ODYSSEE-MURE

Second physical Meeting of the Project "ODYSSEE-MURE EED" Monitoring the EED-Recast"

Session 3 - Status and trends of energy efficiency indicators in the household and transport sectors

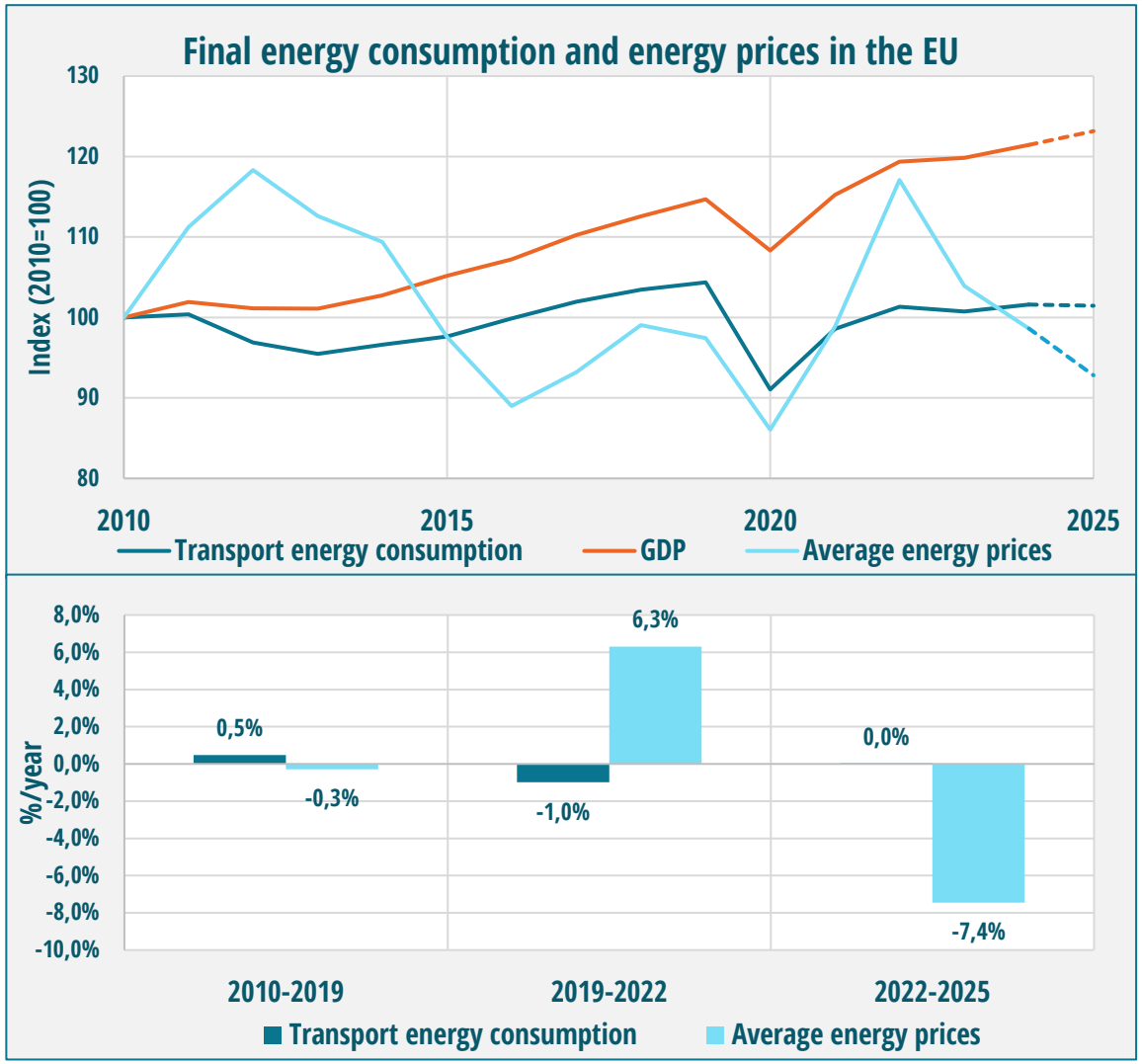
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Status and trends of energy efficiency in Transport

Trends in energy consumption and energy prices in the EU



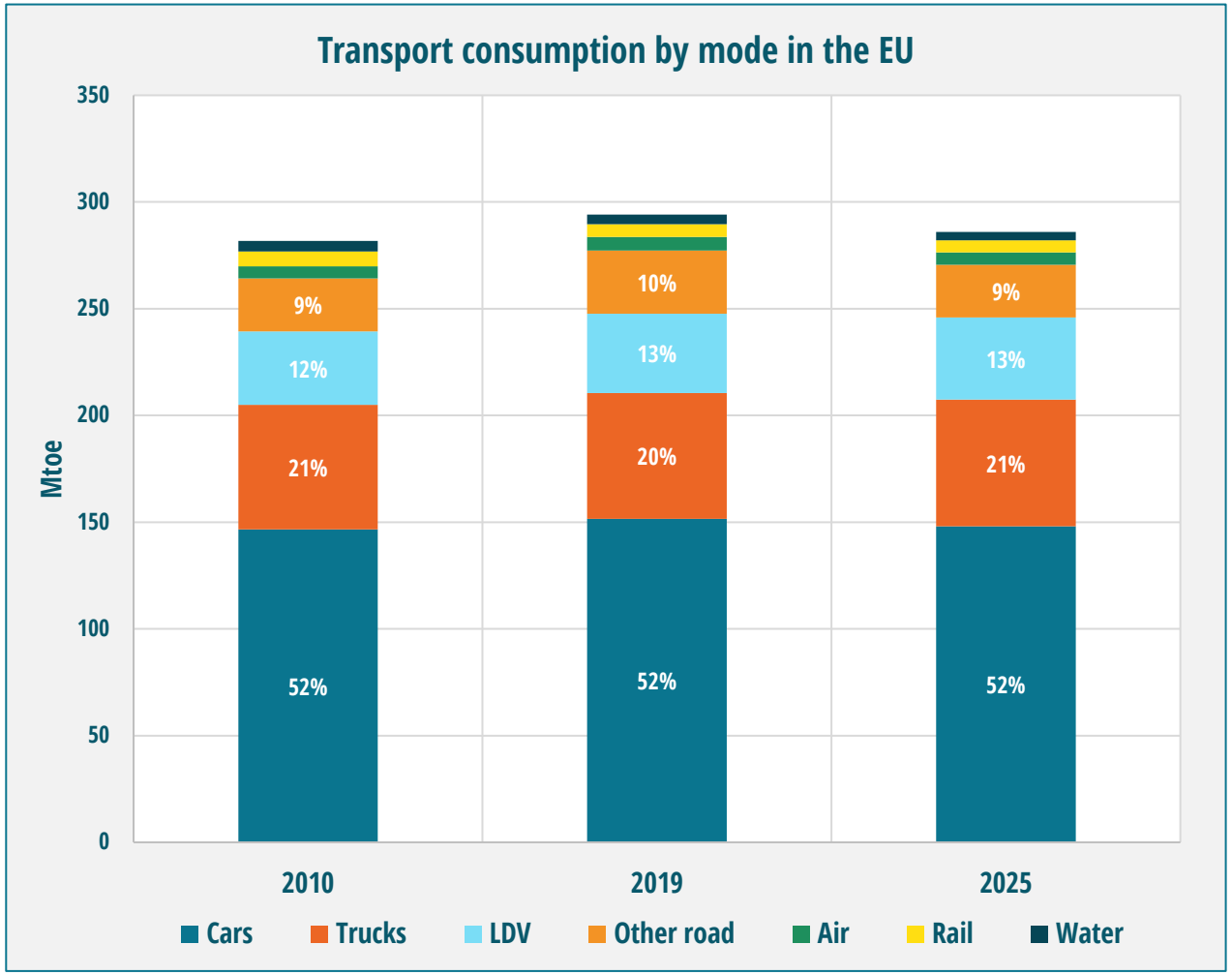
Source: ODYSSEE, based on Eurostat and early estimates (2025) by Enerdata.

Transport

- **Slight decline of transport consumption since 2019** at EU level (-0.5%/yr), especially between 2019 and 2022, after a slow progression before (+0.5%/yr).
- Stronger reduction since 2019 in 5 countries (AT, DK, DE, LU, LV) (over -2,5%/yr), and strong progression in 3 countries (HR, EE, RO) (>+3%/yr);
- Energy prices in transport increased from 2019 to 2022 (+6.3%./yr) and have been decreasing since then back to their 2019 level.

Transport consumption by mode in the EU

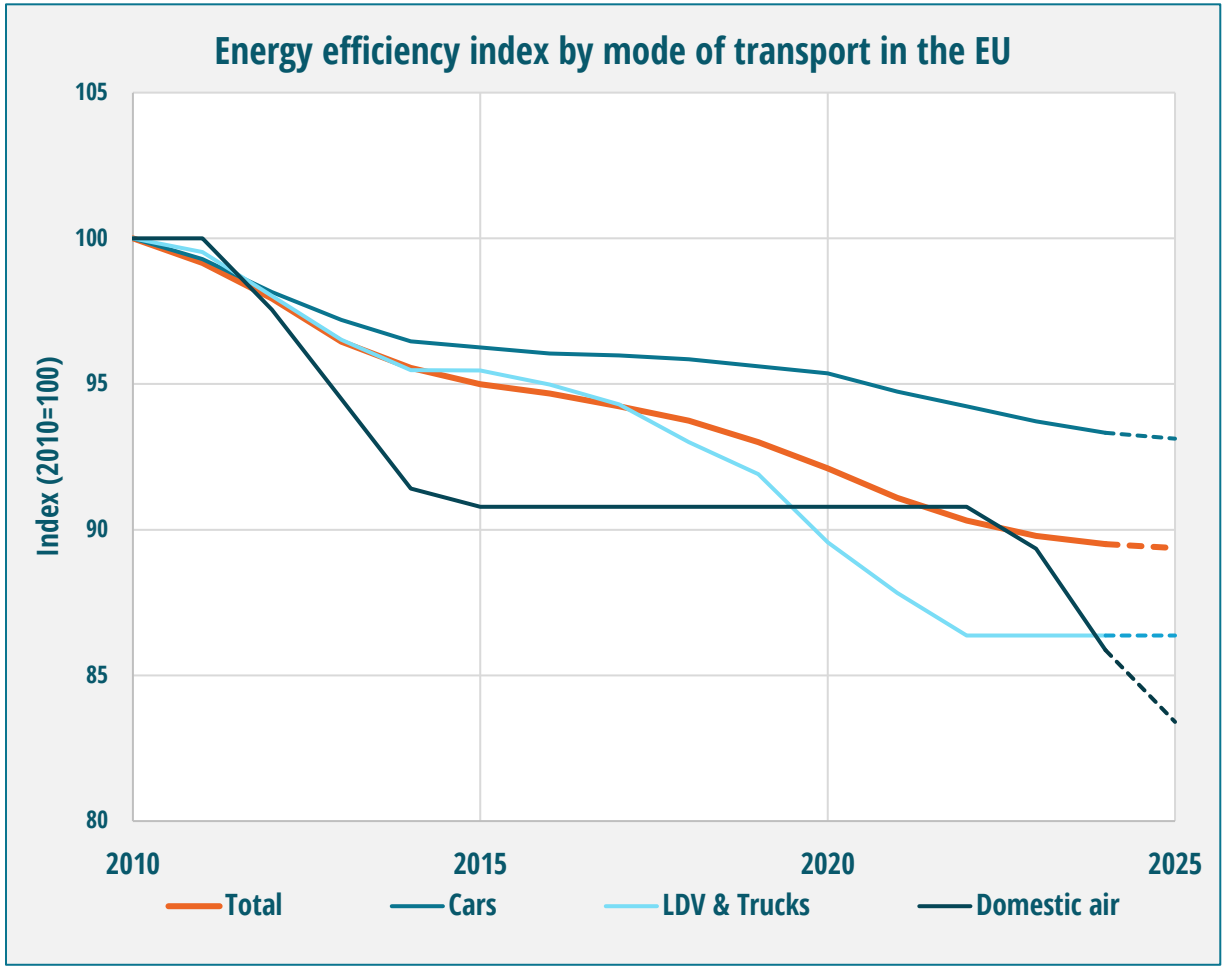
- Cars absorb more than half of transport energy consumption, followed by trucks and LDV (a third).
- The **share of cars** in transport consumption **is stable** since 2010.
- Domestic air and rail account for around 2% of the consumption each and water transport for 1.4%.



Source: ODYSSEE (2010-2024), Enerdata (2025).

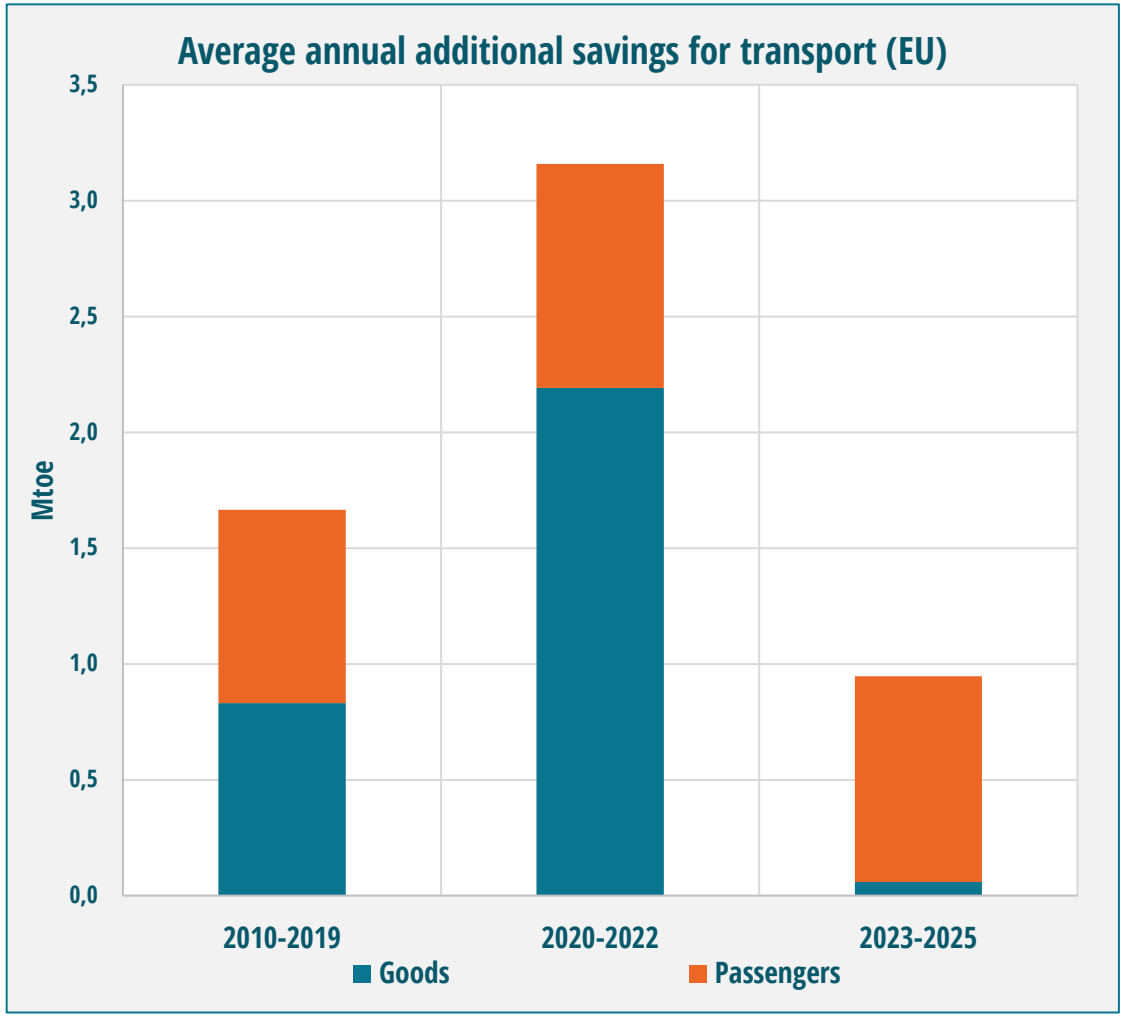
Energy efficiency trends in transport in the EU

- The energy efficiency of transport improved by 0.7%/year since 2010 in the EU (i.e. by 11% compared to 2010 level).
- Slight progress for cars over 2013-2021, **accelerated pace since 2021**.
- Energy efficiency progress has been **significant for trucks and light vehicles since 2012**, after no progress between 2008 and 2012 following the financial crisis (less efficient operation of trucks with lower load and empty running). However, progress seems limited since 2022.
- **Greater progress** was achieved for domestic air transport in the past few years.



Only most important modes and vehicles are represented.
Source: ODYSSEE (2000-2024), Enerdata (2025).

Since 2020, very heterogeneous trends in annual energy savings across the EU



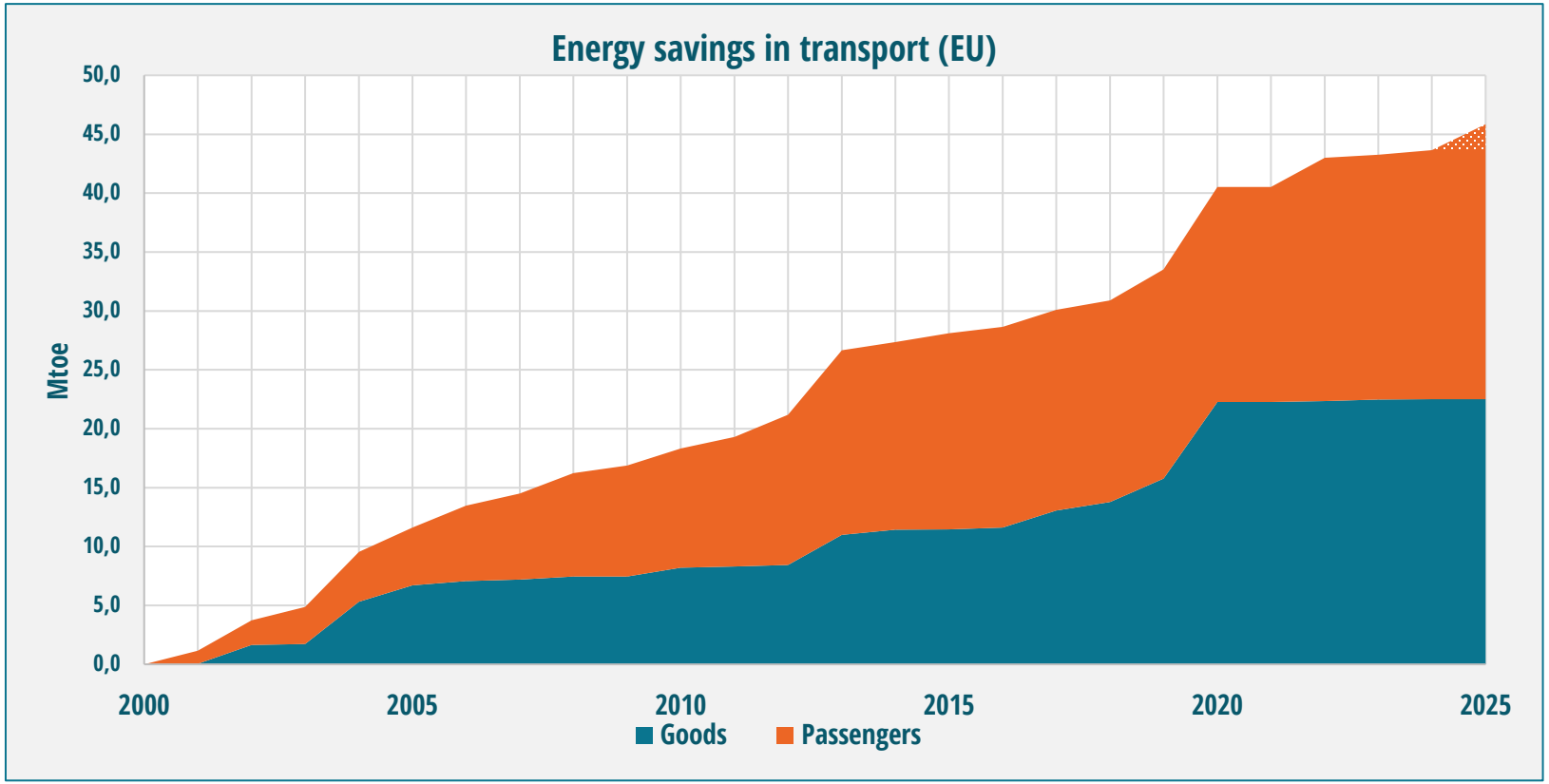
Source: ODYSSEE (2000-2024), Enerdata (2025).

- Average annual additional savings have **decreased significantly since 2023**.
- Over 2020-2022, annual savings represented 1.1% of transport energy consumption, but fell to less than 0.4%, well below the Article 8's targets (1.35% on average over 2021-2030 for all sectors).
- Annual savings for goods transport have increased significantly over 2020-2022 (2.2 Mtoe/year) before slowing down after 2023.
- Annual savings for passenger transport have been almost stable since 2010, around 0.9 Mtoe/year, representing the main part of transport annual savings since 2023.

Transport lags behind the other sectors in terms of energy efficiency improvements

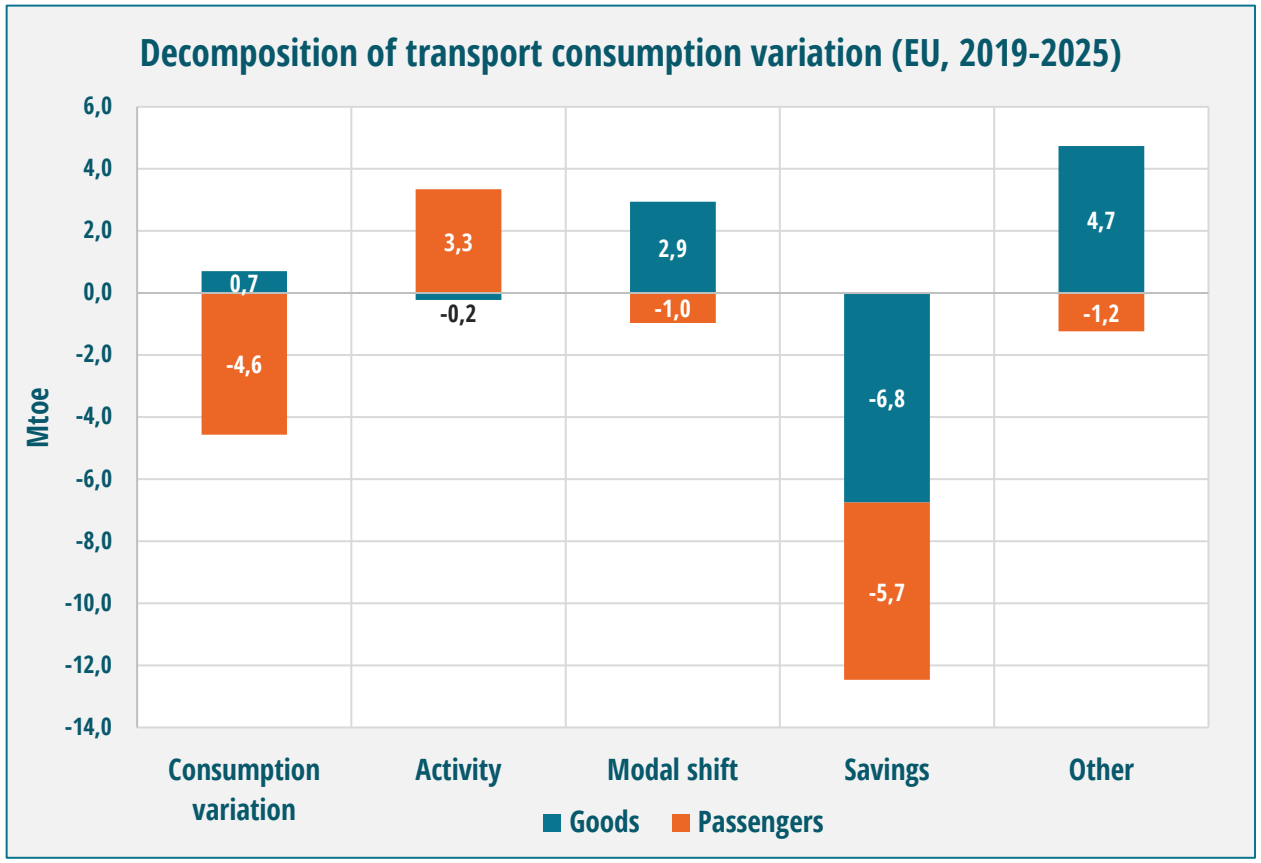
In 2025, total final energy savings of transport reached 46 Mtoe in the EU.

The share of passenger transport in these savings was 51%, a share lower than its share in consumption (61%), due to slower energy efficiency progress than in other sectors.



Source: ODYSSEE (2000-2024), Enerdata (2025)

Drivers of transport consumption variation – 2019-2025 (first estimates)



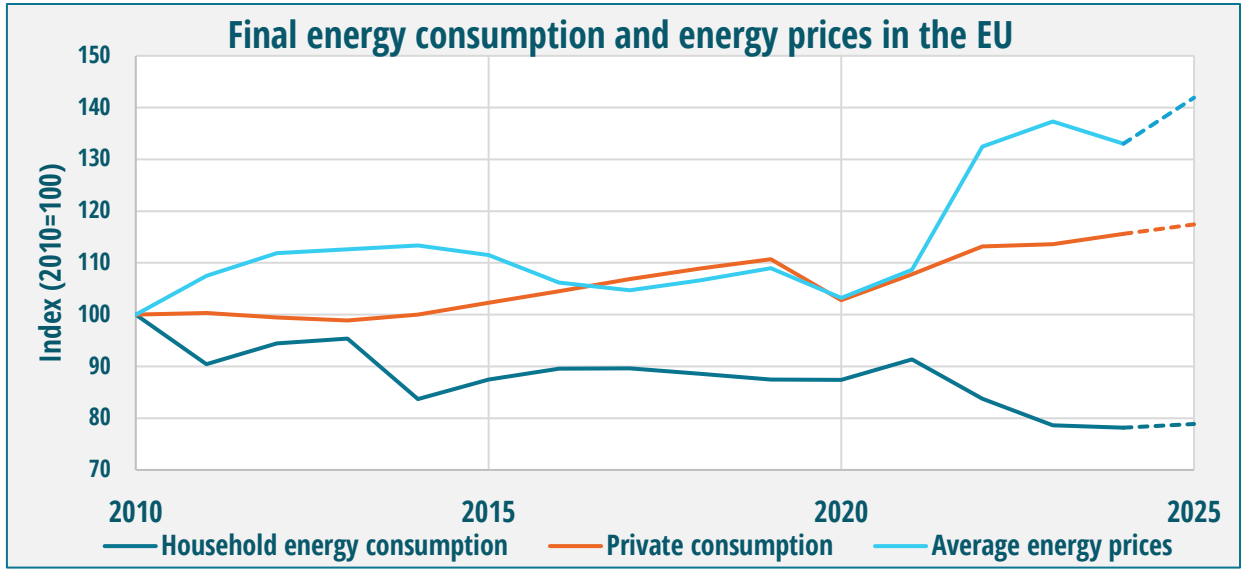
- Between 2019 and 2025, energy efficiency gains in passengers and goods transport largely offset increases driven by other factors, leading to a net reduction of 3.9 Mtoe.
- Activity was the main driver of consumption growth during the post-pandemic recovery period (2021-2022) but **the motor fuels price hikes in 2022 (15%-20%)** resulted in a significant consumption reduction ("constrained sufficiency"), captured under the "Other" effect and offset by goods transport inefficiencies.
- Passenger transport reduced energy consumption by 4.6 Mtoe despite growing activity, while efficiency gains in goods transport were largely offset by modal shift and other effects.

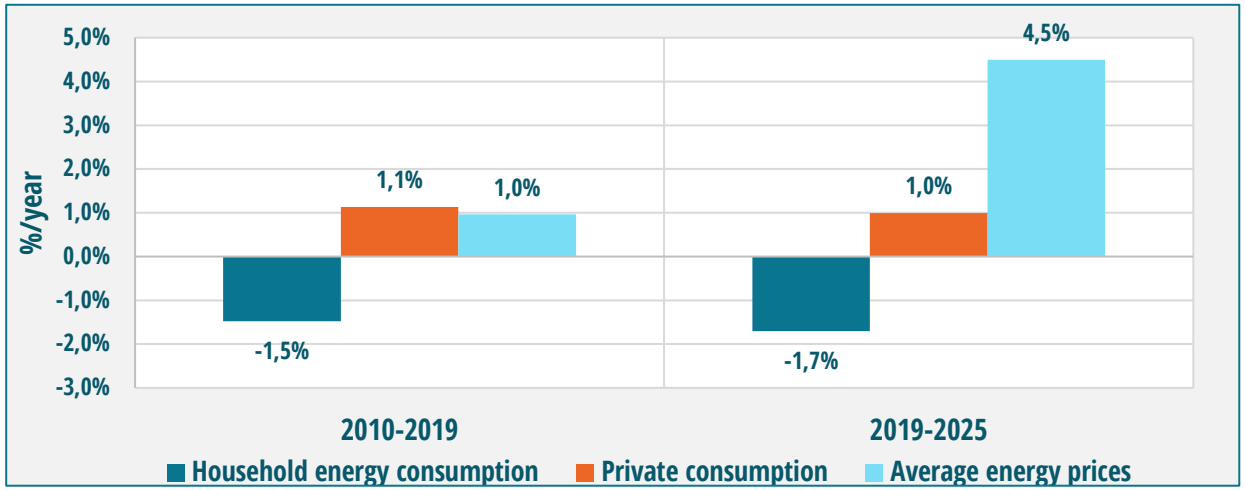
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Sources: ODYSSEE Decomposition tool (2000-2024), Enerdata (2025). https://www.indicators.odyssee-mure.eu/decomposition.html

Status and trends of energy efficiency in Households

Decreasing consumption since 2010 at EU level





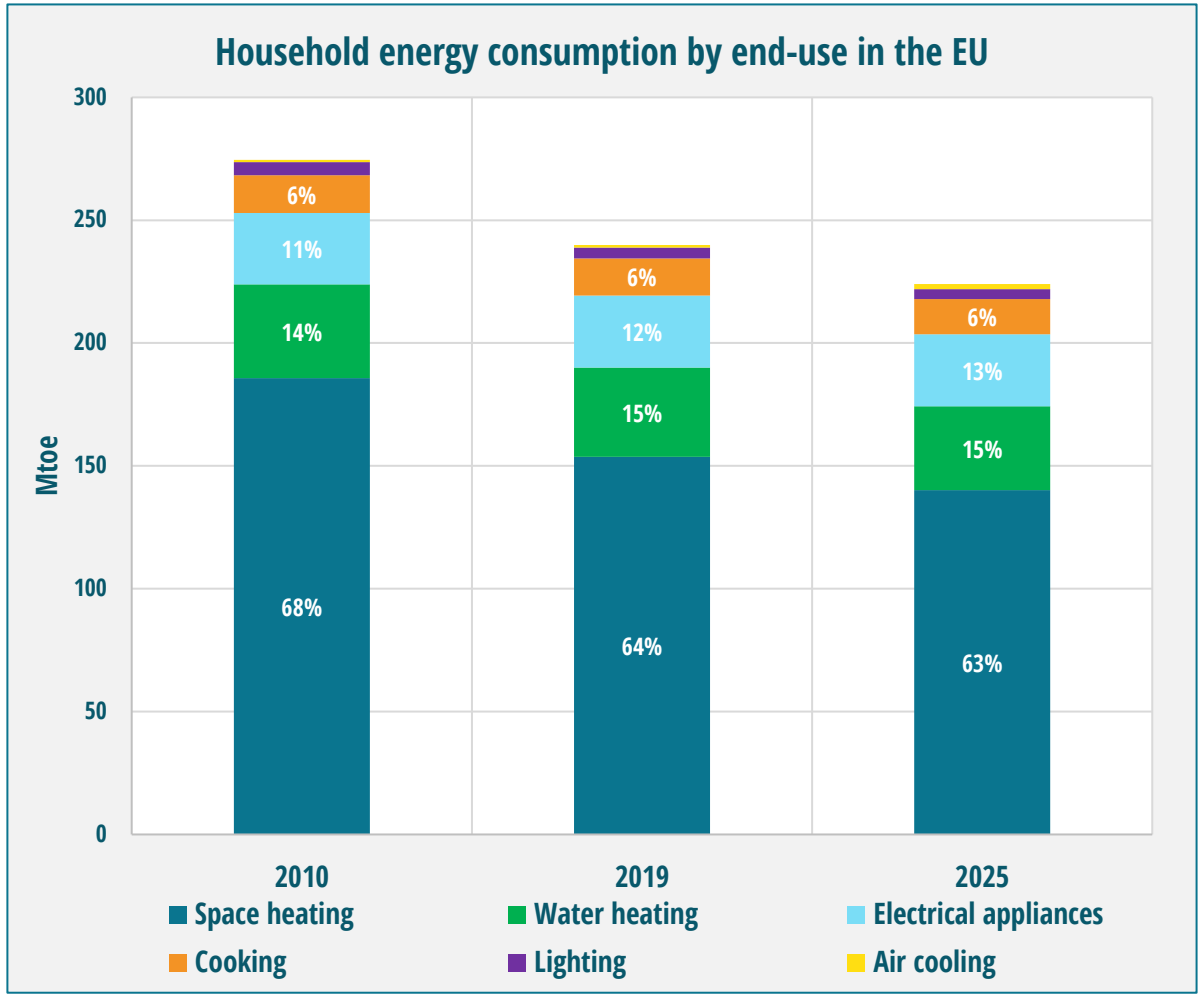
Source: ODYSSEE, based on Eurostat and early estimates (2025) by Enerdata; consumption at normal climate.

Households

- Decreasing consumption since 2010 at EU level, with an acceleration since 2019 (1.7%/yr vs 1.5%/yr before), while energy prices soared by 4.5%/yr on average since 2019, especially in 2022 (+22%).
- Stronger reduction since 2019 in 5 EU MS (CZ, FR, IT, NL, SK) (over -3%/yr), and progression in 4 countries (AT, LT, MT, PT).
- Household energy prices increased in most EU MS since 2019, with significant disparities, depending on fuel mix and national policies, exceeding 4.5%/year in 10 countries
- Most of the increase took place in 2022.

Growing consumption for cooling in the EU

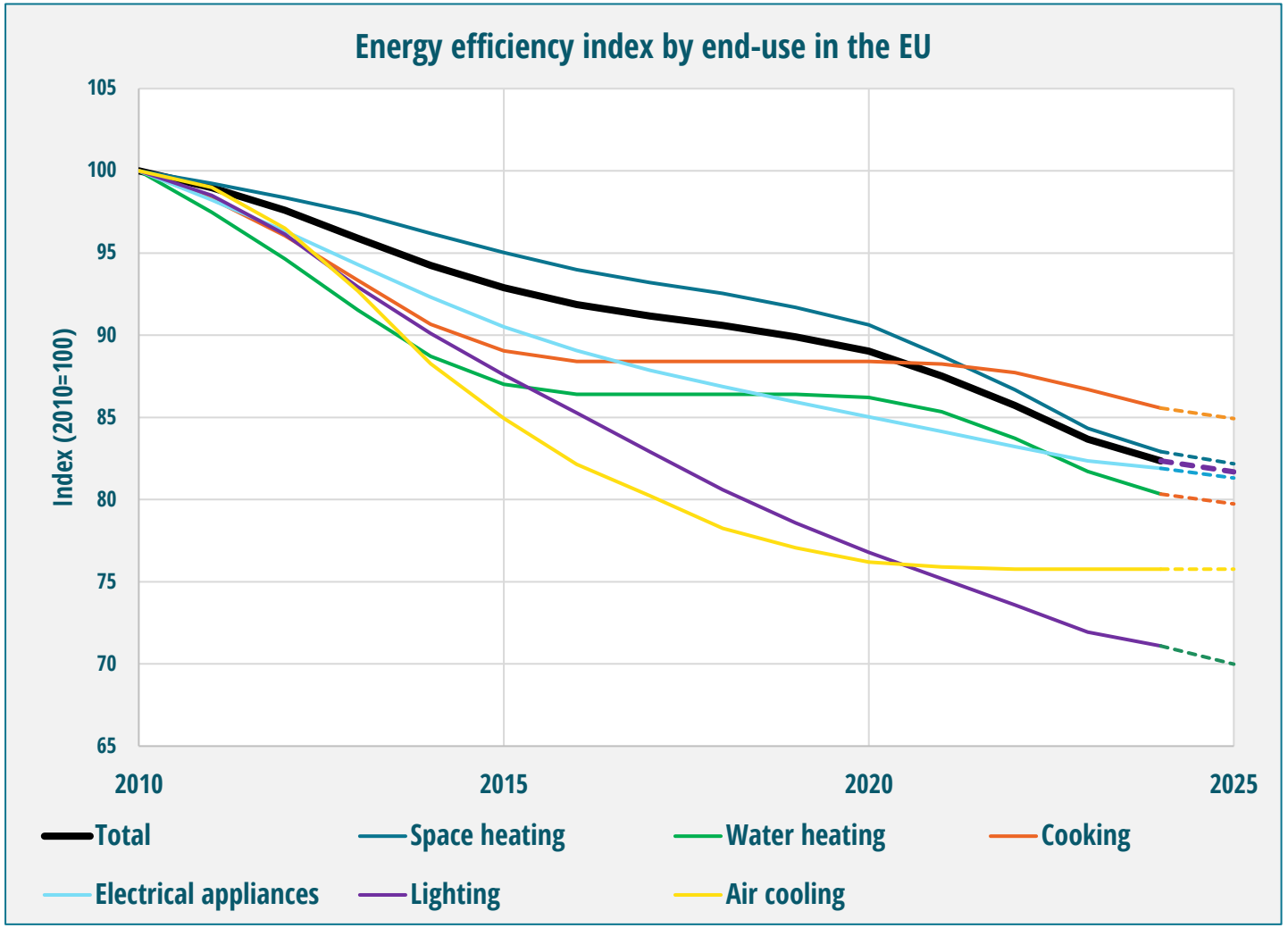
- Decreasing consumption and share for space heating (-5pp) since 2010 to 63% in 2025, remaining the dominant end-use.
- Relatively stable consumption and share for water heating (15%), electrical appliances (13%), and cooking (6%).
- Decreasing consumption for lighting (-1.8%/year) but a relatively stable share (2%)
- Growing consumption for cooling (+6.5%/year) which remains marginal (0.9%).



Source: ODYSSEE (2010-2024), Enerdata (2025).

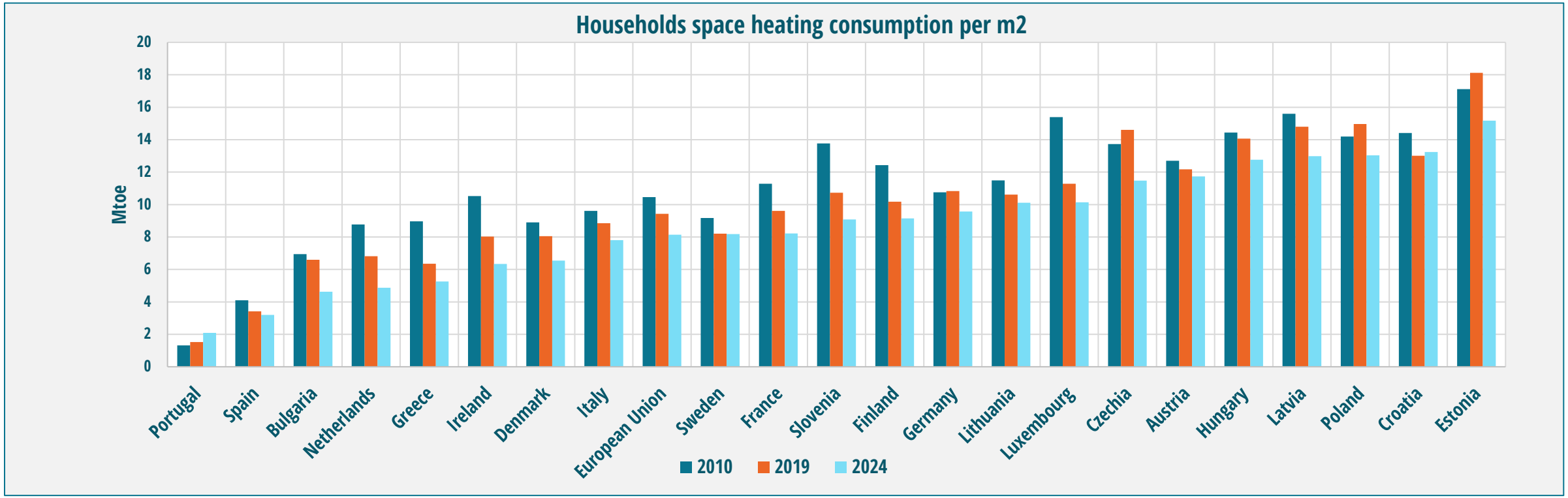
Energy efficiency trends for households in the EU

- **Household energy efficiency** improved by 18% or 1.2%/yr since 2010, most progress was achieved before 2014 (1.4%/year), and after 2019, with a net slow down over 2014-19 (0.9%/year).
- Progress has mainly been driven by efficiency gains for heating, lighting and appliances.
- Since 2022, cooking and water heating have also contributed to these efficiency gains, after showing no improvement over the 2014-2022 period.



Source: ODYSSEE (2010-2024), Enerdata (2025).

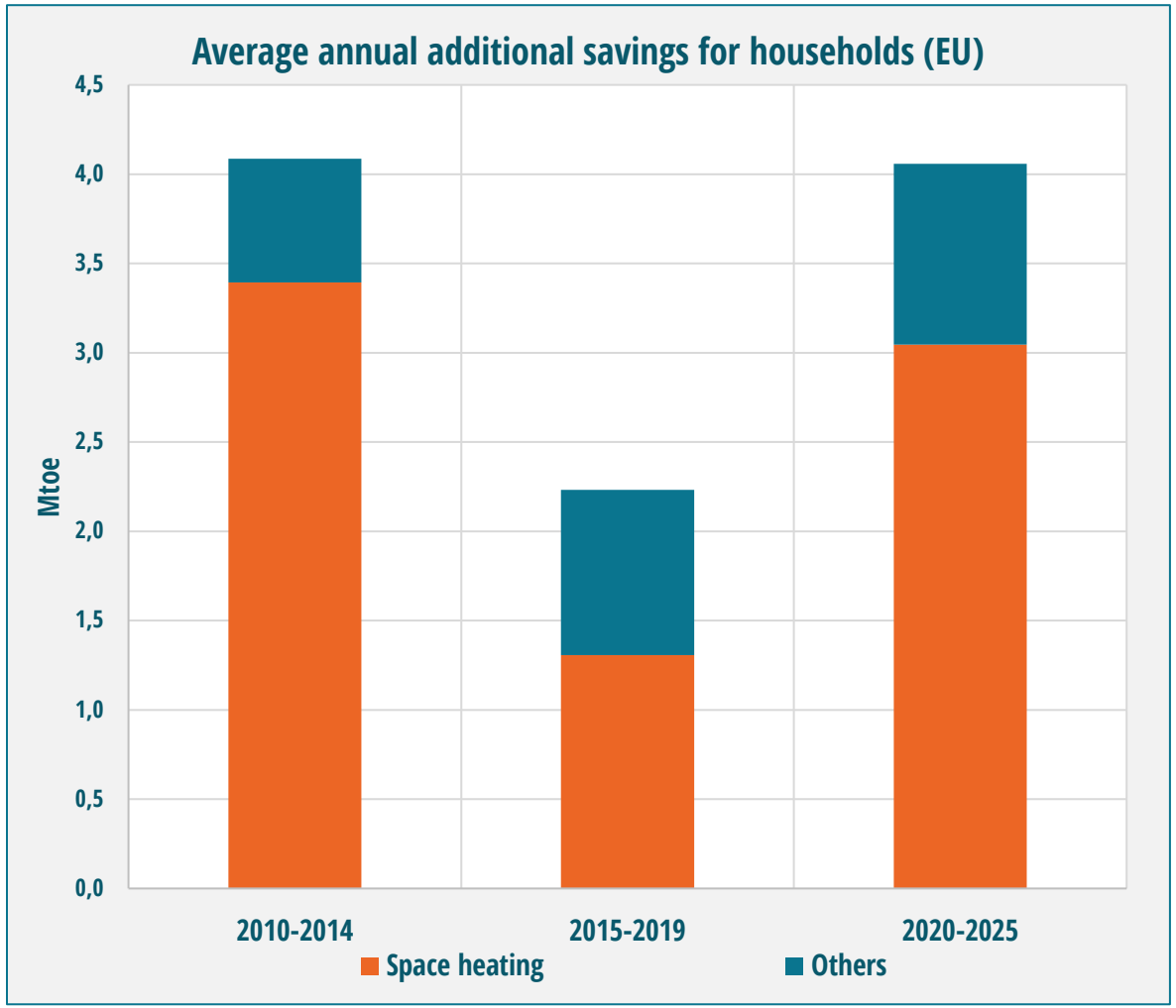
Specific energy consumption for household space heating



**At normal climate; ambient heat excluded; No data before 2016 for Malta ; No data on m2 for Belgium*

- The **specific consumption of households for space heating has decreased in all EU MS**, except Croatia and Portugal, since 2019 (-2.9%/year on average in the EU).
- Higher reduction pace in 6 countries, above 3%/year (Bulgaria, Netherlands, Czechia, Ireland, Denmark, Estonia).

Annual energy savings for households back to their historical progression



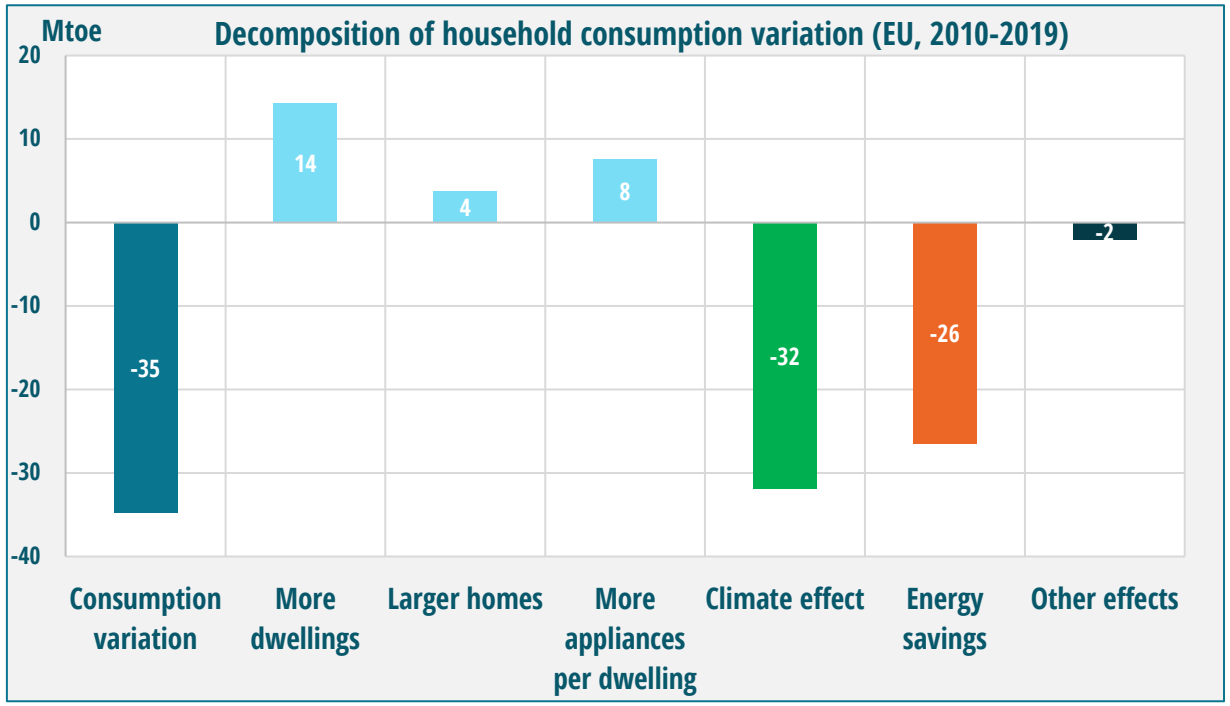
Source: ODYSSEE (2010-2024), Enerdata (2025).

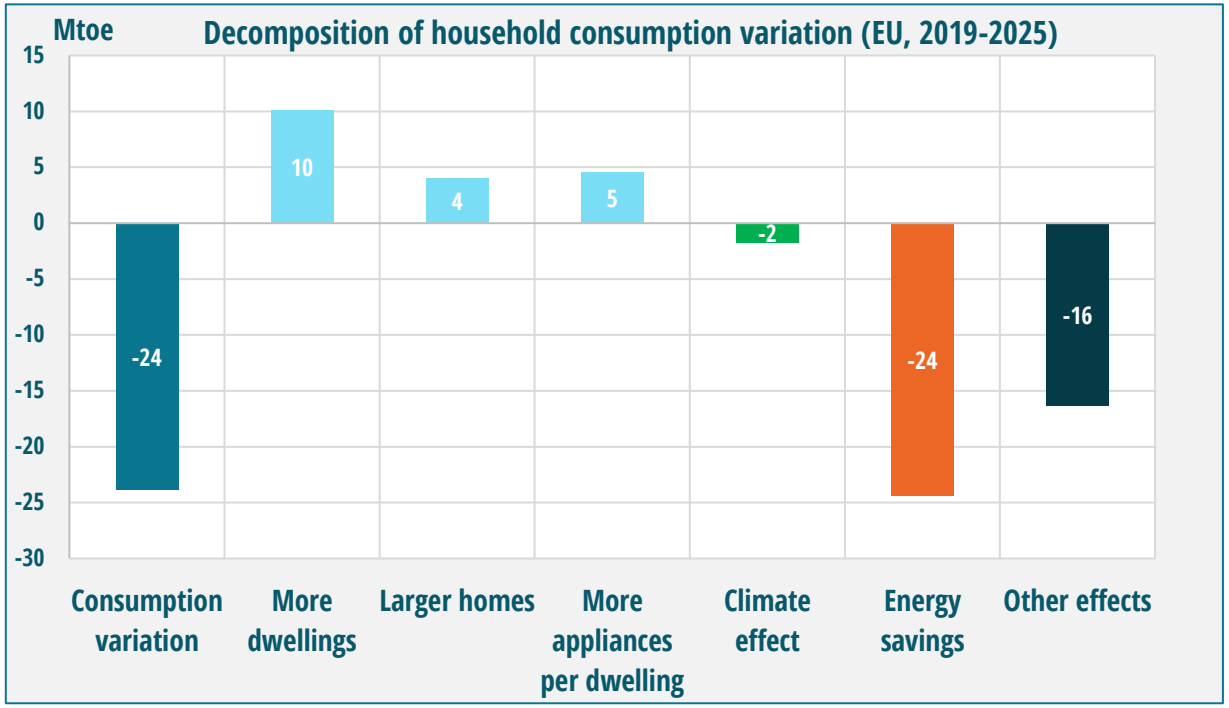
- Average annual additional savings have rebounded since 2020 back to their historical level of around 4 Mtoe/year, after a significant slow down over 2025 – 2019.

- This represents the equivalent of 1.4% of household's consumption, which is in line with Article 8's target (1.35% on average over 2021-2030 for all sectors).

- Space heating represents the bulk of these savings, with a share higher than its consumption share (75% of total savings since 2020 and 83% over 2010-14, compared to 63% of final consumption).

Climate effect driving households' consumption variation over 2010 - 2019





Source: ODYSSEE Decomposition tool: https://www.indicators.odyssee-mure.eu/decomposition.html

- At real climate, consumption decreased significantly between 2010 and 2019 (- 35 Mtoe), as 2019 had much warmer winter, climate effect contributed to most of this reduction (-32 Mtoe); the other effects are the same as at normal climate: with an activity effect raising consumption by 26 Mtoe, and energy savings reducing it by 26 Mtoe).

- Between 2019 and 2025, the drivers of the household consumption remain quite similar, except for the climate effect, which had a reduced impact due to a similar climate in 2025 as in 2019.



Key findings

Key messages - Transport

Consumption

- Slight decline of transport's energy consumption since 2019 (by 0.5%/year).

Energy efficiency gains

- Limited cars energy efficiency gains over 2013-2021, accelerated pace since 2021.
- The transition to alternative fuels is hardly visible in consumption but has accelerated since 2020, with a rapid penetration of electric cars.

Energy savings

- Energy savings for transport reached 46 Mtoe in 2025 (28 Mtoe since 2010), with very different trends in annual savings since 2020.
- Trucks and LDV account for half of total energy savings in transport, i.e. much more than their share of consumption (34%), but their energy efficiency gains has been very limited since 2022.

Key messages - Households

Consumption

- Rapid decline of household's energy consumption since 2020 (by 2%/year) due to increasing energy prices.

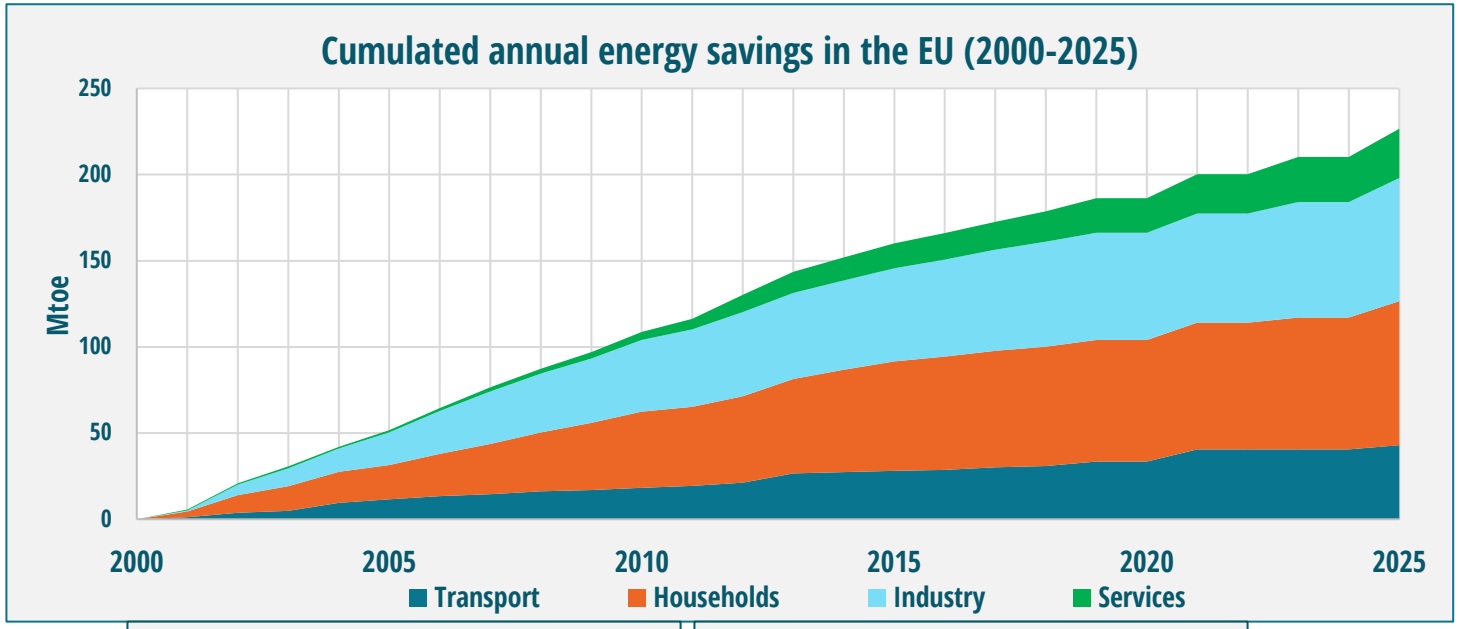
Energy efficiency gains

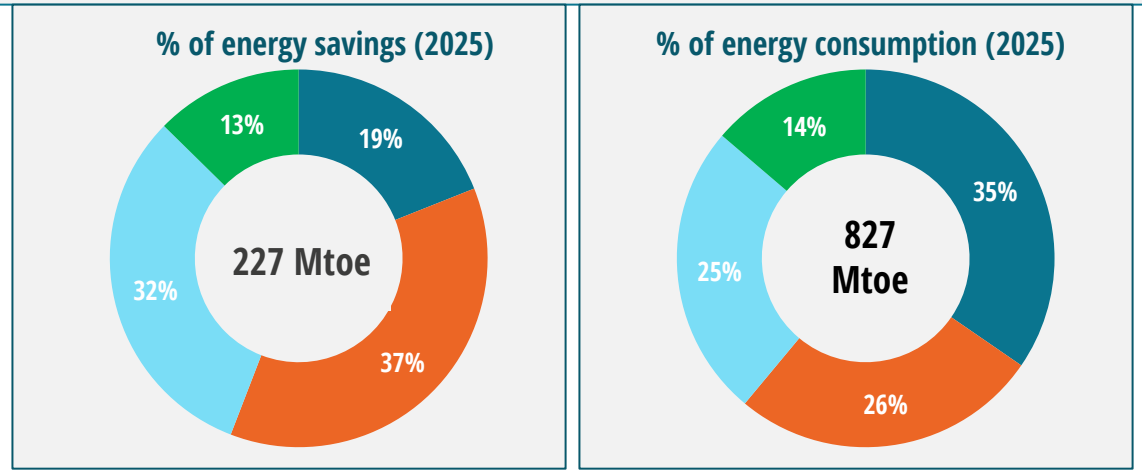
- Household energy efficiency improved by 1.2%/yr since 2010, with most progress achieved before 2014 and after 2019.
- Progress has mainly been driven by efficiency gains for heating, lighting and appliances.

Energy savings

- Energy savings for households reached 94 Mtoe in 2025 (51 Mtoe since 2010), with annual savings back to their historical trend since 2020 (5 Mtoe/year).
- Since 2019, consumption at normal climate decreased by 22 Mtoe, driven by energy savings (-24 Mtoe) and behaviours (-16 Mtoe), which more than offset the activity effect (+19 Mtoe).

Energy savings vs. Consumption by sector





Source: ODYSSEE (2010-2024), Enerdata (2025).

- The Households sector is overrepresented in total savings, with a share of total savings much higher than its share in consumption (37% vs 26%). It is the sector with the highest number of EU measures (over 50%).
- The share of transport in total savings was only 19%, much lower than its share in consumption (35%), due to much slower energy efficiency progress than in other sectors.