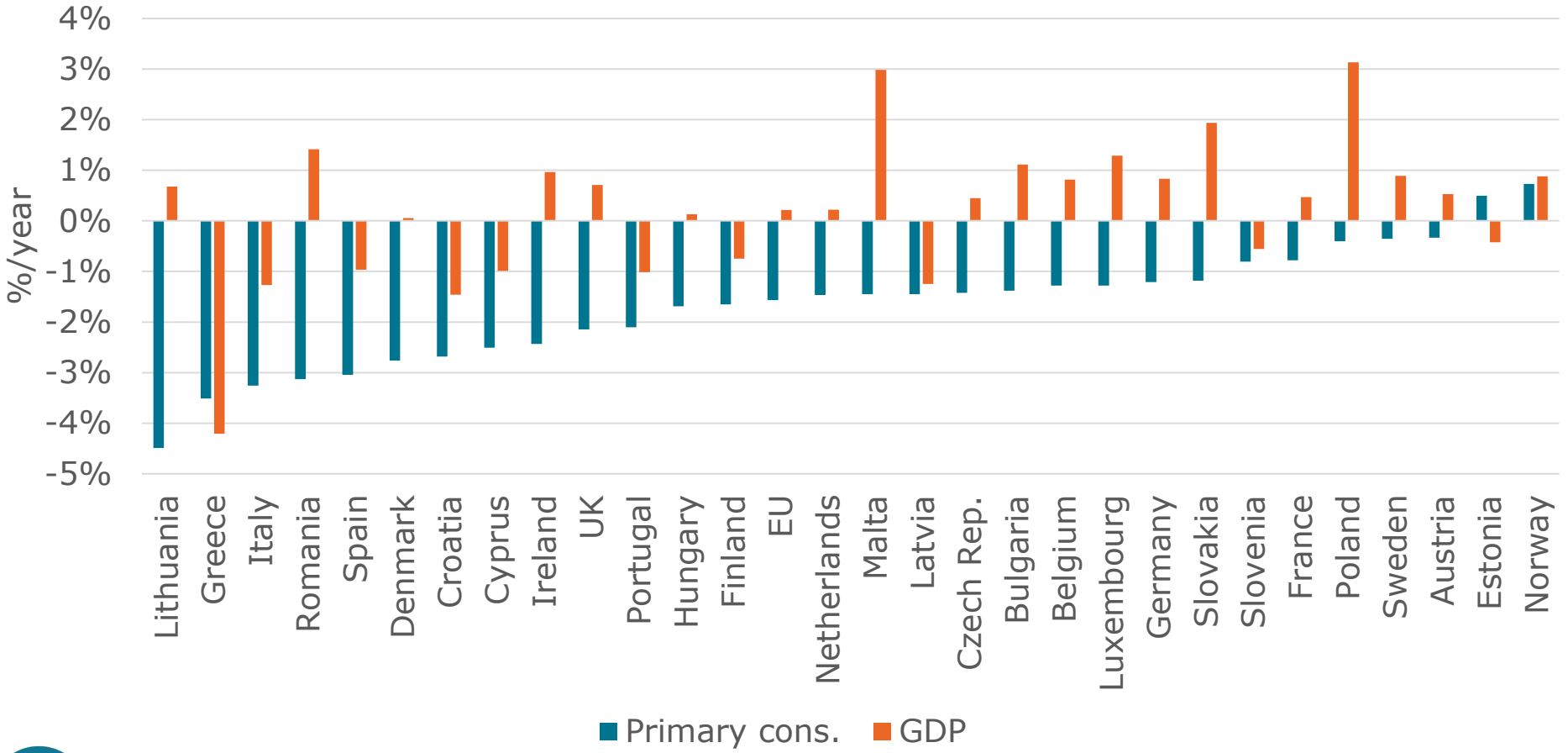
Annex

Decreasing trend of the primary consumption in all countries in the period of slow economic growth or recession**

- ✓ Strong reduction, between -2 and -5%/yr in 11 countries;
- ✓ Between -1 and -2%/yr in 12 countries

Variation of primary energy consumption* and GDP over 2007-2014



*At normal climate

**except in Estonia and Norway*