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ODYSSEE-MURE

Second meeting of the project “*ODYSSEE-MURE,
Monitoring EU Energy Efficiency First Principle and Policy
Implementation*”
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Energy efficiency trends in the EU

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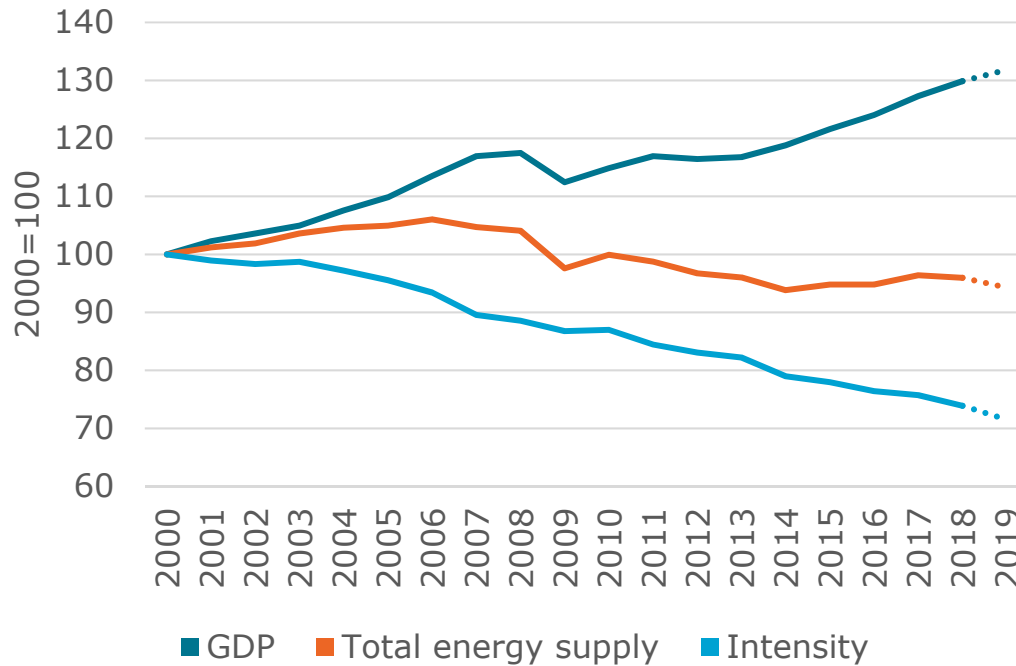


Outline

- Energy consumption trends
 - Energy efficiency trends
 - Conclusions
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- *Sources of data for the EU:*
 - ✓ *2000-2018: Eurostat when available, if not sum of countries or average of representative countries based on national data from ODYSSEE data base.*
 - ✓ *2019: Enerdata estimates for final energy consumption and "early estimates" for key indicators produced from ODYSSEE (<https://www.odyssee-mure.eu/private/methodology-early-estimates.pdf>)*
 - *EU includes UK.*
 - *International air transport excluded from energy consumption data and indicators.*

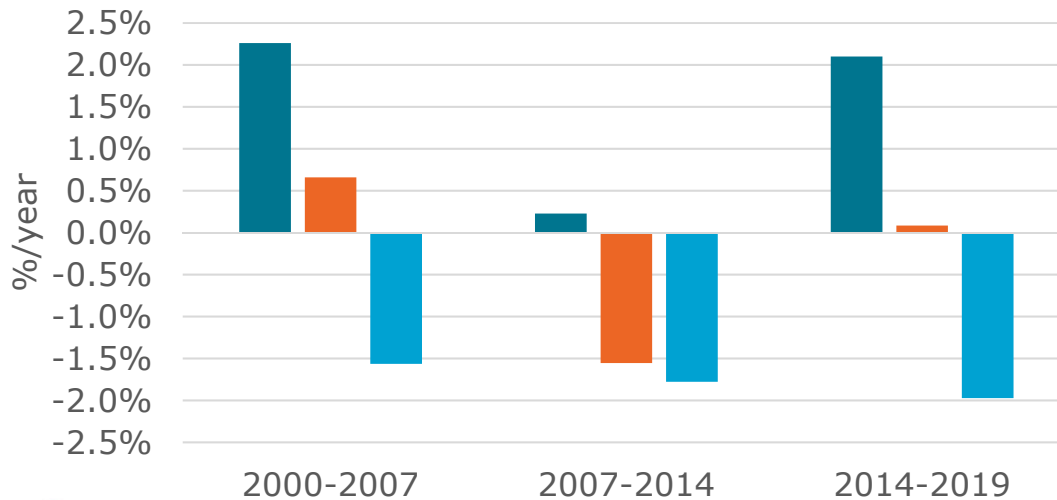
Energy consumption trends

Total energy supply and intensity VS GDP



- **Relative stability** of EU **total energy supply** since 2014, although **GDP** increased **by 2%/year** with the return to economic growth.

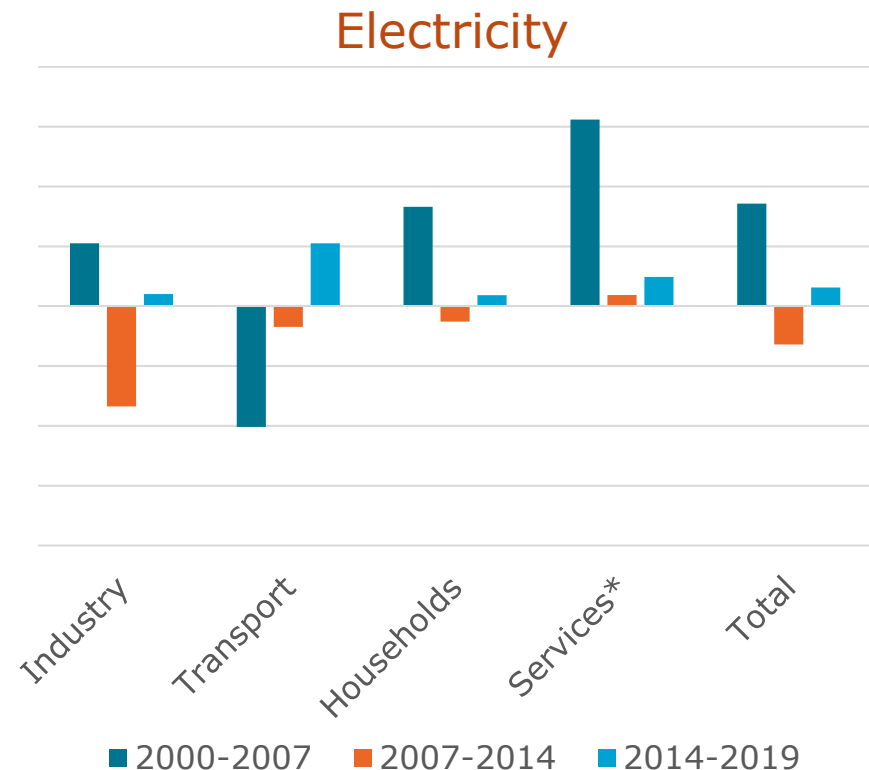
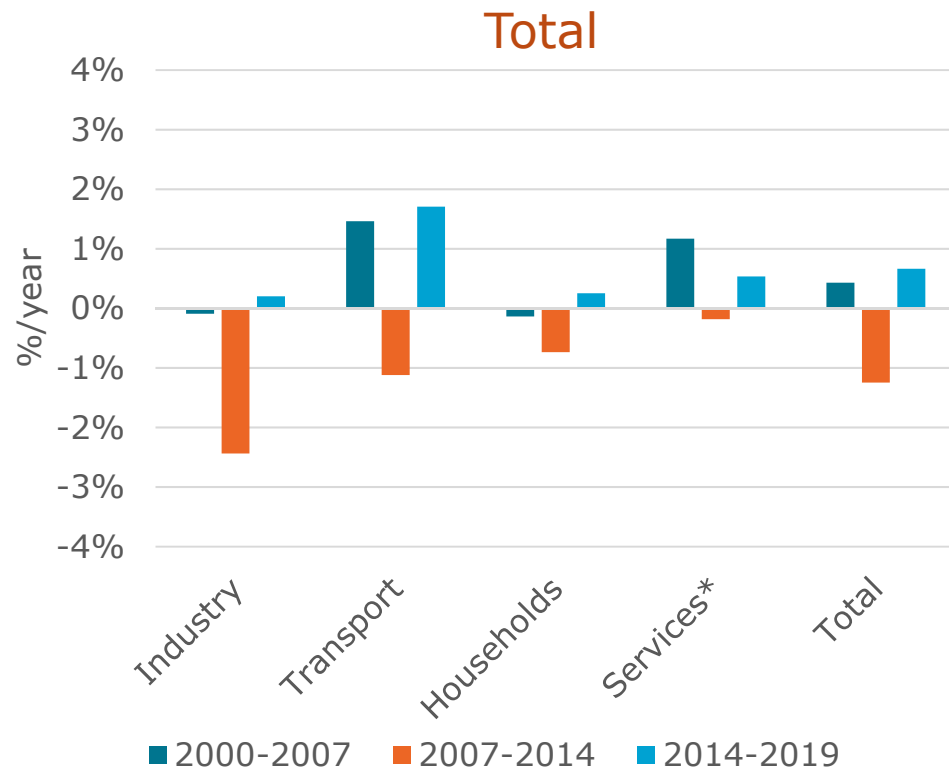
- This follows a significant decrease of 1.6%/year between 2007 and 2014 due to the financial crisis of 2009.



- **More rapid decrease** of the primary energy **intensity** since 2014 ($\sim 2\%/year$), slightly faster than over 2000-2007 (+0.4 pt) and 2007-2014 (+0.2 pt)

Final energy consumption trends

- Final energy consumption grows again since 2014 with the economic rebound (+0.7%/yr), which contrast greatly with total energy supply.
- Electricity consumption growth is much slower (0.3%/yr) than before the financial crisis.
- Transport is the most dynamic sector since 2014 and is back to the trend before 2007 (1.7%/yr).
- Industry has the lowest progression (0.2%/yr).



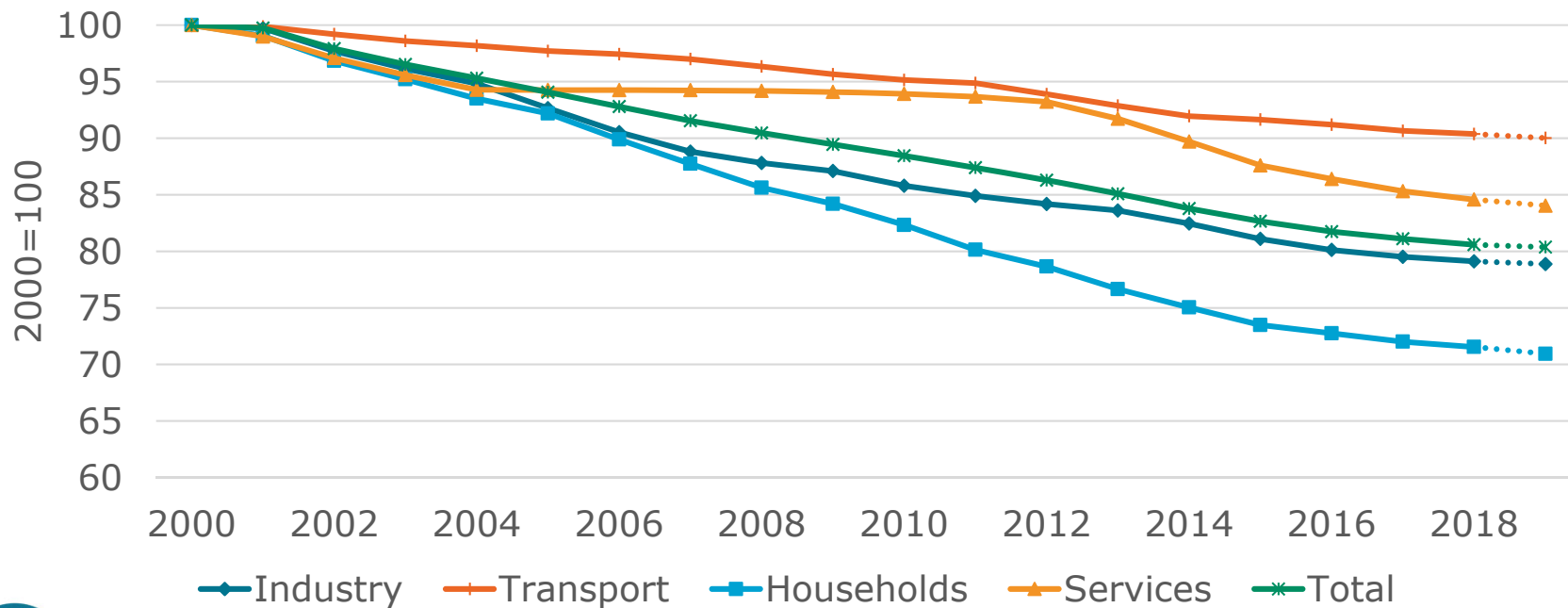
Households and services at normal climate
 *Services include non-specified
 Source: ODYSSEE

Energy efficiency trends

Lower energy efficiency improvements since 2014

- Efficiency of final consumers increased by 0.8%/yr since 2014, compared to 1.3%/yr between 2000 and 2014).
- Larger gains for buildings: 1.3%/yr for services since 2014; 1.1 %/yr for households, however with progress twice lower since 2014.
- Strong slow down in industry since 2007 (0,9%/yr since 2014; down from 1.7%/year before 2007 and 1.1%/yr over 2007-2014).
- Lower improvement in transport (0.4%/yr since 2014), twice less than over 2007-2014) because of no more progress for cars (penetration of SUV).

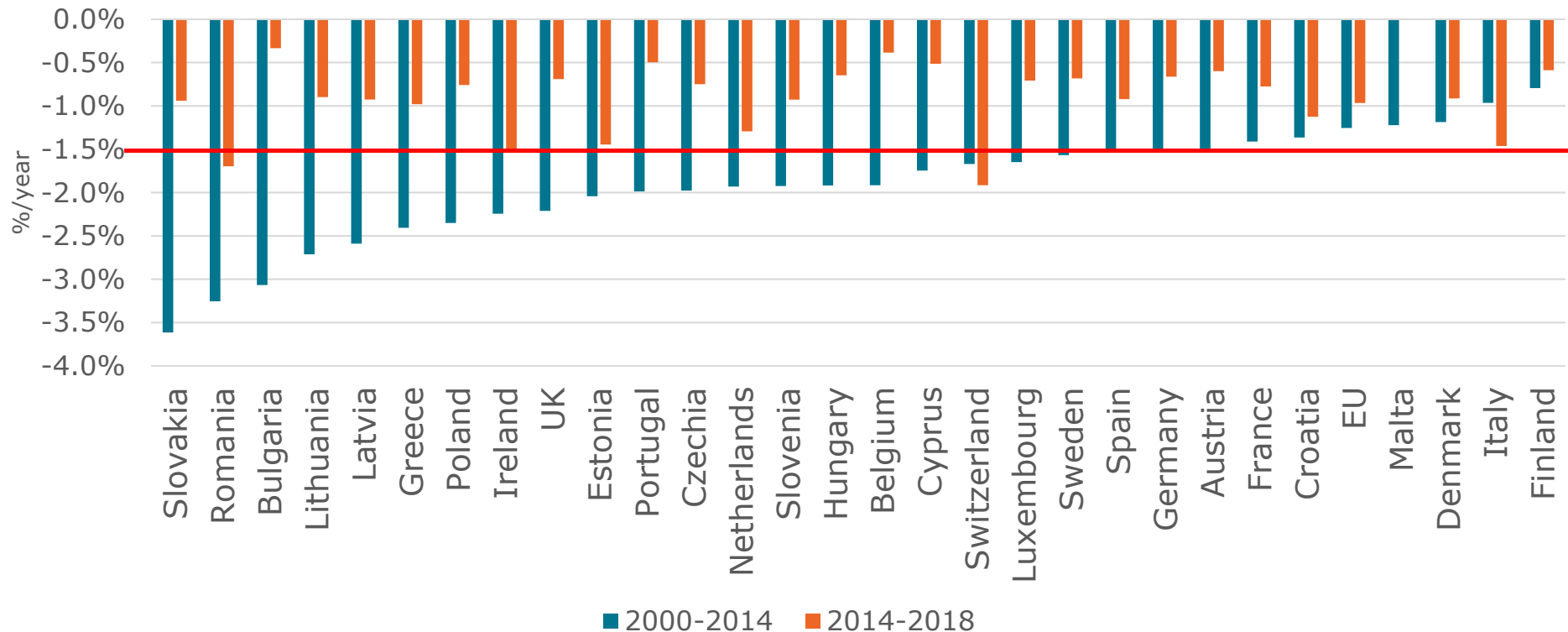
Energy efficiency improvements for final consumers (EU)



Source: ODYSSEE, measured with ODEX, Odyssee Energy Efficiency Index; ODEX=80.4 in 2019 → 19.6% energy efficiency improvement since 2000; for services new calculation by branch instead of at aggregate level.

- In most countries (except Italy and Switzerland), energy efficiency is progressing **much slower since 2014**.
- Progress in a range of 0.5 to 1%/yr in most countries since 2014 with 8 countries around 1% and 4 below 0.5%/yr, compared to 3/4 of countries above 1.5%/year* before 2014.

Energy improvement of final consumers by country**



*As a comparison with Article 7 target of EED

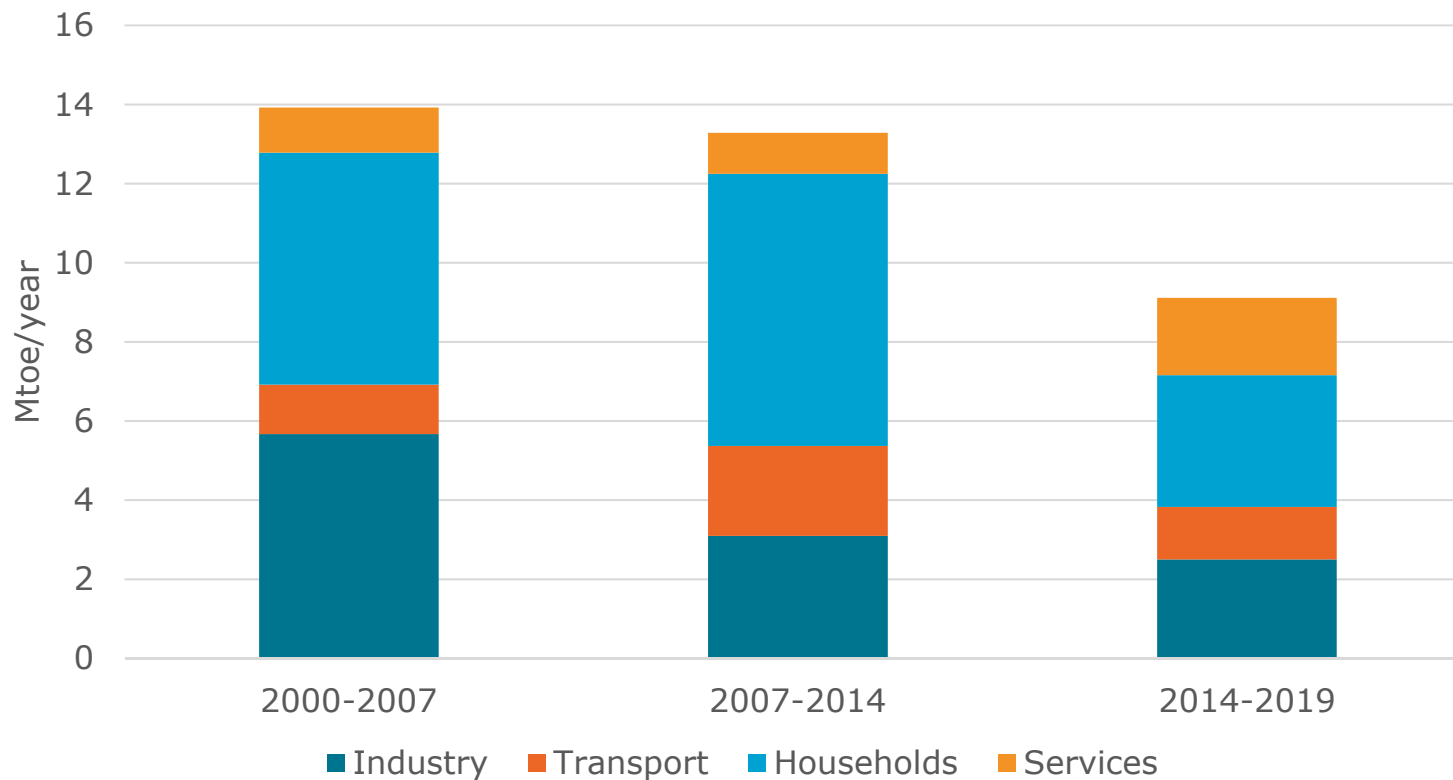
**As measured with the energy efficiency index ODEX.

Source: ODYSSEE

Regular decrease in energy savings

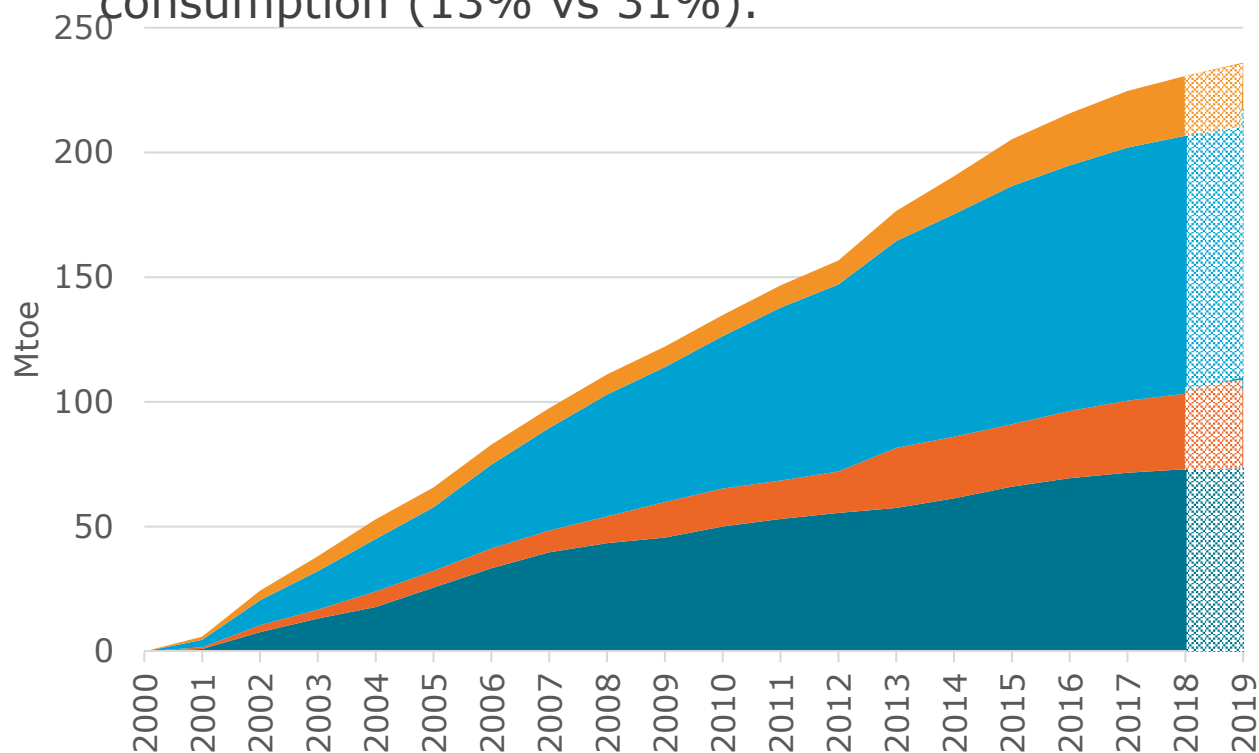
- Because of the slowing pace of energy efficiency improvement, the **annual additional savings** have been **decreasing since 2014**: from an average volume of 13,5 Mtoe/year over 2000-2014 to 9 Mtoe/year since 2014.
- They have been divided by 2 since 2007 in industry and since 2014 for households.

Average annual additional savings by sector

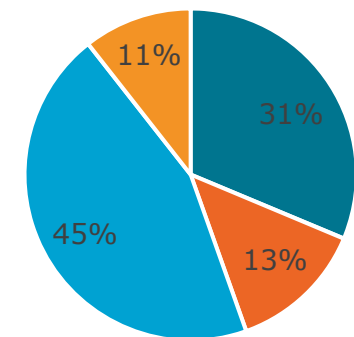


Energy savings vs. consumption

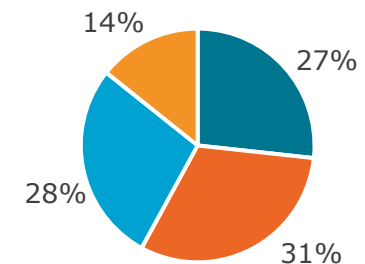
- The cumulated annual **energy savings** since 2000 represents the equivalent of 22% of final energy consumption in 2019: without these savings the **final consumption** would have been **22% higher**.
- **Households**, the sector with the highest number of regulations and financial measures, is over represented, with a share of total savings (45%) much higher than its share in consumption (28%).
- On the other hand, savings in **transport** are much lower than their share in consumption (13% vs 31%).



% in energy savings

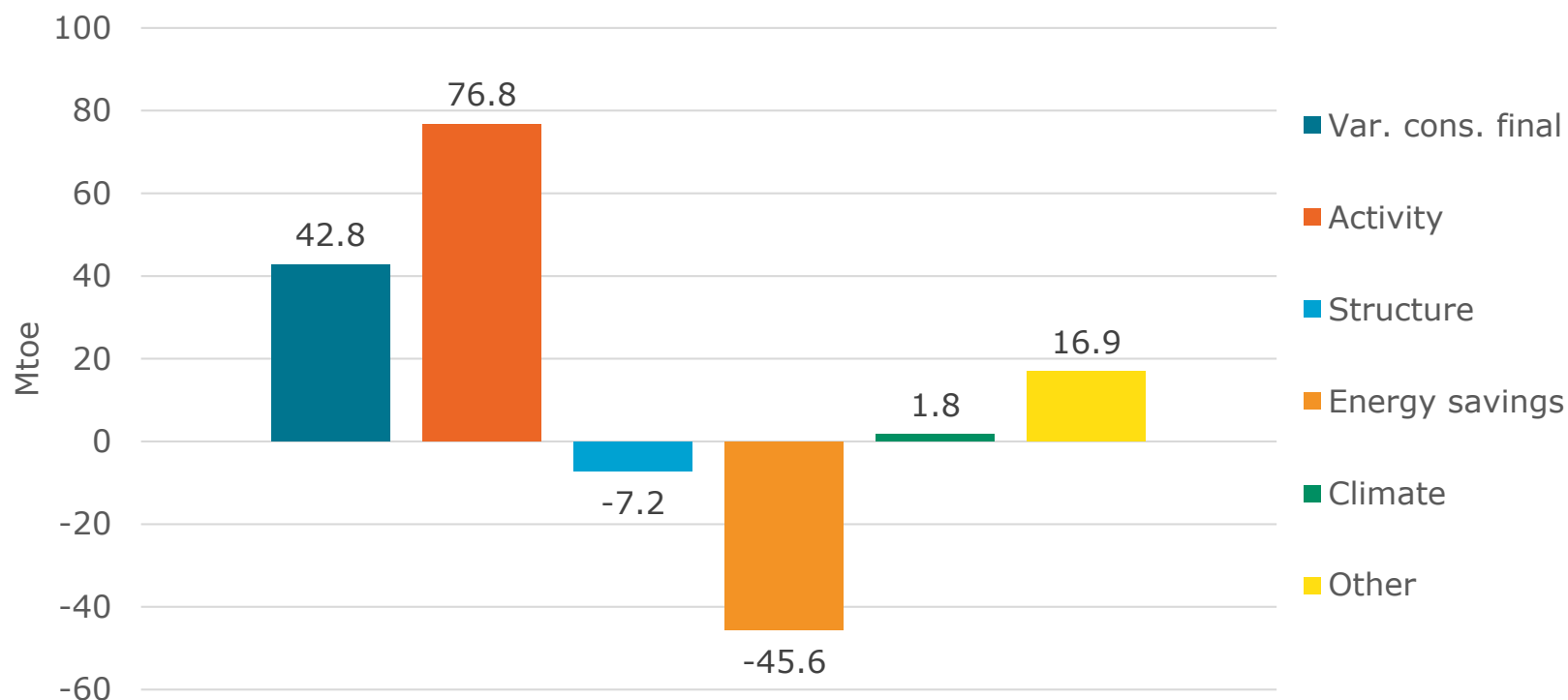


% in final consumption



Drivers of final energy consumption variation: 2014-2019

- Between 2014 and 2019, final consumption **increased** by 43 Mtoe.
- The **“activity” effect** contributed to raise final consumption by 77 Mtoe.
- **Energy savings** offset more than half of this effect by reducing consumption by 46 Mtoe.



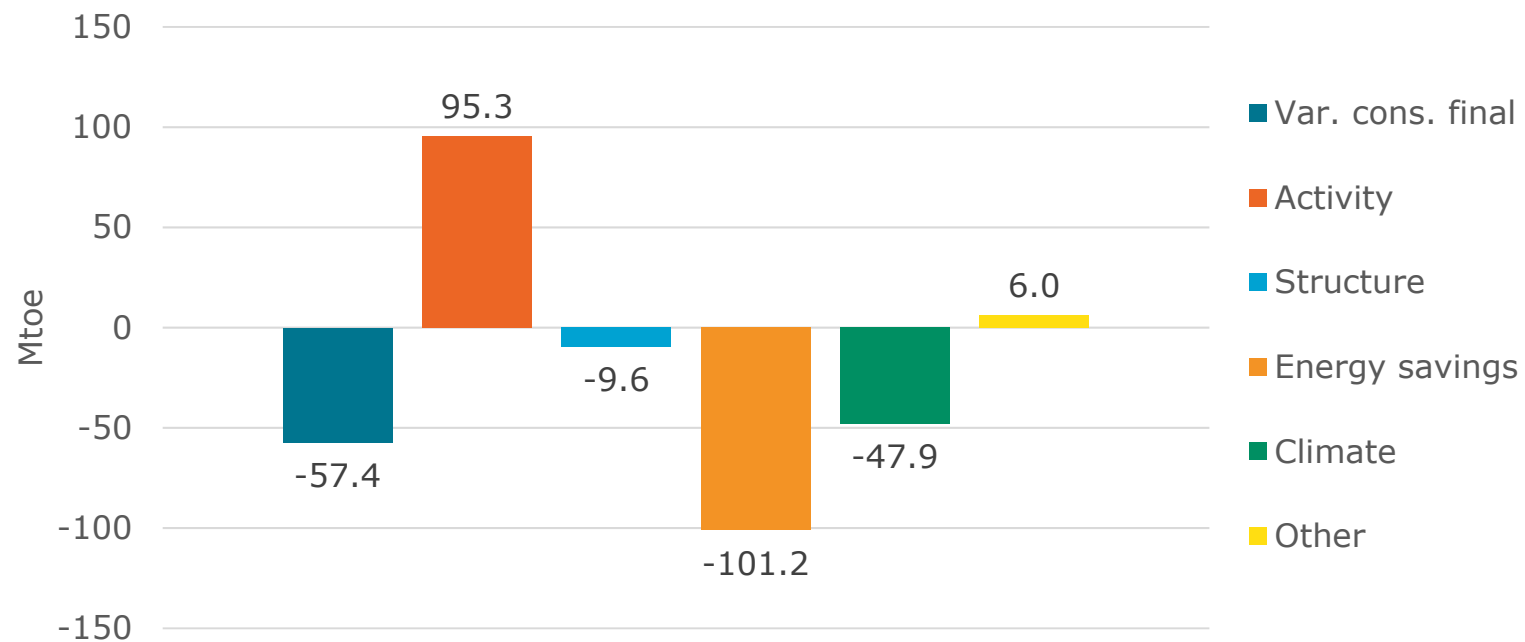
Final consumption at real climate

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

*Source: ODYSSEE; decomposition tool <https://www.indicators.odyssee-mure.eu/decomposition.html>*¹¹

Drivers of final energy consumption variation: 2010-2019

- Between 2010 and 2019, final consumption **decreased** by 57 Mtoe.
- The “**activity**” effect contributed to raise this consumption by 95 Mtoe.
- **Energy savings** totally offset the activity effect.
- The **climate** had a significant impact and lowered consumption by 48 Mtoe, due to a much warmer 2019 winter compared to 2010.
- **Structural changes** in industry and **modal shift** in transport also contributed to decrease consumption (-10 Mtoe).



Which countries sit on the european podium of EE? The ODYSSEE-MURE scoreboard 2020

Overall

Level	Trend	Policies	Combined
1: Lithuania	1: Romania	1: France	1: Switzerland
2: Switzerland	2: Ireland	2: Switzerland	2: UK
3: Denmark	3: UK	3: Finland	3: Ireland

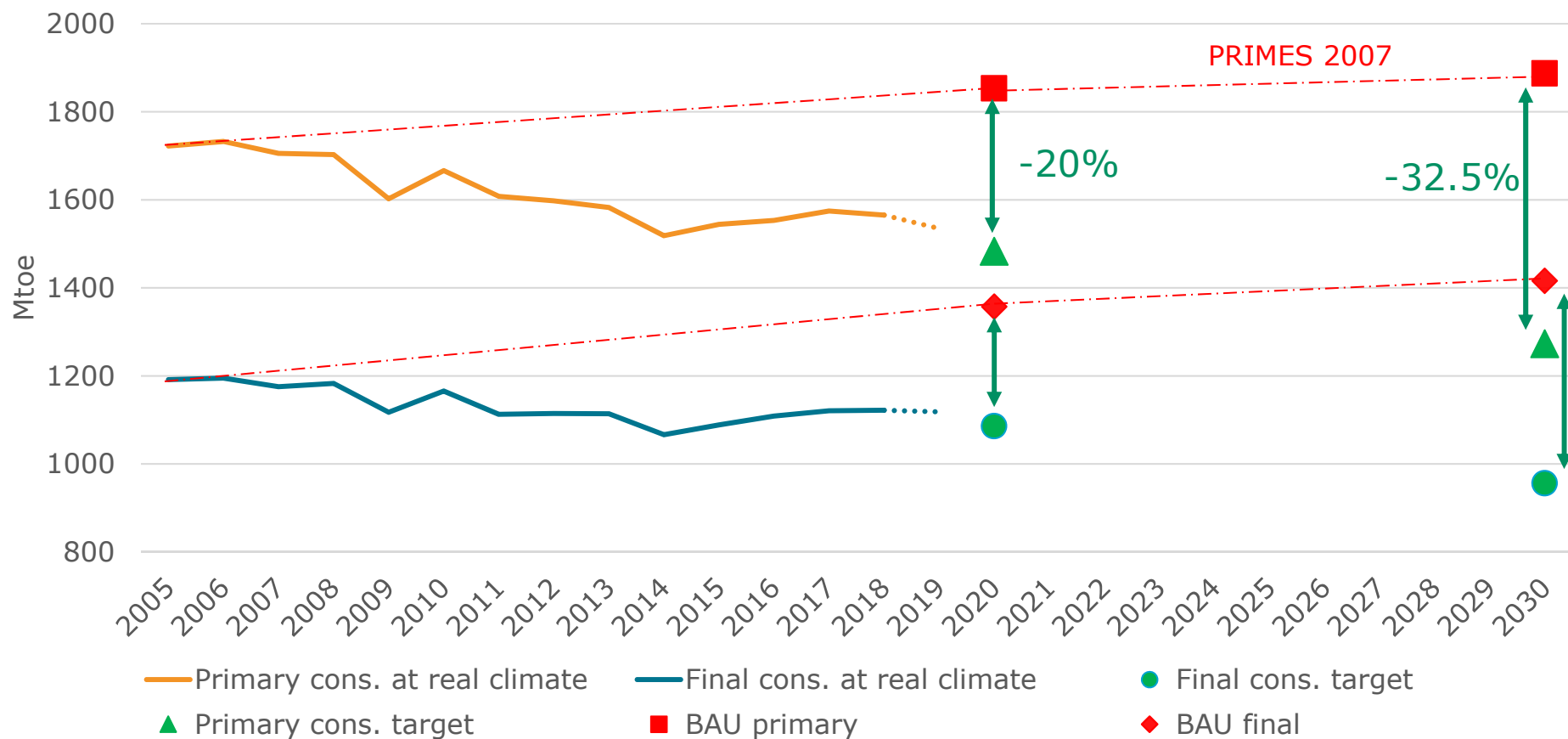
Industry

Level	Trend	Policies	Combined
1: Switzerland	1: Lithuania	1: Finland	1: Switzerland
2: Lithuania	2: Estonia	2: Switzerland	2: Lithuania
3: Denmark	3: Bulgaria	3: Romania	3: Romania

Conclusions

Primary and final energy consumption targets

- In 2019, EU primary and final consumption were closed to the 2020 efficiency targets (both 3% above).
- Warmer winters have helped achieving the targets (final consumption at normal climate 5% above target in 2019).
- Past trends do not enable to reach the 2030 targets.



Conclusions

- Since 2014, the increasing share of renewables and natural gas has offset 90% of the increase in final consumption.
- Energy efficiency improvement of final consumers has been much slower since 2014.
- Depending on the period energy savings offset entirely or partly the effect of economic and growth.
- EU 2020 targets on primary consumption will be exceeded with the COVID crisis but was already closed to be achieved.
- EU target to 2030 will not be reached with present trends and require additional measures.
- Since 2014 various types of structural changes have contributed **as much as energy efficiency** to the energy intensity reduction.