REPORT

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EU BUILDINGS CLIMATE TRACKER

METHODOLOGY AND INTRODUCTION OF BUILDING DECARBONISATION INDICATORS AND THEIR RESULTS

BPIE

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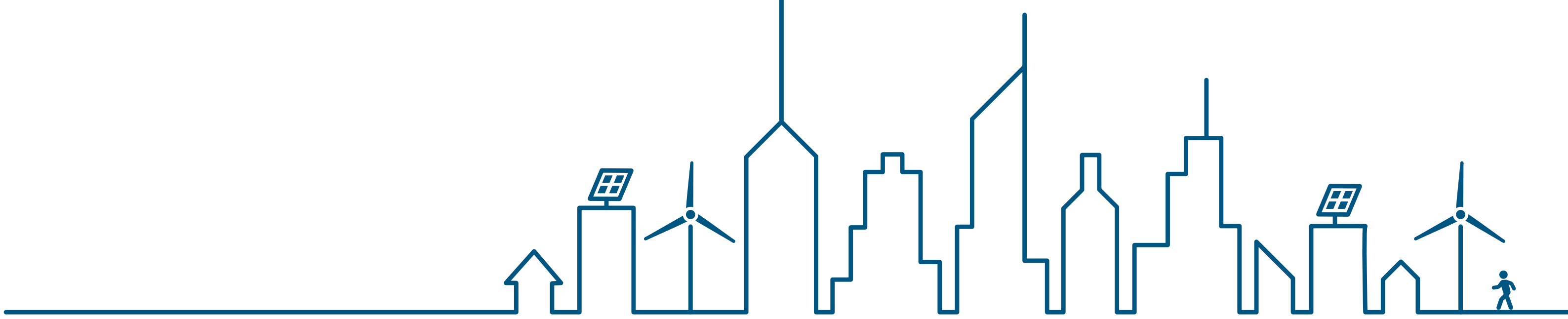

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INTRODUCTION

WHAT IS THE EU BUILDINGS CLIMATE TRACKER AND WHY WAS IT DEVELOPED?

European decision-makers are currently in the process of negotiating the revision of the Energy Performance of Buildings Directive (EPBD), following a proposal from the European Commission at the end of 2021. Sound policymaking should build on the analysis of the impact of policies already in place, in order to identify potential gaps, as well as opportunities to correct them.

The EU Buildings Climate Tracker is an index composed of a set of indicators. It is a response to the challenges of collecting and using data to monitor and assess decarbonisation progress in the EU building stock. Its starting point is the adoption of the Paris Agreement in 2015, while the objective is defined as climate neutrality by 2050. The Tracker serves as a benchmark and assessment tool for the status of decarbonisation progress in the European buildings sector and its progress towards climate neutrality by 2050. It provides evidence of the need for further action, which should be reflected in an ambitious outcome from the negotiations around the EPBD and the Fit-for-55 package. However, the Buildings Climate Tracker is not a tool for modelling the future: it rather documents the progress achieved since 2015 and puts it into perspective towards 2050, based on one scenario.[1]

THE TRACKER ANSWERS THE FOLLOWING QUESTIONS:

- **How has decarbonisation of the building stock in the EU evolved since 2015?**
- **Is the building stock improving enough to achieve climate neutrality by 2050?**
- **If not, how much more must it improve between the latest observations and 2050, to achieve climate neutrality in 2050?**

[1] MIX scenario from the impact assessment accompanying the Communication 'Stepping up Europe's 2030 climate ambition'

WHAT IS THE EU BUILDINGS CLIMATE TRACKER?

The EU Buildings Climate Tracker is an index composed of a set of indicators. It is a response to the challenges of collecting and using data to monitor and assess decarbonisation progress in the EU building stock.

In 2020, BPIE developed a global tracker for climate change action for the buildings and construction sector for the Global Status Report of the Global Alliance for Buildings and Construction.[2] This tracker allowed an evaluation of whether the sector is on track globally to full decarbonisation by 2050. Based on this work, BPIE developed the EU Buildings Climate Tracker.

A policy briefing highlighting its results as well as concrete policy recommendations for the EPBD revision was published in June 2022.[3] This current paper complements the policy briefing, giving more details about the methodology and results for all sub-indicators of the EU Buildings Climate Tracker.

2 2020 GLOBAL STATUS REPORT FOR BUILDINGS AND CONSTRUCTION - Towards a zero-emissions, efficient and resilient buildings and construction sector.

3 BPIE (Buildings Performance Institute Europe) (2022). EU Buildings Climate Tracker: Urgency to close the buildings decarbonisation gap.

METHODOLOGY

HOW WAS THE EU BUILDINGS CLIMATE TRACKER DEVELOPED?

SELECTING INDICATORS FOR THE TRACKER

The EU Buildings Climate Tracker is based on a set of indicators used to create an index to assess and track decarbonisation of the building stock in the EU. More than 60 European and global data sources that monitor the building sector[4] were reviewed in choosing the indicators. To select the most relevant, the potential data sources were screened against the following criteria:

- **EU coverage: the data source should cover many Member States or the EU as a whole**
- **Reliability: the data should be of high quality and the data provider of good reputation**
- **Consistency: the data is available over successive years and across countries in a comparable way**
- **Continuity: the data source is regularly updated, at least annually**
- **Timeline: the data is available as of 2015 at least, the date chosen as reference year**
- **Quality: the data has undergone quality checks by the data publisher and missing data as well as outliers have been treated.**

[4] Including the European Environment Agency (EEA), International Energy Agency (IEA), Eurostat, ODYSSEE and Tabula.

After this initial screening, a final set of six indicators was chosen for inclusion in the Tracker:

Table 1: Selected indicators description and sources

	Indicator	Description	Source
1	**CO_2 emissions from energy use in buildings by households and services,** expressed in $MtCO_2$	CO_2 emissions from the direct use of fossil fuel energy in buildings and indirectly from the production of electricity and heat used in buildings.	ODYSSEE using data from the EEA
2	**Final energy consumption in households and the service sector,** expressed in TWh[5]	Energy consumption of end-users in households and the service sector, excluding consumption of the energy sector itself and losses occurring during transformation and distribution of energy.[6]	Eurostat
3	**Improvement in EPC ratings,** expressed in percentages	Increase in the share of high energy performance classes (EPC classes A, B and C) and decrease in the share of low energy performance classes (EPC classes D, E, F and G).[7]	*BPIE own analysis
4	**Renewable energy share**		
	A **Share of energy from renewable sources for heating and cooling**, expressed in percentages	Share of renewable energy used for heating and cooling, including solar thermal, geothermal energy, ambient heat captured by heat pumps, solid, liquid, and gaseous biofuels, and the renewable part of waste.	Eurostat
	B **Share of energy from renewable sources in gross electricity consumption,** expressed in percentages	Share of electricity produced from renewable energy sources including wind power, solar power, hydropower, tidal power, geothermal energy, ambient heat captured by heat pumps, biofuels, and the renewable part of waste.	Eurostat
5	**Cumulated investment in renovation in real terms,** expressed in 2020 Euros	Cumulated investments in renovation of the building stock excluding inflation, i.e., expressed in real terms. Includes the investments that Member States have reported for all renovation activity i.e., not solely energy renovation, in residential and non-residential.	FIEC[8]
6	**Annual domestic expenditure per household[9] in real terms,** expressed in 2010 Euros	Annual expenditure per household on energy (electricity, heating and gas) for end uses, such as space and water heating, space cooling, electrical appliances, cooking, lighting.	ODYSSEE

5 The source, Eurostat, provided MtOE which was converted to TWh.
6 The preferred choice would have been final energy demand for space heating. However, this indicator is not available for the service sector, and for households only as of 2018.
7 The lack of data prevented, in this edition of the Tracker, the assessment of the improvement of EPC ratings. The calculation thus uses zero improvement. However, it was possible to calculate a proxy for the EU average EPC rating distribution as a starting point for the next analysis. For more information, see the section on 'Tracker results'.
8 The analysis excludes Bulgaria, Cyprus, Estonia, Greece, Croatia, Hungary, Ireland, Latvia, Lithuania, Luxemburg, Romania and Slovakia.
9 The name of the indicator in ODYSSEE database is "Annual energy expenditure for housing per household".

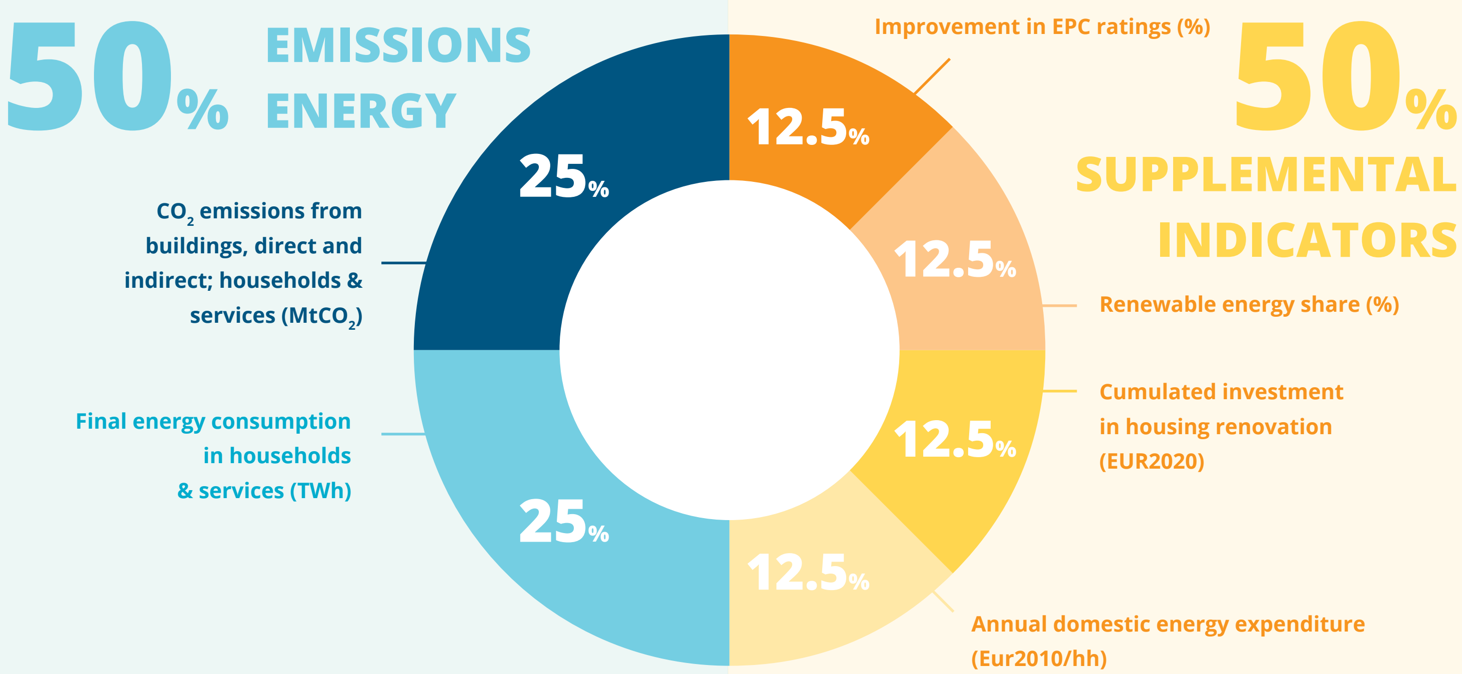
In the development phase of the Tracker, some potentially relevant indicators were considered but finally excluded:

- **Embodied emissions in buildings:** to reach full decarbonisation of the building stock, it is equally important to track the embodied CO_2 emissions along with operational emissions. However, challenges in data availability, accessibility, quality, scope and collection methods make it difficult to monitor the embodied emissions, let alone to set the baseline for reduction efforts (goal value). This indicator has therefore not been retained for inclusion in the Tracker.
- **Renovation activity (rate and depth):** determining renovation rates and depth from each Member State is essential for formulating impactful policies. However, the uncertainty and variation around definitions of renovation depth and irregular updates (no data is available at EU level since 2016) make it difficult to collect and compare the data to create a renovation activity indicator. Renovation rate and depth were also therefore dismissed as indicators for the Tracker.

WEIGHTING INDICATORS WITHIN THE TRACKER

The Tracker consists of an aggregation of six indicators. However, it does not assume the same weight for each of them.

Figure 1: Indicators and their weighted contribution to the EU Buildings Climate Tracker



CO_2 emissions and final energy consumption are the main indicators to monitor decarbonisation and energy performance in buildings, so represent half of the Tracker. However, those two indicators may be influenced by other factors than implementation of policies and measures, such as economic activity and climate fluctuations. For example, in 2020, there was a global reduction of CO_2 emissions and of energy consumption, mainly due to the reduction of economic activity during the COVID-19 pandemic, which resulted in a reduced use of tertiary buildings. Aggregating supplemental indicators, besides CO_2 emissions and energy consumption, balances each indicator's weaknesses and gives a more robust picture of the complex multidimensional issue of decarbonising the building stock in the EU, as the combination of indicators sheds light on the progress from different perspectives.

TRANSLATING CLIMATE NEUTRALITY INTO A 2050 GOAL VALUE FOR EACH INDICATOR

To compare the observed development of the different indicators between 2015 and 2019 in relation to the objective of reaching climate neutrality by 2050, goal values have been determined for each indicator. These goal values are based (apart from one) on the MIX scenario used in different impact assessments[10,11], undertaken by the European Commission in the framework of the EU Green Deal legislative work. While the MIX scenario could be called into question regarding its level of ambition and alignment with climate neutrality by 2050, it has been selected as benchmark as it guides the setting of energy and climate objectives at EU level, as well as the adoption and implementation of policy measures. The Tracker therefore assesses progress between the real situation compared to commonly agreed goals at EU level. The goal value related to the improvement in EPC ratings is not based on the MIX scenario but on existing BPIE research with the idea of fully decarbonising the building stock by 2050.

[10] Impact Assessment accompanying Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement.
[11] Impact assessment accompanying the Communication 'Stepping up Europe's 2030 climate ambition'.

Table 2: Indicator goal values

	Indicator	Goal value 2050	Methodology determining goal values
1	**CO_2 emissions from energy use in buildings for households and services**	0 $MtCO_2$	The MIX scenario approximately achieves the goal of net zero greenhouse gas (GHG) emissions in 2050. As these reductions include appliances, we assume that the GHG emissions for building conditioning and use would be reduced by 100%, so the goal of GHG emissions for 2050 is set as 0 $MtCO_2$.
2	**Final energy consumption in households and the service sector**	3315 TWh	The MIX scenario aims at 55% GHG reduction by 2030[11] and translates this goal into a final energy consumption reduction of 17% by 2030 and 29% by 2050 (households), and 8% by 2030 and 18% by 2050 (services). The goal value is the sum of the remaining energy consumption in 2050 for households and services.
3	**Improvement in EPC ratings**	100% of buildings in EPC class A	The goal value was set based on a review of research, as there is currently no database at European level providing up-to-date data on EPC ratings in Member States. It is based on the EPBD objective in the recast proposal to reach a 'zero emission building stock by 2050' (Article 1) and intention to transform all existing buildings into zero emission buildings, equivalent to EPC class A (Article 3).
4	**Renewable energy share**		
	A Share of energy from renewable sources for heating and cooling	100%	The MIX scenario translates net-zero emissions in 2050 into 100% renewables in 2050 and 62.5% renewables in 2030.
	B Share of energy from renewable sources in gross electricity consumption	85% renewables, 15% nuclear[12]	Gross electricity production in the MIX scenario will be CO_2 neutral in 2050 but the assumptions in the scenario also contain 15% nuclear power. For 2030 the MIX scenario assumes 57% renewables and 19% nuclear power.
5	**Cumulated investment in renovation in real terms**	14,669 billion EUR2020[13]	The goal for investments in renovation activities is derived from observed data in the data source and the absolute envisaged increase in renovation investment defined in the MIX scenario.[14] The scenario details that average annual energy-related investments in renovation in the residential and tertiary sector between 2021 and 2030 should annually be €152 billion higher than in 2011–2020, while investments between 2031 until 2050 should annually be about €130 billion higher than between 2011 and 2020. The goal value was defined as the sum of the currently observed and scenario-based future investments during the period from 2015 to 2050 in 2020 Euro value.
6	**Annual domestic energy expenditure per household in real terms**	1,084 EUR2010[15]	We used the MIX scenario goal for final energy consumption (17% reduction by 2030, 29% by 2050 for households; 8% by 2030 and 18% by 2050 for services). To set the goal value, we assume that the inflation-adjusted expenditure follows the same reduction rates, e.g., households consuming 29% less energy in 2050.

[12] While the MIX scenario could be called into question regarding the nuclear share, it has been selected as a benchmark as it guides the setting of energy and climate objectives at EU level.

[13] The analysis excludes Bulgaria, Cyprus, Estonia, Greece, Croatia, Hungary, Ireland, Latvia, Lithuania, Luxemburg, Romania and Slovakia.

[14] Renovation investments from the MIX scenario are defined as "average renovation costs by climate type and renovation deepness, as used in the PRIMES buildings module. Investment costs are the energy related expenditures needed to implement the indicated level of renovation of a building, excluding usual renovation expenditures needed for other purposes (structure, finishing materials, decoration etc.)." See EU Reference Scenario 2020 which is the baseline for the MIX scenario and its modelling approach.

[15] Assuming inflation-corrected expenditures change in relation to energy consumption, they decrease by 29% by 2050 compared to 2015 according to the MIX scenario.

TRACKER RESULTS:

THE DECARBONISATION GAP IS INCREASING

The EU Building Climate Tracker aggregates the six above-mentioned indicators and assumes the target of a highly energy efficient and fully decarbonised building stock by 2050 (target point "100"). The dashed line is the direct 35-year reference path from the starting point "0" in 2015 (the reference year when the monitoring of building sector decarbonisation started, based on the adoption of the Paris Agreement) to the target point. The Tracker assumes that the path to the goal is linear, with intermediate milestones in 2025, 2030 and 2040. Reality may differ from a linear pathway; however, this choice makes the benchmarking of progress clearer.

By comparing the evolution of the Tracker (dark blue line) with the reference path (Figure 2) it is clear that decarbonisation of the building stock in the EU is far from being on track and well below the desired levels. Decarbonisation in buildings slowed in 2016 and 2017 and increased by 2019, but only back to the 2015 level. This lack of progress led to almost a doubling of the decarbonisation gap (i.e., the distance between the dark blue line and the dashed grey line) between 2016 and 2019, from 8 to 14 points.

On a more positive note, it can be observed that since 2017 and up to the latest observed values (2019), the decarbonisation index is moving in the right direction. It can therefore be assumed that if ambitious policies were to be applied on all aspects (indicators) composing the Tracker in an accelerated and sustained manner, the positive dynamics observed in the most recent years could be further supported and the gap closed.[16]

Figure 2: Path to climate neutrality 2050 with milestones, EU Tracker[16]

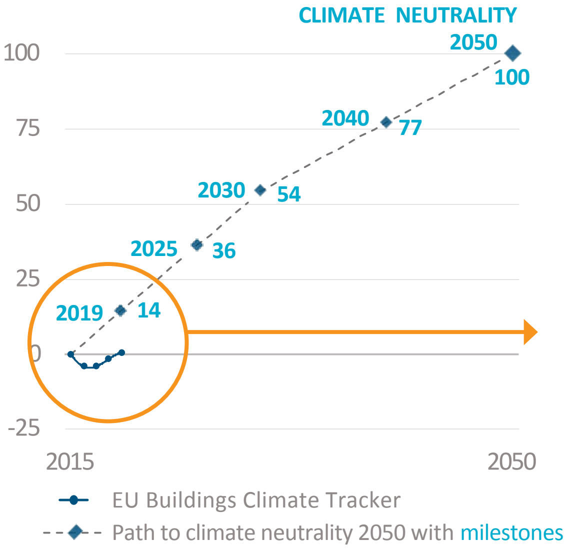
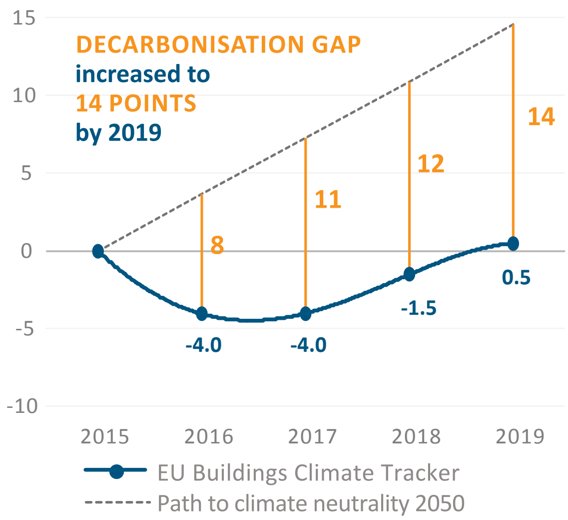


Figure 3: EU Buildings Climate Tracker with growing distances to the path to climate neutrality 2050



[16] The dashed line is the path from the starting point "0" in 2015 to climate neutrality "100" in 2050.

RESULTS
FOR ALL SINGLE INDICATORS

This section presents the results for each indicator individually, both in its original (absolute) and its transformed form.

1. CO_2 EMISSIONS

A. CO_2 EMISSIONS FROM ENERGY USE IN BUILDINGS FROM HOUSEHOLDS

CO_2 emissions from households in 2019 were 4% lower than in 2015 when they should have decreased by 17% according to the reference path. This shows that progress between 2015 and 2019 is insufficient. CO_2 emissions from households did not reduce enough to be on track for the Paris Agreement.

Figure 4: CO_2 emissions from households ($MtCO_2$) 2015–2019

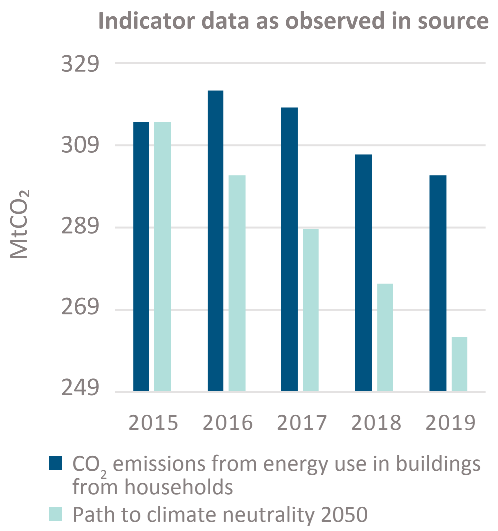


Figure 5: CO_2 emissions from households ($MtCO_2$) 2015–2019 on a normalised scale

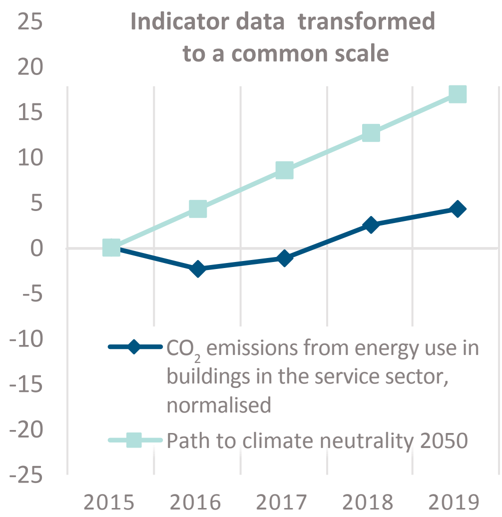
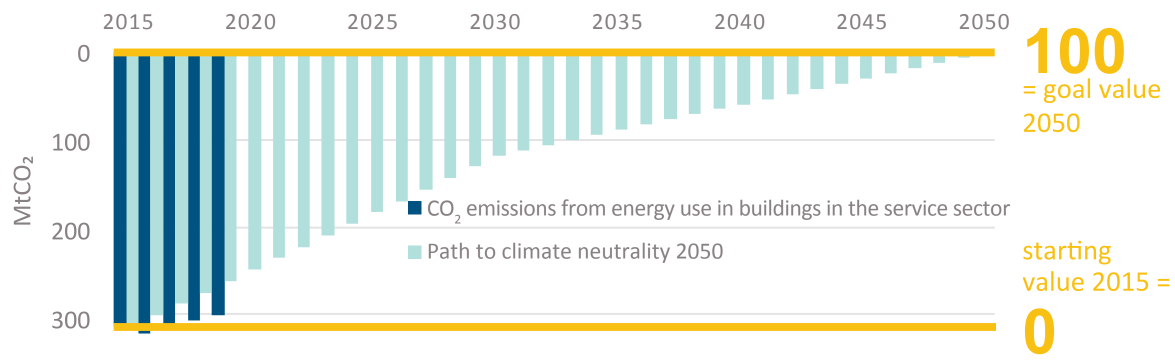


Figure 6 shows that the most important decade for action is between now and 2030, as the reference path is steeper until 2030.

Figure 6: CO_2 emissions from households ($MtCO_2$) 2015–2050, normalised and inverted so upwards represents an improvement. Source: ODYSSEE/ EEA



B. CO_2 EMISSIONS FROM ENERGY USE IN SERVICE-SECTOR BUILDINGS

CO_2 emissions from the service sector in 2019 were 3% lower than in 2015 (133 $MtCO_2$ per year), when they should have decreased by 14% according to the reference path. This shows that progress between 2015 and 2019 is insufficient to be on track with the 2050 objective.

Figure 7: CO_2 emissions from energy use in buildings in the service sector ($MtCO_2$) 2015-2019

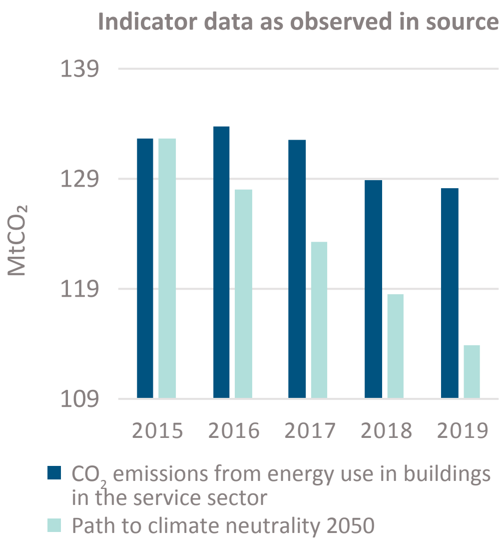
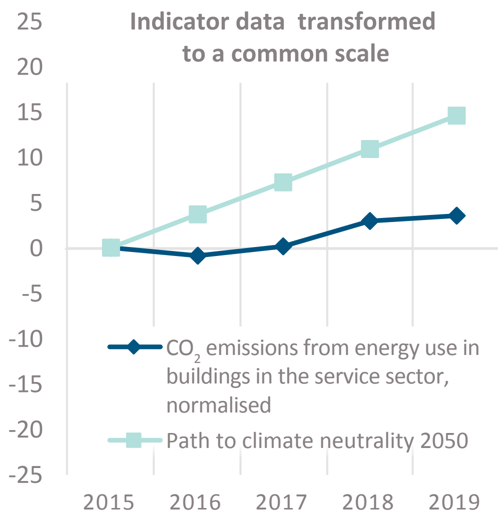
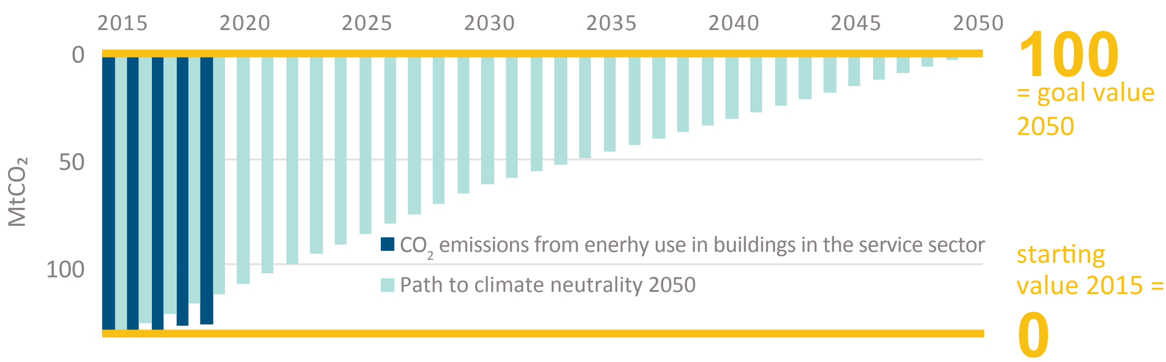


Figure 8: CO_2 emissions from energy use in buildings in the service sector ($MtCO_2$) 2015–2019 on a normalised scale



The complete path to 2050 in Figure 9 shows a need for a continuous reduction in CO_2 emissions for the service sector.

Figure 9: CO_2 emissions from the service sector ($MtCO_2$) 2015–2050, normalised and inverted so upwards represents an improvement. Source: ODYSSEE/ EEA



2. FINAL ENERGY CONSUMPTION IN HOUSEHOLDS AND SERVICES

A. FINAL ENERGY CONSUMPTION IN HOUSEHOLDS

Figure 10: Final energy consumption in households, 2015–2019

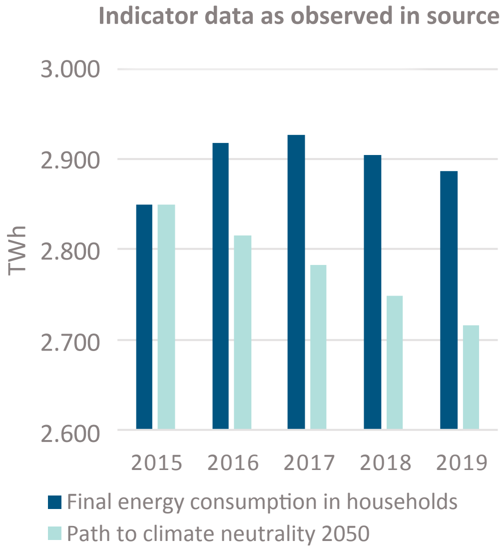


Figure 11: Final energy consumption in households, 2015–2019, on a normalised scale

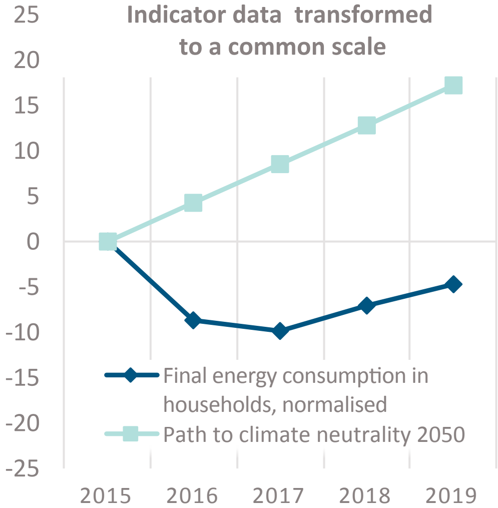
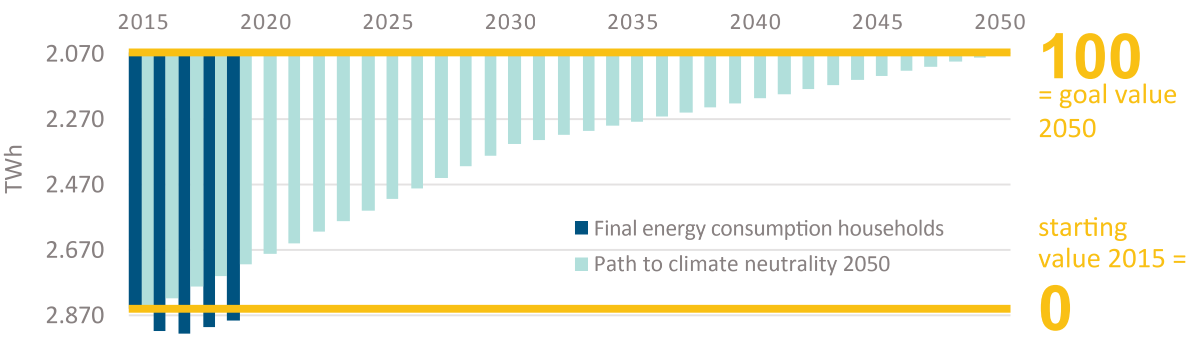


Figure 10 and Figure 11 show negative progress between 2015 and 2019: after an increase in 2016 and 2017, final energy consumption in households decreased but remained above the 2015 starting point, i.e., 2890 TWh per year in 2019 vs. 2850 TWh per year in 2015.

Figure 11 shows how final energy consumption in households is not on track to achieve the 2030 and 2050 milestones. Following the path to goal, final energy consumption in households was expected to decrease on average by 1.3% per year until 2030 and by 0.6% per year between 2030 and 2050.

Figure 12 shows the complete path with the original source scale on the left and the normalised scale used to combine indicators on the right. It shows that the path to goal (light blue) is steeper until 2030, meaning the MIX scenario expects higher energy savings in that period.

Figure 12: Final energy consumption in households 2015–2050, normalised and inverted so upwards represents an improvement. Source: Eurostat



B. FINAL ENERGY CONSUMPTION IN THE SERVICE SECTOR

Final energy consumption in the service sector shows a similar pattern as in households; it is approximately at the same level in 2019 as in 2015 (about 1495 TWh per year). Figure 13 shows that after an increase in 2016 and 2017, final energy consumption in the service sector decreased again but only to remain around 2015 levels. Figure 14 highlights clearly the lack of progress between 2015 and 2019.

Figure 13: Final energy consumption in the service sector, 2015–2019

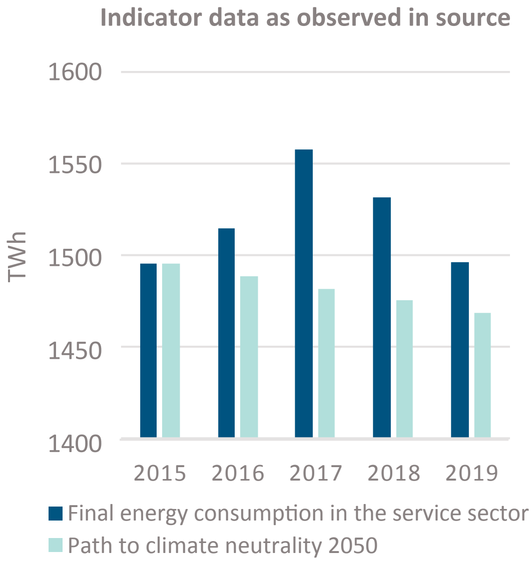
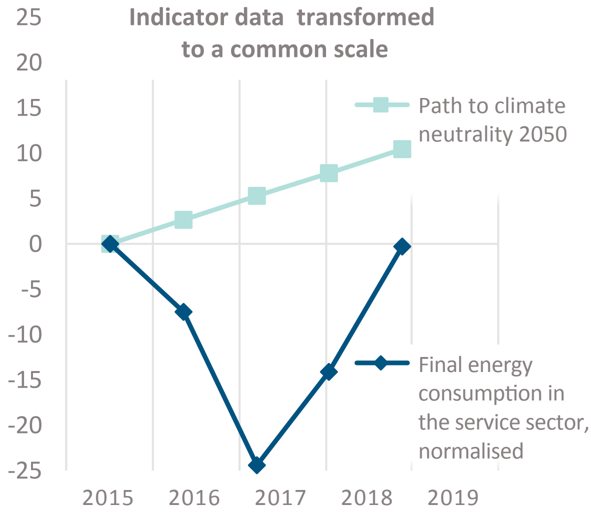
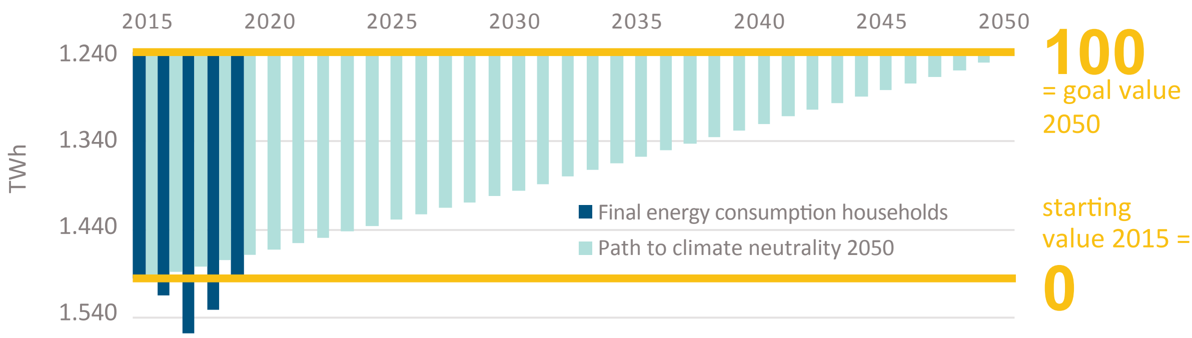


Figure 14: Final energy consumption in the service sector 2015–2019 on a normalised scale



The complete path to 2050 in Figure 15 shows the need for a continuous reduction in final energy for the service sector.

Figure 15: Final energy consumption in the service sector 2015–2050, normalised and inverted so upwards represents an improvement. Source: Eurostat



3. IMPROVEMENT IN EPC RATINGS

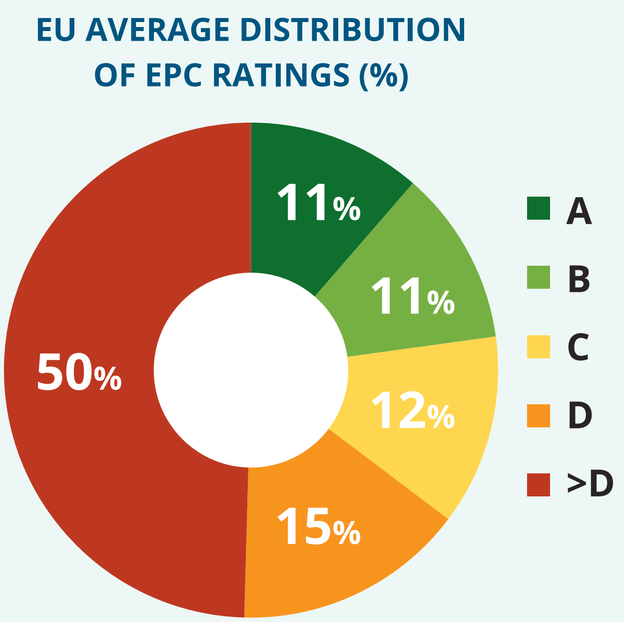
Energy performance certificates (EPCs) are documents containing information on the energy performance of each building and can be considered as the only source of bottom-up information on the performance of the building stock. It is therefore imperative to include the information from EPCs as an indicator in the Tracker. However, there are two caveats to this.

First, there is currently no database at European level that provides up-to-date data on EPC ratings in all Member States. The analysis therefore must rely on getting data from national EPC databases, although most of them are not publicly available. The EPBD recast proposal introduces a provision (Article 19) that would require Member States to open access to their EPC databases. The volume of available EPC data is expected to increase in the future if this provision is adopted.

Second, depending on the Member State, EPC classes refer to very different energy performance thresholds. Therefore, the data collected so far from Member States cannot be easily compared. Again, the EPBD recast proposal introduces a provision requiring Member States to re-scale EPC classes in a more harmonised way, although no estimation is yet available of what this will mean in terms of the distribution of EPC classes in Member States as well as on average in the EU. As this data becomes available in the future, the Tracker indicator will reflect this evolution.

Even considering these two limitations, EPC ratings were included as an indicator in the Tracker as it the only bottom-up information source about the energy performance of buildings, and because improvements in data availability and quality are expected in the future, following the implementation of the EPBD recast. In the meantime, a proxy for the EU average distribution in EPC classes was derived for the year 2021, based on available EPC data. This data covers 14 Member States, representing around 82% of the total useful floor area of buildings in the EU.[17]

Figure 16: EPC ratings, average distribution in the EU



This snapshot of the situation will be used as starting point (reference situation) for future progress analysis. In this first version of the Tracker, only a description of the current situation can be presented, but not a progress report in terms of the distribution of EPC classes on average at EU level. The EPC rating indicator therefore contributes zero improvement points at a weight of 12.5% to the overall composite indicator of the Tracker (2022 edition).

[17] Bulgaria, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Portugal, Slovakia, Spain, Sweden.

4. RENEWABLE ENERGY SHARE

A. SHARE OF ENERGY FROM RENEWABLE SOURCES FOR HEATING AND COOLING

The renewable share for heating and cooling in 2019 (22.4%) was 2.1 percentage points above the level in 2015 (20.3%). Between 2015 and 2019 the renewable share should have increased by 11.3 percentage points according to the reference path instead of 2.1 percentage points. This shows that the increase in renewable energy in heating and cooling between 2015 and 2019 is insufficient and off track.

Figure 17: Share of energy from renewable sources for heating and cooling (%), 2015–2019

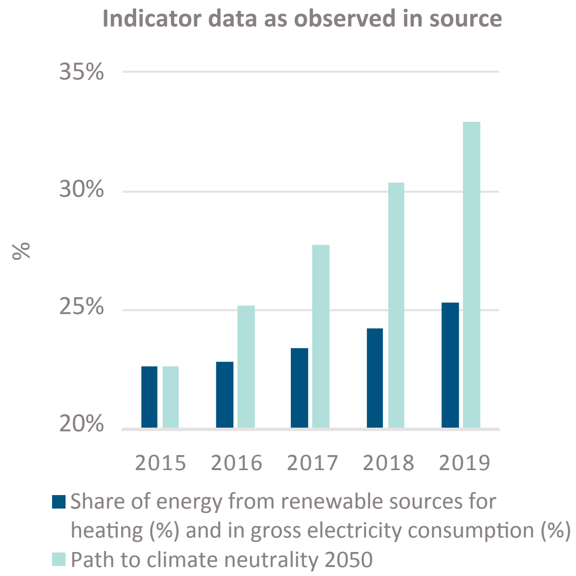


Figure 18: Share of energy from renewable sources for heating and cooling (%), 2015–2019, on a normalised scale

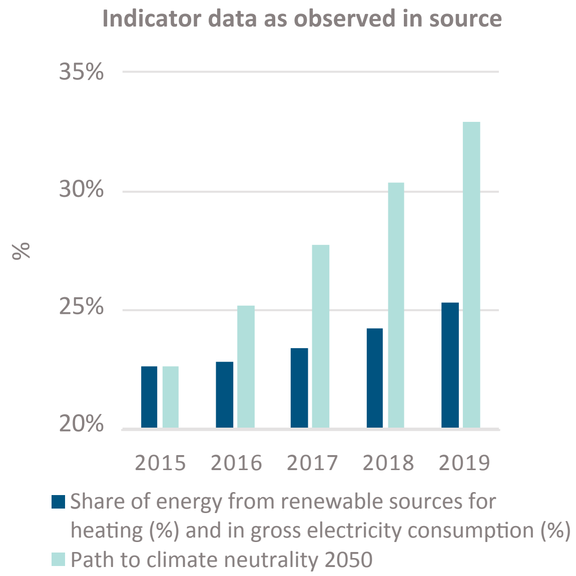
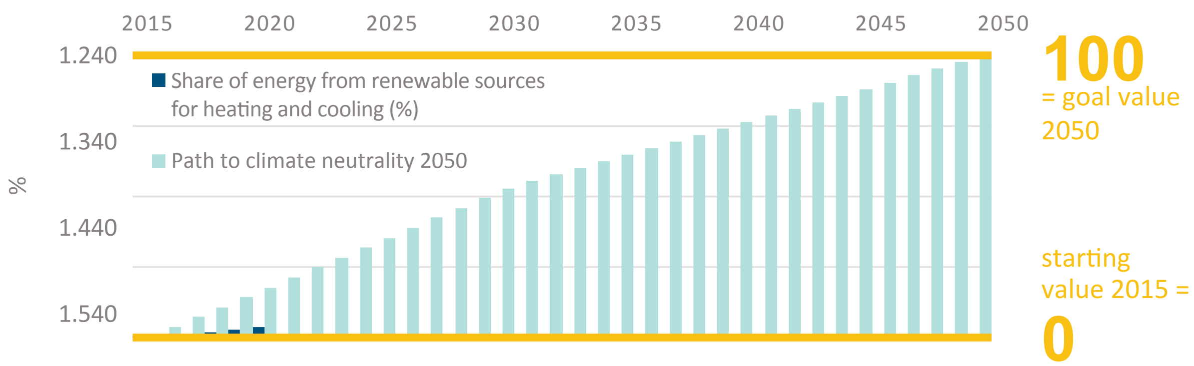


Figure 19 shows how small the improvement is compared to the path to the 2050 goal.

Figure 19: Share of energy from renewable sources for heating and cooling ($MtCO_2$%) 2015–2050 with normalised range. Source: Eurostat



B. SHARE OF ENERGY FROM RENEWABLE SOURCES IN GROSS ELECTRICITY CONSUMPTION

The renewable share in gross electricity consumption in 2019 was above the level in 2015, reaching a share of 34%. This growth almost aligns with the reference path, which requires an increase to 37%. If the energy sector is able to keep accelerating its transformation, it will reach the goal. Until then, the analysis shows that progress between 2015 and 2019 is insufficient, although only marginally.

Figure 20: Share of energy from renewable sources in gross electricity consumption (%) 2015–2019

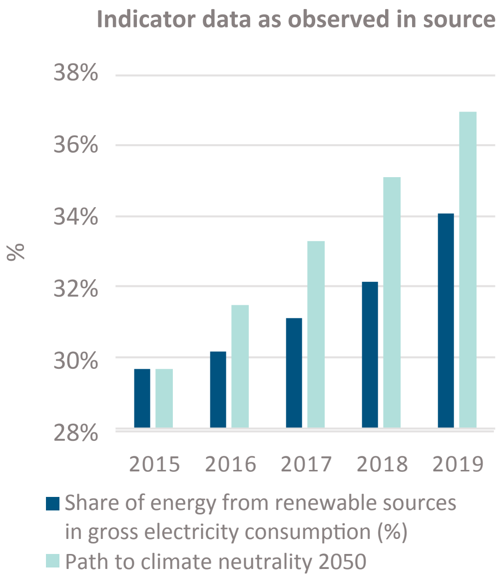


Figure 21: Share of energy from renewable sources in gross electricity consumption (%) 2015–2019 on a normalised scale

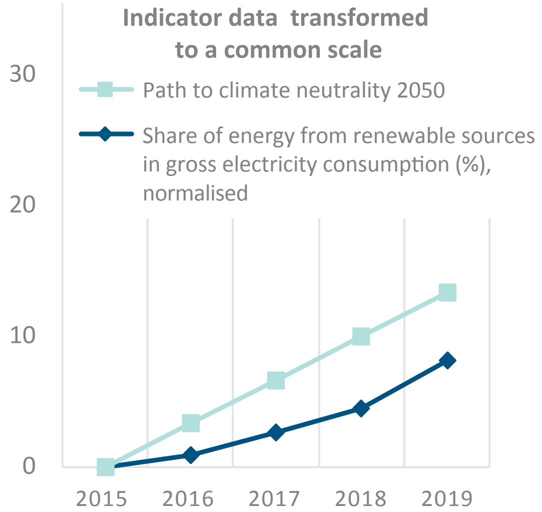
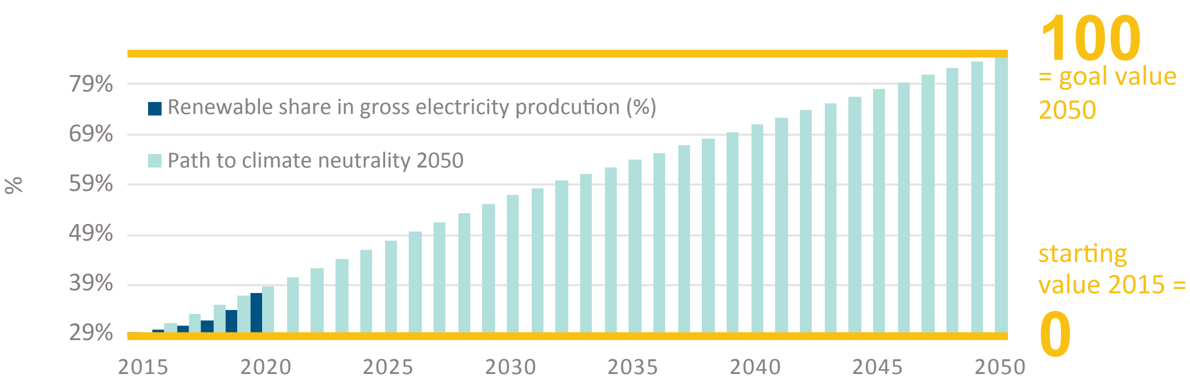


Figure 22 shows how the electricity sector is almost catching up to the path to climate neutrality in 2050 concerning renewables in gross electricity consumption.

Figure 22: Share of energy from renewable sources in gross electricity consumption (%) 2015–2050 with normalised range. Source: Eurostat



5. CUMULATED INVESTMENTS IN RENOVATION IN REAL TERMS

The annual investments in renovation increased by 13.2% between 2015 (280 billion EUR2020) and 2019 (317 billion EUR2020[18]) and accumulate to about 1,500 billion EUR2020. However, in that time frame, the investments should have accumulated to about 1,870 billion EUR2020 and are thus 20% below the path to climate neutrality.

Figure 23: Investments in renovation, 2015–2019

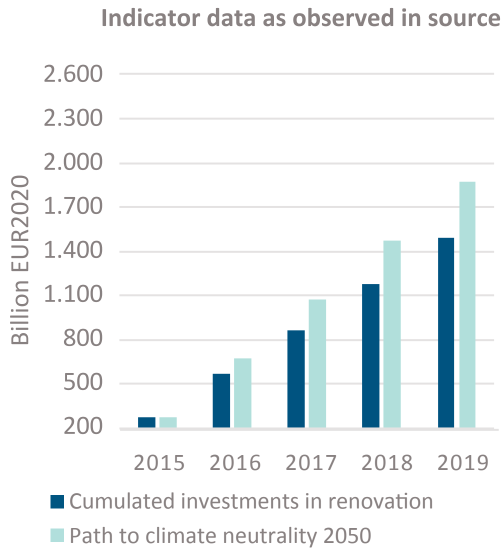


Figure 24: Investments in renovation 2015–2019 on a normalised scale

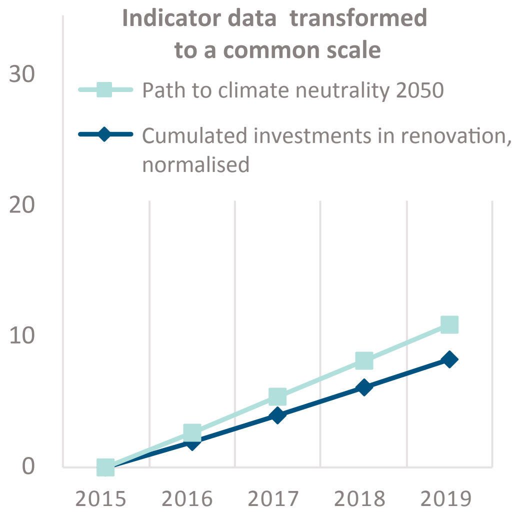
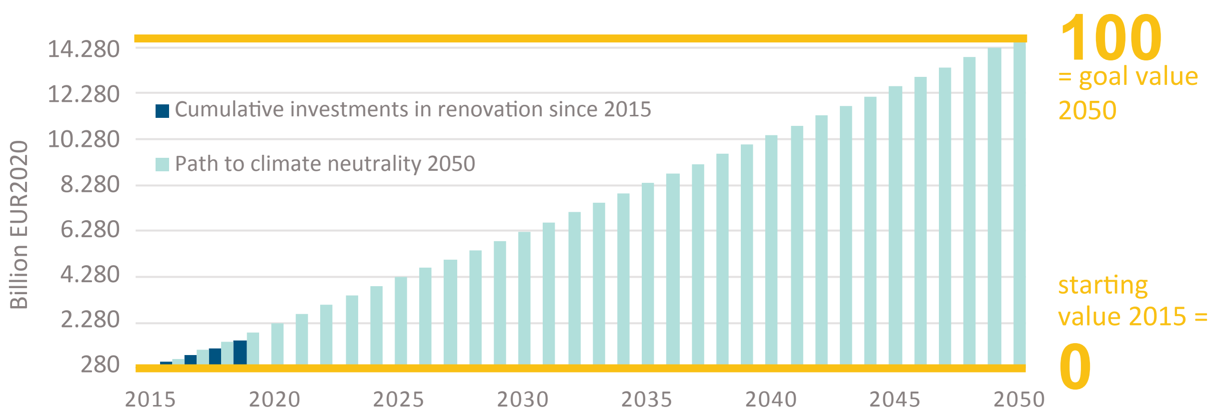


Figure 25 shows that to reach the milestones for 2030 and 2050, investments need to increase further until 2030 following the cumulative reference path based on the MIX scenario.

Figure 25: Investments in renovation, 2015–2050. Source: FIEC



[18] Shown as the differences between the dark blue bars between 2018 and 2019.

6. ANNUAL DOMESTIC ENERGY EXPENDITURES PER HOUSEHOLD

Annual energy expenditures[19] in 2019 are 4% lower than in 2015 (1,427 EUR2010) which is exactly how much they should have decreased according to the reference path. The progress between 2015 and 2019 is on track.[20] However, considering that the rate at which energy expenditures[21] are decreasing is slowing down, there is a risk that it will fall below the path to climate neutrality (light blue). This could be explained by several factors, such as (i) an increase in the average size of dwellings, (ii) the slower diffusion of energy-efficient heating methods, and (iii) slower renovation rate.

Figure 26: Annual domestic energy expenditure per household (EUR2010), 2015–2019

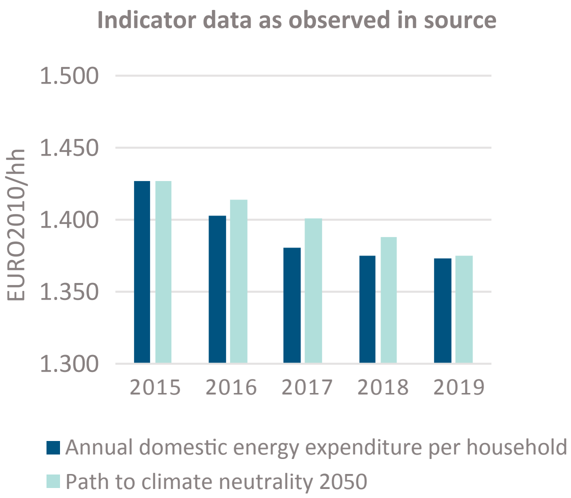


Figure 27: Annual domestic energy expenditure per household (EUR2010), 2015–2019 on a normalised scale

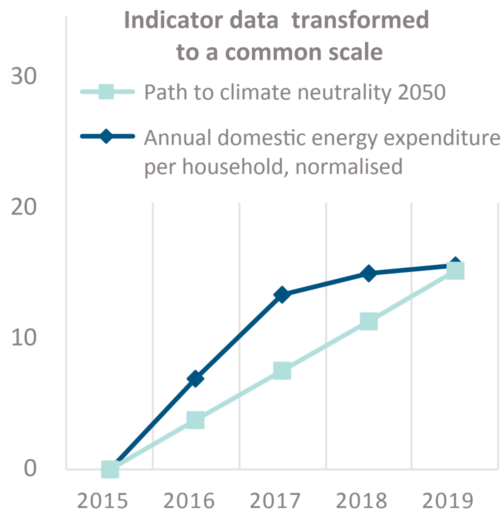
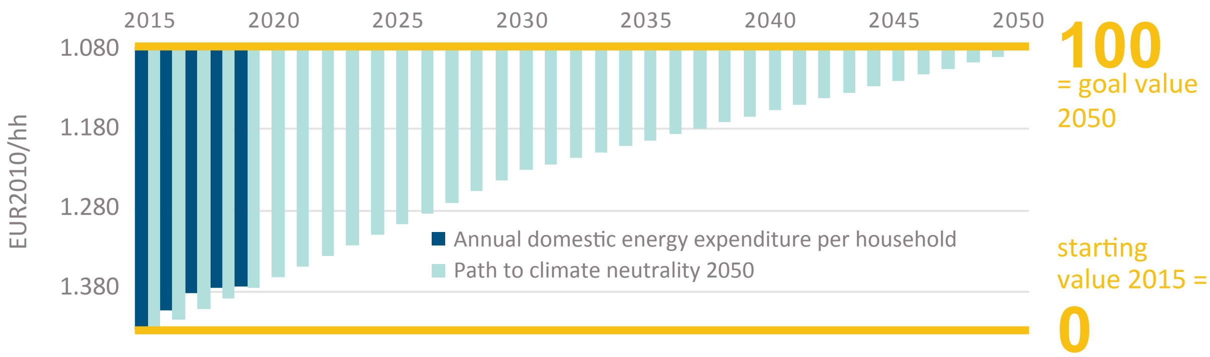


Figure 28 shows that domestic energy expenditures per household are expected to steadily decrease (in 2010 Euro values).

Figure 28: Annual domestic energy expenditure per household (EUR2010) with a normalised scale. Source: ODYSSEE



[19] This indicator is inflation-corrected, meaning energy price changes will not have a large influence on it.
[20] Recent energy price developments are not considered as the data is shown only until 2019.
[21] The indicator is inflation-corrected, which means that growing inflation, which is closely connected to growing energy prices, will not lead to an increase in this indicator.

Conclusion

THE EU BUILDINGS CLIMATE TRACKER INDEX AS WELL AS RESULTS FOR THE INDIVIDUAL INDICATORS HELP TO ANSWER THE INITIAL QUESTIONS:

- **How is the decarbonisation of the building stock in the EU evolving since 2015?**
- **Is the building stock improving enough to achieve climate neutrality in 2050?**
- **If not, how much more does it need to improve between latest observations and 2050, to achieve climate neutrality in 2050?**

After some initial fallback, since 2017 decarbonisation of the building stock in the EU can be observed, albeit not at all at the speed required. Considering the strong catch-up needed to stay on track with the climate-neutrality path by 2050, there is no time to lose. The only way to keep the promises of the Paris Agreement alive is to pick up speed, adopt bold policies and stop delaying actions.

	INDICATOR	OBSERVATION	COLOUR CODE
1	CO_2 emissions from energy use in buildings for households and services	**OFF** track	
	• Households	**OFF** track	
	• Services	**OFF** track	
2	Final energy consumption for households and services	**FAR OFF** track	
	• Households	**FAR OFF** track	
	• Services	**FAR OFF** track	
3	Improvement in EPC ratings	**NOT** trackable	
4	Renewable energy share	**OFF** track	
	• Share of energy from renewable sources for heating and cooling	**OFF** track	
	• Share of energy from renewable sources in gross electricity consumption	**ALMOST ON** track	
5	Cumulated investment in renovation in real terms	**ALMOST ON** track	
6	Annual domestic energy expenditure per household in real terms	**ON** track	

ANNEX:
TRANSFORMING THE INDICATORS INTO A COMPARABLE FORM

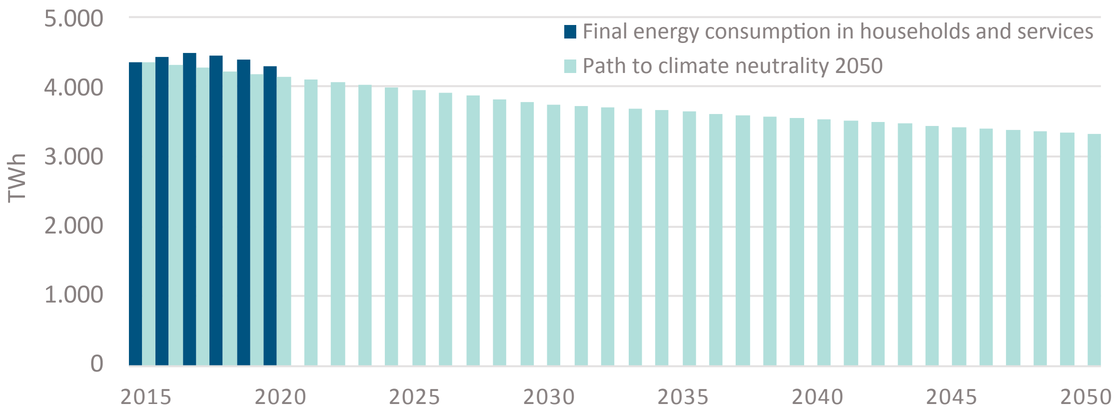
A step-by-step approach explained by the example of final energy consumption

Indicators are created through multiple steps. This transformation enables their aggregation into a final index (a composite indicator), the EU Buildings Climate Tracker.

Below, we explain the four steps undertaken for the transformation of the indicators by using final energy consumption in households and the service sector as an example.

This indicator tracks the final energy consumption reported by Eurostat for households and services. The absolute values of the data collected on the original scale are shown in dark blue. The light blue draws a linear direct path connecting the starting point in 2015 and the target values for 2030 and for 2050 that are defined based on the Fit for 55 package.[22]

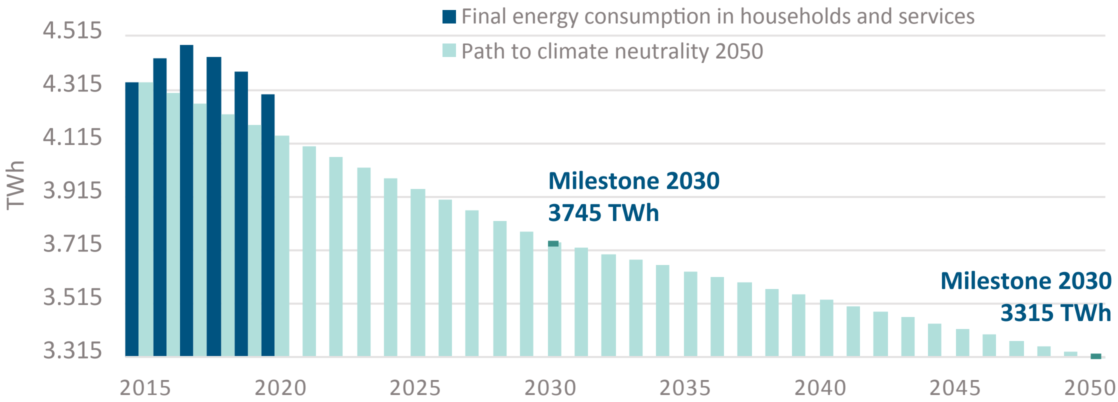
Figure 29: Final energy consumption in households and the service sector (TWh) 2015–2050



In step 1 the absolute values of the data are collected. In the next step, the axis is only shown between the starting point in 2015 and the goal value to be reached in 2050 (direct reference path) and observed values only if they exceed the range. The excerpt shown in Figure 30 visualises the path to climate neutrality in 2050 and how it relates to the original absolute data in Figure 29. The figure below shows how the original values perform against the reference path, drawn in light blue bars, and the 2030 and 2050 EU milestones. The figure shows that the reported final energy consumption for households and the service sector is above the reference values for 2016–2019 and even grew until 2017. By contrast, the reference path prescribes a steady reduction.

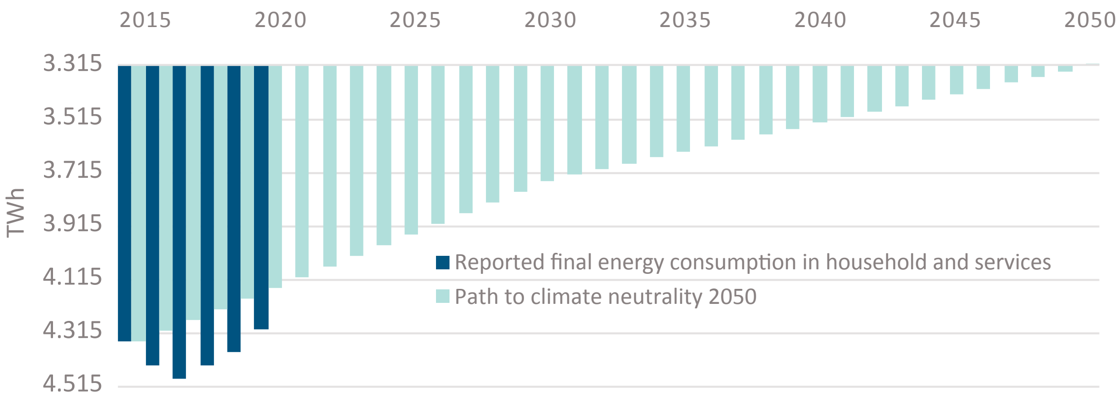
[22] 'Fit for 55' package: Revision of the Effort-Sharing Regulation | Think Tank | European Parliament (europa.eu)

Figure 30: Final energy consumption in households and the service sector, 2015–2050. This graph shows the emission range between the starting point in 2015 and the goal value in 2050.



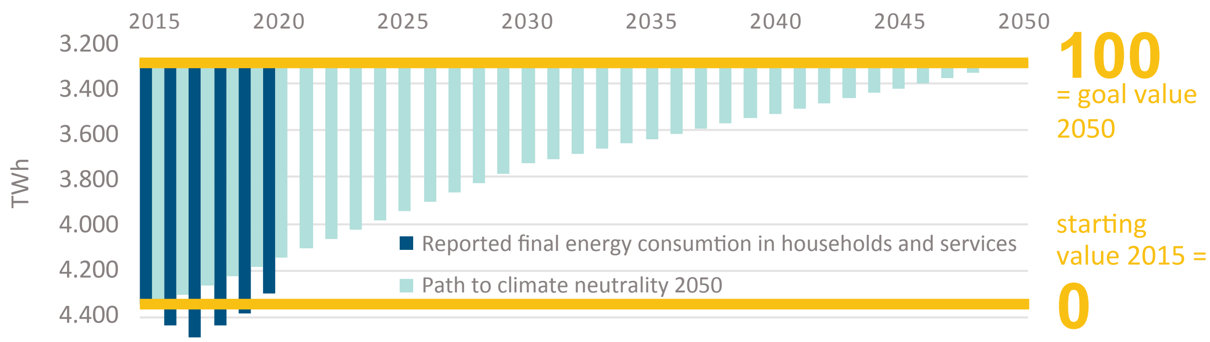
Step 2. The orientation of the graph is then adjusted, to enable the creation of an index. In line with the Global BCT, a higher EU BCT value means a higher degree of decarbonisation, i.e., the higher the better. This means that the lower energy consumption needs to correspond to a higher value of the EU BCT. For this reason, the orientation of the graph is inverted so upwards represents an improvement, as shown in Figure 31 below.

Figure 31: Final energy consumption households and the service sector 2015–2050, inverted



Step 3. The scale is then normalised and all values between 2015 and 2050 are projected on a range between 0 and 100. This allows the comparison of each indicator from year to year.

Figure 32: Final energy consumption households and the service sector 2015–2050, inverted and with normalisation range



If we take the example of final energy consumption, we observe that the transformed values are negative, which means that the indicator is **moving away from the target.** In this case, the energy consumption increased after 2015 when it should have been decreasing.

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