

Europe's national energy efficiency champion The European energy efficiency 2023 scoreboard

An eceee & ODYSSEE-MURE joint project

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The raised European ambition on energy efficiency

- The revised Energy Efficiency Directive (EU/2023/1791), published in the Official Journal on 20 September 2023, significantly raises the EU's ambition on energy efficiency.
- It establishes 'energy efficiency first' as a fundamental principle of EU energy policy, giving it legalstanding for the first time.
- The 2023 revised directive makes it binding for EU countries to collectively ensure an additional 11.7% reduction in energy consumption by 2030, compared to the 2020 reference scenario projections.
 - EU energy consumption by 2030 should not exceed 992.5 million tonnes of oil equivalent (Mtoe) for primary energy and 763 Mtoe for final energy.
- The revised directive more than doubles the annual energy savings obligation (Article 8) by 2028.
 - EU countries are required to achieve cumulative end-use energy savings for the entire obligation period (running from 2021 to 2030), equivalent to new annual savings of at least 0,8% of final energy consumption in 2021-2023, at least 1.3% in 2024-2025, 1.5% in 2026-2027 and 1.9% in 2028-2030.
- Supply security issue (and gas/electricity prices) have (re) awakened interest in energy efficiency



Why this Scoreboard?



Distance to 2030 target for final energy consumption, EU

Distance to 2030 target for primary energy consumption, EU

 Scoring the achievements and efforts of the EU Member States helps to understand where we have to speed up efforts.

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Why this Scoreboard?

Distance to 2030 target for primary energy consumption, EU





What is the eceee & ODYSSEE-MURE energy efficiency scoreboard?

- Scores are based on data from (www.odyssee-mure.eu):
 - the ODYSSEE database on energy efficiency indicators
 - the MURE database on energy efficiency policies.
- A benchmarking tool to compare the impacts of energy efficiency policies and developments amongst European countries. It is intended to paint a well-rounded picture of how a country is performing with respect to energy efficiency, relative to its peers in Europe.
- The first energy efficiency scoreboard to account for quantitative impacts of policies (output-based scoring).
- It accounts for several decades of statistical data as well as future impacts of current energy efficiency programmes.

How does the ODYSSEE-MURE scoring method work?

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The score "Level" – assessing today's performance level

The Level Score answers the question "How is my country currently performing with respect to energy efficiency?"

Quantitative measure ot a country's performance at the present time, influenced by autonomous developments, energy prices and policies in place. Accounts tor all major sectors of the economy (Industry, Transport, Households, and Services).

The scoring is based on **adjusted** and mainly **physical indicators** tor energy efficiency (and not on simple energy intensities), such as:

- energy use per m² and building type (household, office...)
- share ot public transportation in total land passenger transport
- specific energy consumption tor industrial branches

Note: The "Level" parameter is based on the top-down statistical energy efficiency indicators in the ODYSSEE database



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The score "Trend" – a look at progress since 2010

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Max score 1.0

EE

Progress,

Trends

The "Trend" score answers the question "How much progress has the country achieved in the area of energy efficiency?"

The Trend score determines progress using the same set ot energy efficiency indicators as selected tor the "Level" score since the year 2010.

Dynamic parameter that takes development and past actions into account.

Note: The "Trend" parameter is based on the top-down statistical energy efficiency indicators in the ODYSSEE database

The "Policy" score – quantifying future savings from today's policies

The Policy Score answers the question "What future impacts can I expect from recent policies enacted in my country?"

This score forecasts the energy-saving impacts of more recent policies from a given starting year, e.g., 2010, until a target year (e.g., until 2030). It converts policy impacts into a quantitative or semi-quantitative score.

Bottom-up evaluation of policies, based on the energy savings expected to be achieved in each sector compared to the sectoral energy consumption.

Note: Policy impacts are gathered in the MURE Database from quantitative and semi-quantitative measure impact evaluations in a target year, e.g., 2030. Also, the reference year for policies has changed from 2000 to 2010

The eceee & ODYSSEE-MURE energy efficiency scoreboard for 2023

Max score 1.0 EE Policies

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A deeper view to households



Households: Which country scores best on "Level"?

Lithuania

Netherlands Finland



Denmark



Households: Netherlands gets the best score 2023 on "Level"

Level – Household Sector ranking top 5

Rank Country Score

1 Netherlands	5 1.0		
2 Denmark	0.97		
3 Finland	0.96		
4 Sweden	0.92		
5 Lithuania	0.92		



Households Which country scores best on EE "Trend"?

Croatia

Netherlands Latvia

Luxembourg

Ireland



Households: Luxembourg has the highest score 2023 on "Trend"

Trend – Household Sector ranking top 5

Rank Country S	Score		
1 Luxembou	ırg 1.0		
2 Croatia	0.91		
3 Netherlan	ds 0.89		
4 Latvia	0.87		
5 Ireland	0.87		

*Note: baseline year changed from 2000 to 2010 in 2023 UPDATE



End-use	Indicator	Weighting factor
Heating	Consumption for heating per m ² scaled to EU climate and equivalent to central heating ³	Share of heating in total households consumption
Other thermal uses	Consumption per dwelling for cooking and water heating	Share of cooking + ½ of water heating in total households consumption
Appliances	Specific consumption of electricity per dwelling for appliances (including AC) and lighting	Share of appliances (incl. AC) & lighting in households consumption
Solar penetration	% of dwellings with solar water heater	½ share of water heating in households consumption

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Trends/Levels: Space heating households (since 2010)

Unit consumption per m2 for space heating scaled to EU average climate (MJ/m2) EU European Union

The eceee & ODYSSEE-MURE energy efficiency scoreboard for 2023

ODYSSEE-MURE

Trends/Levels: Space heating households (since 2010)



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Trends/Levels: Space heating households (since 2010)

Unit consumption per m2 for space heating scaled to EU average climate (MJ/m2) 900 800 Croatia 700 Luxembourg 600 France 500 Germany 400 EU Lithuania Netherlands Denmark 300 Finland Sweden 200 100 0 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 European Union —Croatia —Denmark -Finland —France -Germany —Ireland —Lithuania —Luxembourg — Netherlands -Sweden

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Households: The "Policy" score – quantifying future savings from today's policies

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Bottom-up evaluation of policies, based on the energy savings expected to be achieved in each sector compared to the sectoral energy consumption.

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Household sector: Germany gets the best score 2023 on "Policy"

Policy – Household Sector ranking top 5

Rank Country	Score	
1 Germany	1.0	
2 Romania	0.72	
3 Luxembou	rg 0.69	
4 Poland	0.67	
5 France	0.63	



 Germany: Tax incentives for energy efficient building refurbishment (Steuerliche Förderung der energetischen Gebäudesanierung). The tax incentive is limited to individual measures in owneroccupied apartments and residential buildings. The subsidy is provided in the form of a deduction from tax liability over a period of three years. 20% of the investment costs are deductible. The maximum subsidy amount is EUR 40,000.Start 2020 (expected impact in 2030: 52 PJ)

• Poland:

* Thermo-modernization tax relief (expected impact in 2030: 24 PJ)

* Agreements with municipalities: The municipalities issue a call for applications in their area among the residents - the final beneficiaries. These are individuals, owners of flats in multi-family houses, tenants of flats owned by the municipality and housing communities with 3-7 flats. (expected impact in 2030: 18 PJ)

• France:

* Mandatory standards for buildings (expected impact 2030 in households: 118 + 8,8 PJ)

* Subsidy for thermal renovation of private dwellings (MaPrimeRénov') (expected impact in 2030 in households: 9 PJ)

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Household Sector: Combined Score





Household Sector: European Energy Efficiency Scoreboard 2023

Who is doing best in 2023?

Germany

France

Latvia

Luxembourg Netherlands



Households: Luxembourg is Europe's 2023 energy efficiency champion

Overall Score – Household Sector ranking top 5

Rank Country Score				
1 Luxembour	g 0.83			
2 Germany	0.80			
3 Netherlands	6 0.72			
4 France	0.66			
5 Latvia	0.62			



A glimpse on transport



Transport: Luxembourg is Europe's 2023 energy efficiency champion

Overall Score – Transport Sector ranking top 5

Rank Country Score			
1 Luxembou	ırg 0.84		
2 France	0.64		
3 Latvia	0.56		
4 Spain	0.56		
5 Greece	0.55		

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Example of how transport scores for level and trend are composed

Transport

Modes	Indicator	Weighting factor
Cars	Specific consumption (goe/pkm)	Share of cars in total transport consumption
Trucks and light vehicles	Specific consumption (goe/tkm)	Share of trucks and light vehicles in total transport consumption
Air	Specific consumption (koe/pass)	Share of air in total transport consumption
Modal split: -Passengers	% of traffic by public mode	Share of buses and rail passengers in total transport consumption
-Goods	% of traffic by rail and water	Share of water and rail freight consumption in total transport

Transport - where many/all countries are weak: cars



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EU27

Transport - where many/all countries are weak: cars



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Transport - where many/all countries are weak: cars



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eceee eceee eceee **Transport - where many/all countries are weak: cars**



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A glimpse to industry



Industry: Estonia is Europe's 2023 energy efficiency champion

Overall Score – Industry Sector ranking top 5

1 Estonia 0.63

2 Cyprus 0.58

Germany 0.58

4 Ireland 0.49

5 Romania 0.47


Where Germany is weak...ODEX Industry Germany

Sectoral and overall ODEX Germany 105 Scoreboard Trends 100 95 90 Industry 85 Transport 80 Overall 75 The ODEX is an aggregate sector energy efficiency 70 index ("Dow Jones" of Households 65 energy efficiency) 60 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 Technical energy efficiency index (ODEX) for final consumers ----- Technical energy efficiency index of households Technical energy efficiency index of transport

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Overall Champion Energy Efficiency Scoreboard 2023



Luxembourg is Europe's 2023 energy efficiency champion

Best top Overall Score – ranking top 5

Rank	Country	Score
1	Luxembourg	0.86
2	Germany	0.68
3	France	0.63
4	Latvia	0.61
5	Denmark	0.60



Luxembourg – detailed scoring – 2023 UPDATE

Aggregate score of many sectors and three scoring categories

	Level	Trend	Policy	Combined
Overall	0.57	1	1	0.86
Industry	0.39	0.20	0.40	0.33
Transport	0.76	1	0.79	0.85
Households	0.80	1	0.69	0.83
Services	0.00	0.42	1	0.47



Overall Champion Energy Efficiency Scoreboard 2023 (Summary on Levels/Trends/Policies)

OVERVIEW - SUMMARY

Overall

Level	Trend	Policies	Combined
1: Denmark	1: Luxembourg	1: Luxembourg	1: Luxembourg
2: Lithuania	2: Estonia	2: Germany	2: Germany
3: Slovenia	3: Ireland	3: Cyprus	3: France



Sectors included and combined



Sectors included and combined







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Discussion of results



- Policies scores are a promises to the future: they represent expected savings by 2030 (including nevertheless policies since 2010)
- Achieved policy impacts are included in the present levels (2021) and the trends (from 2010 to 2021)
- Trends (since 2010) are more advantageous for "Eastern and Southern" Member States, given less good starting positions (levels) but ambitious energy efficiency policies over the past
- Scores in the middle of the scoreboard are sometimes close together, making it more difficult to clearly distinguish ranks. However, the scoreboard clearly shows where a country is weaker in efforts.
- No country, even the best, is excellent in all sectors and all 3 components. There is still a lot of scope to improve Energy Efficiency



This presentation and infographic on the energy efficiency scoreboard was developed by Borg & Co and eceee as part of the ODYSSEE-MURE project. *Graphic design: Björkman & Mitche!!*

More information

https://www.odyssee-mure.eu/data-tools/scoring-efficiency-countries.html





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Back-up slides

Q/A on some methodological questions

Why is the European Energy Efficiency Scoreboard unique?

- Raise the profile of energy efficiency
- Increase transparency about progress and impacts of energy efficiency policy
- **Facilitate learning** highlight successes and areas for improvement.

The unique aspects of this scoreboard are:

- It uses indicators that are adjusted for structural and climatic factors
- It accounts for quantitative effects of policies
- It considers impacts from the **past**, the **present**, and even **future** implications
- It weighs various evidence-based parameters into one single score

By weighing various parameters, and by looking back and to the future, the score gives a more fair and realistic description of development than simple comparisons of energy intensity.

Do we account for comfort and standard of living?

Do we fail to catch comfort level, such as differences in indoor temperature? Do we give poor countries too high rating?

- The scoreboard does not take the level of energy services into account.
- However, the "Trend" score for each a country relies on 10 years of comparable data for the country.
- We can assume that the level of services has not changed drastically.

What about weather fluctuation and differences in industry structure?

- The "Level" score uses average data for the last three years to account for changes in specific years.
- Differences among countries concerning climate and annual temperature variations are corrected for.
- Different industry structures are accounted for.

What about sufficiency?

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- A country with more sqm floor space per person is compared with countries with fewer square meters per person.
- The share of public transport is compared to the total passenger transportation in a given country.
- Additional indicators in future could be added, reflecting the impact of sufficiency policies on energy efficiency on the scoreboard.



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Back-up slides

Overall Champion Energy Efficiency Scoreboard 2023 (by component: level, trend, policy, overall)



Which country scores best on "Level"?

Lithuania Slovenia France



Denmark



Denmark has the highest score 2023 on "Level"

Level – overall (all sectors) ranking top 5

Rank	Country	Score
1	Denmark	1.0
2	Lithuania	0.96
3	Slovenia	0.87
4	Greece	0.86
5	France	0.86



Which country scores best on "Trend"?





Luxembourg has the highest score 2023 on "Trend"

Trend – overall (all sectors) ranking top 5

Rank	Country	Score
1	Luxembourg	1.0
2	Estonia	0.81
3	Ireland	0.74
4	Greece	0.72
5	Denmark	0.69



Which country scores best on "Policy"?

Germany

Poland

Bulgaria



Luxembourg



Luxembourg get the best score 2023 on "Policy"

Policy – overall (all sectors) ranking top 5

Rank	Country	Score
1	Luxembourg	1.0
2	Germany	0.89
3	Cyprus	0.83
4	Bulgaria	0.57
5	Poland	0.49



Europe's top country 2023?

France

Luxembourg

Germany

Denmark

Latvia



Luxembourg is Europe's 2023 energy efficiency champion

Best top Overall Score – ranking top 5

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Back-up slides

- A deeper look to industry
- (by component: level, trend, policy, overall)

Industry: The score "Trend" – a look at progress since 2010

The "Trend" score answers the question "How much **progress** has the country achieved in the area of energy efficiency?"

The Trend score determines progress since the year 2010.

The scoring is based on **adjusted** and mainly **physical indicators** tor energy efficiency (and not on simple energy intensities):

 specific energy consumption tor industrial branches which are combined into the industrial ODEX ("Dow Jones" of energy efficiency)

Dynamic parameter that takes development and past actions into account.

Note: The "Trend" parameter is based on the top-down statistical energy efficiency indicators in the ODYSSEE database





Industry Which country scores best on EE "Trend"? Lithuania Greece Estonia

Romania





Estonia has the highest score 2023 on "Trend"

Trend – Industry Sectors ranking top 5

Rank Country Score

1 Estonia 1.0

2 Romania 0.66

3 Cyprus 0.65

4 Lithuania 0.60

5 Greece 0.41

*Note: baseline year changed from 2000 to 2010 in 2023 UPDATE



Where Germany is weak...ODEX Industry Germany

Sectoral and overall ODEX Germany 105 Scoreboard Trends 100 95 90 Industry 85 Transport 80 Overall 75 The ODEX is an aggregate sector energy efficiency 70 index ("Dow Jones" of Households 65 energy efficiency) 60 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 Technical energy efficiency index (ODEX) for final consumers ----- Technical energy efficiency index of households Technical energy efficiency index of transport

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Max score 1.0

Achieved

EE Level

Industry: The score "Level" – assessing today's performance level

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Quantitative measure ot a country's performance at the present time, influenced by autonomous developments, energy prices and policies in place. Accounts tor all major sectors of the economy (Industry, Transport, Households, and Services).

The scoring is based on **adjusted** and mainly **physical indicators** tor energy efficiency (and not on simple energy intensities):

 specific energy consumption tor industrial branches normalised to the average structure of European industry

Note: The "Level" parameter is based on the top-down statistical energy efficiency indicators in the ODYSSEE database



Industry: Which country scores best on "Level"?

Estonia

Denmark Cyprus

Slovenia




Industry: Cyprus gets the best score 2023 on "Level"

Level – Industrial Sector ranking top 5

Rank Country Score		
1 Cyprus	1.0	
2 Latvia	0.94	
3 Estonia	0.86	
4 Denmark	0.85	
5 Slovenia	0.79	

Industry: The "Policy" score – quantifying future savings from today's policies

The Policy Score answers the question "What future impacts can I expect from recent policies enacted in my country?"

This score forecasts the energy-saving impacts of more recent policies from a given starting year, e.g., 2010, until a target year (e.g., until 2030). It converts policy impacts into a quantitative or semi-quantitative score.

Bottom-up evaluation of policies, based on the energy savings expected to be achieved in each sector compared to the sectoral energy consumption.

Note: Policy impacts are gathered in the MURE Database from quantitative and semi-quantitative measure impact evaluations in the target year 2030. The reference year for policies has been set to 2010 onwards.

The eceee & ODYSSEE-MURE energy efficiency scoreboard for 2023

Max score 1.0 EE Policies

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Industry: Germany gets the best score 2023 6n "Policy"

Policy – Industrial Sector ranking top 5

Rank Country Score		
1 Germany	1.0	
2 Finland	0.87	
3 Bulgaria	0.47	
4 Luxembourg 0.40		
5 Poland	0.28	



Industry: The "Policy" score – examples of industrial Energy Efficiency policies

- Germany: The programme "Federal support for energy and resource efficiency in the economy" ((Bundesförderung für Energie- und Ressourceneffizienz in der Wirtschaft EEW) provides incentives for companies to invest in highly efficient energy-saving technologies, particularly in plant and process modernization, and to speed up market penetration. The EEW) came into force on 1st May 2023 (4.525 billion Euro 2023-2030, expected impact in 2030: 105 PJ)
- **Finland:** Third generation of voluntary energy efficiency agreement for different industries for 2017-2025 (expected impact in 2030: 55 PJ).
- Poland: Energy Saving Obligations (expected impact in 2030 in industry: 29 PJ)

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Industry Sector: Combined Score



The eceee & ODYSSEE-MURE energy efficiency scoreboard for 2023



Industry Sector: European Energy Efficiency Scoreboard 2023

Who is doing best in 2023?

Germany

Romania

Cyprus

Ireland Estonia

The eceee & ODYSSEE-MURE energy efficiency scoreboard for 2023



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Overall Score – Industry Sector ranking top 5

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