ODYSSEE database

- BIES, DFT, DCLG etc.
- ONS
- MET office
- EEA, OECD
- EUROSTAT
- DUKES
- EU/UK Associations

Title	ry code	Unit	2014	2015	2016	2017	2018	2019	Source
Passengers traffic									
Traffics in passenger-km									
Passengers traffic by cars (pkm)	gbr	Mpkm	667,463	655,127	665,500	669,843	672,713		DFT
Passengers traffic by motorcycles (pkm)	gbr	Mpkm	4,882	4,841	4,870	4,850	4,935		DFT
Passengers traffic in buses (pkm)	gbr	Mpkm	40,410	39,367	34,364	37,979	35,267		DFT
Passengers traffic in rail transport	gbr	Mpkm	76,907	76,788	78,696	80,261	80,526		DFT
Passengers traffic in trains (pkm)	gbr	Mpkm	*76,907*	*76,788*	*78,696*	*80,261*	*80,526*		DFT
Passengers traffic in metros, tram (pkm)	gbr	Mpkm							

Main controls | ODEX graphics | Decomposition graphics | Macroeconomy | Industry | Transport | Households | Services | M_upd ...

			Source	Note	Unit	2010	2011	2012	2013	2014	2015
Total energy supply			Eurostat		Mtoe	1,727.17	1,664.04	1,649.34	1,630.42	1,567.05	1,587
Total energy supply with climatic corrections			Eurostat		Mtoe	1,711.16	1,679.73	1,649.19	1,634.41	1,589.42	1,604
Population			Eurostat		k	503,170.62	502,964.84	504,047.75	505,163.05	507,235.09	508,520
GDP at exchange rate			Eurostat		MEUR2010	12,847,170.80	13,078,396.40	13,023,477.60	13,062,021.70	13,289,335.60	13,602,147
GDP at 2010 purchasing power parities			Eurostat		MEUR2010p	12,847,170.80	13,078,396.40	13,023,477.60	13,062,021.70	13,289,335.60	13,602,147
Final consumption of coal			Eurostat		Mtoe	50.55	49.42	48.41	47.99	46.74	46
Final consumption of oil products			Eurostat		Mtoe	415.54	402.34	389.38	384.81	380.39	386
Final consumption of gas			Eurostat		Mtoe	270.45	242.83	251.50	256.68	227.56	235
Final consumption of heat			Eurostat		Mtoe	53.03	48.61	49.73	49.66	45.86	46
Final consumption of renewable			Eurostat		Mtoe	89.00	85.18	91.21	92.21	88.45	91
Final consumption of electricity			Eurostat		Mtoe	243.88	240.07	240.93	238.92	233.28	236
Total final consumption			Eurostat		Mtoe	1,122.46	1,068.45	1,071.17	1,070.28	1,022.28	1,043
Total final consumption with climatic corrections			Eurostat		Mtoe	1,106.44	1,084.14	1,071.02	1,074.30	1,044.65	1,060

Blue italic: early estimates by Enerdata

MARKET DIFFUSION

DECOMPOSITION

COMPARISON

ENERGY SAVING

ENERGY EFFICIENCY SCOREBOARD

ODYSSEE Database

ODYSSEE-MURE

- BIES, DFT, DCLG etc.
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Main controls | ODEX graphics | Decomposition graphics | Macroeconomy | Industry | Transport | Households | Services | M_upd ...

Indicator analysis

SHARE OF PUBLIC TRANSPORT IN TOTAL LAND PASSENGER TRANSPORT

TREND   Year: 2017

MAP   EXCEL

UK

Below 15
15 to 17
17 to 20
20 to 30
Above 30
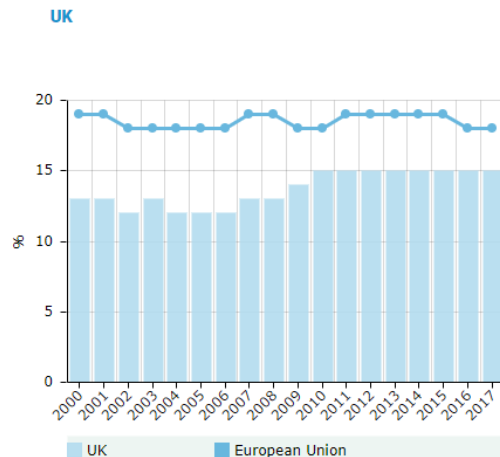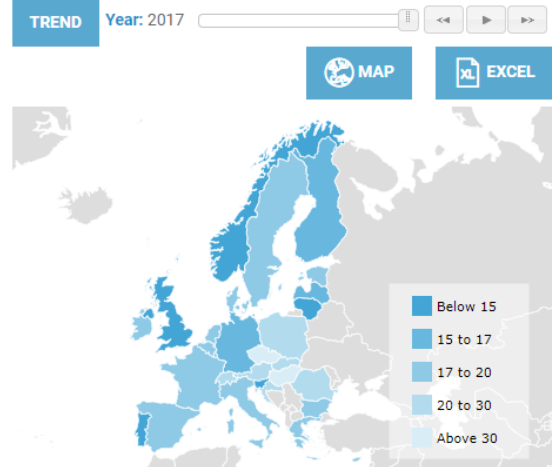
UK   European Union

Decomposition

VARIATION TRANSPORT CONSUMPTION EUROPEAN UNION MTOE (2000-2017)

EXCEL
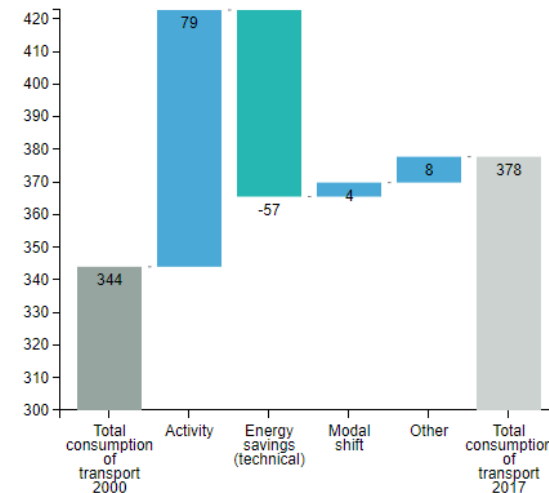
- Diffusion indicators
- Energy saving
- Trends and targets
- Indicator score board

ODYSSEE Database – Applications of tools

ODYSSEE-MURE enables evaluation of the energy efficiency of UK sectors via comparisons with other countries.

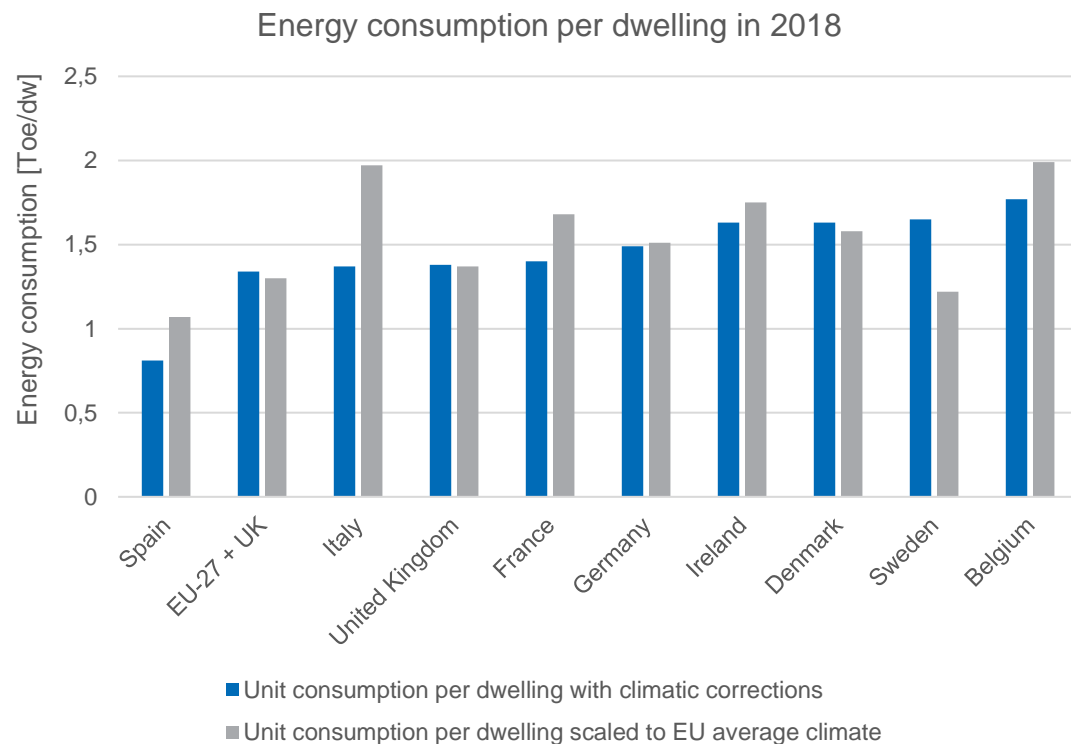The Odyssee database provides a range of key indicators, for example:

Macro
- Overall energy saving rate
- Primary energy intensity
- Final energy intensity

Industry
- Energy saving rate
- Energy intensity
  - Industry
  - Manufacturing
  - Chemicals
  - EU structure
- Specific consumption
  - Steel
  - Cement
  - Paper and pulp

Transport
- Energy saving rate
- Specific consumption by mode
  - Road
  - Freight
  - Passenger
  - Air
- Car efficiency
  - Fleet (goe/pkm)
  - Fleet (l/100km)
  - New cars
- LDV efficiency
  - Fleet
  - New LDVs
- Modal split
  - Freight
  - Public transport

Households
- Energy saving rate
- Consumption per dwelling
  - Normal climate
  - EU climate
  - Specific electricity
- Heatimg
  - Per dwelling
  - Per m^2 (normal climate)
  - Per m^2 (EU climate)

Services
- Energy saving rate
- Energy intensity
  - Total
  - Electricity
- Consumption per employee
  - Total
  - Electricity

ODYSSEE-MURE enables evaluation of the energy efficiency of UK sectors via comparisons with other countries.

The Odyssee database provides a range of key indicators, for example:

- <mark>Demonstration in tool</mark>

Energy consumption of households per permanently occupied dwelling (normalised climate and at EU climate average)

- Climatic corrections remove the influence of large climatic variations from one winter to the next.
- Corrections are made only for final consumption corresponding to space heating.

Energy consumption per dwelling in 2018

- Unit consumption per dwelling with climatic corrections
- Unit consumption per dwelling scaled to EU average climate

KEY INDICATORS

ENERGY CONSUMPTION PER DWELLING SCALED TO EU AVERAGE CLIMATE

TREND | Year: 2018

MAP   EXCEL

Unit: toe/dw

- Below 1.2
- 1.2 to 1.4
- 1.4 to 1.6
- 1.6 to 2
- Above 2

Source Odyssee
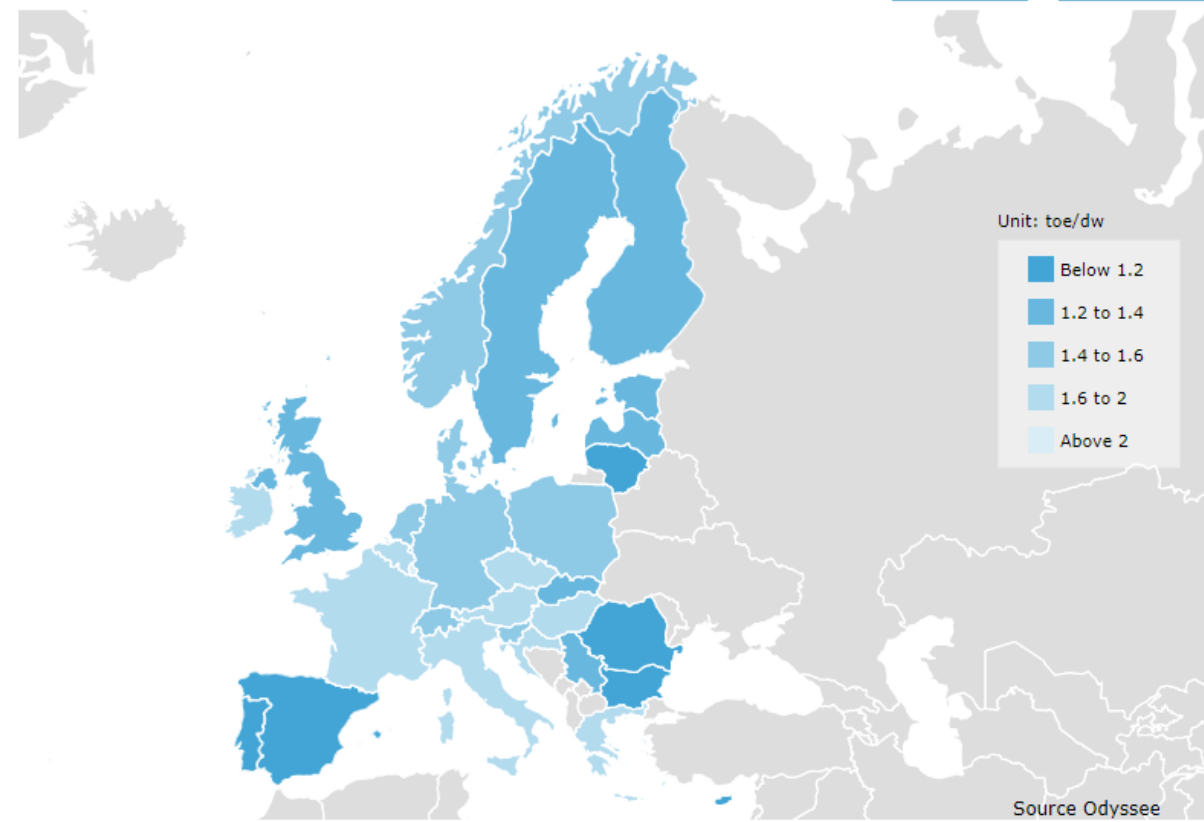
The ODYSSEE database contains other indicators of specific consumption:

- By sub sector in industry (e.g. toe/ton for steel, cement) and services (e.g. kWh/employee, /per m2/per bed (for accommodation))

- By end-use/appliances for households (e.g. toe/m2 for heating, kWh/household, kWh/electrical appliances, kWh/heating and AC, kWh /appliance and appliance's kWh/litre)

- By transport mode/ vehicle type in transport (e.g. km/l or pkm for cars, toe/tkm for freight)
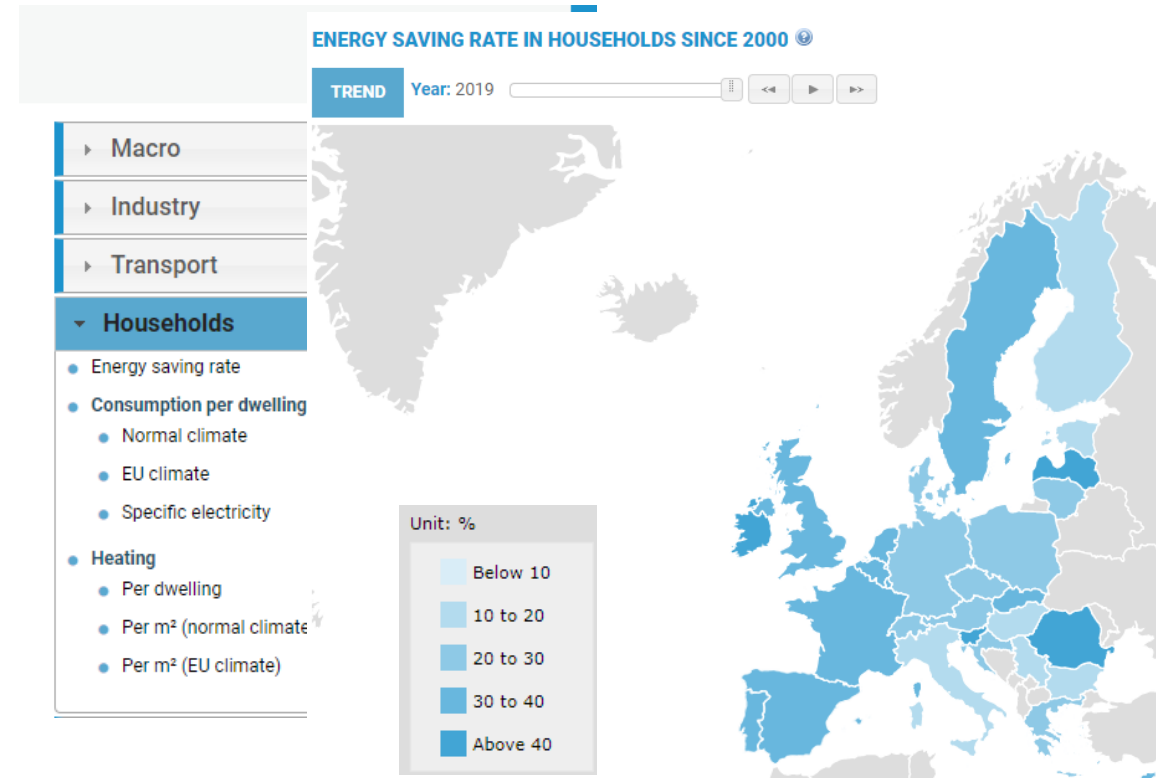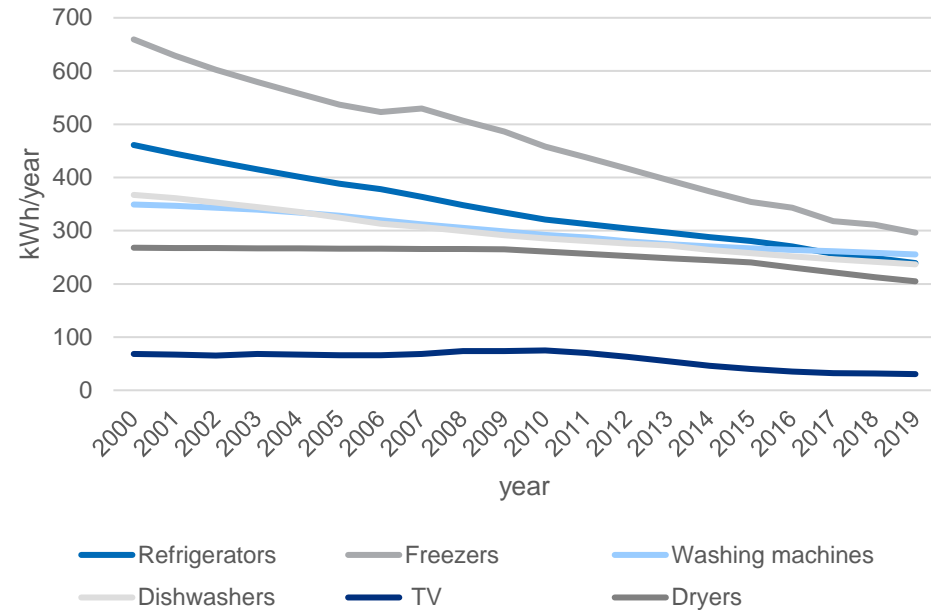
- Household index considers use of: heating, water heating, cooking, cooling, lighting, refrigerator, freezer, washing machine, dishwashers, dryer and TV

- Heating: unit consumption per m2 at normal climate (toe/m2)
- Water heating: unit consumption per dwelling with water heating
- Cooking: unit consumption per dwelling
- Cooling, lighting and large electrical appliances: specific electricity consumption, in kWh/year/appliance
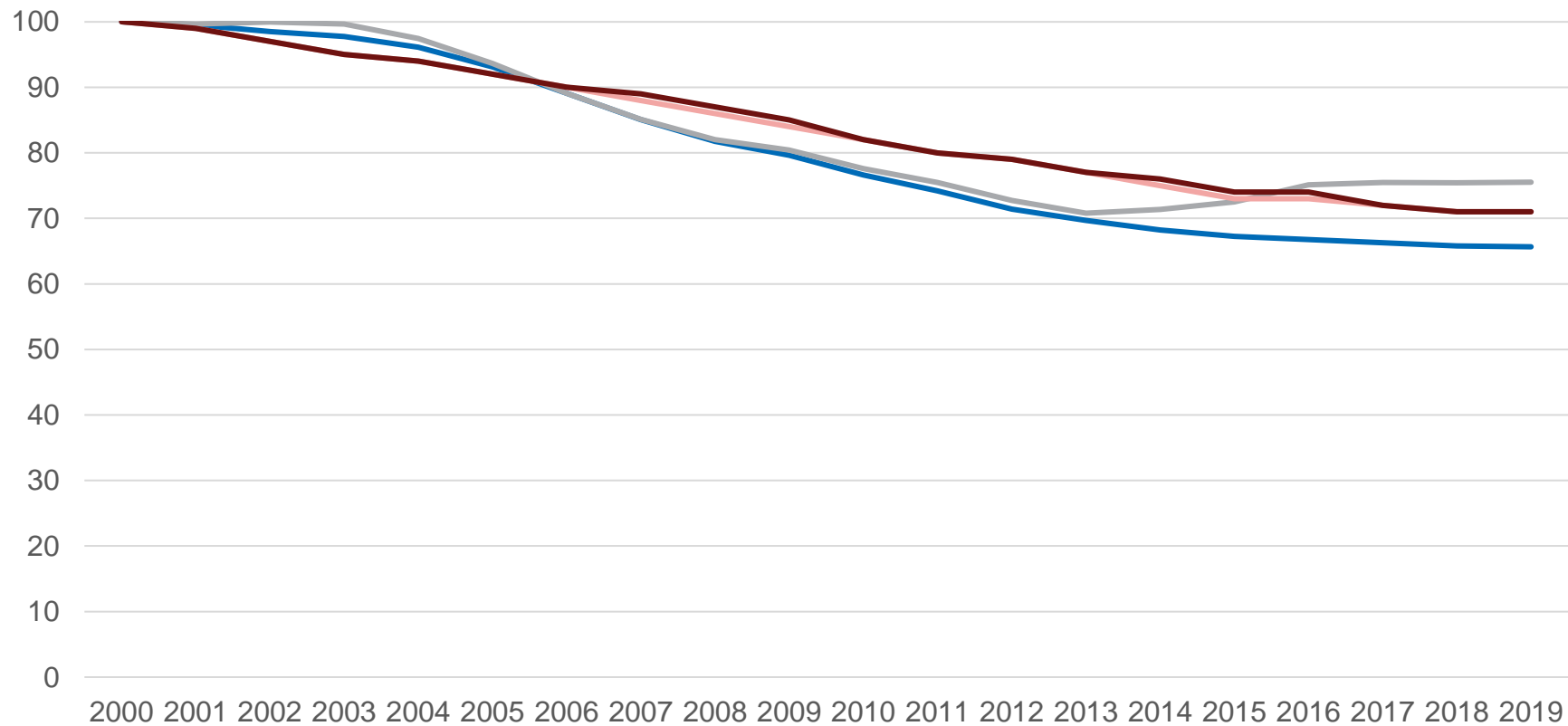
Energy efficiency index 2000-2019

- **Since 2000:**
- Technical energy efficiency index of households improved **34.3%**
- Gross energy efficiency index of households improved by **24.5%**
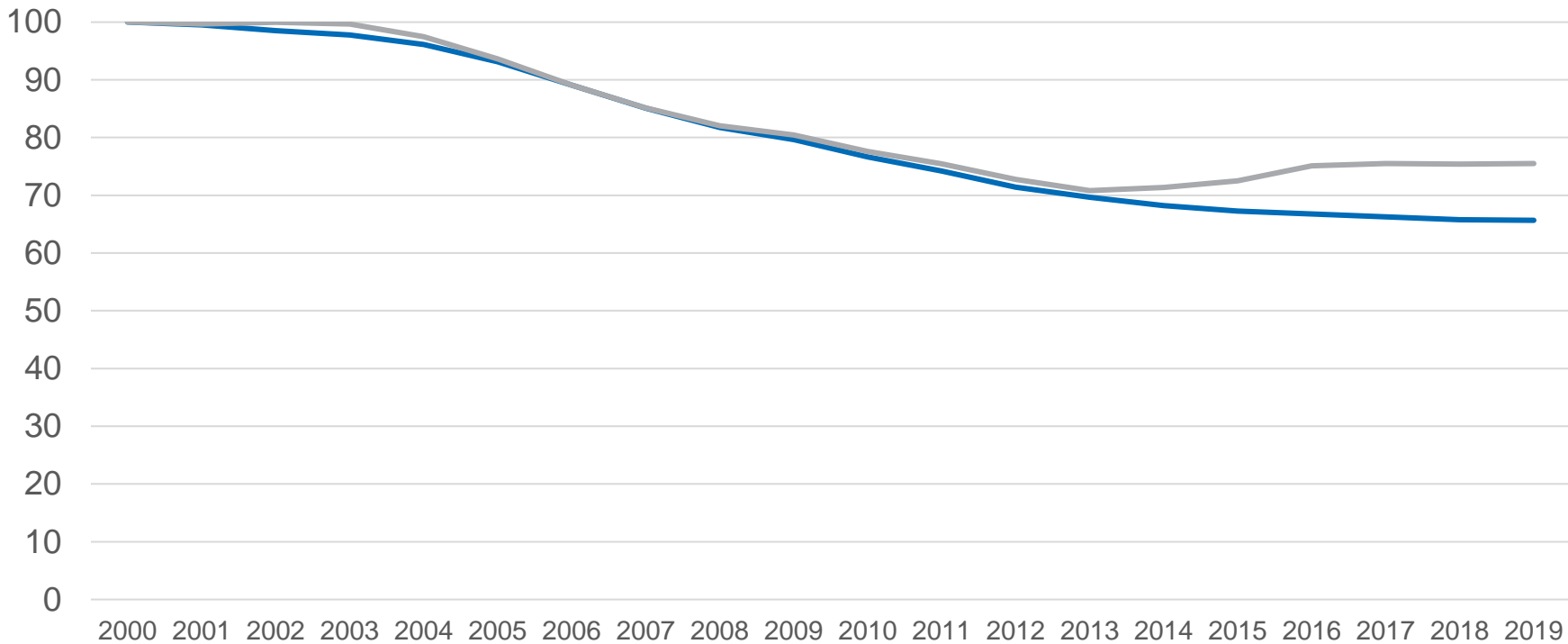
Legend:
— Technical energy efficiency index of households
— Gross energy efficiency index of households

Energy efficiency index, UK and Europe 2000-2019

UK - Technical energy efficiency index of households

UK - Gross energy efficiency index of households

European - Technical energy efficiency index of households

European - Gross energy efficiency index of households

Decomposition analysis

Decomposition methods 'decompose' a target variable across a give time period into pre-defined factors to determine their contribution to the overall target value.

ODYSSEE provides a **Decomposition Tool** Effects are split into **activity effects**, **energy savings**, and **behavioural effects for** specific sectors.

This tool helps explore explanatory variables behind changes in energy efficiency/consumption.

https://www.indicators.odyssee-mure.eu/decomposition.html

Variation in household energy consumption United Kingdom, MTOE (2000 – 2019)
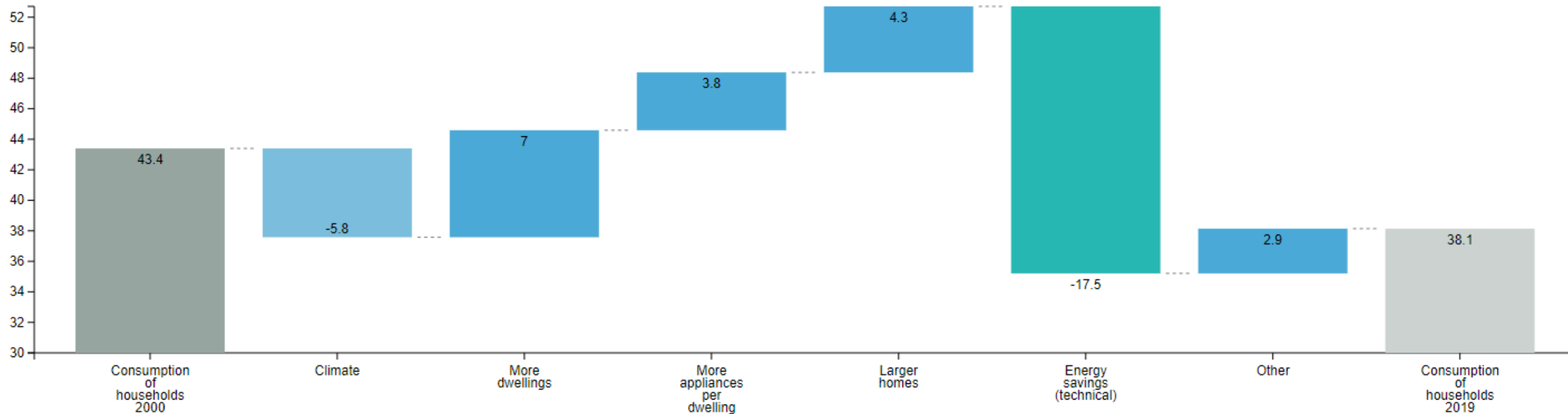
The UK's household energy consumption has decreased by **12.2%** between 2000 and 2019, primarily driven by energy savings. The total variation is explained by the following indicators:

- Climatic difference between these two dates ("climate")
- Change in the number of occupied dwelling ("more dwellings");
- Change in the appliances ownership ("more appliances per dwelling" for electrical appliances and central heating);

- Change in the average floor area per dwelling ("larger homes");
- Energy savings; corresponds to technical savings, i.e. gross savings corrected of negative savings due to inefficient behaviours. It is derived from technical ODEX;
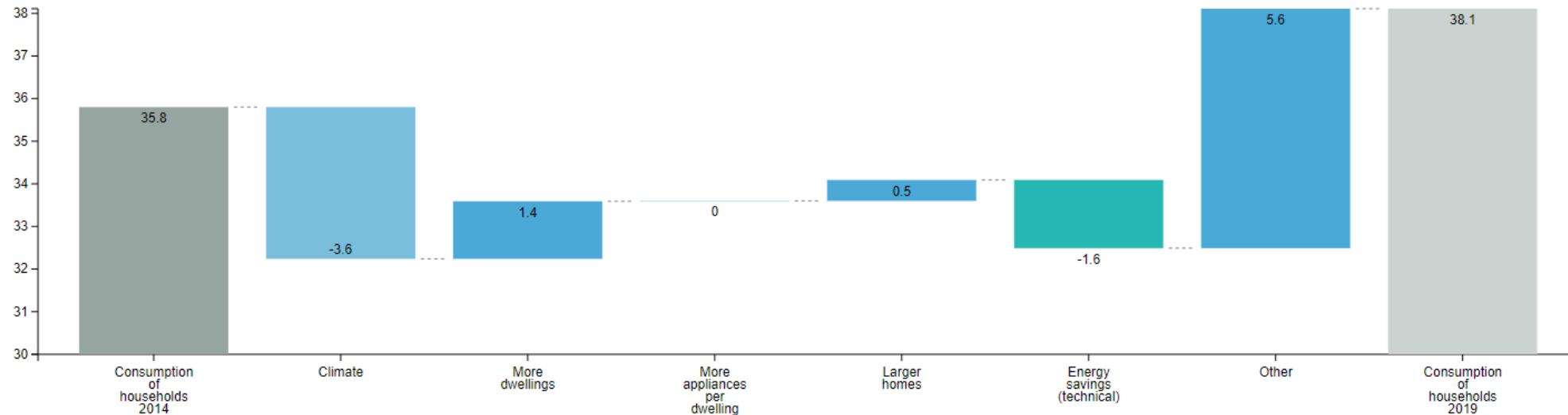- Other effects (mainly changes in heating behaviours).

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Variation in household energy consumption United Kingdom, MTOE (2000 – 2019, 2014-209)

- Plateauing rates of change across the key drivers
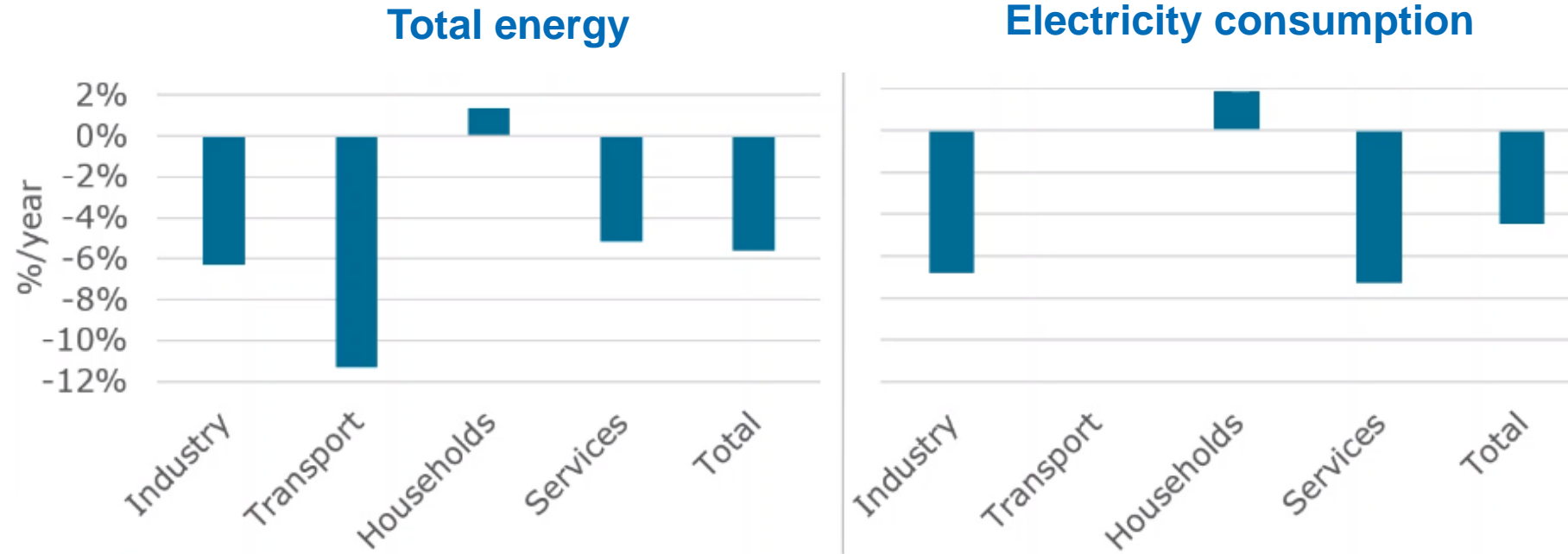
- Nearly x4 smaller increase in technical energy savings

MTOE (2009-2014)
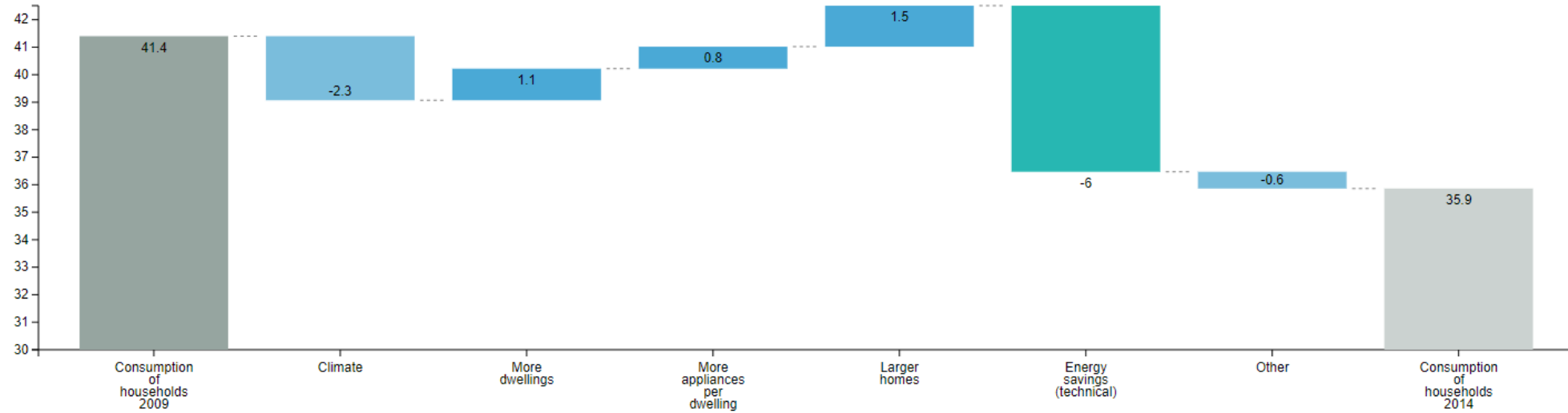
MTOE (2014-2019)

Energy consumption by sector in 2020 (Initial estimates)

Total energy

Electricity consumption

- Total energy consumption dropped by 5.6%. Electricity consumption by 4.5%.

- Transport was the most impacted sector due to lock down travel restrictions -11%

- Services saw the largest decrease in electricity consumption (-7%) due to increases in remote working shifting consumption to households.

- Households was the only sector with an increase in consumption (+1.4% overall and +1.9% for electricity)

Energy efficiency improvements by sector
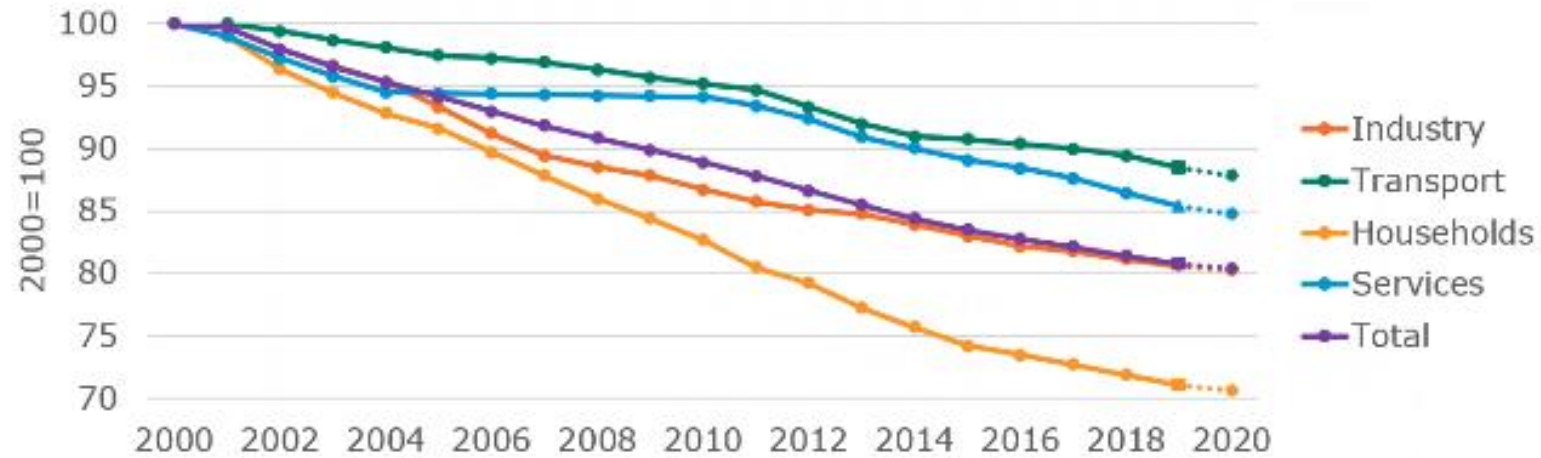
- According to early estimates from Odyssee - efficiency increased by around 0.5% in 2020 across sectors
  - 0.4% for industry
  - 0.5% for households and transport

- Average of 0.7%/yr 2014-2019

ODYSSEE Database (reference slide)

	Industry	Households	Transport	Tertiary
Energy consumption	Total and for 11 branches: Chemical, Primary metals (Steel & Non-ferrous), Non-metallic mineral (Cement & Glass), Paper Printing, Food & beverage, Textile Machinery & Fabricated metals, Transport equipment, Miscellaneous industries, Wood, Mining, Construction)	6 end-uses: heating, water heating, cooking, AC, lighting, electrical appliances.	By mode: road, rail, water, air By vehicle: cars, bus, trucks, LDV, motorcycles	7 branches: offices, public, health, trade, education, hotels, others
Activity	- Value added and production index by branch. - Physical production for intensive products	- Dwelling stock (number, size, type of fuel used) - Stock of electrical and heating appliances)	- Number of vehicles - Traffic in passenger-km and tonne-km - Average distance driven by vehicle - Specific consumption (stock average, new vehicles).	- Value added by branches - Employment - Other activity data (person-nights, pupils, bed in hospitals)
Indicators	- Energy and CO2 intensities - Specific consumption (for energy intensive branches). - ODEX and savings	- Unit consumption per dwelling by end-use - Specific consumption of electrical appliance - ODEX and savings	- Unit consumption per vehicle; - Unit consumption per unit of traffic - ODEX and savings	- Energy intensity - Unit consumption per employee - ODEX and savings
Diffusion indicators		- Share of efficient heating system, appliances - Diffusion of smart meters - Share of biofuels	- Share of efficient and alternative vehicles - Biofuel in transport - Per capita mobility - Modal split for passengers or goods	

Access ODYSSEE here: https://www.indicators.odyssee-mure.eu/online-indicators.html

Conclusions

https://www.odyssee-mure.eu/project.html

- **ODYSSEE –** Registered user access only
- **MURE** – Some freely available on website, greater access with login details

Contact Samantha.morgan-price@ricardo.com to request access

- Consortium is planning a new phase under LIFE programme
- The projects coordinators are (really) keen for the UK to continue.

Creating a world
fit for the future

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Q&A